

A STUDY ON THE DESIGN OF SUPPLY CHAIN FOR PERISHABLE GOODS

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Abstract

Supply chain is one of the most important aspects that assures the availability of the right goods to the customer. In the entire supply chain, logistics plays an important role in moving the goods from the point of origin to destination. In the recent times, the companies have outsourced the logistics division of the company to a Third-Party Logistics (3PL). This saves the company enormous amount of skills and cost, hence making a win-win situation.

This study was conducted in Broekman Logistics. It focuses on understanding the requirements of the clients and the company catering to the required specifications. This study is also aimed at understanding the important parameters required to be considered to design the logistics. The objectives of this study are firstly, to ascertain the factors influencing the logistics design and secondly, to identify the impact of perishability of goods on planning. Both Survey Method and Interviews were used to achieve these objectives.

The study gives insights on the capacity of Carrier Vehicles and their availability impact the design of supply chain for perishable goods. It was also found that there existed a cultural gap in the employees working at the firm that may lead to client dissatisfaction

Keywords – Supply chain, Logistics, Perishable goods, 3PL

Introduction

A supply chain is a structured process which involves various business entities, consumers, functionalities, data and infrastructure management for successful transferring of a goods or a service from source to destination. The transfer may include raw materials, components for a product, consumables, assemblies, semi-finished items, and so on. Supply chain mechanisms are indirectly called as value chain mechanisms, which are designed and developed to improve business value and there by customer satisfaction is achieved.

Some of the activities in supply chain management are sourcing, procurement, transformation process, logistics and distribution management. The very skeletal structure includes coordination and collaboration with suppliers, intermediaries, 3PL providers, and customers. In crux, supply chain management main objective is to matche supply and demand within and across organizations. It comprises of logistics management activities, manufacturing operations and also coordinates the processes and activities with different departments within the organization such as marketing, sales, product design, human resource, and finance and information technology. Supply chain management acts like a business enabler which helps in reducing the cost and thereby reduce the length of production cycle.

Statement of the problem:

Design of the supply is completely different for different industries and different products in the same industries as well. Hence taking care of this is the major challenge. Study enables us to understand how the design for perishable goods can be brought about.

These might be operational decisions but will make its way to be a strategic decision in the future as it gives the company a very high competitive advantage.

Literature Review

Jean-Paul et.al (2012) analyzed about the importance of physical separation between the two points of logistics. It was found that larger the distance, greater is the chances of the damage to the product. In cases such as food, since they are perishables, their quality lowers with time. This is because they initiate and contain chemical reactions that can be mostly stopped with lower temperatures. It is due to these reasons there was emergence of Cold Chain technologies to maintain the right environment even when shipping and transportation.

B. S. Sahay et al., (2006) study gives about the implementation of Logistics philosophies in Indian companies. 3PL philosophy is at a growing rate all over the world. Although, they are trying to establish themselves in India, they need more grounds for improvement. It says that the usage of these services is likely to expand by 40% in the future.

Rohit Chaudhri et al, (2010) study focuses on the transportation techniques used to transport vaccines. During the transportation, many technologies like mobile enabled tracking, GPS tracking can be used to simplify the logistics.

Tom van Woensel et al., (2007) study gives about the consumer behavior with regards to stock-outs of perishable goods. Importance of optimization techniques and the qualitative aspects of goods to understand the consumer behavior for perishable goods in particular. Some of the studies inferred that the major cost involved in supply chain management will be in the last 50 meters of a retail supply chain.

Research Objectives

Literature study has been conducted to understand the logistics issues for 3PL especially for perishable and seasonal goods. Research gaps have been identified and objectives were formulated

- a. To understand the Logistics Management of Broekman Logistics
- b. To ascertain the factors influencing the design of supply chain in Broekman Logistics
- c. To identify the impact of perishability of goods on the shelf-life of the products in Broekman Logistics.

Hypothesis:

H₀: Perishability of products to be transported does not affect the routine planning of the organization

H₁: Perishability of products to be transported affects the routine planning of the organization

Research Methodology

The methodology of descriptive research is followed in the present study. Primary data, collected by administering the questionnaire and interviews with the Logistics manager and the employees. Secondary data, collected through past literatures, is used to understand the Research Gaps and is used to analyze and meet the objectives of the study. Convenient Sampling technique was adopted to collect 40 responses from the employees. Chi-Square was used to analyze and test the hypothesis

Data analysis and Results:

The company has many employees with high experience which helped the company make the right decisions quickly and their average working experience is 15 years. The company, entirely based on Logistics for their business model, depends entirely on the supply chain.

The transportation vehicles are mostly taken on rent to cater to the demand. If the availability of the carrying vehicles are low, this will definitely affect the design of supply chain. Quantity of goods to be carried, on one hand determines the load of the vehicles and the type of vehicles to be chosen, but does not provide a basis to reduce the quality of the service. Hence this parameter had mixed opinion. The capacity of the carrying vehicle determines the number of vehicles needed and hence leading to that many trips. Also, this determines if the vehicles move in full-load situation or otherwise.

The employees understand the technical aspect of the product. The client discloses the material or the goods that is to be transported and the flanks that it possesses. This helps the team to design the right supply chain and no material is lost.

There is a significant association between the availability of logistics vehicles and the design of the supply chain. It was already seen that there was not much availability of vehicles for transportation for perishable and hazardous goods. And this needs a different mode and design of transportation. If the logistic vehicles take higher lead time arrive and load the goods, the logistics has to be in such a way that the transportation time is reduced. The association is found to be noticeable between the product types and the supply chain design. This was conducted specifically with respect to perishable and hazardous goods. In this case, the supply chain has to be specifically designed. From the type of carrier to the safety measures

Vertical Specializations handled * Planning of the Supply chain				
		Planning of the Supply chain		Total
		Routine	Changed Plan	
Vertical Specializations handled	Chemicals	0	6	6
	Construction and Building materials	8	0	8
	Food and beverage	4	4	8
	Groceries	6	0	6
	Healthcare	0	5	5
	Pharmaceuticals	0	7	7
Total		18	22	40

Chi-Square Tests			
	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	31.919 ^a	5	.000
Likelihood Ratio	43.961	5	.000
Linear-by-Linear Association	2.642	1	.104
N of Valid Cases	40		
a. 12 cells (100.0%) have expected count less than 5. The minimum expected count is 2.25.			

P-value is less than 0.05. Hence, we reject the null hypothesis. It can be interpreted that there is a significant association between the type of products handled and the supply chain design. In this case, the supply chain has to be specifically designed. From the type of carrier to the safety measures.

Suggestions:

Study provided the company with the following suggestions. The company has to adopt techniques that can enable it to understand the demand and hence forecast it. This will help the organization to plan for the future. The company should also plan for the availability of the necessary transport equipment that can result in a decrease in lead time. On the cultural aspect, the company should have a clear understanding of the culture of the firm and this has to be adequately disseminated from the top management to any employee working in the firm. Organization culture can be improved by being more transparent, building cordial relationship with co-workers, communicating the purpose, inspiring the employee autonomy and so on.

Conclusion

The Price of the product to be moved determines the price at which the company can transport the materials from one point to another. Smaller the carrier size, more the number of carriers required for transportation. The quantity carried by the vehicles decides the load at which the shipment will be moving. It is not optimal if the shipment moves at half-load or anything less. The company, being a combination firm, the carrier may be rented. Hence the availability has to be checked. The type of product that is being transported has a great impact on the design. This was seen in various instances in the interview as well as in the questionnaire.

The study also concludes about the company culture influencing the perception of the employees towards treating their clients. We see that the veterans understand that the client product parameters such as price of the product, profit margins of the product do not impact the decisions taken by the employees to design the supply chain. They entirely concentrate on providing the right kind of service for the customers. The veterans believe that this will either nurture the existing relationships or plant a seed for a new one. However, the employees with lower experience with the company or the company or the clients tend to be of the opinion that the client factors impact the decision making of the company. This for the reason that these parameters decide the cost of the product, hence determining the cost to the company. This creates a culture gap amongst the employees causing a value loss in the long run. The experience of the employees has provided great amount of expertise in the field of logistics. 3PL usually needs immense technical background for running the organization. In this case, the company definitely has SMEs that can provide the required inputs for the normal functioning of the organization.

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