

The Design Of Logistics Networks

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Abstract

The following paper is involved in researching and explaining the network design logistics for any type of supply chain company. It focuses on the issues involved in the design and configuration of the design network. Many authors have revealed the facilities, raw materials, and other aspects of network design logistics. The logistic network design consists of plants, warehouses, retail prices, distribution centers, and customers.

The critical strategic decisions used in the logistic networks include assumptions such as plant and its production in warehouses. The inventory concept of a logistic design network focuses on reducing costs and improving productivity in any supply chain. The significant steps in logistic network designs involve four levels which are data collection, data aggregation, optimization, and data model and validation. The following paper includes requirements for data network logistics. The critical issues faced by logistic network designing are also discussed. The literature review of logistic network design has revealed that two factors define the network such as reverse and forward logistics. The literature review has focused more on reverse logistics due to its usage in supply chain companies. The conclusion section summarizes the overall research paper by pointing out the main factors discussed here.

The Design Of Network Logistics For Supply Chains

The purpose of the number of sites of manufacturing plants, warehouses, distribution of warehouses to the production plant, and allocation of customers has a concern with the logistics network design. The service level needs are satisfied by enabling a configuration process whose aim is to deliver the best goods to the customers. The rights must be at least costs available for the customers. The demand of customers is exogenous as it describes the consistency level of the product in the logistic design network. The advantage of the possibility is not taken by the steady demand as different customers have different requirements for different products expected by logistic network design (Glaskowski et al,1992).

Data requirements for network design logistics:

- All products must be listed.
- The sources, stocking points, and customer service locations must be understood.
- Customer location must be approachable by each product
- The rates of transportation

- The cost of warehouses
- The sizes of shipments by the products
- The patterns of orders by format, content, season, and frequency
- The order of the required processing costs
- Goals of customer service

It has shown that companies can reduce the price of products just by adding consolidation hubs at suitable spots. It would lower the pricing of logistic network networks.

Literature Review

By value-adding factors such as logistics, the productivity of any industry or supply chain is affected and improved. The designing of network logistics determines and focuses on the transport of goods and waste materials along with some resources from the suppliers to the factory. It takes raw materials which are discarded by the supply chain and transports them to the customer service level for the usage of people. A literature review on network design logistics reveals the growing competition globally. The installations, facility locations, day-to-day transportations, maintenance, and operations form the beginning of the network towards the customer service and demands. According to the literature, the logistics are finally divided into two groups such as forwards logistics and reverse logistics. Forwards logistics has got much research work, while there is less approach towards reverse logistics (Ballou et al, 1972).

Supply chain facilitates the use of logistic networks for any organization, which improves the profitability and production level. The author has stated that the productivity level of an organization is enhanced by the reduction in cost. The reduced price could be operational cost, logistics cost, and maintenance cost. The reverse logistics design review states that it is based on certain models, bounded and branch algorithms, genetic algorithms, heuristics, and stimulating algorithms. To meet the targets and goals of a company, logistics networks of supply chains are designed. It is essential to use such designs as it provides access to the policies and programs of the company. The company achieves long-term strategical objectives, and most of the business locations, along with some functional units, are influenced by the structure and design of network logistics (Harmon et al, 1993). The network of any company is vital to understand and acknowledge as it is responsible for the efficiency and customer satisfaction. The scope of the project must be defined and described before designing any supply chain logistics network (Ammer et al, 1974).

Discussion

Taking an example, Audi's logistic design network is considered a viral strategical design for Audi cars. As to the warehouses, it is essential to understand the demand customers state. The products must be allocated from the warehouses to the production houses. Like the car industry, Audi has

become more popular, so the logistic design network goes worldwide. In this way, other car manufacturing companies can focus on the strategy taken by this company to meet the competition. Other companies must have the ability to design efficient and effective car models by logistic design network so that clients would attract. Using a logistics design network would also introduce grooming and growth into the business (Coyle et al,1992).

In any supply chain company, the three models of logistic design network are used to focus on the customer's needs and satisfaction. The three models include

1. Differentiated delivery lead time along with the logistics network design
2. Price and discount along with logistic network design
3. Usage of logistic network design with consolidation hubs

Two factors that are commonly not considered important are the main ones that incorporate the logistics network design in any company. These two factors include delivery lead time and discount price. It has been concluded from the procedures that designing the network logistics while using differentiated delivery time lead can reduce the cost of the network. However, it is estimated that combining prices and decisions along with the demand for management can lead to a logistic network design consisting of higher net profits. It also included a tactical decision combination for the inventory policy of replenishment consisting of the strategic decision for the network design (Harmon et al,1993).

Logistic design network faces several critical issues:

- Picking up a location, number, or size for the warehouse or the plant production project is way challenging to achieve; it would be difficult for the supply chain management to understand the circumstances and then resolve them at once
- The determination of an optimal sourcing strategy is essential to achieving the logistics network design
- It is optimal to comprehend which product would be distributed by which plant product
- The supply chain must understand the best distribution channels
- The customer service provided by the warehouse must be determined first

Significant steps and issues in network designing are as follows:

Data Collection

A large amount of data is involved in any typical data collection problem. It includes the location of all the products, listing of all the products, and each product's manufacturing and demand according to the customer's requirement. Mileage information, the need for service level, and shipment sizes are involved in the data collection issue (Harmon et al,1993).

Data Aggregation

Data cleaning and gathering are essential because the data which was estimated in the data collection step is considered as overwhelming. The real data that is obtained by processing is enormous. Every form of data that is presentable must be streamlined. The forecast demand accuracy, along with the resulting location size, is improved. The impact of data on model effectiveness can be estimated by aggregating the data (Glaskowski et al,1992).

Data Variation And Model

It must be understood that the data must be clean and refined, and it should reflect the network design logistic issue. This issue is resolved by reconstructing the existing network configuration, which is approachable by using the collected data and comparing the output with the existing results. The purpose of doing so is to understand if the data is making any sense or not.

Optimization

The configuration of logistic networks is the next step after cleaning and refining data. It indicates two techniques that are used for optimization. The first one is mathematical optimization techniques that include exact algorithms, and the second one provides stimulation models. The specific design alternatives which are created by the designer are evaluated in this mechanism (Coyle et al,1992).

Reasons For Supply Chain, Logistics, Or Distribution Network Design

The business necessities of a system will change after some time. It can be because of mergers and acquisitions, entering new markets, extending item runs, or real changes to the administrative condition.

Coordination Bureau's specialists have directed hundreds of system examines for a tremendous scope of clients, over an assortment of businesses, and in numerous nations. This experience demonstrates to us that for organizations that have never attempted such an investigation or, to the point that has experienced or plan to undergo the critical change in their Supply Chain, there is a high level of hazard that:

- Network expenses could be 10-15% higher than anticipated standards
- Service lead times might be unfavorably affected
- Excessive item harm could be happening
- Inventory speculation is anomalous high

- Product accessibility is an outstanding issue.

Network Modelling Approach

The business necessities of a framework will change after some time. It can be a direct result of mergers and acquisitions, entering new markets, expanding things runs, or in all actuality, changes to the regulatory condition.

Collaborations Bureau's experts have coordinated hundreds of frameworks looking at a large extent of customers over a variety of organizations and in various countries.

This experience exhibits to us that for associations that have never endeavored such an examination or, to the point that have encountered or plan to meet the essential change in their Supply Chain, there is an abnormal state of peril that:

- Network costs could be 10-15% higher than foreseen benchmarks.
- Service lead times may be influenced.
- Excessive thing mischief could be going on
- Inventory theory is odd high
- Product availability is an important issue
- Of our 30 skilled staff, we as of now have nine who are prepared and talented in this kind of store network, demonstrating venture work.

Highlights And Benefits

- Lessened dissemination costs
- Enhanced comprehension of client benefit needs and choices. Improved perception of administration costs.
- Proper adjustment of capacity, stock, and transport costs
- The supply chain can see a portion of the underlying yet helpful realistic yields at Mapping Products
- Behind these realistic yields lies a far-reaching value, asset and request database, and advancement motors, that give a thorough cost/advantage examination.
- Apparently, having the right programming apparatus is just a piece of the blend.

Testing The Logistics Network

Coordination Bureau's specialists have built up a 'most optimized plan of attack' arrange displaying approach for those organizations that merely need to rapidly test the scope of appropriation arrange choices at an abnormal state or don't be able to accumulate point-by-point cost information all

separate systems as of now.

In light of 100+ parallel systems thinks about, our pro experts can apply showcase-based expenses for your warehousing and transport activities. The company needs to supply client areas and request information to enable a scope of system choices to be immediately displayed.

This approach gives a range of abnormal states and organizes alternatives for relative essential leadership. It also gives models in a small amount of time and cost of more point-by-point approaches.

Designing A Network Logistics

Coordination chiefs must be competent and more receptive to overhauling dispersion arranges all the more as often as possible to work at the most reduced expenses while giving the best client benefit.

“As of late as the 1990s, an organization would survey and rebuild its conveyance arrange once every five to 10 years,” says Edward Frazelle, “That is not true anymore as the issues influencing the system setup are changing so quickly that they must be observed considerably more every now and again, and now and again, consistently.”

Security prerequisites, new exchange assertions, moving work rates, space costs, provider and client areas, new transporters and items, path blockage, and fuel costs assume critical parts in organizing coordination, Frazelle says. Ideal system configuration/upgrade limits stock was conveying, warehousing, and transportation costs while fulfilling client reaction time prerequisites, as indicated by Frazelle. Specifics incorporate the system’s appropriation levels and focuses, area and mission of every office, a task of provider and client areas to reach inside, and stock organization (Frazelle,2002).

To make an ideal system configuration/overhaul, Frazelle suggests 10-step coordination arrange configuration process:

1. To Survey/assess the current system.
2. To Outline and populate organize the streamlining database.
3. Making an arranged plan choices, for example, increasing or less pecking orders, multi-item streams, pooling openings, converging in-travel, coordinating transportation, cross-docking, and supply-stream enhancement ideas.
4. Creating an arranged enhancement show.
5. Picking an organized advancement device.
6. Actualizing and organizing the show in the special device.
7. Assessing the elective system outlines.
8. “Practicalize” prescribed system structure.
9. Processing the reconfiguration cost.

10. Making go/no-go choices.

Conclusion

Summarizing the overall assignment states the procedure of network designing logistics and its usage. Network designs are used due to the purpose of a number of sites of manufacturing plants, warehouses, distribution of warehouses to the production plant, and allocation of customers has a concern with the logistics network design. The service level needs are satisfied by enabling a configuration process whose aim is to deliver the best goods to the customers. The literature review has proved the facts of network design logistics, and the statements of several authors are paraphrased. Also the reasons for designing network logistics, along with the procedure of designing, are also described. The paper has defined the benefits that are achieved by applying network design logistics to a supply chain company. The critical issues are pointed out, and these issues can be resolved by taking some essential steps.

References

Ammer, Dean S. Materials Management, 3rd Edition. Homewood IL: Richard D. Irwin, 1974.

Ballou, Ronald H. Business Logistical Management. Englewood Cliffs, NJ: Prentice Hall, 1973

Coyle, John J., et. al. The Management of Business Logistics, 6th Edition. Minneapolis/St. Paul, Minn: 1992.

Glaskowski, Nicholas A., Jr., et. al. Business Logistics, 3rd Edition. Ft Worth, TX: The Dryden Press, 1992.

Harmon, Roy L. Reinventing the Warehouse: World Class Distribution Logistics. New York, NY: 1993.

Frazelle, E. (2002). *Supply chain strategy: the logistics of supply chain management*. McGraw Hill.