A STRATEGIC ANALYSIS AND OPTIMIZATION OF LOGISTICS NETWORKS AND PROJECT SUPPORT IN MODERN LOGISTICS MANAGEMENT IN DHL

CONTENTS

INTRODUCTION

The discipline of logistics plays a strategic support role in businesses in a variety of industries, considering about well products, services or information will flow between suppliers and customers (Van England et al., 2020). A logistics operation in the present cut throat and global environment strongly determines a firm's ability to sustain its market standing. Logistics chains grow complex, and organisations have no other option than to adopt new technologies and efficient processes in the supply chain to enhance productivity. Logistics management enhances organization responsiveness to custom demands, speeds up the flow of materials around the firm, and ensures the overall business success, which makes it a key factor for any organization that is looking to sustain itself in the future (Aloui et al., 2021).

CHAPTER ONE: Strategic approaches to maintain logistics network

Introduction to establish the foundation of Logistics Management

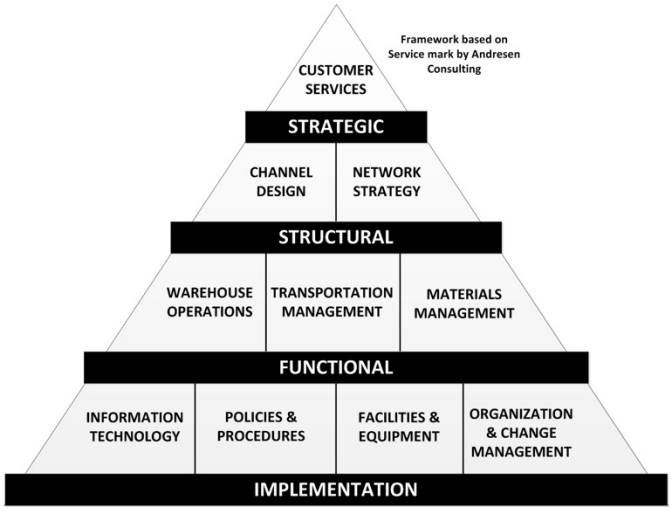


Figure1. Strategic approach for logistics network

Source: (Aloui, Hamani and Delahoche, 2021)

The measures to address the strategically approaches related to the management of global logistics networks, It could be considered that the management of such networks includes many methods which depend on the industry and the environment (Aloui, Hamani and Delahoche, 2021). Logistic management can thus be referred to as an efficient plan that makes it possible for the firms to channel their products in the various channels at the right cost and time. Many businesses subject its supply chain to national and international laws, transport network, and political risks, among others, which makes supply chain management challenging (Bányai et al., 2019). On the other hand, local supply chains are faced with smaller lead times and lower geopolitical volatility but need to look at issues of demand risk and fluctuating transportation cost. In large supply chain networks of the global environment, implementing the idea of hubs and spokes, the giant distribution centers act as chief hub centers that support other minor places called spokes. Some aspects of this approach are reduction of lead time in shipment, especially in the international arena and inventory placement (D'Amico et al., 2021).

Significance of strategic approaches for various businesses

This model is applied in the electronics sector for instance, to cut on the costs that may be required in transporting or warehousing expensive goods (Gudehus, 2020). However, the local supply chain could create a network of distribution points, which are independent from each other because supply points are located near the demand points, thus eradicating the long distance transportation (Hu, 2024). An industry that provides one classic example of SSN strategy in supply chain networks is the fashion industry and one such company is Reusch. Generally, Reusch logistics system focuses on swift reaction to the changes in fashion trends, and this makes the company can progress from design to the shelves in a short span of weeks. This is done based on the established distribution network, centralized in Spain while outsourcing manufacturing in neighboring countries. Hence, due to a combination of internal and third-party logistics, Reusch is capable of offering its sales correspondingly without compromising on costs (Issaoui, 2022).

Automotive industry on the other has more structured and long term logistics networks in place. Both BMW as well as other producers use another production technique known as Just in Time (JIT) system (Kovalenko, 2024). The system of ensuring that the flow of all parts matches the demand generated by the customers and reduced inventory holding cost and material wastage but considerable coordination with the suppliers to avoid stock out. The JIT model is very powerful on the supply chain management in which the suppliers, manufacturers, and other logistics companies have to ensure components are shipped as when required (Kucukaltan et al., 2020).

CHAPTER TWO: Operational Scenarios in Logistics and Their Impact on Business Development of DHL

Operational scenarios in logistics networks

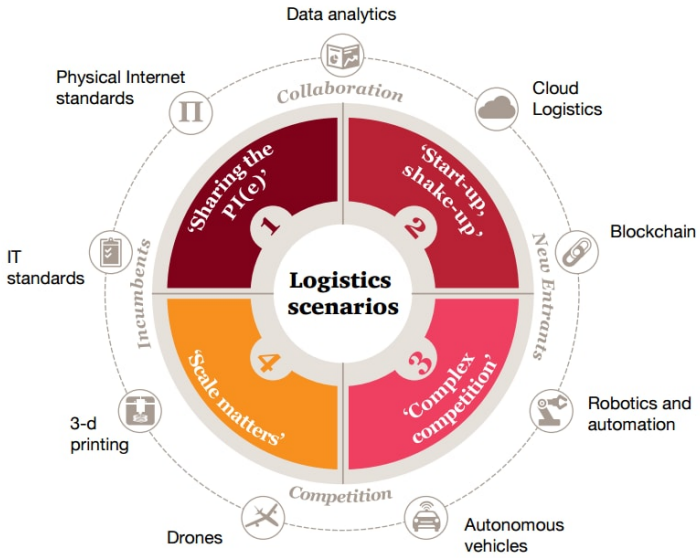


Figure2. Logistic operational scenarios

Source: (Lagorio et al., 2020)

Various types of operations create certain difficulties and open some perspective impacts for the companies working in the sphere of logistics. This operational scenario involves such as automation in the warehouse, robotics etc (Lagorio et al., 2020). The e-commerce industry has shifted the view of organization logistics entirely bearing in mind the final delivery of customer orders and the time taken in this process. Many retailers such as DHL have created logistic networks that focus on fast and efficient ways of delivering their products to millions of customers at a single click away or within the next day. Operating in the retail sector, logistics means a great deal (Li, 2024). This is responsible for constant replenishment of products available in stores. There is the challenge of having low stock and hence low holding costs but, at the same time, there should be no stock outs, particularly in products that are selling well on the market. Some firms have compounded supply chain forecasting systems that accurately estimate customers need at a certain time and ensure that goods are transported properly to the required locations. Giants like

Aldi with these models. Aldi has employed data analytics and the best supply chain management software in which the various stores in the chain are run efficiently with low expenses to the side of high customer satisfaction (Pasupuleti et al., 2024).

Overall development of DHL

The companies operating in the manufacturing sector encounter diverse operational issues when it comes to logistics management (Rejeb, Simske and Rejeb, 2020). They are more complex and extended than those of the industrial companies that include several suppliers and manufacturers and distribution channels. In electronics manufacturing industry, there are so many components that are ordered from different suppliers and organizations and all must be timed appropriately to meet production schedules. For example, if for some reason one of the requisite subassemblies has not been delivered on time, then the entire assembly process comes to a halt, due to this, the manufacturers employ the Supply chain Diversity technique and there will always be some stocks known as safety stocks to avoid the disruption of stocks (Ren et al., 2020). The organizational strategies that are put in place as a reaction to these working plans are also very important to the overall development of the firm. E-tailing business that is most efficient in organizing and executing its supply chain management and prompt and reliable delivery will have a competitive advantage of gaining more market share and gain the loyalty of customers. On the other hand the other manufacturers who already enjoy conducive and efficient logistic structure can also contain the cost and streamline the production to outcompete other players in the market (Shcherbakov and Silkina, 2021).

CHAPTER THREE: Case study: Supply chain modeling in DHL Company of logistics Germany

Supply chain modeling in DHL

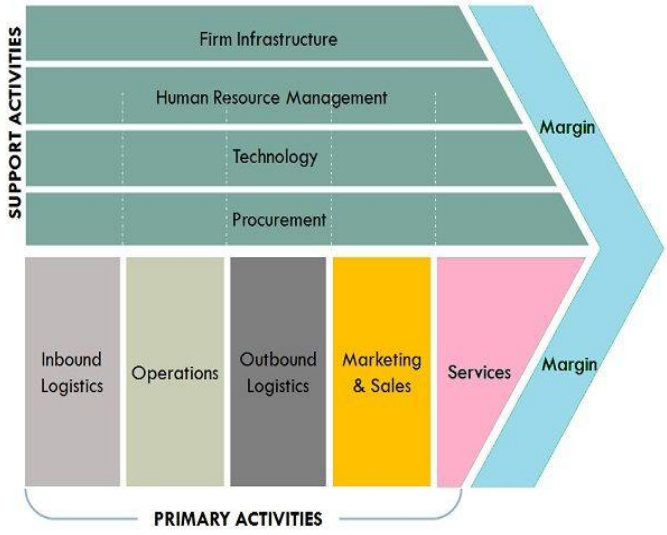


Figure3. Supply chain modelling in DHL

Source: (Sun et al., 2021)

Discussing the complicated nature of the supply chain and its management, Examination of the means by which one of the leading logistics companies of the world, a German-based DHL, secured its success and provided its clients with the specimen of a perfectly arranged and optimized supply system (Sun et al., 2021). It had a wide range of service portfolio ranging from parcel as well as express mail, air, ocean conveying and warehouse as well as distribution. The DHL logistics network structure is to adopt the hub-and-spoke system while major regional hubs are placed in different continents such that goods can easily be transferred between markets. Through the analyses provided by this model, DHL can effectively and efficiently deliver services across all sectors ranging from E-commerce/retail, automotive, health, etc (Van Engeland et al., 2020). In its operation, technology is also incorporated in DHL including live tracking functionality, smart high- bay warehouse and business intelligence to foresee future trends in the market. DHL's organization practices the automation of facilities in some of it's the Warehouse in Germany

through Robotics and artificial intelligence in order picking and identification of products for order reducing the costs and increasing on efficiency (Wang, Peng and Xu, 2021).

Transportation management systems (TMS) are also used to determine the best ways to make deliveries, group that shipment and track the flow of products across the company's supply chain to make sure that it delivers its goods on time and at the least possible transportation expenses (Aloui, Hamani and Delahoche, 2021). A significant enabler that puts much weight on the logistics operation at DHL is increased customers demand for speedy and speedy deliveries particularly in e-commerce where customers insist on having their consignments delivered within the shortest time, or at worst, the next day (Bányai et al., 2019). DHL has put capital in last mile delivery solutions including parcel locker and crowd solution. The company has thousands of pick up shops in Germany and other countries where the orders can be collected at one's leisure and convenience and no delivery is made to the doorstep. Considering the fact that the environmental issues are on the rise DHL has come up with sustainable logistics solutions (D'Amico et al., 2021).

CHAPTER FOUR: Challenges in supply chain and logistics network management

Common challenges in supply chain and logistics network management

Figure4. Challenges in supply chain

Source: (Gudehus, 2020)

Supply chain and logistics network management is a function that is confronted by many challenges most of which are magnified by the growing significance of globalization (Gudehus, 2020). A major one is demand fluctuation where customers propensity to order products results in supply chain irregularities. This often leads to stock out, where a product is out of stock when demanded, or stock in, where excess stock occupy the space and cost money to store. Most of the organizations employ the demand forecasting models which are business prediction tools which incorporate past buying patterns, statistical methods and other tools to discover future demand. One more often encountered problem is that understanding and supply chain management across borders can become problematic for the company (Hu, 2024). There are still other constraints, which an organization is likely to experience in the course of conducting its activities in the international system which include restrictions and bans in imports or exports by customs, alteration of the tariff levels, disruption of transport and among others. This means going to over two countries because companies which invest in over one country are likely to encounter different legal systems that cause more time wastage or additional expenses (Issaoui, 2022).

Strategic solutions to the challenges

To ensure that this problem is overcome, it is evident that supply chain visibility software has adopted the ability to track stocks in different supply chains (Kovalenko, 2024). These tools assist in the ability of companies to anticipate certain types of delay so that corrective action can be taken where and if necessary. The growth of e-commerce has also brought new issues of last-mile delivery, which can be the most costly and inefficient segment of supply chain (Kucukaltan et al., 2020). Traffic density, delivery problem, and the demand of the client to receive their products early have pushed consumable companies to revise their last-mile delivery strategies. Other strategies like crowd-based delivery professionals, associated with drone deliveries, locker points for pickup are to be implemented to minimize such impacts. Distribution is one of the stages of the logistic chain and therefore plays the role of the connection between procurement and usage of goods increasing complexity of global trade (Lagorio et al., 2020).

CHAPTER FIVE: Role of warehousing in logistics operations of DHL

Role of warehousing

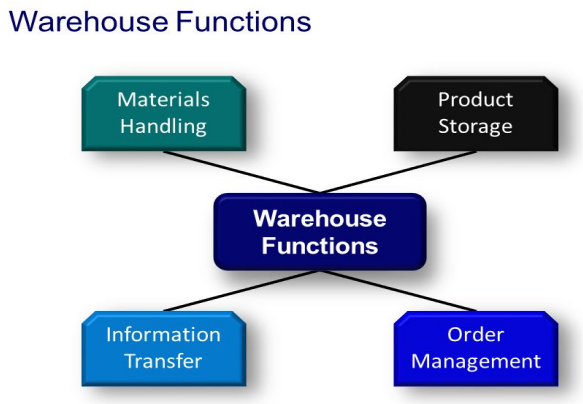


Figure5. Role of warehousing

Source: (Li, 2024)

Warehousing is critical element of logistics operations, acting as intermediary between supply and demand. Warehouse generally serve as an area where the products are kept until they are required but have of late provided other services like packing, branding as well as simple construction (Li, 2024). The position of the warehouses is however one of the most important factors that concern the efficiency of the said warehouses to the total efficiency of the company in as much as or meeting the customer needs and the minimum cost possible. Therefore, in the manufacturing factories, the overall primary function of a warehouse is to ensure that the production line has the requirement raw materials (Pasupuleti et al., 2024). JIT manufacturing systems are based on the arrival of components necessary to sustain the continuity of the manufacturing process. Manufacturing firms require the distribution centers to hold a large quantity of stock, as well as the ability and space to store the stock as it flows through the distribution channel. Technology is among the areas that are gradually being adopted in most of the warehousing businesses by using automation systems, automated storage and retrieval systems (AS/RS), Warehouse management systems (WMS). The mechanical picking and packing of the items, makes it possible for the large volumes of goods to pass through the warehouse without the need for more human power (Rejeb, Simske and Rejeb, 2020).

CHAPTER SIX: Strategies for efficient warehousing and distribution operation

Strategies for efficient warehousing

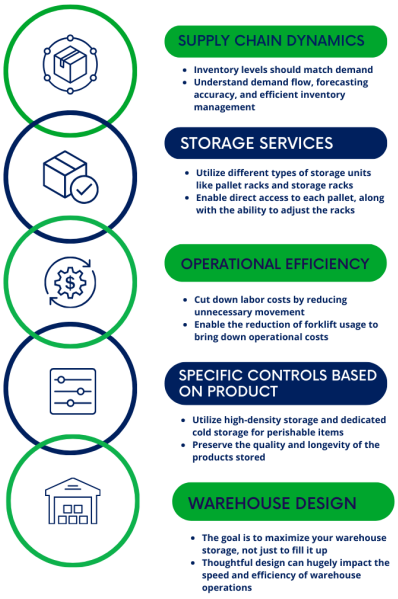


Figure6. Strategies for efficient warehousing

Source: (Ren et al., 2020)

In the warehousing and distribution context the firms have to pursue strategies that would create efficiency while at the same time reducing costs (Ren et al., 2020). One of them is cross-docking a maneuver where products are sort and transfer and from the incoming transport to the outgoing transport that takes it directly to clients without any stocking in middle-wear house. This is useful given that there are firms that engage in the sale of products with low durability or bargaining stocks in that it helps cut on the amount of money that would be spent on handling and storing of the products (Shcherbakov and Silkina, 2021). Here we encounter the layout of a warehouse which means the selection of the most appropriate pattern of a warehouse so that one can effectively utilize the space within a structure. Storage space technologies which include vertical racking systems and automatic guided vehicles are other succeeds warehousing techniques that help warehousing companies to store more products in a small space. It also improves easy stock management through monitoring of the inventory in the warehouses and will prevent a time when the physical stock will be out or restocking the inventory where necessary (Sun et al., 2021).

Distribution operations of DHL in logistics

Distribution Centre, in particularly those owned by manufacturing organizations, must be equipped to store large quantities of parts and products, while avoiding excessive stock (Van Engeland et al., 2020). Being able to automate some aspects of a warehouse's function is becoming a central feature of modern supply chain management. They also pointed at the use of further technological devices including robotics, AS/RS, and WMS as key strategies of cutting the costs significantly, and increasing the efficiency and accuracy of the process. Some of these include picking and packing, whereby applying technology the warehouse is able to handle more stocks due to reduced cost of employing more workers in the warehouse (Wang, Peng and Xu, 2021). In an effort to improve overall warehousing and distribution, companies need to devise strategies that will guarantee optimal performance, but at the same time, control the cost. A common one is the cross-docking which refers to situation where products are not even stored in a warehouse but are relayed directly from the inbound transportation system to an outbound one. Cross-docking eliminates handling expenses and reductions stock storage time, it is appropriate for companies that handle perishable products and/ or fast-moving products (Aloui, Hamani and Delahoche, 2021).

CHAPTER SEVEN: Transportation management in logistics of DHL

Transportation management in DHL logistics

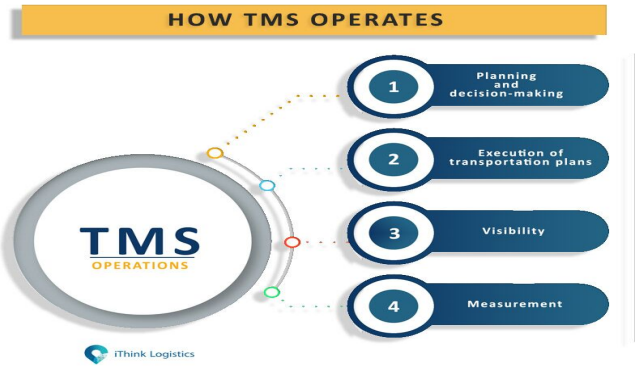


Figure7. Transportation management in DHL logistics

Source: (Bányai et al., 2019)

Transportation management is a key element of the logistics activities, and the transportation mode selected affects delivery time, cost and customer satisfaction. Amongst the factors which are considered include nature of the products that are to be transported (Kucukaltan et al., 2020). Another emerging change that has been identified in the field of transportation management in logistics is the new shifts registered in the light of growing sustainability concern. Companies are slowly looking for ways on how to reduce carbon footprint by incorporating green modes of transport including electric cars, electric trains, and electric ships (Lagorio et al., 2020). The search for environmentally sustainable and socially responsible ways by which companies can cut down on the amount of carbon emissions that their transport facilities produce has seen some companies turn to bio fuels. Most of these sustainability efforts have not only a positive effect of environment but also have positive outcomes in relation to corporate image and meet the objectives of CSR. Earlier on than the actual process of logistics was much more directed in the goods transported and about the warehoused, but this has evolved. Logistics has evolved from the simple management of inventory and timely shipment of material to complex processes of order allocation, storing, tracking real time information and highly developed theory of demand planning. These are vital aspects in making certain products get to their intended destination in the right time and at the lowest possible cost (Li, 2024).

CHAPTER EIGHT: Inventory management technique in DHL logistics

Inventory management technique

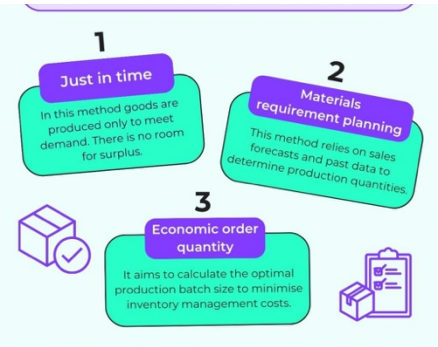


Figure8. Inventory management techniques

Source: (Pasupuleti et al., 2024)

Inventory control is one of the most crucial practices in the supply chain management because it is a flow of stock in a system (Pasupuleti et al., 2024). One of those techniques that are used to manage inventory is the Just-in-Time (JIT) that regards ordering inventory when it is needed for production or reselling. JIT systems are really helpful in those organizations which purchase/commercialize products that are perishable (Rejeb, Simske and Rejeb, 2020). Those products whose value degrades or demand drops significantly within a comparatively short period of time, such as processed or unprocessed foods or fashionable clothes. There is another type of the inventories which are arranged according to their value or frequency and it is called ABC analysis. This categorization makes it easier for companies to identify which inventory items requires most of its attention and thus minimizes chances of having stale products (Ren et al., 2020).

CHAPTER NINE: Project support management in logistics of DHL

Project Support management

Figure10. Project Support management

Source: (Shcherbakov and Silkina, 2021)

Project support management is important in the implementation of logistics as it is responsible for managing all projects that would alter the state of the supply chain (Shcherbakov and Silkina, 2021). PSM is used to provide for the successful completion of a number of logistics projects such as the implementation of new technologies, establishment of new channels of distribution, or the development of transport networks. PSM is very important especially in large projects which may involve the different players like suppliers, manufacturers and logistics service providers (Sun et al., 2021). As a result of effective PSM, all stakeholders understand project objectives and the right resources are deployed for its completion. The researchers have noted that the efficient control of the logistics networks is perceived as key competitive success factor in the domestic and the global environment. It also should include the other factors such as the consumers, the available policies, rules and regulations, and other advanced technologies in the process (Van Engeland et al., 2020).

CONCLUDING REMARKS

Logistics management is a specialized area of learning that encompasses sharing of information and expertise in supply chain, stocks management and transportation, warehousing, inventory and material support. Logistics networks are beneficial for businesses as they help to enhance flow analysis and productivity, reduce cost and raise the customer satisfaction level. This picture demonstrates that only the companies' supply chains that use technologies, implement the best practices in their logistics framework, and adapt the necessary increase in flexibility meet the current market requirements. Therefore, it can be argued that Project Support Management is of paramount significant in the achievement of logistics projects in the stipulated time and cost which in turn facilitates the achievement of logistics operations. So it could be conclude that continuous examination and optimization of the logistics operations play a central role in creating growth and operational performance without compromising on the competitive world market.

BIBLIOGRAPHY

Aloui, A., Hamani, N. and Delahoche, L. (2021). Designing a Resilient and Sustainable Logistics Network under Epidemic Disruptions and Demand Uncertainty. Sustainability, 13(24), p.14053. doi: https://doi.org/10.3390/su132414053.

Bányai, Á., Illés, B., Glistau, E., Machado, N.I.C., Tamás, P., Manzoor, F. and Bányai, T. (2019). Smart Cyber-Physical Manufacturing: Extended and Real-Time Optimization of Logistics Resources in Matrix Production. Applied Sciences, 9(7), p.1287. doi: https://doi.org/10.3390/app9071287.

D'Amico, G., Szopik-Depczyńska, K., Dembińska, I. and Ioppolo, G. (2021). Smart and sustainable logistics of Port cities: A framework for comprehending enabling factors, domains and goals. Sustainable Cities and Society, [online] 69(1), p.102801. doi: https://doi.org/10.1016/j.scs.2021.102801.

Gudehus, T. (2020). Comprehensive Logistics. [online] Google Books. Available at: https://books.google.com/books?hl=en&lr=&id=moZOiEvXdyYC&oi=fnd&pg=PR6&dq=Strategic+Analysis+and+Optimization+of+Logistics+Networks+and+Project+Support+in+Modern+Logistics+Management+article+since+2020&ots=Pc6rJ33a4R&sig=EywPccSSvLJjunFZpmx9PkOvXvI

Hu, J. (2024). Collaborative filtering based talent development algorithm in sustainable modern logistics management project. Journal of Industrial and Production Engineering, 41(7), pp.577–590. doi: https://doi.org/10.1080/21681015.2024.2351502.

Issaoui, Y. (2022). An Advanced System to Enhance and Optimize Delivery Operations in a Smart Logistics Environment. [online] ieeexplore.ieee.org. Available at: https://ieeexplore.ieee.org/abstract/document/9673768/.

Kovalenko, E. (2024). ProQuest - ProQuest. [online] Proquest.com. Available at: https://search.proquest.com/openview/501f7df70c9b719d019be216f10d8e58/1?pq-origsite=gscholar&cbl=38745.

Kucukaltan, B., Saatcioglu, O.Y., Irani, Z. and Tuna, O. (2020). Gaining strategic insights into Logistics 4.0: expectations and impacts*. Production Planning & Control, pp.1–17. doi: https://doi.org/10.1080/09537287.2020.1810760.

Lagorio, A., Zenezini, G., Mangano, G. and Pinto, R. (2020). A systematic literature review of innovative technologies adopted in logistics management. International Journal of Logistics Research and Applications, 25(7), pp.1–24. doi: https://doi.org/10.1080/13675567.2020.1850661.

Li, X. (2024). Optimization of logistics flow management through big data analytics for sustainable development and environmental cycles: Soft Computing - A Fusion of Foundations, Methodologies & Applications. Soft Computing - A Fusion of Foundations, Methodologies & Applications, [online] 28(3), pp.2701–2717. doi: https://doi.org/10.1007/s00500-023-09591-x.

Pasupuleti, V., Thuraka, B., Kodete, C.S. and Malisetty, S. (2024). Enhancing Supply Chain Agility and Sustainability through Machine Learning: Optimization Techniques for Logistics and Inventory Management. Logistics, [online] 8(3), p.73. doi: https://doi.org/10.3390/logistics8030073.

Rejeb, Mr.A., Simske, S. and Rejeb, K. (2020). Internet of Things Research in Supply Chain Management and Logistics: A Bibliometric Analysis. Internet of Things, [online] 12, p.100318. Available at: https://www.sciencedirect.com/science/article/pii/S2542660520301499.

Ren, R., Hu, W., Dong, J., Sun, B., Chen, Y. and Chen, Z. (2020). A Systematic Literature Review of Green and Sustainable Logistics: Bibliometric Analysis, Research Trend and Knowledge Taxonomy. International Journal of Environmental Research and Public Health, [online] 17(1), p.261. doi: https://doi.org/10.3390/ijerph17010261.

Shcherbakov, V. and Silkina, G. (2021). Supply Chain Management Open Innovation: Virtual Integration in the Network Logistics System. Journal of Open Innovation: Technology, Market, and Complexity, [online] 7(1), p.54. doi: https://doi.org/10.3390/joitmc7010054.

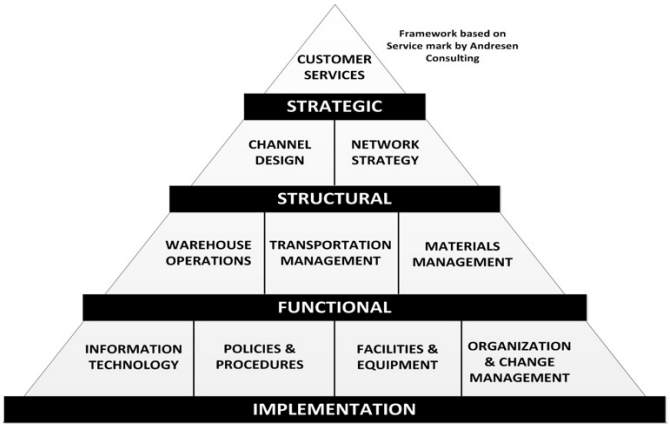
Sun, X., Yu, H., Solvang, W.D., Wang, Y. and Wang, K. (2021). The Application of Industry 4.0 Technologies in Sustainable logistics: a Systematic Literature Review (2012–2020) to Explore

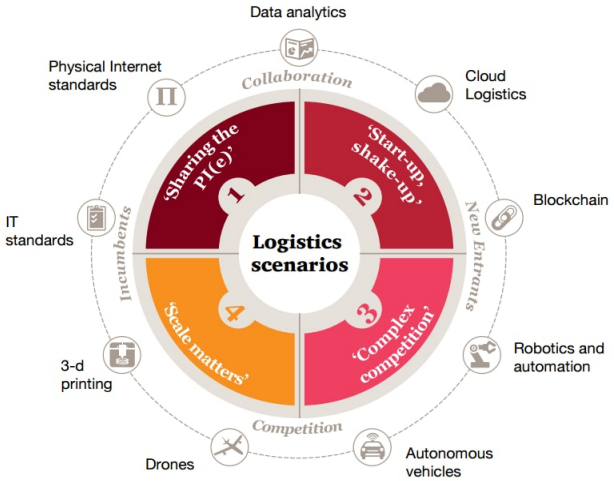
Future Research Opportunities. Environmental Science and Pollution Research. [online] doi: https://doi.org/10.1007/s11356-021-17693-y.

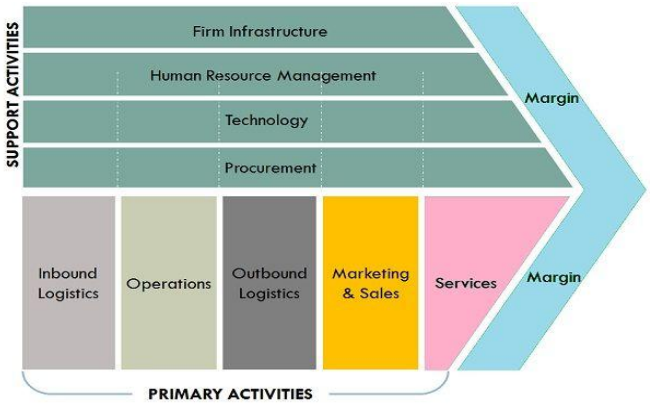
Van Engeland, J., Beliën, J., De Boeck, L. and De Jaeger, S. (2020). Literature review: Strategic network optimization models in waste reverse supply chains. Omega, 91, p.102012. doi: https://doi.org/10.1016/j.omega.2018.12.001 .

Wang, Y., Peng, S. and Xu, M. (2021). Emergency logistics network design based on space–time resource configuration. Knowledge-Based Systems, 223, p.107041. doi: https://doi.org/10.1016/j.knosys.2021.107041.

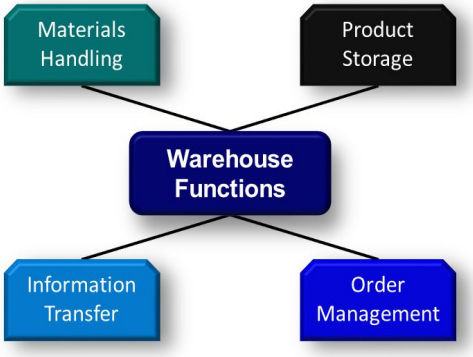
APPENDIX (if necessary)

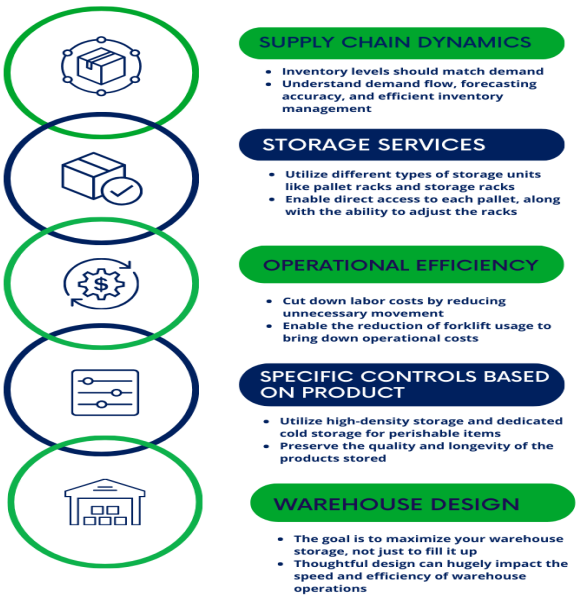






Warehouse Functions





SUPPLY CHAIN DYNAMICS

- Inventory levels should match demand
- Understand demand flow, forecasting accuracy, and efficient inventory management

STORAGE SERVICES

- Utilize different types of storage units like pallet racks and storage racks
- Enable direct access to each pallet, along with the ability to adjust the racks

OPERATIONAL EFFICIENCY

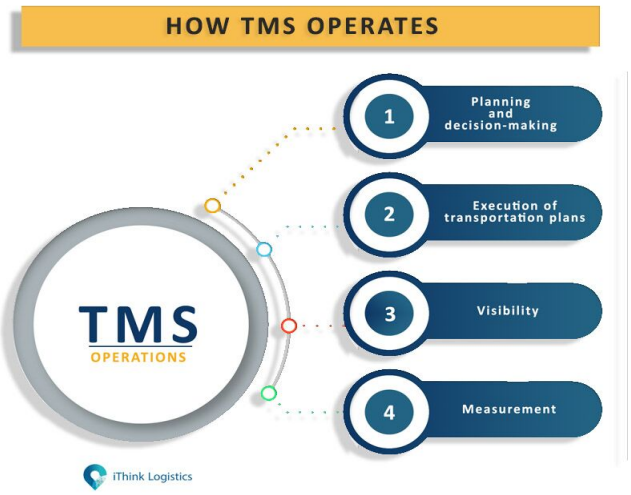
- Cut down labor costs by reducing unnecessary movement
- Enable the reduction of forklift usage to bring down operational costs

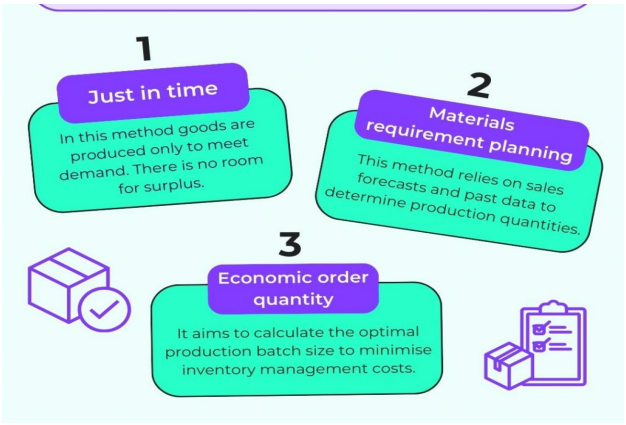
SPECIFIC CONTROLS BASED ON PRODUCT

- Utilize high-density storage and dedicated cold storage for perishable items
- Preserve the quality and longevity of the products stored

WAREHOUSE DESIGN

- The goal is to maximize your warehouse storage, not just to fill it up
- Thoughtful design can hugely impact the speed and efficiency of warehouse operations


HOW TMS OPERATES
TMS
OPERATIONS
1
Planning and decision-making
2
Execution of transportation plans
3
Visibility
4
Measurement
iThink Logistics


1
Just in time
In this method goods are produced only to meet demand. There is no room for surplus.
2
Materials requirement planning
This method relies on sales forecasts and past data to determine production quantities.
3
Economic order quantity
It aims to calculate the optimal production batch size to minimise inventory management costs.


Freight Management
Cold Chain Logistics
Inventory Management
Logistics Management
Container Logistics
Reverse Logistics
E-Commerce Shipping & Distribution