

FACTORS INFLUENCING DISTRIBUTION PLANNING

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ABSTRACT

An analysis of supply chain system could become more complex when the network system should cover widely dispersed locations. This could happen in a case where a product must be delivered using long distribution channel. By reviewing literatures over the last decade, this paper aims to identify and to gain more comprehensive understanding of the problems related to the long distribution channel's characteristics. The term 'long distribution channel' refers to a

Multi-tiers in the distribution stages where each tier commonly contains more than one site. The result shows that in order to design an optimum long distribution channel, some prominent problems that impact on both distribution costs and delivery times need to be considered. The problems encompass variability, bottleneck, bullwhip effect, high transportation and logistics costs.

Following customer centric focus, supply chain management plays a vital role in success of an organization. To meet customer demand on or before time is becoming primary motto of each organization. Hence distribution planning process is important in success of Supply Chain Planning.

Below are various factors that play an important role in distribution planning studied in this paper,

- i) Demand at depots/ warehouse*
- ii) Stock on hand at each node*
- iii) Short term firm production plan*
- iv) Safety stock requirement at each node*
- v) Various costs: storage cost, safety stock violation cost, transportation cost, demand lost cost*
- vi) Storage space at each node*
- vii) Detention issue at any node*
- viii) Government factors*
- ix) Role of information systems*

Keywords: distribution planning, supply chain management

I. INTRODUCTION

Over the last few years, the demand placed on the distribution and logistics departments of manufacturing and marketing organizations has been continuously intensifying due to pressures from increased competition, introduction of new manufacturing methods, and increased expectations from partners and consumers in terms of low price and high service levels. Corporations are looking to increase their customer service levels, while reducing inventory, working capital requirements and distribution costs.

While distribution and logistics planning is gaining importance within corporations, distribution planners and supply chain managers are still struggling to come to terms with the increased expectations. The bulk of their time is still spent on short-term operational problems related to meeting immediate demand requirements, without much consideration for longer-term costs or strategic issues.

In the recent past, organizations have realized that the real competition is not between the organizations in a supply chain but rather between one supply chain and the other. High competition, global market place and market maturity are some of the factors that have forced organizations to rethink the way they do business. A critical rethinking paved the way for organizations to embrace the paradoxical concept of integration within the business and between businesses, popularly known as supply chain integration. **Christopher (2000)** clearly explained that true supply chain integration seeks to achieve linkage and coordination between processes of other organizations in the supply chain and the organization itself.

A basic assumption in any transportation problem is that the cost of transportation is directly proportional to the number of units transported (**Diaby 1991**). Such approaches consider the total cost of distribution as purely

quantity dependent and proportional to the amount transported between a source and a destination. Trip wise transportation costs were also considered by researchers.

The complexity of today's supply chain requires manufacturers and distributors to search for new methods to reduce costs, increase efficiencies, reinvent channel models, engineer collaborative relationships, and span functional, cultural, and personal boundaries (**Harsono, 2013**)

Smith and Agarwal (2000) develop a base-stock inventory model with stock-out based substitution that determines the optimal assortment to be carried as well as inventory levels subject to a service level constraint.

II. OBJECTIVES OF THE STUDY

Based on the research problem indicated above, the objectives of the study are the following:

1. To study the impact of inventory Management on distribution Process
2. To study the impact of distribution strategy on distribution process
3. To study the impact of transportation management on the efficiency of distribution process

III. SHORT CONCEPT EXPLANATION

Distribution process is a path through which particular product travels from producer to final consumer. This path in distribution process is nothing but Distribution Channel.

Physical distribution is the set of activities concerned with efficient movement of finished goods from the end of the production operation to the consumer. Physical distribution takes place within numerous wholesaling and retailing distribution channels, and includes such important decision areas as customer service, inventory control, materials handling, protective packaging, order procession, transportation, warehouse site selection, and warehousing.

A distribution strategy is a plan that leads to obtaining an ideal channel. It means ideal from the producer point of view. The physical distribution is a process consisting of various activities responsible for efficient movement of finished product within individual firms and through distribution channels. Moreover increasingly the term physical distribution is being used to describe a total and integrated process Including transportation, storage and warehousing, inventory control and closely related activities. This refers to the whole gamut of transferring produce to the end user.

TYPES OF DISTRIBUTION

a) Physical Distribution

In order to maintain freshness of the product efficient physical distribution is necessary for the industry. Keeping in mind the rail road and air line facilities the manufactures has to manage production and its distribution. The raw material supply to a larger extent depends upon the efficient transportation warehousing and inventory carrying etc. Perishable nature of fruits necessitates careful handling at each and every step. Normally cold storage facility is needed for processed products in order to increase the shelf life. The public warehouse and private warehousing facility can be hired in case own storage facility is not available. Inventory carrying cost may increase if proper assessment of demand is not made. The choice of transportation carriers affect the pricing of the products, on time delivery performance, and the condition of the goods when they arrive all of which will affect customer satisfaction.

Physical distribution is part of a larger process called "distribution," which includes wholesale and retail marketing, as well the physical movement of products. Physical distribution activities have recently received increasing attention from business managers, including business owners

This is due in large part to the fact that these functions often represent almost half of the total marketing costs of a product. In fact, research studies indicate that physical distribution costs nationally amount to approximately 20 percent of the country's total gross national product (GNP).

An efficient physical distribution system includes the following activities: Transportation, Storage, Inventory Control, Order Processing, and Material Handling System.

b) Channels of Distribution

Distribution channels are the set of marketing institutions participating in the marketing activities involved in the movement or the flow of goods or services from the primary producer to the ultimate consume. The selection of channels of distribution are affected by following factors: The target consumer, the product, the producers status & objective, and the middlemen's status & objective

- The first channel is the longest in that it includes all four, from producer to the end consumer. The wine and adult beverage industry is a perfect example of this long distribution channel. In this industry, thanks to laws born out of prohibition, a winery cannot sell directly to a retailer. It operates in what is known as the three-tier system, meaning the winery is required by law to first sell its product to a wholesaler, who then sells to a retailer. The retailer, in turn, sells the product to the end consumer.
- The second channel is one where the producer sells directly to a retailer, who then sells the producer's product to the end consumer. This means the second channel contains only one intermediary. Dell, for example, is large enough where it can sell its products directly to reputable retailers such as Best Buy.
- The third and final channel is a direct to consumer model where the producer sells its product directly to the end consumer. Amazon, using its own platform to sell Kindles to its customers, is an example of a direct model, which is the shortest distribution channel possible.
- Independent Channel
 - Independent Channel has “conventional” distribution arrangement, a channel member negotiates deals with others that do not result in binding relationships
- Dependent Channel
 - Dependent Channel, also called “vertical marketing system”, a channel member feels tied to one or more members of the distribution channel

IV. RESEARCH METHODOLOGY

The type of the topic researched is mainly the quantitative research method, with the study being descriptive and contextual in nature.

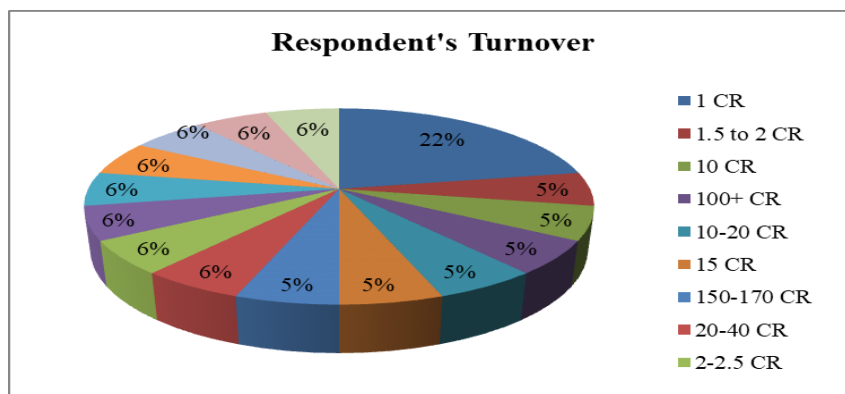
The research methods utilized in this study included: Convenience sampling as a non-probability sampling method; a self-administered questionnaire as the measuring instrument to measure the study variables; and statistical methods to analyze the data collected. The target population of the study comprised of manufacturing & third party logistic companies are involved in the distribution of products. The total of 20 dispatch executives was participated in the survey Therefore; the sample size was restricted to the 20 dispatch executives working in the Thane, Navi Mumbai district.

The final questionnaire consisted of a total of 14 close ended & 12 open-ended questions. The open ended questions were structured in such a manner that the researcher could review the opinions of the respondents for each of the variables to address the purpose of the study. After designing the questionnaire, it was pre-tested.

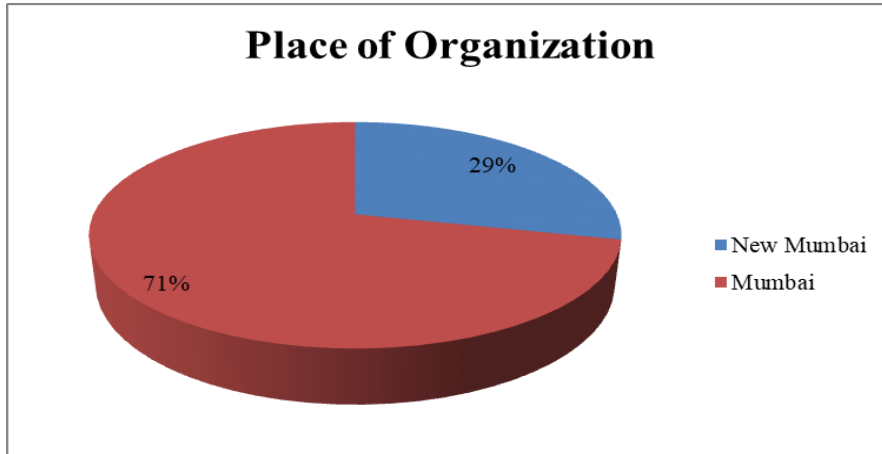
Two types of validity are applicable to this study, namely content validity and face validity. Content validity refers to the extent (adequacy) to which the measuring instrument (a questionnaire in this case) measures the actual concepts related to the topic. Face validity refers to the fact that the questions are unambiguous to the respondents and therefore the gathered information will be valid (De Vos et al. 2011, p. 167).

V. DATA ANALYSIS AND INTERPRETATION

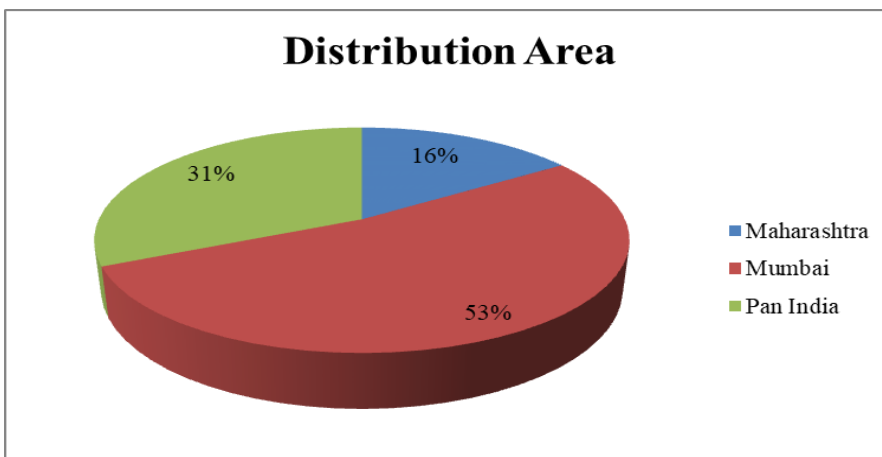
This section presents the observed findings of the study with the aid of Pie cart. The charts are based on the summaries of the questionnaire responses and presented in terms of the study objectives and the lay-out of the questionnaire used in the study. Of the sample size of 20 possible respondents identified, 21 responded, giving a response rate of 100%. Based on the empirical results,



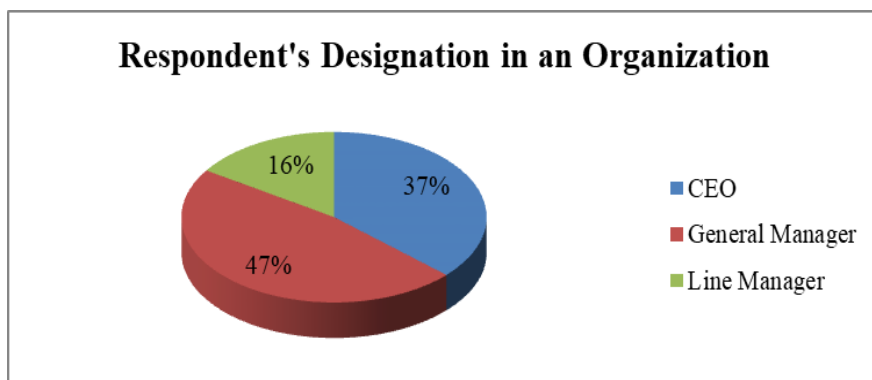
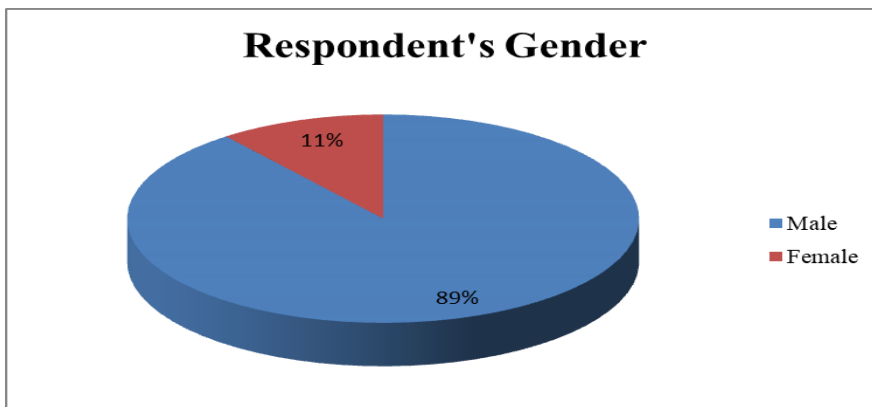
We have considered companies having annual turnover more than Rs. 1 Crore.



Company plant locations: Mumbai and Navi Mumbai

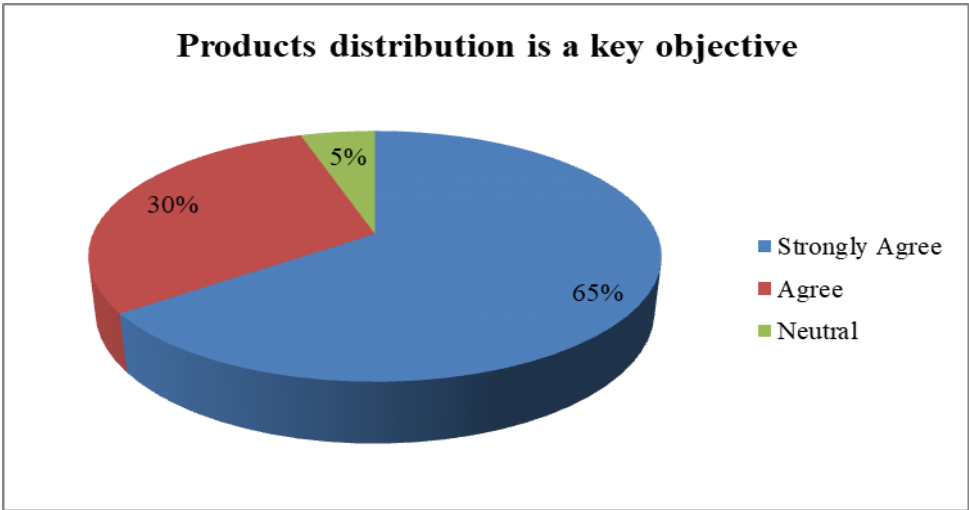


Distribution Network from plant: 47% in Mumbai and Navi Mumbai and 53% Pan India



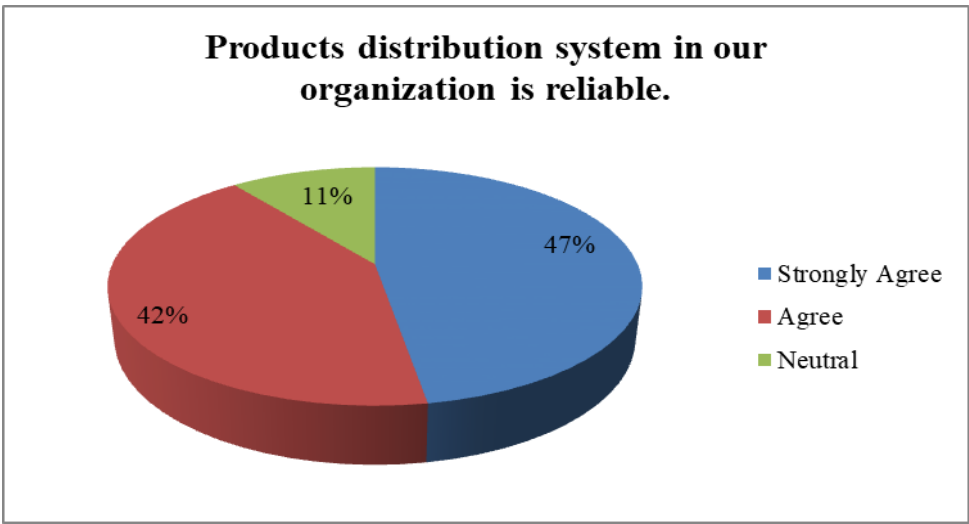
Products distribution is a key objective.

Scale-1 Strongly Agree, 2 –Agree, 3 –Neutral, 4 – Disagree, 5 –Strongly Disagree



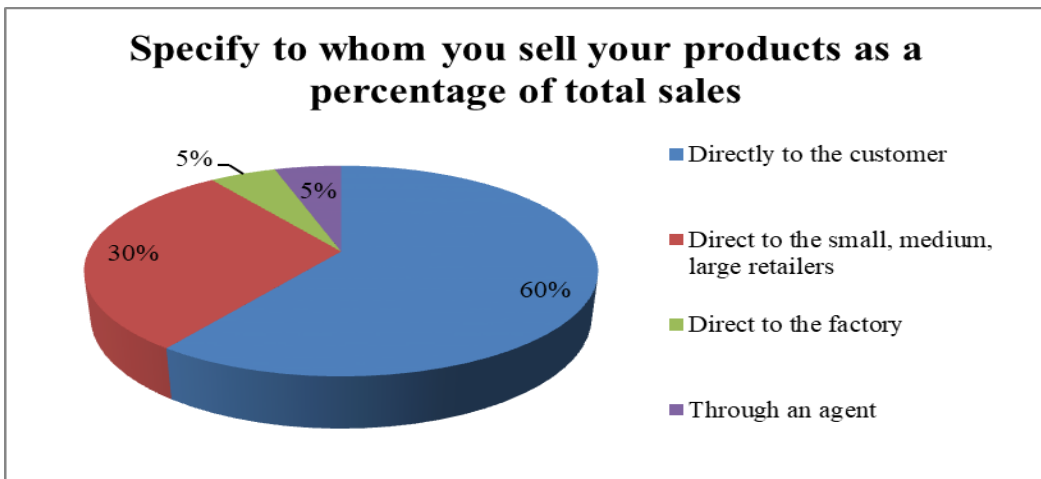
Products distribution system in our organization is reliable.

Scale-1 Strongly Agree, 2 –Agree, 3 –Neutral, 4 – Disagree, 5 –Strongly Disagree



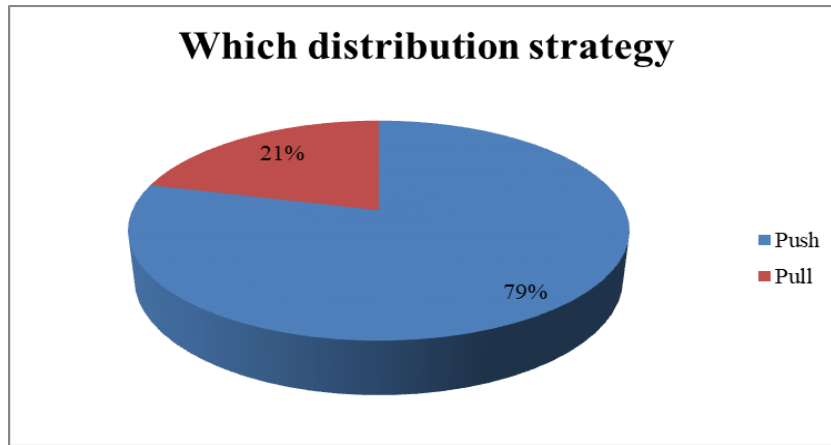
Specify to whom you sell your products as a percentage of total sales

- a. Directly to the customer ()Yes () No
- b. Direct to the small, medium, large retailers ()Yes () No
- c. Direct to the factory ()Yes () No
- d. Through an agent ()Yes () No
- e. Through a consortium with other manufacturers ()Yes () No



Which distribution strategy?

- a. Push
- b. Pull



VI. FINDINGS AND RECOMMENDATIONS

As discussed earlier, the literature review identified the following distribution processes as being critical for delivery performance management: distribution planning and design; inventory management and warehousing; distribution and transportation; and labour management. The recommendations proposed based on responses received through open ended questions mentioned below:

i. Storage facility problem

40% organizations are facing storage facility problem and the reasons are:

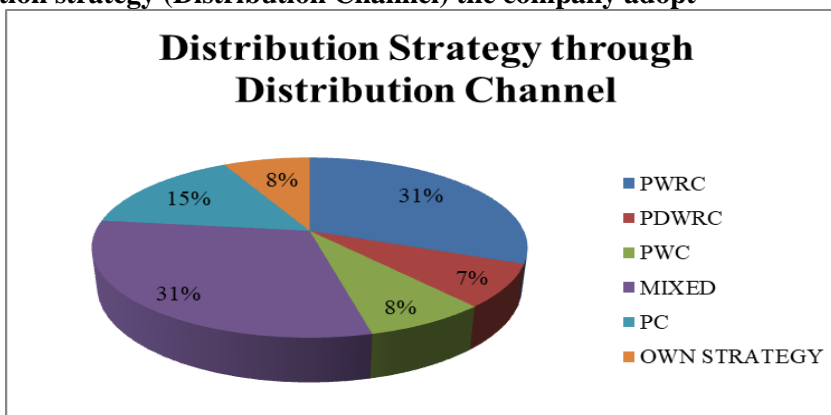
- a) Excess stock of underselling products
- b) Huge future demand at depots for top class products
- c) Stock of products of other companies at retailer outlets

Factory and depots should keep track of daily stock status at warehouse/depot (point of sale) location. This can be done using reporting functionality by use of technology. This report will hold below information:

- Monthly demand at each depot
- Stock on hand at depot
- Total sales done in that respective month
- Safety stock Norm requirement at depot
- In-transit stock at depot
- Today’s dispatch plan

This information will be useful to keep track of immediate dispatch requirement at depots also this will help factories to plan the production well in advance

ii. Type of distribution strategy (Distribution Channel) the company adopt



- a) Adoption of distribution strategy purely depends on business complexity.
- b) Companies who have huge turnover, they are following Producer-Distributor-Wholesaler-Retailer-Customer approach. This strategy gives them extra benefit of storage place at distributor location.
- c) Companies whose portfolio is limited, they are directly sending their stock to either wholesaler or retailer
- d) Manufacturing companies are extra conscious about big retailers as stock requirement from such customer is more focused on fresh output.

In case of small depots, vehicle type (capacity) should be frequently reviewed for dispatches from plants. This will help organizations to cater issues such as minimal truck load for small depots during off season period.

iii. What are the likely problems affecting distribution strategy?

- Worker's absenteeism is a major problem
- Improper inventory records at Depot, warehouse & at retailer side
- Unable to keep track of long distribution channel
- Employees are facing challenge regarding product knowledge & awareness
- Technology change
- Untimely issues such as transporter strikes

In case of multiple point of sale locations within single city/district, options of central warehouse for such zone must be reviewed. This will help to reduce cost of primary distribution (plant to warehouse).

iv. What transportation, loading and off-loading problems are encountered?

- Unloading & loading machines shuts down in-between
- Unavailability of vehicles
- Managing the labors of transporter
- Space issues in vehicle in case of high volume products

Contract with transporters must be reviewed in timely manner to avoid any conflicts.

v. Specialist equipment or vehicles used for distribution

- Heavy truck
- Tempo
- Pallet truck

If the point of sale locations is within near vicinity of each other, options such as multi-drop dispatch plan should be evaluated.

If company is having multiple manufacturing locations within nearby vicinity, options such as multi-pick dispatch plan for depots must be evaluated

vi. The state of the road

- Insecure and very unsuitable for distribution vehicle
- Material gets damaged

vii. Safety stock to stock on hand

- Demand loss is a major concern for companies, hence many companies try to pre-build the stock of immediate demand at distributor level
- 20% keep safety stock always with them
- 20% keep safety stock only when demand is high

If there is any planned shutdown or long holidays at plant level, there should be mechanism to flush out stock from plants. This will minimize the impact from distribution point of view during plant holidays. This can be achieved using increasing safety stock norms at depot levels proportionally

viii. Impact of underselling at depot on distribution process?

- Increase in inventory
- Increase in inventory carrying cost
- Product expiry concern in case of perishable goods

Stock on hand status must be reviewed daily at depots. In case of underselling, immediate dispatches from plant for the same product must be discontinued temporarily. This information should be shared with plant and as well as with other depots. If other depots have enough space and short term demand for such products, it can help in stock shift between depots.

ix. What is impact of overselling at depot on distribution process?

- Problems occur in transportation and at production
- Due to less vehicles there is load on distribution
- Demand prioritization needs to be done for overselling depots.

In such case, companies try to meet the demand at depot level by doing transfer of stocks between depots. This helps them to minimize the impact on production at plant

VII. CONCLUSION

- a) In today's challenging business environment, every company focuses that their customer demand should be fulfilled well in time. Hence distribution planning holds the same importance as that of production and demand planning in supply chain framework.
- b) Unplanned incidence such as underselling and overselling create extra pressure on distribution channel
- c) Transporter contracts must be revised frequently to avoid any legal issues
- d) Use of technology in dispatch planning will play vital role

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