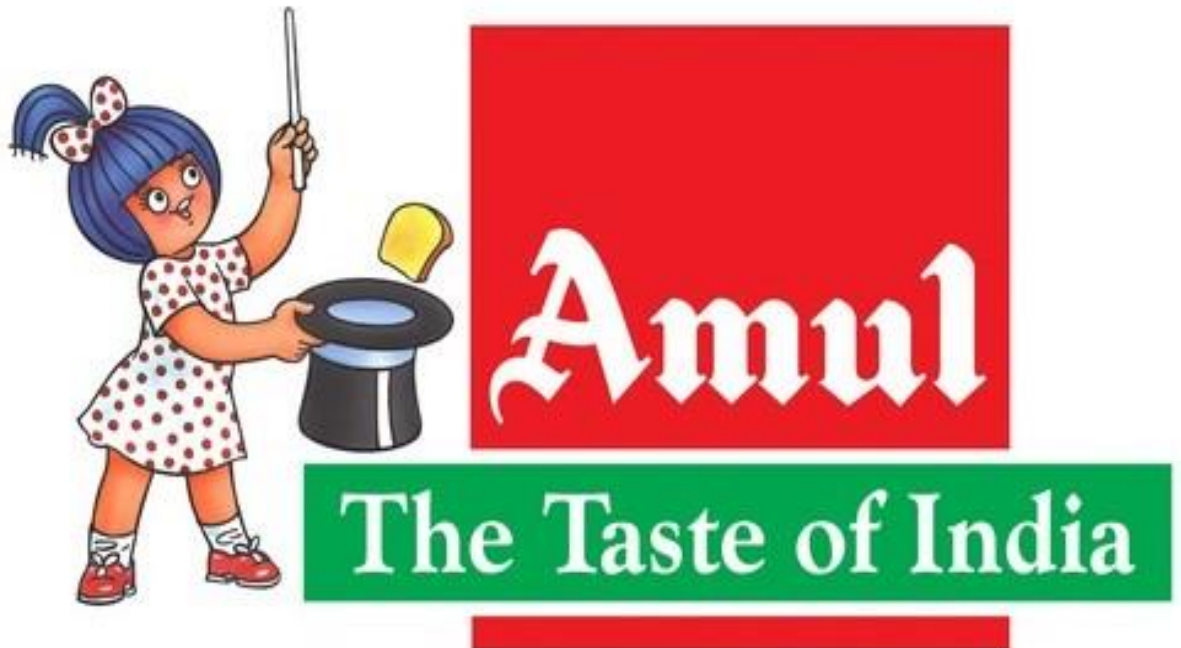


2020

SUPPLY CHAIN MANAGEMENT AND LOGISTICS MANAGEMENT OF AMUL



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CERTIFICATE



ACKNOWLEDGEMENT




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1.1 INTRODUCTION

AMUL is a dairy cooperative based in the Anand district of Gujarat, India (western India) that has been primarily responsible, through its innovative practices, for India to become the world's largest milk producer. The distinctive features of this paradigm involves managing a large decentralized network of suppliers and producers, simultaneous development of markets and suppliers, lean and efficient supply chain, and breakthrough leadership. The co-operative was initially referred to as Anand Milk Federation Union Limited and hence the name AMUL.

In the year 1946 the first milk union was established. This union was started with 250 liters of milk per day. In the year 1955 AMUL was established. In the year 1946 the union was known as KAIRA DISTRICT CO-OPERATIVE MILK PRODUCERS' UNION. This union selected the brand name AMUL in 1955.

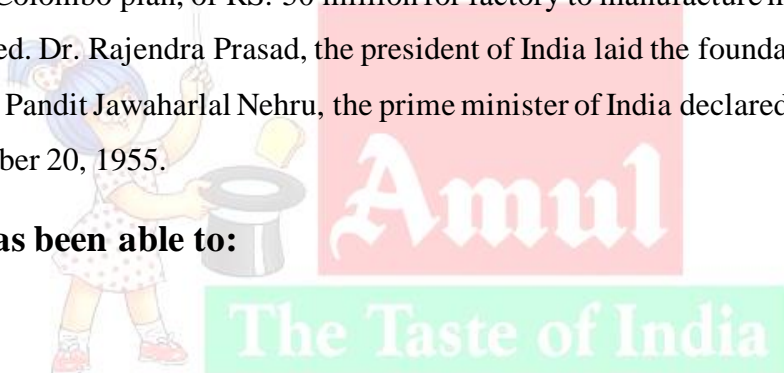
The brand name Amul means "AMULYA". This word derived from the Sanskrit word "AMULYA" which means "PRICELESS". A quality control expert in Anand had suggested the brand name "AMUL". Amul products have been in use in millions of homes since 1946. Amul Butter, Amul Milk Powder, Amul Ghee, Amul spray, Amul Cheese, Amul Chocolates, Amul Shrikhand, Amul Ice cream, Amul Milk and Amulya have made Amul a leading food brand in India. (Amul annual turnover is US \$ 5.1 Billion in 2019-20 with a growth rate of more than 17.5% than last year) Today Amul is a symbol of many things like of the high-quality products sold at reasonable prices, of the genesis of a vast co-operative network, of the triumph of indigenous technology, of the marketing savvy of a farmers' organization. And have a proven model for dairy development (Generally known as "ANAND PATTERN").

In the early 40's, the main sources of earning for the farmers of Kaira district was farming and selling of milk. Thus their cooperative unions were forced at the village and district level to collect and sell milk on a cooperative basis, without the intervention of Government. Mr. Verghese Kurien showed main interest in establishing union who was supported by Shri Tribhuvandas Patel who lead the farmers in forming the Co-operative unions at the village level. The Kaira district milk producer's union was thus established in ANAND and was registered formally on 14th December 1946. Since farmers sold all the milk in Anand through a co-operative union, it was commonly resolved to sell the milk under the brand name AMUL.

At the initial stage only 250 litres of milk was collected everyday. But with the growing awareness of the benefits of the cooperativeness, the collection of milk increased. Today Amul collect approx 23 million per day from 18600 village milk cooperative societies, 18 member unions covering 33 districts, and 3.6 million milk producer members. Since milk was a perishable commodity it becomes difficult to preserve milk for a longer period. Besides when the milk was to be collected from the far places, there was a fear of spoiling of milk. To overcome this problem the union thought out to develop the chilling unit at various junctions, which would collect the milk and could chill it, so as to preserve it for a longer period. Thus, today Amul has more than 150 chilling centres in various villages. Milk is collected from almost 1073 societies.

With the financial help from UNICEF, assistance from the govt. of New Zealand under the Colombo plan, of RS. 50 million for factory to manufacture milk powder and butter was planned. Dr. Rajendra Prasad, the president of India laid the foundation on November 15, 1954. Shri Pandit Jawaharlal Nehru, the prime minister of India declared it open at Amul dairy on November 20, 1955.

Amul has been able to:



- Produce an appropriate blend of the policy makers farmers board of management and the professionals: each group appreciating its routes and limitations.
- Bring at the command of the rural milk producers the best of the technology and harness its fruit for betterment.
- Provide a support system to the milk producers without disturbing their agro-economic systems.
- Plough back the profits, by prudent use of men, material and machines, in the rural sector for the common good and betterment of the member producers
- The Union looks after policy formulation, processing and marketing of milk, provision of technical inputs to enhance milk yield of animals, the artificial insemination service, veterinary care, better feeds and the like - all through the village societies.
- Basically the union and cooperation of people brought Amul into fame.

1.2 SIGNIFICANCE OF STUDY

Significance of the study is very important which help the reader are as follows:

- To get a complete over view about the milk distribution channel of Amul.
- To understand procurement of milk
- To understand distribution of milk and milk product
- To aware lack of supporting information systems.
- To study the technology solution.
- To take right decision to increase their turn over and minimize their cost from supply distribution and maximize their profit.

1.3 SCOPE OF THE STUDY

The scope of the study are as follows:

- To focus on the supply chain management of Amul.
- To find the distribution gap in the market.
- To create proper branding for existing outlets and convert new outlets for Amul.
- To check the awareness as well as level of satisfaction of retailers with distributors & the company.
- To Analyse the competitor's activity and profit margin through retailers.
- Supply Chain Strategies are the critical backbone to Business Organizations today.
- Transportation network design and management assume importance to support sales strategy.
- Detail discussion of product starting from procurement, marketing, delivering to sales of products to the customers.
- Inventory control and inventory visibility are two very critical elements in any operations for these are the cost drivers and directly impact the bottom lines on the balance sheet Inventory means value and is an asset to the company.
- The health of the inventory turn relates to the health of business.
- In a global scenario, the finished goods inventory is held at many locations and distribution centres, get manage.
- Effective control of inventory and visibility of inventory gains importance as a key factor of Supply Chain Management function.
- Difficulties, challenges, threats and opportunities faced by Amul in their supply chain.

1.4 OBJECTIVE OF THE STUDY

The objective of the study are as follows:

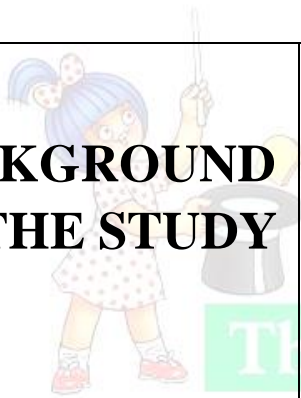
- To study the significance of Amul co-operative in India.
- To identify the relationship between organizational design and operational efficiency of Amul co-operative in India.
- To suggest an action plan for smooth functioning of Amul co-operative in India.
- To Calculate the Loading and Unloading Time of Crates from the Truck.
- To Calculate the distance between the plant to the drop Point of the distributors.
- To analyse the truck sheet entry of the raw chilled milk received from village dairy cooperative society.
- To analyse tanker route management for effective milk transport.
- To ensure raw milk quality and quantity.

1.5 CHAPTER PLAN



CHAPTER 2

BACKGROUND OF THE STUDY



2.1 BAKGROUND OF THE STUDY

2.2 SUPPLY CHAIN MANAGEMENT OF AMUL

2.3 LOGISTICS MANAGEMENT OF AMUL

2.4 LINKING OF SCM & LM

2.5 E-SUPPLY CHAINMANAGEMENT

2.1 BAKGROUND OF THE STUDY

As a small producer of milk in the state of Gujarat established Amul Diary so this was a reaction to the inefficient, corrupt monopoly in place at that point of time. The objective was to ensure that the small fragmented milk producers received the maximum possible remuneration while creating low-cost high-quality products for consumers, while eliminating the middlemen. Ensuring availability and providing great service to both the suppliers and consumers was of great importance as well.

The process includes minimization of the time of loading and unloading of crates from the truck. Calculate distance from plant to milk collection centre to avoid deuteriation of milk by long time contamination.

Ensure the hygienic and quality of milk to have clean, safe and nutritive milk for further processing of it. To distribute the quality product to final end without any deuteriation. Ensuring of Milk product to reach in unseasonal condition to fulfil the demand of end user.

2.2 SUPPLY CHAIN MANAGEMENT OF AMUL

Amul has effectively managed both upstream and downstream partners in establishing one of the most complex supply chains across the globe. The producers bring milk to the village cooperatives, which is then transported to the unions by specialised trucks. From the union's production facility, milk is transported to wholesale distributors who then transport the milk to retailers in specialised trucks.

All of these processes are outsourced to third party logistics and retail partners to ensure efficient execution. A stringent verification process and guarantees for the safety of the milk products are required from channel members before they are on-boarded to the network.

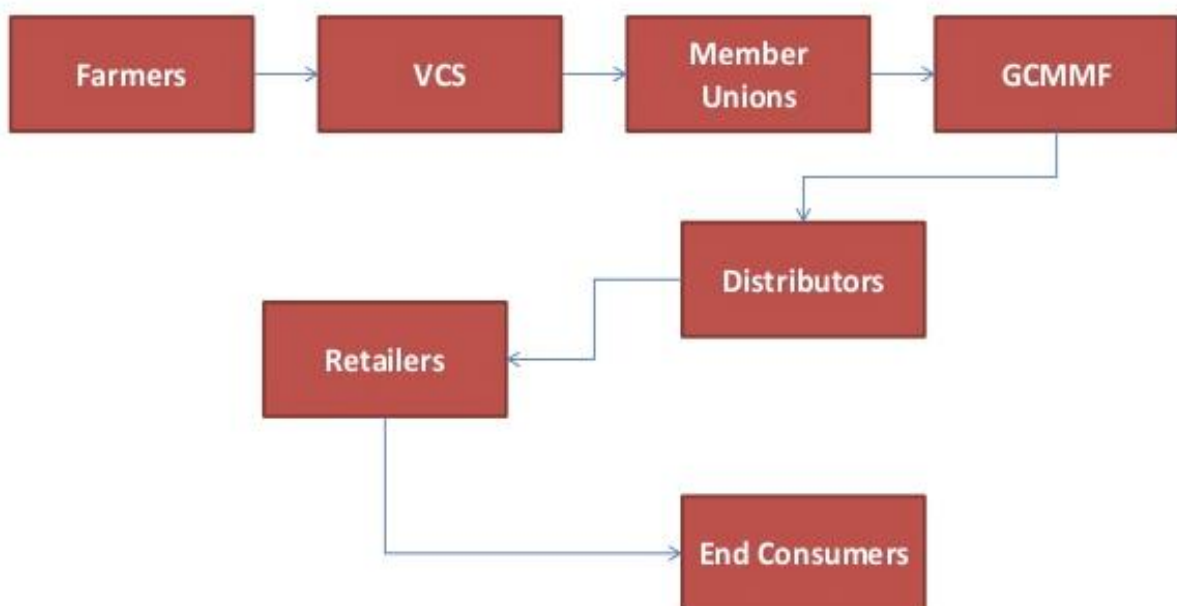
To the wholesalers and retailers, Amul offers reasonable margins on a high volume good. It offers support in demand prediction, reducing the potential bullwhip effects that might arise from inexperienced sales partners. It also offers easy repayment programs for capital investments in infrastructure like freezers etc by the retailers.

The strategy, design and practices in Amul's network are strongly driven by the objective of establishing and operating an efficient supply chain from milk production and procurement to product delivery to customers. Management of this network is built around two key elements.

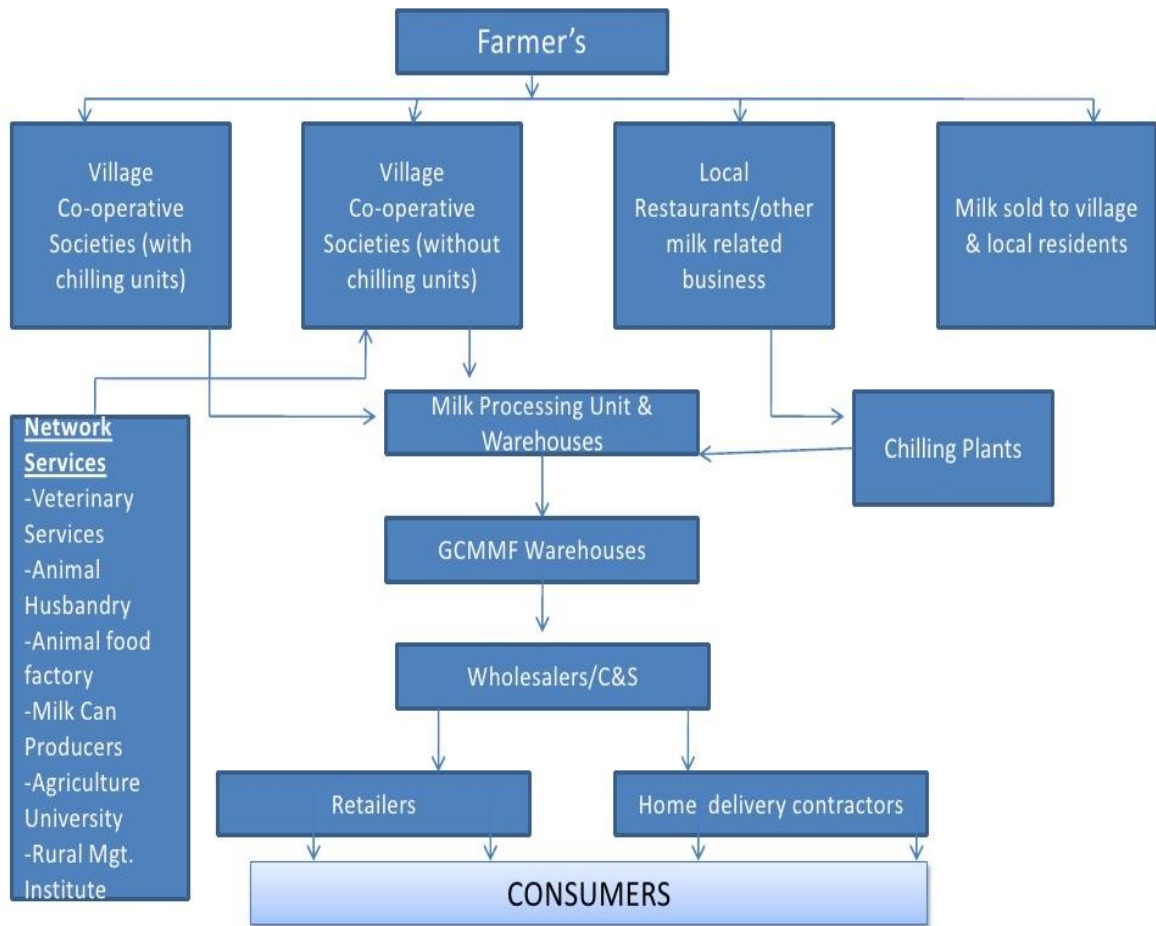
- Coordination of the diverse elements of the network.
- Use of appropriate technology that includes product, process and information technology and managerial practices and systems. In what follows, we describe various features of these elements that have contributed to the evolution of an efficient supply chain.

SUPPLY CHAIN OF AMUL DAIRY:

- Supply of inputs for dairying in form of fodder, animal feed plant, veterinary aids for the animal (cattle and buffalos).
- Milk is taken out from the milching animal on the daily basis by the dairy farmers (large, medium and small scale farmers).
- Collection of milk by collection centres (various milk cooperatives societies).
- Milk collected by the cooperative societies are sent to the dairy plants where chilling of milk, processing and packaging of milk and milk product, transportation of milk and milk product is carried out.
- The transportation of chilled milk and milk products from one place to another is done through the means of refrigerated vans, or insulated milk tankers.
- Final processed milk and milk products are transported to various retail outlets, supermarkets, and to retail markets from where the processed milk and milk products finally reaches to their end consumers.



AMUL'S SUPPLY CHAIN



2.3 LOGISTICS MANAGEMENT OF AMUL

Amul has effectively managed its movement of materials in whole supply chain which is known as logistics management and they are as follows:

I. LOGISTICS IN COLLECTION

- Today Amul collect approx. 23 million milk per day.
- They collect it from 18600 village milk cooperative societies.
- There are 18 member unions covering 33 districts.
- Amul have approximately 3.6 million milk producing members.

II. LOGISTICS IN COORDINATION

- Storing the milk.
- Processing the milk.
- Distributing the milk.

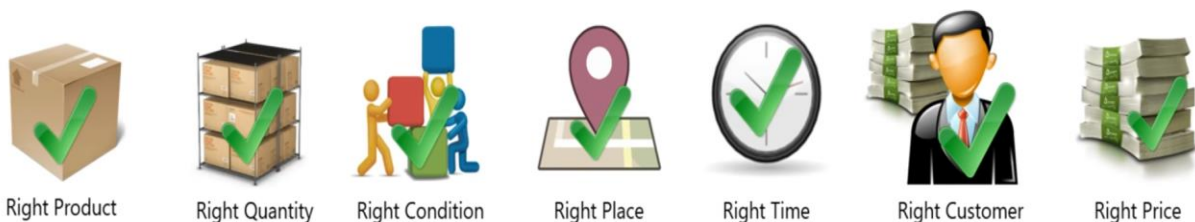
III. SUPPLIER LOGISTICS

- Weighing the milk.
- Determining of fat content.
- Calculation of the purchase price.

SEVEN R's OF LOGISTICS

Amul follow the Seven R's concept which is most popular concepts of logistics management.

They are as follows:



LOGISTICS FUNCTIONS

Following areas of logistics management, contribute to an integrated approach to logistics.



Transportation logistics is simply moving products and materials from one place to another. This includes shipment of raw materials to the manufacturer and movement of finished product to the customer through different channel which are as follows.

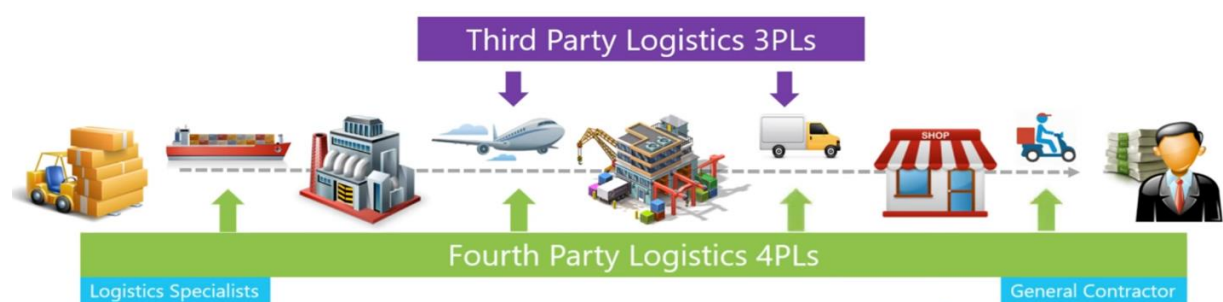


Warehouse logistics is a planned space for the storage and handling of goods and material. A warehouse and logistics specialist is responsible for the storage, distribution, inventory management and records maintenance of items in a warehouse. It emphasizes the receipt and proper storage of property.

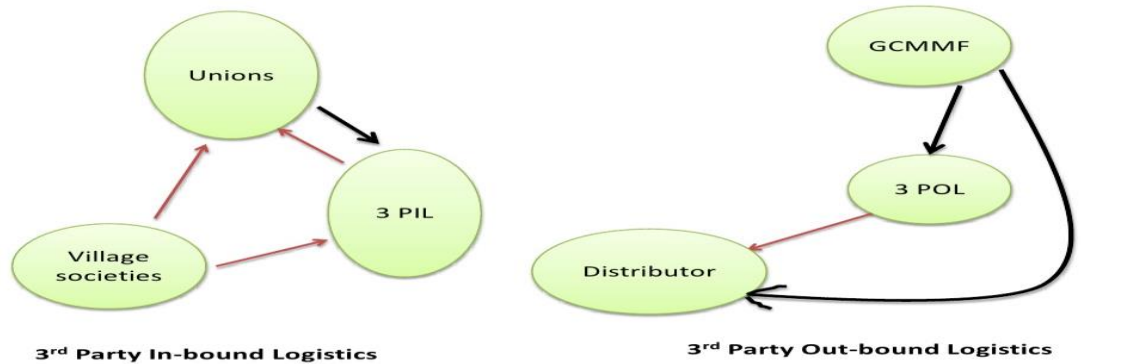


THIRD PARTY LOGISTICS SERVICES:

In addition to the weaknesses in the basic infrastructure, logistics and transportation services are typically not professionally managed, with little regard for quality and service. In addition to outbound logistics, GCMMF takes responsibility for coordinating with the distributors to assure adequate and timely supply of products. It also works with the Unions in determining product mix, product allocations and in developing production plans. The Unions, on the other hand, coordinate collection logistics and support services to the member-farmers. In what follows we elaborate on these aspects in more detail and provide a rationale for the model and strategies adopted by GCMMF.



Third Party Logistics Services



REVERSE LOGISTICS

Reverse Logistics is the set of activities that is conducted after the sale of a product to recapture value and end the product's lifecycle. It typically involves returning a product to the manufacturer or distributor or forwarding it on for servicing, refurbishment or recycling.



LOGISTICS GOAL

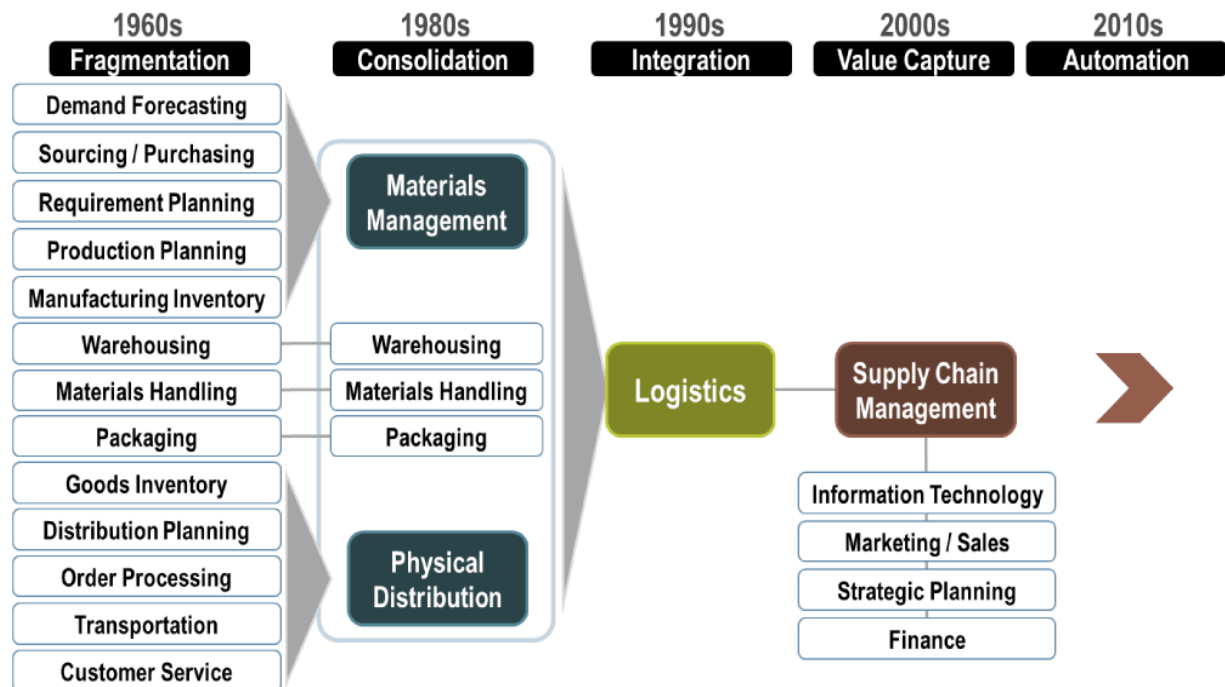
The Taste of India

There is a temporal and special gap between production and consumption. The goal of logistics is to fill in this gap. In the past, the main mission of logistics was to deal with the spatial distance by increasing transportation efficiency and reducing the time to deliver goods. However, now an important theme is not only speed but also how timely goods can be delivered to consumers. For this reason, a system is essential that can use functions such as transportation and storage as well as adjust the amount, time, and location of goods to prevent too much or too little inventory while delivering goods efficiently and without waste. The goal now is efficient logistics with no waste.



2.4 LINKING OF SCM & LM

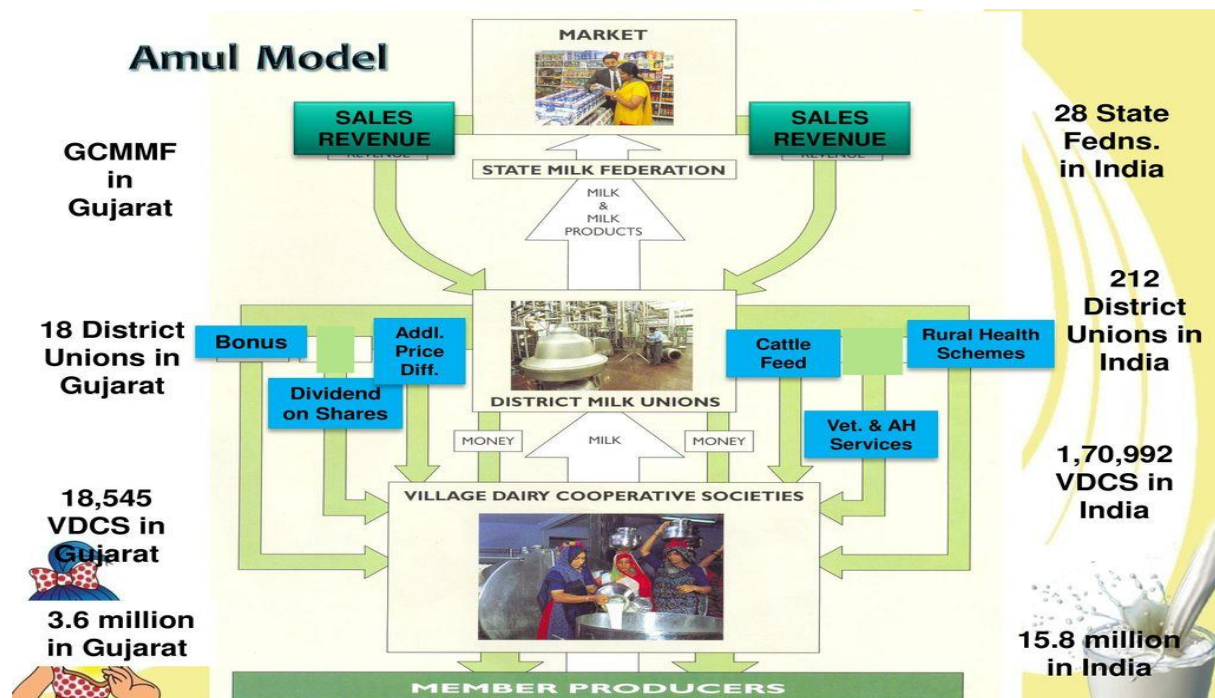
Logistics management is that part of supply chain management that plans, implements, and controls the efficient, effective forward and reverse flow and storage of goods, services and related information between the point of origin and the point of consumption in order to meet customers' requirements.



AMUL MODEL

The Taste of India

Amul model show how amul link its SCM AND LM.



2.5 E-SUPPLY CHAIN MANAGEMENT

Electronic Supply Chain Management (e-SCM) is an optimization of business processes and business value through effective utilization of internet and business processes that help in delivering goods, services and information from the supplier to the consumer in an organized and efficient way.

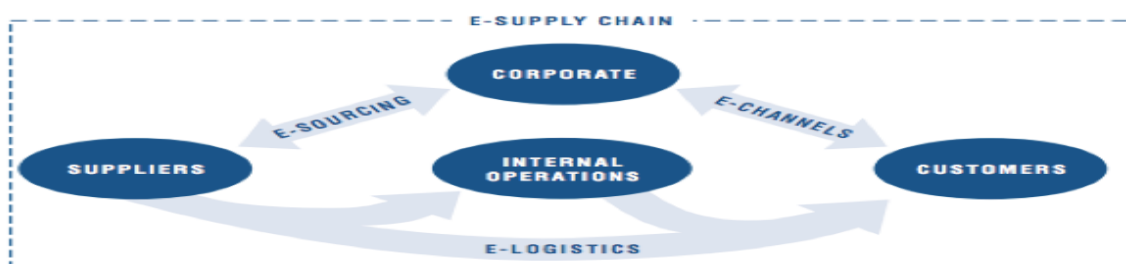
It uses e-business concepts and web technology to manage beyond the enterprise, both upstream and downstream. This strategic approach unites all the steps in the business cycle, from initial product design and procurement of raw materials, through shipping, distribution, and warehousing right up to the point when the finished product is delivered to the customer. These in turn lead to-

- Improved relations with channel partners.
- Better control over budgeting and investments.

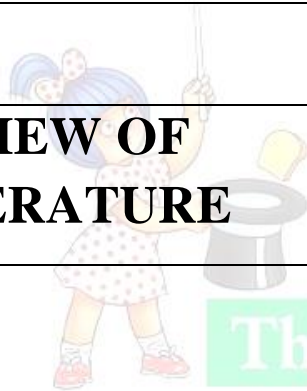
The evolution of e-SCM(IT) in Amul was took place in the guidance of DR.B.M Vyas. The milk collection centre at village cooperative societies, were first automated. Data analysis software utilization for milk production estimation and increasing productivity. VATS network between all the level of distribution network and GCMMF.

BENEFITS OF E-SCM

- Improved delivery mechanisms and transparency of business operations.
- Radical changes in business processes - eliminating middlemen.
- Huge reduction in processing time for effecting payments to the farmers from a week to couple of minute.
- Practicing just in time supply chain management with six sigma accuracy.
- Online order placements of Amul's products on the web.
- Distributors can place their orders on the website.
- Amul exports products to countries in West Asia, Africa and USA.



CHAPTER 3	
REVIEW OF LITERATURE	3.1 LITERATURE REVIEW



Amul
The Taste of India

3.1 LITERATURE REVIEW

In this paper we describe a case study of a dairy cooperative 'AMUL' in western India that has developed a successful model for doing business in large emerging economy. It has been primarily responsible through its innovative practices, for India to become world's largest producer of milk. This paper draws various lessons from experiences of Amul that would be useful to cooperatives globally as well as firms that are interested in doing business in large emerging markets like India and China.

Many of these economics have underdeveloped markets and fragmented supply bases. Market failures for many of these small producers are high. On the other hand, the size of both, markets and suppliers are large. As a result, firms that identify appropriate business strategies that take into account these characteristics are more likely to succeed in these markets. The following are some key message from Amul's success firms in these environments need to simultaneously develop markets and suppliers to synchronize demand and supply planning, develop or become a part of network of producers(cooperatives in this case)to obtain scale economies, focus on operational effectiveness to achieve cost leadership to enable low price strategy. In addition, a central focus to bring the diverse element together and long term approach the required.

In emerging economies different industrial sectors may be at different stages of development. In some of the sectors all of the above environmental characteristics faced may not hold. However, a subset of strategies followed by Amul would still be very useful. Thus, firms that are contemplating addressing large undeveloped markets or have an intention of taking advantages of extensive but marginal supplier base would still benefit.

STRATEGY

Amul's business strategy is driven by its twin objectives of

(i) long-term, sustainable growth to its farmers.

(ii) value proposition to a large customer base by providing milk and other dairy products a low price. Its strategy, which evolved over time, comprises of elements described below.

SIMULTANEOUS DEVELOPMENT OF CUSTOMERS: From the very early stages of the formation of Amul, the cooperative realized that sustains growth for the long-term was contingent on matching supply and demand. Further, given the primitive state of the market and the suppliers of milk, their development in a synchronous manner was critical for the

continued growth of the industry .The organization also recognized that in view of the poor infrastructure in India, such development could not be left to market forces and proactive interventions were required. Accordingly, AMUL and GCMMF adopted a number of strategies to assure such growth. For example, at the time Amul was formed, the vast majority of consumers had limited purchasing power and was value conscious with very low levels of consumption of milk and other dairy products. Thus, Amul adopted a low-price strategy to make their products affordable and guarantee value to the consumer. The success of this strategy is well recognized and remains the main plan of Amul's strategy even today. The choice of product mix and the sequence in which Amul is introduced its products is consistent with this philosophy. Beginning with liquid milk, the product mix was enhanced slowly by progressive addition of higher value products while maintaining desired growth in existing products. Even today, while competing in the market for high value dairy products, GCMMF ensures that adequate supplies of low value products are maintained.

On the supply side, as mentioned earlier, the member-suppliers were typically small and marginal-farmers had severe liquidity problems, were illiterate and had no prior training in dairy farming. Amul and other cooperative Unions adopted a number of strategies to develop the supply of milk and assure steady growth. First, for the short term, the procurement prices were set so as to provide fair and reasonable return. Second, aware of the liquidity problems cash payments for milk supply was made with minimum of delay. For the long-term, the Unions followed a multi-pronged strategy of education and support. For example, only part of the surplus generated by the Unions is paid to the members in the form of dividends. A substantial part of this surplus is used for activities that promote growth of milk supply and improve yields. These include provision of veterinary services, support for cold storage facilities at the village societies etc. In parallel, the Unions have put in place a number of initiatives to help educate the members.

To summarize, the dual strategy of simultaneous development of the market and member farmers has resulted in parallel growth of demand and supply at a steady pace and in turn assured growth of the industry over an extended period of time.

COST LEADERSHIP: Amul's objective of providing a value proposition to a large customer base led naturally to a choice of cost leadership position. Given the low purchasing power of the Indian consumer and marginal discretionary spending power, the only viable option for

Amul was to price its products as low as possible. This in turn led to focus on costs and had significant implications for managing its operations and supply chain practices.

FOCUS ON CORE ACTIVITIES: In view of its small beginnings and resources, it became clear fairly early that Amul would not be in a position to be an integrated player from milk production to delivery to the customer. Accordingly, it chose a strategy to focus on core dairy activities and rely on third parties for other complementary needs. This philosophy is reflected in almost all phases of Amul network spanning R&D, production, collection, processing, marketing, distribution, retailing etc. For example, Amul focused on processing of liquid milk and conversion to variety of dairy products and associated research and development. On the other hand, logistics of milk collection and distribution of products to customers was managed through third parties.

However, it played a proactive role in making support services available to its members wherever it found that market as for such services were not developed. For example, in the initial stages, its small and marginal member farmers did not have the access to finance, veterinary services, knowledge of basic animal husbandry etc. Thus, to assure continued growth in milk production and supply, Amul actively sought and worked with partners to provide these required services. In cases where such partnerships could not be established, Amul developed the necessary capabilities and provided the services. These aspects are elaborated later in this section.

These include logistics of milk collection, distribution of dairy products, sale of products through dealers and retailers' stores, some veterinary services etc. It is worth noting that a number of these third parties are not in the organized sector, and many are not professionally managed. Hence, while third parties perform the activities, the Unions and GCMMF have developed a number of mechanisms to retain control and assure quality and timely deliveries. This is particularly critical for a perishable product such as liquid milk.

FINANCIAL STRATEGY: AMUL's finance strategy is driven primarily by its desire to be self-reliant and thus depend on internally generated resources for finding its growth and development. This choice was motivated by the relatively underdeveloped financial markets with limited accesses to funds, and the reluctance to depend on Government support and thus be obliged to cede control to bureaucracy. Amul's financial strategy may thus be characterized by two elements:

(a)retention of surplus to fund growth and development and

(b)limited/no credit, i.e. All transaction are essential cash only.

For example, payment for milk procured by village societies is in cash and within 12 hours of procurement (most, however, pay at same time as receipt of milk). Similarly, no dispatches of finished products are made without advance payment from distributors etc. This was particularly important, given the limited liquidity position of farmer/suppliers and the absence of banking facilities in rural India. This strategy strongly helped Amul implement its own vision of growth and development. It is important to mention that many of the above approaches were at variances with industry practices of both domestic and MNC competitors of AMUL.

In essence, the organization structure of Amul allows effective utilization of resources without losing the democratic aspiration of individual members. It is obvious that such a system needs charismatic leadership to achieve consensus across issues-a process that has long -term benefits for any organization.



CHAPTER 4

RESEARCH METHODOLOGY



4.1. RESEARCH METHODOLOGY

4.2 RESEARCH DESIGN

4.3 SAMPLING METHOD

4.4 DATA COLLECTION METHOD

4.5 TOOLS & TECHNIQUES OF DATA ANALYSIS

4.1. RESEARCH METHODOLOGY

Research methodology is the systematic approach to solve the research problem with some logic behind it and to evaluate the success of organizational design the two types of data sources are considered. Primary Source as well as Secondary Source. Primary data was collected through a structured closed / open-ended questionnaire and interviews with senior officials of AMUL, its employees and customers. Secondary data was collected through internet, newspapers, magazines, journals and annual reports.

4.2 RESEARCH DESIGN

A research design is the specification of method and procedure for accruing the information needs. It is overall operational pattern of frame work of project that stipulates what information is to be collected for source by the procedures. It specifies the information required to address these issues, designs the method for collecting information, manages and implements the data collection process, analyses, and communicates the findings and their implications.

Descriptive Research design is appropriate for this study.

Descriptive study is used to study the situation. This study helps to describe the situation. A detail description about present and past situation can be found out by the descriptive study.

DATA SOURCE AND COLLECTION

Data sources used in this research is secondary data. Secondary data was collected for reputed statistical website, procurement officer and sales team to get some ideas about the project and related perception of the situation. This means the data are already available, i.e. the data which have been already collected and analyzed by someone else.

4.3 SAMPLING METHOD

There are two types of sampling methods:

- 1) Probability sampling methods
- 2) Non probability sampling methods

In this study the non-probability sampling has been used using convenience-sampling technique. This is because probability sampling involves random selection, allowing you to make statistical inferences about the whole group and non-probability sampling methods involves Convenience sampling, Voluntary response sampling, Purposive sampling and

Snowball sampling. It is helpful because population elements were scattered over a wider area and specific category could not be find out.

For the kind of research study sampling plan must be designed for appropriate result. A part of the population is known as a sample. When researcher thinks about the sampling plan, researcher must have clear idea about the following things: -

POPULATION

The aggregate of elementary unit to which conclusion of the study apply is formed as population. The population of this study is the retailers of the Bhubaneswar region.

SAMPLING UNIT

The units that form the basis of the sampling process are called as sampling unit. Sampling unit may be as elementary unit.

SAMPLE

Sample is the reprehensive part of the population is chosen at random from a large number of items.

4.4 DATA COLLECTION METHOD

The search of answer to research questions called of collection of data are facts, figures, and other relevant materials, past, and present servings as based for study and analysis.

Data are of two types

- Primary data
- Secondary data

PRIMARY DATA:

The information that has been directly given by the prospect or obtained from the questionnaires is considered to be primary data. The responses were recorded on the basis of conversations with the prospects both over the phone and face to face. The scales used in the questionnaire were nominal and ordinal. Pictures are also taken so that it could be used for further reference.

- Questionnaire
- NGO Members
- Dealers

SECONDARY DATA:

Data which exists already is considered as secondary data, such data were collected through sources such as

- Company website
- Magazines
- Journals
- Newspapers
- Product brochures
- Booklets etc.

In the research study only type of data has been collected.

- Secondary data

For the Secondary data, the instruments are used: -



4.5 TOOLS & TECHNIQUES OF DATA ANALYSIS

There are different tools and techniques of data analysis.

DATA ANALYSIS TOOLS: -

There are several data analysis tools available in the market, each with its own set of functions. The selection of tools should always be based on the type of analysis performed, and the type of data worked.

Here Ms Excel is used for data analysis.

MS EXCEL

It has a variety of compelling features, and with additional plugins installed, it can handle a massive amount of data. So, Ms Excel is a very versatile tool for data analysis.

DATA ANALYSIS TECHNIQUES

There are different techniques for data analysis depending upon the question at hand, the type of data, and the amount of data gathered. Each focuses on strategies of taking onto the new data, mining insights, and drilling down into the information to transform facts and figures into decision making parameters.

Here Techniques based on Visualization and Graphs are used. Some of them are as follows: -

- **Column Chart, Bar Chart:** Both these charts are used to present numerical differences between categories. The column chart takes to the height of the columns to reflect the differences. Axes interchange in the case of the bar chart.
- **Line Chart:** This chart is used to represent the change of data over a continuous interval of time.
- **Area Chart:** This concept is based on the line chart. It additionally fills the area between the polyline and the axis with colour, thus representing better trend information.
- **Pie Chart:** It is used to represent the proportion of different classifications. It is only suitable for only one series of data. However, it can be made multi-layered to represent the proportion of data in different categories.
- **Funnel Chart:** This chart represents the proportion of each stage and reflects the size of each module. It helps in comparing rankings.

CHAPTER 5

DATA ANALYSIS

5.1 DATA ANALYSIS

5.2 DATA PROCESSING

5.3 TABLES AND CHARTS WITH INTERPRETATION



5.1 DATA ANALYSIS

The systematic application of statistical and logical techniques to describe the data scope, modularize the data structure, condense the data representation, illustrate via images, tables, and graphs, and evaluate statistical inclinations, probability data which derive a meaningful conclusion.

Here to analyse data different types of tables and charts are used.

5.2 DATA PROCESSING & INTERPRITATION

Amul have a strong supply chain management also it effectively manages its upstream flow and down stream flow.

THE CHANNEL NETWORK

- Procurement channel- upstream flow
- Distribution channel- downstream flow

PROCUREMENT

Activities at the village level comprised developing and servicing the VCSs which results in increasing milk collection, procuring milk, and transporting it to the chilling and processing units twice a day. The VCSs provided the farmers with good quality animal feed, fodder, and other services like veterinary first aid.

PROCUREMENT CHANNEL (UPSTREAM)

On an average around thousand farmers come to sell milk at their local co-operative milk collection centre. Each farmer has been given a plastic card for identification. At the milk collection counter, the farmer drops the card into a box and the identification number is transmitted to a personal computer attached to the machine. The milk is then weighed and the fat content of the milk is measured by an electronic fat testing machine. Both these details are recorded in the PC. The computer then calculates the amount due to farmer on the basis of the fat content. The value of the milk is then printed out on a slip and handed over to farmer who collects the payment at adjacent window.

COLD STORAGE NETWORK

Amul have chillers in proximity of villages. Prompt transport to district facilities for further dispatch to consumers/ processing units. Chilled trucks to transport processed products which

delivered to local chillers by insulated rail tankers and chilled trucks. At the end refrigerators and freezers with retailers and departmental stores to retain freshness.

DISTRIBUTION

Amul coordinated with various unions to get a regular supply of milk and dairy products. The processed milk and dairy products were procured from district dairy unions and distributed through third party distributors. To ensure quality and timely deliveries, GCMMF and the district unions had several mechanisms in place. The unions monitored the supplies of milk and the distribution of finished products.

DOWNSTREAM FLOW

First leg - Manufacturing units to company depots using trucks, Frozen food below -18 C, Dairy wet 0-4 C.

Second leg - Depots to warehouses which transport through insulated 3 and 5 MT TATA 407's.

Third leg - Warehouses to retailers which transport through rickshaws.

REVERSE LOGISTICS

Milk churn from dairy to vcs, bottle from retailer to dairy, damaged products from customer to retailer then to dairy, pouch milk tray from retailer to dairy.

DIRECT RETAILING

Amul has recently entered into direct retailing through "Amul Utterly Delicious" parlours created in major cities. Amul has plans to create a large chain of such outlets to be managed by franchisees throughout the country. More than 2000 parlour with a turnover of Rs. 200 crores.

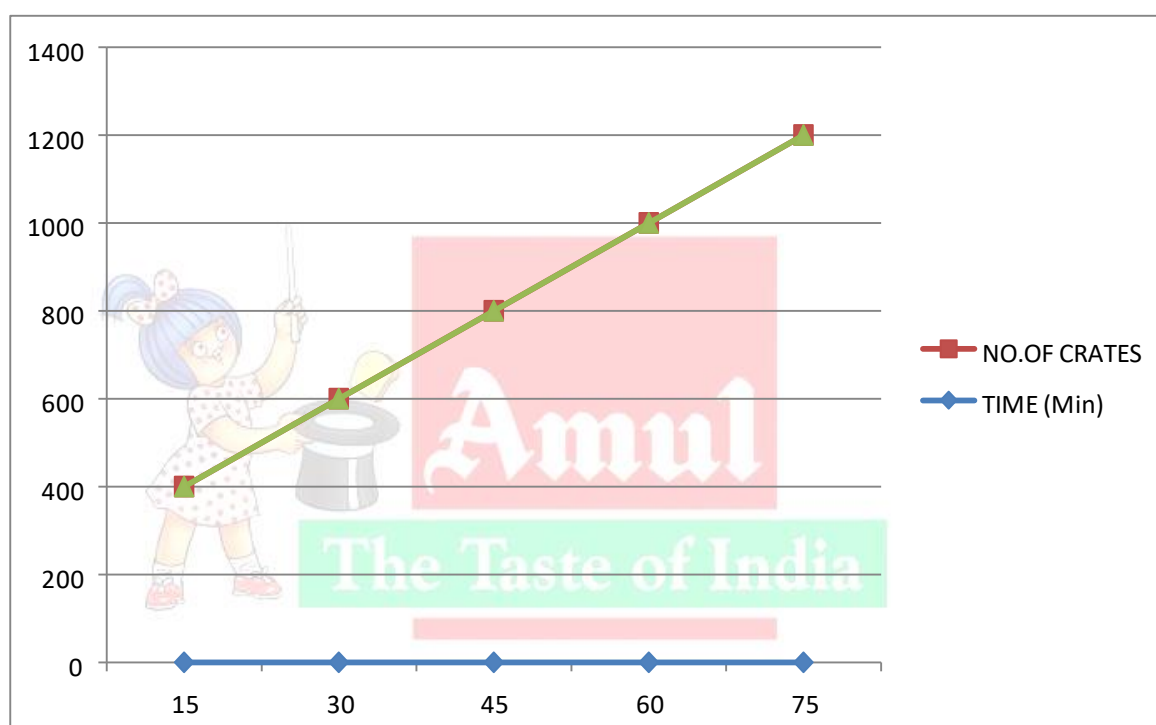
5.3 TABLES AND CHARTS WITH INTERPRETATION

5.3.1 LOADING AND UNLOADING TIME CALCULATION

This time calculate on the basic of no. of labour for loading and unloading. It's also depends size of truck means no of crates in on t truck and distances between the truck and godown. One truck loading required 1 ½ hr for loading with 4 labours. Unloading also required same time as like the loading the truck.

Table No. 5.3.1 No. of labours for loading the truck

Time (min)	No. of Labour	No. of Crates /truck
15	4	400
30	4	600
45	4	800
60	4	1000
75	4	1200



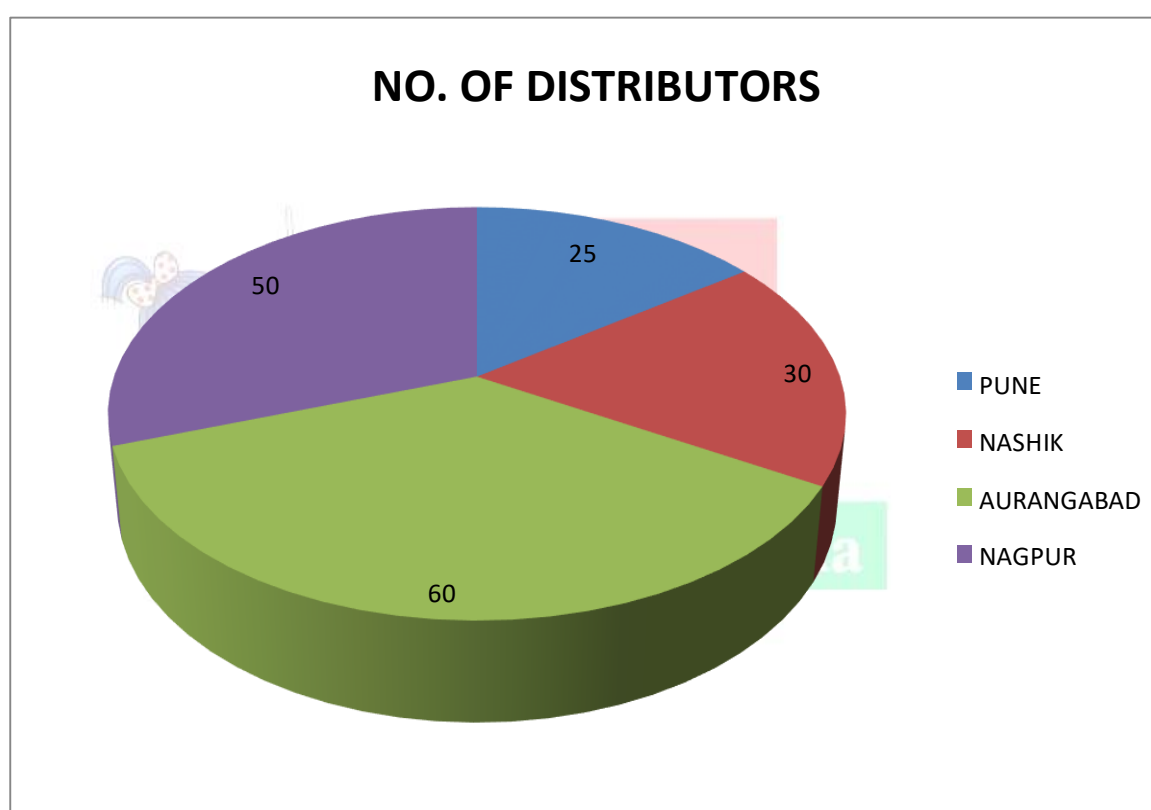
(Graph 5.3.1)

5.3.2 CALCULATION OF KILOMETERS FROM CHANDOLI TO DROP POINT OF THE DISTRIBUTORS

The distributors were different location as like the Pune, Nasik, Aurangabad. The distance between the Chandoli to Distributors is vary from location. All trucks from Chandoli start at the evening and early morning it reached to distributor location. For the kilometre calculation GPS system fit in the Truck. It helps to track the location of truck exact. Truck size and No. of truck at each location is depends on the no. distributors and quantity of milk at each distributing point required. The mobile tracking is also done some time.

Table 5.3.2 No. of truck per Distributing point and location

No. of Truck	Location	No. of Distributors
1	Pune	25
2	Nasik	30
3	Aurangabad	50
4	Nagpur	60



(Graph no. 5.3.2)

5.3.3 TANKER FOR COLLECTIVE CENTRES:

First, they were selected the no. of collective centre and milk procurement in the same route. It helps to select the size of container required for same route for collecting the milk. The effective management is possible by route management of the truck. For Example. One route and no. of cooperative society as calculate like.

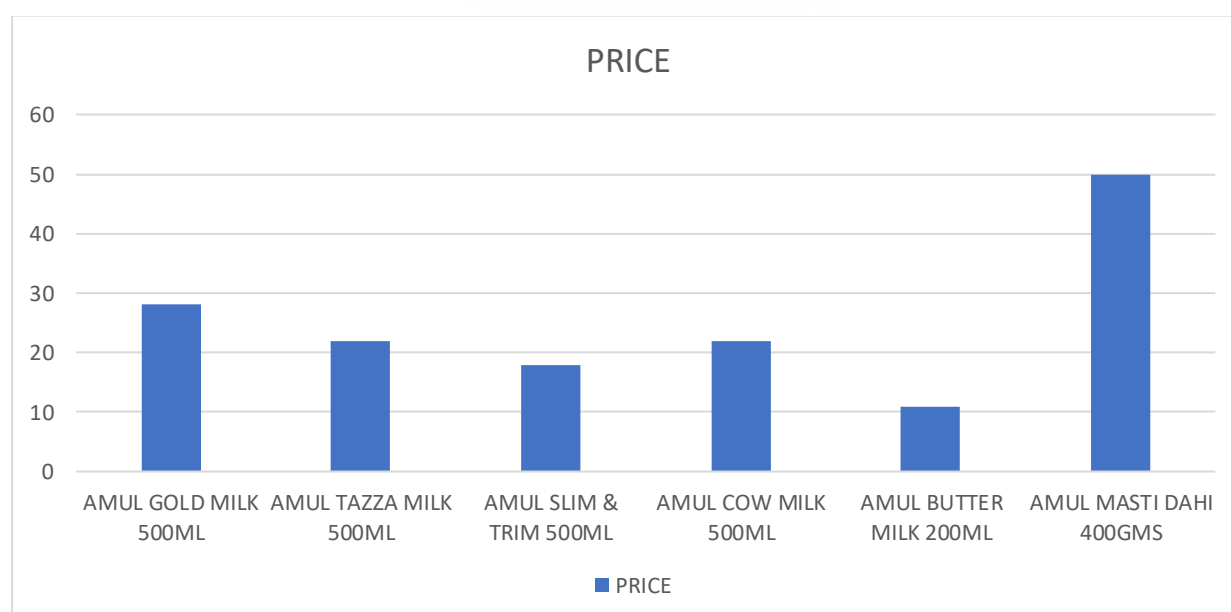
(Table 5.3.3 - No. of truck per Distributing point and location)

No. of Co-operative society	Milk Procurement (litter)
1 Daad	1296
2 Chas	1759
3 Saigoan	1986
4 Gargoatewadi	1456
5 Neherewadi	1585
6 Agarvadi	1090
Total	9172

5.3.4 PRICE FACTOR OF AMUL PRODUCTS

(Table no.5.3.4 - Price Factor Of Amul Products)

Sr. No	Product	ML	Price
1	Amul Gold Milk	500ml	28
2	Amul Tazza Milk	500ml	22
3	Amul Slim & Trim	500ml	18
4	Amul Cow Milk	500ml	22
5	Amul Butter Milk	200ml	11
6	Amul Masti Dahi	400gms	50



(Graph no. 5.3.4)

5.3.5 SALES TURNOVER OF AMUL

Sales Turnover	Rs (million)	US\$ (in million)
1994-95	11140	355
1995-96	13790	400
1996-97	15540	450
1997-98	18840	455
1998-99	22192	493
1999-00	22185	493
2000-01	22588	500
2001-02	23365	500
2002-03	27457	575
2003-04	28941	616
2004-05	29225	672
2005-06	37736	850
2006-07	42778	1050
2007-08	52554	1325
2008-09	67113	1504
2009-10	80053	1700
2010-11	97742	2172
2011-12	116680	2500
2012-13	137350	2540
2013-14	181434	3024
2014-15	207330	3410
2015-16	229720	3500
2016-17	270850	4100
2017-18	292250	4500
2018-19	331500	4800
2019-20	385500	5100

(Table 5.3.5)

	CHAPTER 6
FINDINGS AND CONCLUSION	6.1 MAJOR FINDINGS OF THE STUDY 6.2 CONCLUSION 6.3 SUGGESTIONS 6.4 IMPLICATIONS OF THE STUDY

6.1 MAJOR FINDINGS OF THE STUDY

- Direct milk bill payment to farmers. After every 10 days cycle payment has made to farmers.
- Produce meeting to be conducted at DCS level for the better transparency and improvement in trust level.
- Amul focus on that to maintaining good rates in flush season.
- Random visit of quality person to attend the reception, collection of doubtful samples and adulteration test. All per strictly monitored for good since.
- Veterinary service started at all target area.
- Amul provides good quality of cattle feed to Amul milk producers.
- Amul provided milk adulteration kit at per level .it helps to know identify the Milk adulteration at per.
- FSSAI license to societies- All the per have applied for food & drugs license.

6.2 CONCLUSION

The benefits of an efficient supply chain management included reduction in lead time faster inventory turnover accurate forecasting increased warehouse space reduction in safety stock and better working capital utilization. It also helped in reducing the dependency on distribution centre management personnel resulting in minimization of training costs and errors. Stock outs were also completely eliminated. Amul, is playing a vital role in serving the rural class & contribution for the economic up. It is helping the farmers by giving them all facilities to rural people by supplying fodder & feed, improving the breed by artificial insemination with the help of their veterinary services. AMUL is reaping profit by equipping the latest technology& producing better quality products. It is serving the best quality milk & milk products to its customers, thereby maintaining their top position in the market. It has atomized manufacturing and every process is computerized. In other words, through automation it has achieved great success and a good recognition.

6.3 SUGGESTIONS

- AMUL Should maintain the good relationship with the farmers, co- operative societies and distributors.
- More focus on milk procurement and maintain quality milk product.
- The distributors are also facing the problem of dumping which make it impossible for them to forecast and give order for the next day as they currently have extra stock.

- The distributors of Amul should not be allowed to keep other milk products. And even if they maintain the same, they should be punished.
- Certain schemes need to entertain to the milk distributors shall be given so as to motivate them and increase our sales.
- Trucks which are used for transport of Amul Pouch Milk should be washed regularly.
- Company should try to make available their product at all most retailer's shops by improving their distribution channel.
- Satisfaction level of customers should be raised by providing good quality product at low price, and should try to remove reasons for dissatisfaction of customers.
- Feedback, suggestion & complaints should be revised by AMUL if they are appropriate & Good. It should also try to take actions for Implementation.

6.4 IMPLICATIONS OF THE STUDY



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