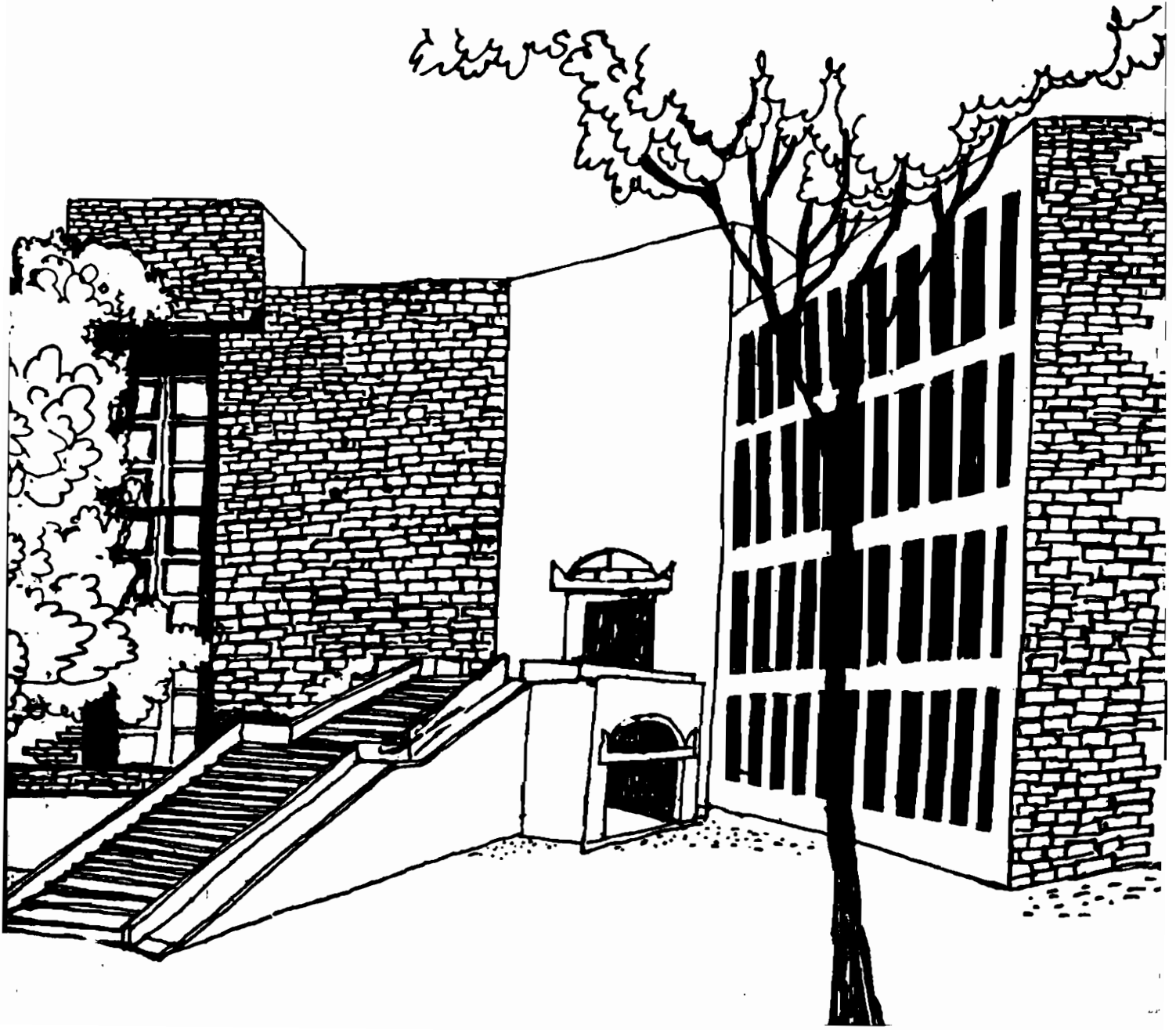




# Working Paper



# MANAGING COMPLEX NETWORKS IN EMERGING MARKETS: THE STORY OF AMUL

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# **Managing Complex Networks in Emerging Markets: The Story of AMUL**

## **Abstract**

Firms that desire to do business in large emerging markets need to develop a new paradigm for looking at opportunities in these markets. The success of many such firms has depended on how well have they formed or managed to become a part of an existing network of suppliers and consumers. These economies are complex and have unique characteristics that range from underdeveloped markets to small and fragmented supplier base. Clearly, traditional business models are not adequate for this environment. Successful firms participate in the development of both these elements of the supply chain. The prize, needless to mention, is significant sales in a large market. In this paper we describe a successful business model using the example of AMUL. AMUL is a dairy cooperative in the 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. This paper draws various lessons from the experiences of AMUL that would be useful to firms contemplating entry into emerging market.

## 1. Introduction

Large emerging markets like China and India are becoming the proving grounds for existing business norms and practices of multinationals (MNC) worldwide. To get a foothold in these markets MNCs have tried various models that range from replicating home country practices to becoming a dyed-in-the-wool host country firm. Most of these approaches, however, have failed to deliver the promise with which these markets were seen at the time of entry. For example, many MNCs in India focused on the 200 million middle-class as their target customers (a number which appears large enough for any new entrant) but performed very poorly. This segment was subjected to marketing efforts of all MNCs. All wanted to sell their T-shirts or their cars or their expensive shoes or their foreign holidays to the same set of consumers. At some point the budget constraint of this large segment and absence of an attractive value proposition in the products & services offered stood in the way of successful MNC entry into India. The strategy failed and many MNCs beat a hasty retreat.

Large emerging economies have their own complexities that range from development of markets (where the largest segment of population is the one which has low purchasing power) to integration of low cost suppliers who are predominantly small. For firms that aspire to conduct substantial business in such markets, such complexities have to be recognized and then overcome. The challenge is to understand the linkages between markets and the society. This would also require development of a new business model that helps a firm grow in such environments. This paper is about one such successful model. The Kaira District Milk Cooperative Union or AMUL in India is an example of how to develop a network of firms in order to overcome the complexities of a large yet fragmented market like those in emerging economies by creating value for suppliers as well as the customers.

The central message of the paper is that large fragmented markets need a long-term perspective on profitability. It requires simultaneous development of customers and suppliers. The requirements of this new business model are capabilities to develop a large network of suppliers, nurturing the market for long-term growth, focusing on efficiency & quality, developing a commitment to small stakeholders, strong implementation skills and breakthrough leadership. It is worth noting that today AMUL competes successfully with the private sector that includes multinational corporations and domestic players, and provides handsome returns to farmers without receiving any form subsidy from the government.

In this article we will describe the breakthrough vision that led to the simultaneous development of the market and supply side through a process of social development and education at AMUL. Clearly implementation of this vision in a competitive environment and maintaining sustained growth and profitability requires development of competitiveness on several dimensions and operational effectiveness. This article would also provide insights into management of very large supply chains by adapting and integrating a variety of strategies and techniques. This includes building networks, developing trust & values in the network, developing fair mechanisms for sharing benefits across the supply chain, coordination for operational effectiveness, innovation and new technology for gaining competitiveness. It is noteworthy that these successes were achieved within the framework of a network of cooperatives organized in a hierarchical manner.

This paper is organized as follows. The next section briefly outlines the characteristics of a network that operates as a large firm within the supply chain and organizational framework. Section 3 describes the AMUL network and provides a historical background on its formation. In Section 4 we present the business model of such a network, delineate the managerial framework for its success and highlight its performance. In Section 5 we draw lessons from managing such a complex network of firms in an emerging economy environment.

## **2 Characteristics of a Network Environment**

During late 1980s and 90s network structure emerged as an innovative mechanism for enhancing competitiveness and providing value to the consumer. Essentially, a network is made up of various stakeholders ranging from suppliers to retailers, loosely linked by a common interest of remaining competitive in a demanding environment. This is in contrast to the traditional mechanism of vertical integration, joint ventures etc. In recent years, much of the interest in the network structure has been motivated by the increased attention to supply chain management with the focus shifting from the individual firm to the supply chain. A typical supply chain network spans several levels of suppliers, manufacturers/assemblers, distributors, wholesalers, and retailers. It is now quite well recognized and well documented that cooperation among the members is necessary to manage such chains effectively and efficiently. Further, research on the subject has highlighted the role of coordination and its importance in supply chain management (Lee et al., 1997). Proctor & Gamble and Walmart in the grocery industry, Ford and GM in auto industry are some of the well known examples of firms that have realized substantial benefits by shifting the focus to supply chain. It is also recognized that such changes are not easy to implement and require a paradigm shift in the

outlook of firms in the chain. Specifically, this requires that decision making by various players be driven by the objective of optimizing the performance of the chain (global optimum) rather than by the interests of the individual firms (local optimum). Further, complexity and dynamics of the supply chain make it very difficult to assess the interaction effects.

Increased cooperation among network members has resulted in a number of changes at all levels -- operational, tactical and strategic, and has led to the emergence of practices and strategies for improving the chain's performance. Most prominent among these include the following:

(i) information sharing, often dynamically, to improve planning and execution. Sharing of POS data is a classic example for minimizing the distortions due to bull-whip effect and reducing perceived variability of demand by the partners in the chain. Typically, information sharing extends to costs as well.

(ii) focus on core competence of each player in the chain. The objective is to ensure that each task is performed by the entity best suited for it. As a result, firms have become willing partners in ceding control to a network partner for improving performance. VMI in many industries is a direct result of such change in management thinking. Similarly, the role of third parties for providing specific expertise such as logistics has grown substantially with emphasis on supply chain.

(iii) help network partners in improving their capability and making them competitive. Again, this represents a sea change from the past when such entities were viewed as rivals in a zero-sum game. The new thinking is motivated by the recognition that helping partners become competitive will make the chain more effective and lead to higher growth in revenues and profits, thus leading to a win-win situation for all parties. Helping suppliers with process improvements and implementation of JIT methods are examples of such initiatives leading to overall improvement.

With many of the above characteristics being embodied in a network, it may start to perform all the functions of a firm by satisfying the requirements of an organization, i.e., having multiple agents, having a legal standing, presence of group objective as well as individual objectives amongst agents, existence of a hierarchy of relationship and pooled interdependence, sharing of common information and centralized planning (to some extent), sharing of risks, having centralized marketing function for most products etc. (Carley 1992, Dyer and Singh 1998, Van Zandt, 1998). It is interesting to note that AMUL has adopted the network model in early 1950s in a broader context and more complex environment, well before the approach was recognized in Western Europe and

North America. In the following sections we describe the AMUL story and elaborate on its practices.

### **3 The AMUL Story**

The Kaira District Cooperative Milk Producers' Union Limited was established on December 14, 1946 as a response to exploitation of marginal milk producers in the city of Anand (in Kaira district of the western state of Gujarat in India) by traders or agents of existing dairies. Producers had to travel long distances to deliver milk to the city. In Polson Dairy, the milk that was sold to the city went sour, especially in the summer season, as producers had to physically carry in individual containers. These agents decided the prices and the off-take from the farmers by the season. Milk is a commodity that has to be collected twice a day from each cow/buffalo. In winter, the producer was either left with surplus unsold milk or had to sell it at very low prices. Moreover, the government at that time had given monopoly rights to Polson Dairy (around that time Polson was the most well known butter brand in the country) to collect milk from Anand and supply to Bombay city in turn (about 400 kilometers away). India ranked nowhere amongst milk producing countries in the world in 1946.

The producers of Kaira district took advice of the nationalist leaders, Sardar Vallabhbhai Patel (who later became the first Home Minister of free India) and Morarji Desai (who later became the Prime Minister of India). They advised the farmers to form a Cooperative and supply directly to the Bombay Milk Scheme instead of selling it to Polson (who did the same but gave low prices to the producers). Thus the Kaira District Cooperative was established to collect and process milk in the district of Kaira. Milk collection was also decentralized as most producers were marginal farmers who would deliver 1-2 litres of milk per day. Village level cooperatives were established to organize the marginal milk producers in each of these villages. The first modern dairy of the Kaira Union was established at Anand (which popularly came to be known as AMUL dairy after its brand name). The new plant had the capacity to pasteurize 300,000 pounds of milk per day, manufacture 10,000 pounds of butter per day, 12,500 pounds of milk powder per day and 1,200 pounds of Casein per day. Indigenous R&D and technology development at the Cooperative had led to the successful production of skimmed milk powder from buffalo milk – the first time on a commercial scale anywhere in the world. The foundations of a modern dairy industry in India had just been laid as India had one of the largest buffalo populations in the world.



We move to year 2000. The dairy industry in India and particularly in the State of Gujarat looks very different. India for one has emerged as the largest milk producing country in the world (see Table 1). Gujarat emerges as the most successful State in terms of milk and milk product production through its cooperative dairy movement. The Kaira District Cooperative Milk Producers' Union Limited, Anand becomes the focal point of dairy development in the entire region and AMUL emerges as one of the most recognized brands in India, ahead of many international brands.

Starting with a single shared plant at Anand and two village cooperative societies for milk procurement, the dairy cooperative movement in State of Gujarat had evolved into a network of 2.12 million milk producers (called farmers) who are organized in 10,411 milk collection independent cooperatives (called Village Societies). These Village Societies (VS) supply milk to thirteen independent dairy cooperatives (called Unions). AMUL is one such Union. Milk and milk products from these Unions are marketed by a common marketing organization (called Federation). Figure 1 and 2 together show the structure and the range of activities in this extensive network. While Figure 1 describes the hierarchical nature of the cooperative structure, Figure 2 presents the supply chain linking farmer-suppliers of milk with the millions of consumers. Gujarat Cooperative Milk Marketing Federation or GCMMF is the marketing entity for the State of Gujarat (see Panels A, B & C of Table 2 for details on the scale of its operations). GCMMF has 42 regional distribution centers in India, serves over 5,00,000 retail outlets and exports to more than 15 countries. All these organizations are independent legal entities yet loosely tied together with a common destiny! (In a recent survey GCMMF was ranked amongst the top ten FMCG firms in the country while AMUL was rated the second most recognized brand in India amongst all Indian and MNC offerings). Interestingly, the Gujarat movement spread all over India and a similar structure was replicated (all are at different levels of achievement but their trajectory appears to be quite similar!). Two national organizations, the National Dairy Development Board (NDDB) and the National Co-operative Dairy Federation of India (NCDFI) were established to coordinate the dairy activities through cooperatives in all the States of the country. The former provides financing for development while the latter manages a national milk grid and coordinates the deficit and surplus milk and milk powder across the states of India. In the early nineties, AMUL was asked by the Government of Sri Lanka to establish a dairy on similar lines in Sri Lanka. Interestingly, while Polson folded up sometimes in 1960s, the cooperatives are faced with new competition in liberalizing India – from MNCs who brought in new business paradigms, new and improved product portfolio, international network and

immense financial support. The Cooperatives face new challenges that test the robustness of their approach and their commitment to the movement and a new style of management thinking.

Today AMUL is a symbol of many things. Of high-quality products sold at reasonable prices. Of developing and coordinating a vast co-operative network. Of making a strong business proposition out of serving a large number of small and marginal suppliers. Of the triumph of indigenous technology. Of the marketing savvy of a farmers' organisation. We will now try to address the central issue of how to develop and manage a network of firms in an emerging market environment.

#### **4 The Network as a Firm: Business Model & Management Paradigm**

The AMUL network and its extension that cover the whole country now have the following unique characteristics:

- it combined market and social development in a highly competitive environment. It recognized the inter-linkages between various environments that governed the lives of marginal milk farmers and the unmet needs of the consumers. It also changed the supply chain paradigm in order to reduce the cost to the consumer while increasing the return to the supplier.
- it realized that for the movement to succeed it had to benefit a large number of people – both suppliers and consumers. While large scale had the danger of failure due poor control and management and required more resources, it also had the advantage of creating a momentum that would be necessary to bring more people into the fold and thereby help more suppliers and consumers.
- it also realized that until the intermediaries understood the value of service to the marginal farmers on one hand and the consumers on the other, the task of carrying a large population of potential suppliers along with them would not be possible. More importantly, the goal could only be achieved in the long run and this required developing values in people and processes that were robust, replicable and transparent.
- it also realized that the cooperative would not be independent and viable in the face of competition if it was not financially sound. This implied that the movement had to develop distinct capabilities that would deliver competitive advantage to its operations. This would include long term cost containment, world class deployment of technological resources and R&D, and better leveraging of scarce resources.

The logical next questions, what is the business model of such a “network of entrepreneurs” and the requirements for such a model to work, are addressed in the following section.

#### **4.1 The Business Model**

The objective of the network was to deliver profitable and equitable returns to a large number of farmers for a long period of time. This follows rather directly from the fact that the member farmers own essentially the network of cooperatives. As explained later, given the weak economic status of these members, an additional objective was to develop the supplier over the long term through social change. Consequently, the business model had to include both the costs and benefits of services that would be needed to deliver milk with high productivity as well as to assist farmers in improving their social environment.

The success of the network depended on high collection rate of milk. This required increasing membership with more VSs, raising the number of members per VS, and improving the milk yield (i.e., better cattle management), constant concern about the cost to farmers in the network and delivering quality to customers at low prices. The cooperative had decided as part of its value:

- to charge for each service provided to the supplier
- to purchase all milk that member farmers produced
- to sell liquid milk at affordable prices so as to serve a large number of consumers
- to develop and deliver services that will improve lives of people in the network
- to hire professional managers, to run the federation and unions, whose values included upliftment of rural poor.

It is noteworthy that from the very beginning, in the early 1950s, AMUL adopted the network as the basic model for long-term growth. Two aspects of this network deserve special attention. First, the network explicitly includes secondary services to the farmer-suppliers. Second, several of the entities in the network are organized as cooperatives linked in a hierarchical fashion. In what follows, we describe briefly the environmental characteristics and the rationale for the underlying business model. The details are presented later in Section 4.2.

*Market / Customers:* In comparison with developed economies, the market for dairy products in India is still in an evolutionary stage with tremendous potential for high value products such as ice cream, cheese etc. The distribution network, on the other hand, is quite reasonable with access to

rural areas of the country. Traditional methods practiced in western economies are not adequate to realize the market potential and alternative approaches are necessary to tap this market.

*Suppliers:* A majority of the suppliers are small or marginal farmers who are often illiterate, poor, and with liquidity problems as they lack direct access to financial institutions. Again, traditional market mechanisms are not adequate to assure sustenance and growth of these suppliers.

*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.

Even from the cursory description of the environment provided above, it should be clear that the traditional management practices of the west are not sufficient for success in emerging markets. Many MNCs that ventured into India following the first phase of liberalization in 1990s found this at a great cost. The success of GCMMF and AMUL is in glaring contrast to the experience of these MNCs and thus provides an alternative business model that may be useful for others considering entry into emerging markets like India. A schematic description of the business model showing the demand-supply linkages is presented in Figure 3. In addition to material flows, the figure shows major decisions, support services, and planning and coordination activities. For example, procurement prices set by Unions are a major determinant of milk supply. Similarly, GCMMF's pricing strategy for dairy products has a strong influence on consumer demand. As shown in the figure, the Unions and GCMMF share coordination activities. 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.

*Simultaneous Development of Suppliers and Customers:* From the very early stages of the formation of AMUL, the cooperative realized that sustained 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 plank of AMUL's strategy even today. The choice of product mix and the sequence in which AMUL 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 the 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 with severe liquidity problems, illiterate and untrained. 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 the milk supply was made with minimum of delay. This practice continues today with many village societies making payments upon the receipt of milk. 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 the growth of the industry over an extended period of time.

*Managing Third Party Service Providers:* Well before the ideas of core competence and the role of third parties in managing the supply chain were recognized and became fashionable, these concepts were practiced by GCMMF and AMUL. From the beginning, it was recognized that the core activity for the Unions lay in processing of milk and production of dairy products. Accordingly, the Unions focused efforts on these activities and related technology development (elaborated in Section 4.2). The marketing efforts (including brand development) were assumed by GCMMF. All other activities were entrusted to third parties. These include logistics of milk collection, distribution of dairy products, sale of products through dealers and retail 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.

#### **4.2 The Management Paradigm: “Anand Pattern”**

The business model thus had to include low cost high quality operations, low margins at retail and distribution ends and high level of sharing of profits amongst the suppliers, i.e., the farmers. This led to the evolution of the “Anand Pattern” – a management style, named after the city where AMUL is located, that incorporates the above requirements in its strategy and uses a variety of mechanisms to implement its strategy with a single purpose of aligning the goals of the consumer with those of the suppliers. Some essential features of the Anand Pattern are:

- Inspiring Leadership and Consuming Values
- Building Networks
- Coordination for Competitiveness
- Technology for Effectiveness

##### ***Inspiring Leadership and Consuming Values***

While Kaira Union had the support of the national leaders who were at the forefront of the Indian independence movement, its local leaders were trained in Gandhian simplicity and had their feet rooted firmly amongst people whom they had mobilized – the farmers. The foremost amongst them was Tribhuvandas Patel who had led the movement for the formation of the cooperative of small and marginal farmers in order to compete against private enterprise on one hand, and keep bureaucracy away on the other hand. Tribhuvandas was the first Chairman of the Cooperative. His skills lay in organizing the village producers to believe in the power of cooperation and their rights towards improvement of human condition. He is remembered as fair and honest person whose highest sense of accountability to the members of the union laid the foundation of trust between the network members. Another important aspect of his remarkable management style was his gentleness and ability to repose trust in people – he gave complete autonomy to the managers of the union and earned complete commitment from them (Heredia, 1997). Verghese Kurien was one such manager who would shape the destiny of the union, first, and then the milk movement throughout the country.

Kurien emerged as the father of the dairy movement in India. He managed to keep the government and bureaucrats away from the cooperative and gave shape to the modern structure of the cooperative, worked tirelessly to establish the values of modern economics, technology and concern for farmers within the cooperative. Kurien remained irreverent to the world outside but in the members of the cooperative he had found a reason to exist. He openly claimed himself as an employee of farmers. He interfaced with global financing agencies to build new projects at AMUL (a popular moniker for the entire movement). He worked with the unions to bring the best of technology to the plants. He worked with marginal village farmers to create systems that would increase milk yields. He understood that without meeting the needs of customers he would not be able to satisfy his obligations to the farmers. In short, Kurien shaped the destiny of the milk movement in India through NDDB (as its Chairman) and particularly at GCMMF and cooperatives in Gujarat. He helped build a modern organization with professional management systems that would support the aspirations of farmers and customers. Several people left better paying jobs to join the milk movement and to help create a dream of making India the milk capital of the world. Kurien had learnt the persuasive charm of Tribhuvandas through plain speaking and had soon created a cadre of highly capable managers to whom he had delegated both management as well as commitment. These leaders were created at the village, district and state levels in different organizations of the network.

### ***Building Networks***

The founders of Kaira Union realized that to fulfill their objectives, a large number of marginal farmers had to benefit from the cooperative – a network of stakeholders had to be built. And once built, it had to grow so as to draw more rural poor to undertake dairy farming as a means of livelihood. The network had to have several layers – the organizational network where the voice of the owners governed all decisions, a physical network of support services and product delivery process and a network of small farmers that could deliver the benefit of a large corporation in the market place. More importantly, a process had to be put in place to build these networks.

Building an organizational network that would represent the farmers and the customers was the most complicated task. A loose confederation evolved with GCMMF representing the voice of the customers, the Unions representing the milk processors and the village societies representing the farmers. Competition in the markets ensured that the entire network was responding to the requirements of the customers at prices that were very competitive. The task of ensuring the returns

to the farmers was commensurate with the objectives with which the cooperatives were setup was achieved through representation of farmers at different levels of decision making throughout the network – the societies, Unions and the Federation boards comprised farmers themselves. In order to ensure that most returns from sales went to the farmers themselves who were the producers, the intermediaries had to operate very effectively and on razor thin margins. This turned out to be a blessing in disguise – the operations remained very “lean” and started to provide cost based advantage to the entire network.

AMUL established a group to standardize the process of organizing farmers into village societies. In addition to establishing the criteria for selecting members, the group had to train the VS to run the cooperative democratically, profitably and with concern for its members. This included establishing procedures for milk collection, testing, payment for milk purchased from member farmers and its subsequent sale to the union, accounting, ensuring timely collection and dispatch of milk on milk routes established by the union, etc. The village societies department at AMUL acted as internal representatives of the village societies in their dealings with the Unions.

Milk procurement activity at AMUL comprises development and servicing of village societies, increasing milk collection, procurement of milk from societies & its transport to the chilling locations, and resolving problems of farmers and village societies. Their stated objective is to ensure that producers get maximum benefits. The Societies Division of the Milk Procurement Department coordinates these activities. Milk collection takes place over a large number of pre-defined routes according to a precise timetable. The field staff of this division also help village societies interface with the Union on various issues ranging from improvement of collection, resolving disputes, repair of equipments to obtaining financing for purchase of equipment etc. In addition, they are also responsible for the formation of new societies, which is an important activity at AMUL.

The physical delivery network for distribution of milk and milk products is managed by the marketing arm of the network – GCMMF. GCMMF provides umbrella branding to all the products of the networked. The two brands that GCMMF supports are AMUL and SAGAR. Milk and milk products from all Unions are sold under these two key brands (Table 3 shows the market share of AMUL across various product segments). In essence, GCMMF procures from multiple production plants (the thirteen Unions) which in turn procure from the Village Societies registered with each Union. GCMMF distributes its products through third party distribution depots that are managed by distributors who are exclusive to GCMMF. These distributors are also responsible for servicing



retail outlets all over the country. GCMMF sales staff manages this process. Retailing of GCMMF's products takes place through the FMCG retail network in India most of whom are small retailers. Liquid milk also gets distributed by home vendors who deliver milk at homes. Since 1999, GCMMF has started web based ordering facilities for its customers. A well-defined supply chain has been developed to service customers who order in this manner.

Cooperative development programmes at the village level for educating & training its members have become an important part of the strategy to build this extensive network. It has provided education and training to around 650,000 women members & 550,000 male members along-with the management committee members and staff of the village societies.

### ***Coordination for Competitiveness***

Robust coordination is one of the key reasons for the success of operations involving such an extensive network of producers and distributors at GCMMF. Some interesting mechanisms exist for coordinating the supply chain at GCMMF. These range from ensuring fair share allocation of benefits to the various stakeholders in the chain to coordinated planning of production and distribution. The spirit of cooperation is present in all transactions in the chain and is constantly strengthened by the vision and actions of Unions and the Federation. More importantly, the reason for setting up of this cooperative is not amiss to any one in this large network organization. Employees, customers and distributors are constantly reminded that they work for the farmers and the entire network strives to provide the best returns to the farmers, the real owners of the cooperative. It may be remembered that coordination mechanisms have to link the lives and activities of 2.12 million small suppliers and 0.5 million retailers!

There appear to be three critical mechanisms of coordination that ensure that decision making is coherent and that the farmers gain the most from this effort. These mechanisms are:

- Inter-locking Control
- Coordination Agency: Unique Role of Federation
- Supplier Enhancement and Network servicing

### ***Inter-locking Control***

Each Village Society elects a chairperson and a secretary from amongst its member farmers of good standing to manage the administration of the VS. Nine of these chairpersons (from amongst those VS affiliated to a Union) are elected to form the Board of Directors of the Union. The Chairperson of the Union Board is elected from amongst these members. The managing director of the Union,

who is a professional manager, reports to the chairperson and the board. All chairpersons of all the Unions form the Board of Directors of GCMMF. The managing director of GCMMF reports to its Board of Directors. Each individual organization, the Union or GCMMF, are run by professional managers and a highly trained staff. It must be pointed that all members of all the boards in the chain are farmers who pour milk each day in their respective Village Societies.

A key reason for developing such an inter-locking control mechanism is to ensure that the interest of the farmer is always kept at the top of the agenda through its representatives who constitute the Boards of different entities that comprise the supply chain. This form of direct representation also ensures that professional managers and farmers work together as a team to strengthen the cooperative. This helps in coordinating decisions across different entities as well as speeding both the flow of information to the respective constituents and decisions.

#### Coordination Agency: Unique Role of the Federation

In addition to being the marketing and distribution arm of the Unions, GCMMF plays the role of a coordinator to the entire network within the State – coordinating procurement requirements with other Federations (in other states), determining the best production allocation for its product mix from amongst its Unions, managing inter-dairy movements, etc. It works with two very clear objectives: to ensure that all milk that the farmers produce gets sold in the market either as milk or as value added products and to ensure that milk is made available to an increasingly large sections of the society at affordable prices. In addition, it has to plan its production at different Unions in such a way that market requirement matches with unique strengths of each Union and that each Union also gets a fair return on its capacity. In this regard, the following aspects of the GCMMF's strategy need to be highlighted:

(a) Production Allocation across Unions: GCMMF, in consultation with all the Unions, decides on the product mix at each Union location. Some considerations that govern this choice are the strengths of each Union, the demand for various products in the region of the Union as well as the country, long term strategy of each Union, procurement volumes at different Unions, distribution costs from various locations etc. Demand for daily products and supply of milk vary with the season. Further, demand and supply seasons run counter to each other making the planning problem more complex.

The choice of product mix and its allocation among the unions is determined in a hierarchical fashion by GCMMF. First, annual demand targets are developed for each product category based on long term growth plans and pricing strategy. Next, these targets are converted to

annual plans by matching the targeted demand with projected supply. In case of mismatch between projected supply and demand appropriate adjustments are made as needed. For example, when demand exceeds supply (as is the case most often), the projected supply is allocated among the products in a sequential manner. In the allocation process liquid milk gets the highest priority (as it is perceived as a primary social obligation) followed by other products, the priority typically determined by product shelf life.

In the second stage, the allocation is disaggregated into monthly plans for each union. In developing the monthly plans GCMMF takes into account seasonality in demand and supply availability at each union, geographical distribution of demand, impact on costs and equity between unions. The monthly plans are developed on a rolling horizon basis and the buy-in from the Unions is secured in the monthly meeting attended by MDs of all Unions. The detailed production plans showing inventory of intermediate products and finished goods at the Unions are determined by each union.

(b) Pricing and Product Mix Choices: GCMMF pays the same price for each product to all the Unions independent of their production costs. While there is some variation in pricing by Unions for its farmers, it forces the Unions to homogenize their cost structures with other Unions as much as possible. By devising appropriate pricing structures, it ensures that the Unions (which are independent legal entities) have no reason to produce other than what the Federation desires. Often conflict arises as the preferred mix of the Union (i.e., one that will get them most returns) turns out to be different from what the Federation wants it to produce. GCMMF also manages inter-dairy movement by setting appropriate pricing of surplus quantity. At the end of the day, any surplus revenue which is generated is shared between the Unions on the basis of this inter-dairy movement.

#### Supplier Enhancement and Network Servicing

Each Union has a separate Department that services the needs of the societies and also has the primary responsibility developing new societies in their district. The Societies Department is a single window contact point of the Village Society at the Unions. Their objective is to ensure that producers get maximum benefit and to resolve all their problems. They manage the procurement of milk that comes via trucks & tankers from the VSs. They negotiate annual contracts with truckers, ensure availability of trucks for procurement, establish truck routes, monitor truck movement and prevent stealing of milk while it is being transported. Development of farmers, however, remains as their key role. They coordinate the requirements of the VSs, be it choice of new equipment or

animal husbandry or purchase of cattle, with the respective department at AMUL. They also help in evaluating the performance of the VSs.

Supervisors and Field Officers from the Societies Department constantly visit each VS. These Field Officers form route teams and each week they visit several VSs. Supervisors visit each VS at least once in three months. They check on any problem that a VS is facing, evaluate the testing facility at the VS, take up complaints of the farmers with the VS officials, settle any dispute between the Unions and VSs including settling of financial accounts etc. They also play the important role of encouraging farmers to form new societies, evaluate these potential cooperatives, explain the rules of business as set by AMUL, help initiate their business, and provide all necessary support for its growth. These activities help in improving the contribution of supplier to the network.

GCMMF on the other hand manages the distribution end of the network. In addition to servicing the distributors and retailers, it also forms a bridge for the transfer of network values to the distributors and retailers. The network has also developed support services that would help improve productivity of the network as well as reduce the probability of market failures due to inability of individuals in the network to pay market prices from these services. This was a classic example of cooperation in developing common resources for the entire network. Such network resources included 24-hour veterinary services, animal husbandry services for better cattle management, an animal feed factory, milk can production facility (which was later sold to a third party), strong linkages with the Gujarat Agricultural University in Anand, an Institute for Rural Management for training professionals, and management of contracts with trucking service providers for pickup of milk and delivery of milk products across each union. It may be worth noting that each of the services have to be paid by the farmers though some may have been subsidized by the network. Subsidy, however, must be seen as the common's price for services as it ultimately was debited against profits that may have accrued to each member of the network.

### ***Technology for Effectiveness***

Service to customers required the following: better and newer “products”, “processes” that would deliver the low cost advantage to the network and “practices” that would ensure high productivity and delivery of the right product at the right time. Thus technology or knowledge that was embodied in products, processes, and practices became the important factor in delivering effectiveness to the network. Panel D of Table 2 lists the range of products developed by the Unions in the network. They

not only require diverse skills but also knowledge of various processes. AMUL dairy led the way in developing many of these products and establishing the processes for other member Unions. Perhaps there is no single dairy network that produces such diverse product types.

Equally impressive are the achievements on process technology. While several continuous innovations to equipment and processes have been done at AMUL, the most significant one has been the development of processes for using buffalo milk to produce a variety of end products. Gujarat (and most of India) is a buffalo predominant area. As more farmers joined the cooperatives, the need to develop a mechanism for storage of increasing quantities of milk became intense. Moreover, the cooperative was established on the promise that it would buy any quantity of milk that a member farmer wanted to sell. The need to store milk in powder form increases as excess milk quantities in winter seasons could then be used in lean summer seasons. Moreover, demand for liquid milk was not growing along with growth in milk production. No technology, however, existed worldwide to produce powder from buffalo milk. Engineers at AMUL successfully developed a commercially viable process for the same – first time in the history of global dairy industry. Subsequently, it also developed a process for making baby food out of this milk powder. It has also developed a unique process for making good quality cheese out of buffalo milk thereby converting a perceived liability into a source of comparative advantage – the task was done through process technology research. Most of its plants are state of art and automated. Similar efforts in the area of “embryo transfer technology” have helped create a high yield breed of cattle in the country. AMUL’s innovations in the areas of energy conservation and recovery have also contributed to reduction in cost of its operations. AMUL also indigenously developed a low cost process for providing long shelf life to many of its perishable products.

TQM at the Grassroots has been a strong movement to develop leadership, operational and strategic capabilities in the entire network – farmers, village cooperatives, dairy plants, distributors and wholesalers and retailers. Key elements of this TQM movement have been:

- **Friday Departmental Meetings:** Each Friday, at a prescribed time, every one in the network (from the farmers to the carry & forwarding agents) joins their respective departmental meeting to discuss quality initiatives and share policy related information.

Training for Transformational Leadership so that individuals are able to control their thoughts, feelings and behavior and take more responsibility in one’s life and surrounding environment.

- Application of Hoshin Kanri principles to bring about a bottom-up setting of objectives – aligning policies for effective management of Unions & village societies on hand with those of channel member on the other hand. ISO/HACCP certification was obtained for all the Unions.
- Training for farmers and their families emphasizing the need for good health care for not only cattle during its pregnancy and feeding but also for expecting and feeding mothers and the whole family. This effort has brought about a significant social change towards such issues in villages that have cooperative milk societies.
- Retail Census: GCMMF undertakes a census of all retail outlets (over 500,000) to evaluate customer perceptions and distribution efficacy of their network. Interestingly, this is being done by wholesalers in their respective territories at their own cost. This information is used for policy deployment exercise.

The extent of IT usage includes a B2C ordering portal, a ERP based supply chain planning system for the flow of material in the network, a net based dairy kiosk at some village societies (for dissemination of dairy related information), automated milk collection stations at village societies and a GIS based data network connecting villages societies to markets. Milk collection information at more than 10,000 villages is available to all dairies (or Unions) to enable them make faster decisions in terms of production & distribution planning, and disease control in more than 6,700,000 animals. Similarly, this is linked with information at all 45 distribution offices and 3900 distributors. This network is being extended to cover all related field offices in the network. The GCMMF cyber store delivers AMUL products at the doorsteps of the consumers in 125 cities across the country.

What is remarkable about the above is implementation of very contemporary practices in rural areas where both education and infrastructure are generally low. One of the key sources of competitive advantage has been the ability of the cooperative to continuously implement good practices across all elements of the network – the federation, unions, village societies and the distribution channel. Whether it is implementation of small group activities or quality circles at the federation or SPC and TQM at the Unions or housekeeping and good accounting practices at the village societies level, the network has developed very interesting ways of rolling out improvement programmes across different entities. While these programs may not be very unique, the scale is impressive. One of the key strengths of GCMMF & AMUL can surely be characterized as development of processes that allow them to implement these practices across a large number of members.

## 5 Lessons for managing large networks

Firms that desire to do business in emerging markets need to understand the dynamics of the economic and social environment while designing country practices. The story of AMUL points to several lessons that can be drawn in this context. These are discussed in the following paragraphs.

- Long term perspective: Given the state of economy in emerging markets, a long term perspective and strategy is needed to realize the potential of these large markets. Consequently, new entrants need to take a long term view on investment and develop business practices that help understanding of the environment, build relationships, and develop competencies for operating in such markets.
- Simultaneous development of markets and suppliers: To compete successfully in emerging markets and realize the full potential typically requires simultaneous development of both markets and suppliers. This follows directly from the underdeveloped state of these sectors which require careful nurturing and growth. Further, it is important that growth in these sectors be synchronized to the extent possible. Otherwise, gaps between demand and supply would require complementary strategies. The AMUL example demonstrates clearly that building of robust networks and developing decentralized capabilities leads to success in large, fragmented markets. It is also interesting to note that supplier development was achieved through a process of education and social development activities - activities that are not usually considered to be standard business practices. This type of 'out of the box' vision is essential for developing innovative mechanism in new, unfamiliar environments where traditional practices of west may not be successful.
- Network partnership vs. ownership: An important way of building a network is to forge linkages with small & medium enterprises in emerging economies thereby changing the boundaries of the entering firm. Such a partnership reduces the operational risk while providing a credible source of understanding the market through the experience of partners. It also provides great deal of operational flexibility and makes the network responsive to changes within and outside the network. To be effective it is important that decision-making be decentralized to the extent possible, with appropriate coordination mechanisms to ensure consistency in the system. Associated with this issue is the role of umbrella branding and quality certification by the large firm for its small suppliers. This helps in overcoming the infrastructure related disadvantage of

being small. Here, two more types of capabilities become crucial: developing coordination mechanisms that are process driven and developing skills to roll out programmes to a large number of small organizations.

Cost leadership and value for money: The largest segment of the market in emerging economies desires value for money from its purchases. Moreover, successful firms focus on cost leadership to grow the market exponentially by focusing on the largest segment of the population, the middle and the lower middle class. In this context, it is important for global players based in Western Europe and North America to note that the value proposition perceived by consumers is influenced to a large extent by the state of markets and the economy and cultural factors. Strategies successful in their home markets and elsewhere may not assure success in emerging markets. The experience of several MNCs that entered Indian markets in early 1990s supports this observation. Development of an appropriate value proposition suitable for large mass markets in India requires a thorough understanding of the environment and a focus on costs. This in turn, requires designing the organization structure and practices in a manner that it delivers continued market share through cost leadership. AMUL is a good example of this strategy.

Technology and Information Sharing: Firms that are able to overcome the hesitation of deploying IT for achieving operational excellence in emerging economies gain considerably from its network effect. Most firms either automate decision making to such an extent that it eliminates local initiatives (as many SAP implementations in India are finding out that it has added more rigidity in decision making as opposed to using it in conjunction with a more flexible “telephone” mode of communicating) or use manual systems that lead to inaccurate data based decision making. What works best is IT for information sharing and evaluating complex tradeoffs while making decisions locally. Yet another strong trend in these economies is to use IT for managing the interface between the market and the supplier of goods and services.

In this paper, using the example of AMUL, we have presented a robust business model for operating in large emerging economies characterized by underdeveloped markets, infrastructure and suppliers. To succeed in these markets, firms need to adopt a long-term perspective of the business and simultaneously develop supplier capabilities on the one hand while enhancing purchasing ability of potential customers. A network of firms appears to be the best way to operationalize the above requirements. Large entrants may have to develop such networks, while small firms may be best served by becoming niche players and join an existing network. Managing such distributed



networks would require effective supply chain coordination and capability building at each entity. Cooperative network with interlocking arrangement as in GCMMF is one example of success in managing such complex supply chain. Of course, the long term challenge in such cases is to bring more members into the network and increase their capabilities.

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**Table 1: International Comparisons**

Country	Milk Production (million tonnes)		
	1961	1999	2000
Japan	2.10	8.46	8.50
Canada	8.32	8.20	8.10
Europe	132.40	216.30	214.3
USA	57.02	73.8	76.1
Australia	6.28	10.49	11.17
New Zealand	5.22	10.88	12.23
India	20.38	78.90	81.8

Source: [www.fao.org](http://www.fao.org); Bulletin of the IDF, 339, 1999

**Table 2 : Scale of Operations at GCMMF**

Panel A: Sales Turnover	
Year	Sales Turnover (in million Rupees)
1999-00	22185
1998-99	22192
1997-98	18840
1996-97	15540
1995-96	137900
1994-95	111400
1986-87	3600
Panel B: Milk Collection (in 1000 litres)	
Annual: 1998-99	14,74,000
Daily Average	4020
Union:	
AMUL (98-99)	230000
Mehsana (98-99)	375500
Panel C: Other Information	
Total Milk Handling Capacity: 6 million litres/day	
Milk Drying Capacity: 450 MT/day	
Cattlefeed Manufacturing Capacity: 1450 MT/day (7 plants)	
Panel D: Product Range	
Liquid Milk (nine varieties)	Sweets (three varieties)
Milk Powders (five varieties)	Ice Cream (several varieties)
Butter	Condensed Milk
Ghee (two varieties)	Edible Oil (nine varieties)
Bread Spread	Mineral Water
Cheese (three varieties)	Fruit Drinks
Cocoa Products (two varieties)	
Panel E: Number of Brands	
Liquid Milk: AMUL, SAGAR	Mineral Water: Jal Dhara
Milk Powders: Amulspray, AMUL, SAGAR, Amulspre, Amulya	Fruit Drinks: Safal
Cocoa Products: AMUL, Nutramul	All other products are sold under the AMUL brand name
Edible Oils: Dhara, Lokdhara	

In 1999, US\$ 1 was equal to Rupees 41.33. In 1986, 1 US\$ was equal to Rupees 12.00

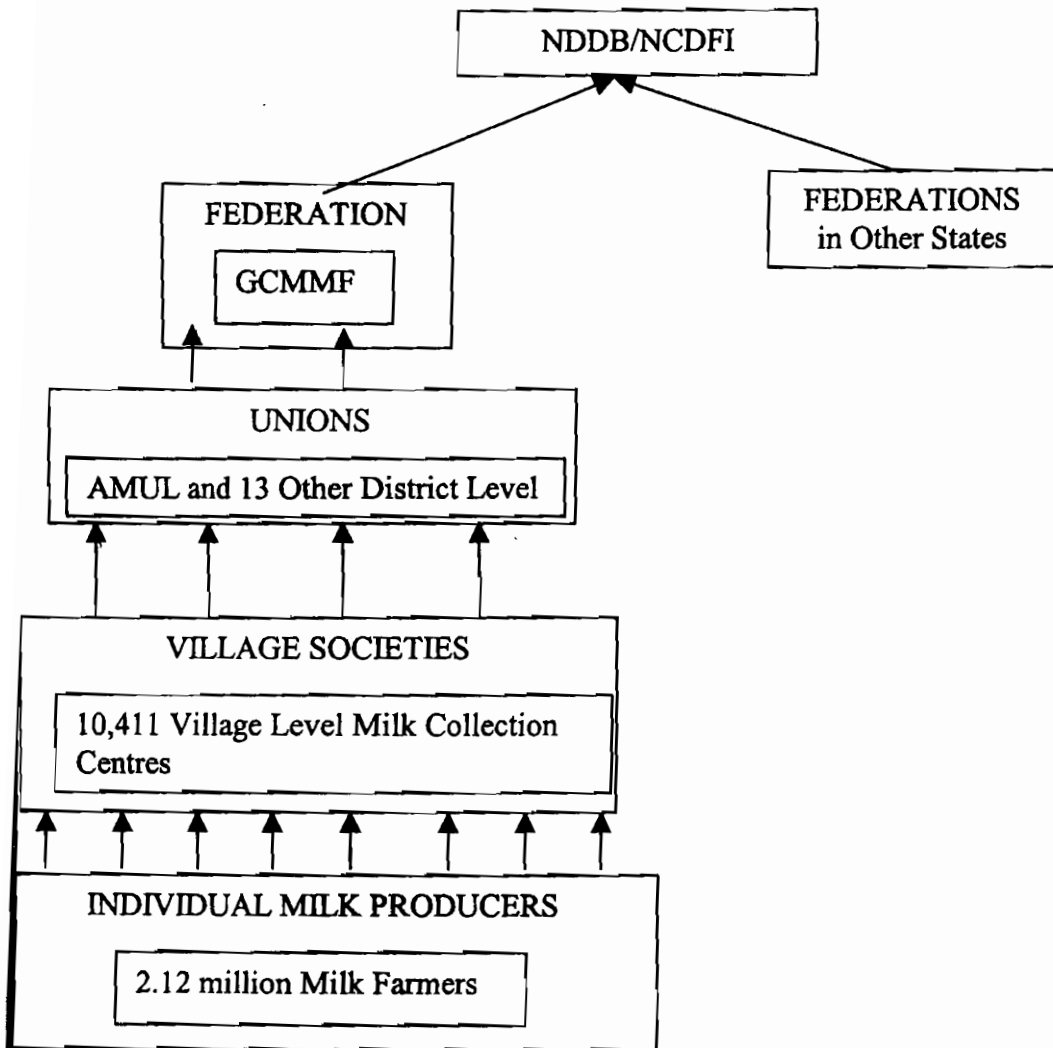
Source: Annual Reports of GCMMF.

**Table 3: Market Share of GCMMF (AMUL brand) in Various Product Categories in India (per cent)**

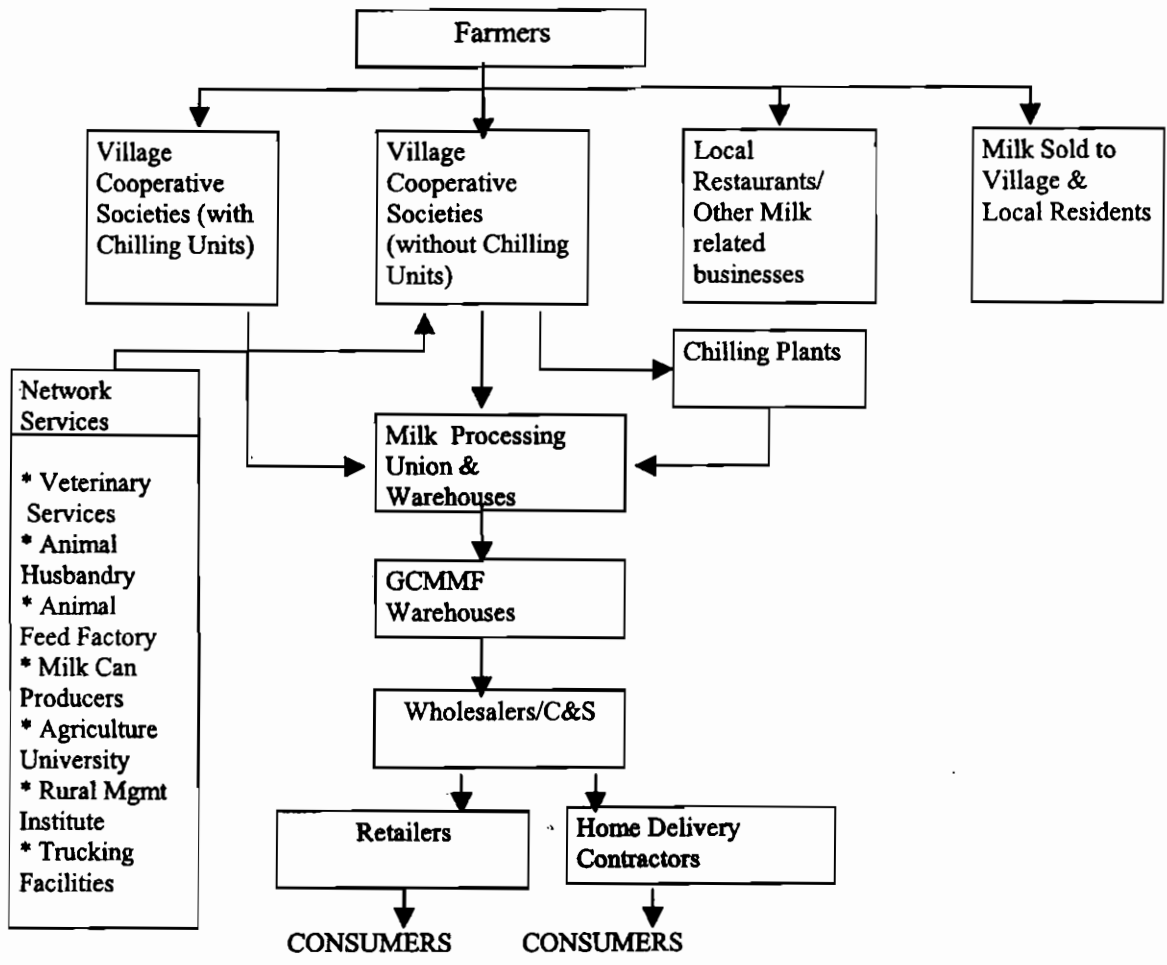
Product	Amul	Cadbury	Britannia	Nestle	Others	Mother Dairy	Vijaya	Saras	Goodlife	HLL	Pizza Hut	Dominos Pizza
Processed Cheese	63	-	36	-	1	-	-	-	-	-	-	-
Chocolates	5	79	-	14	2	-	-	-	-	-	-	-
Butter	86	-	4	-	10	-	-	-	-	-	-	-
Infant Milk	68	-	-	24	8	-	-	-	-	-	-	-
Dairy Whiteners	45	-	12	24	19	-	--	-	-	-	-	-
Yogurt	75	-	-	5	5	15	-	-	-	-	-	-
Ultra High Treated Milk	36	-	-	14	18	-	9	9	14	-	-	-
Sweetened Condensed Milk	30	-	-	70	-	-	-	-	-	-	-	-
Ice Cream	27	-	-	-	22	11	-	-	-	40	-	-
Pizza (pieces per day)	25000	-	-	-	-	-	-	-	-	-	21000	50000

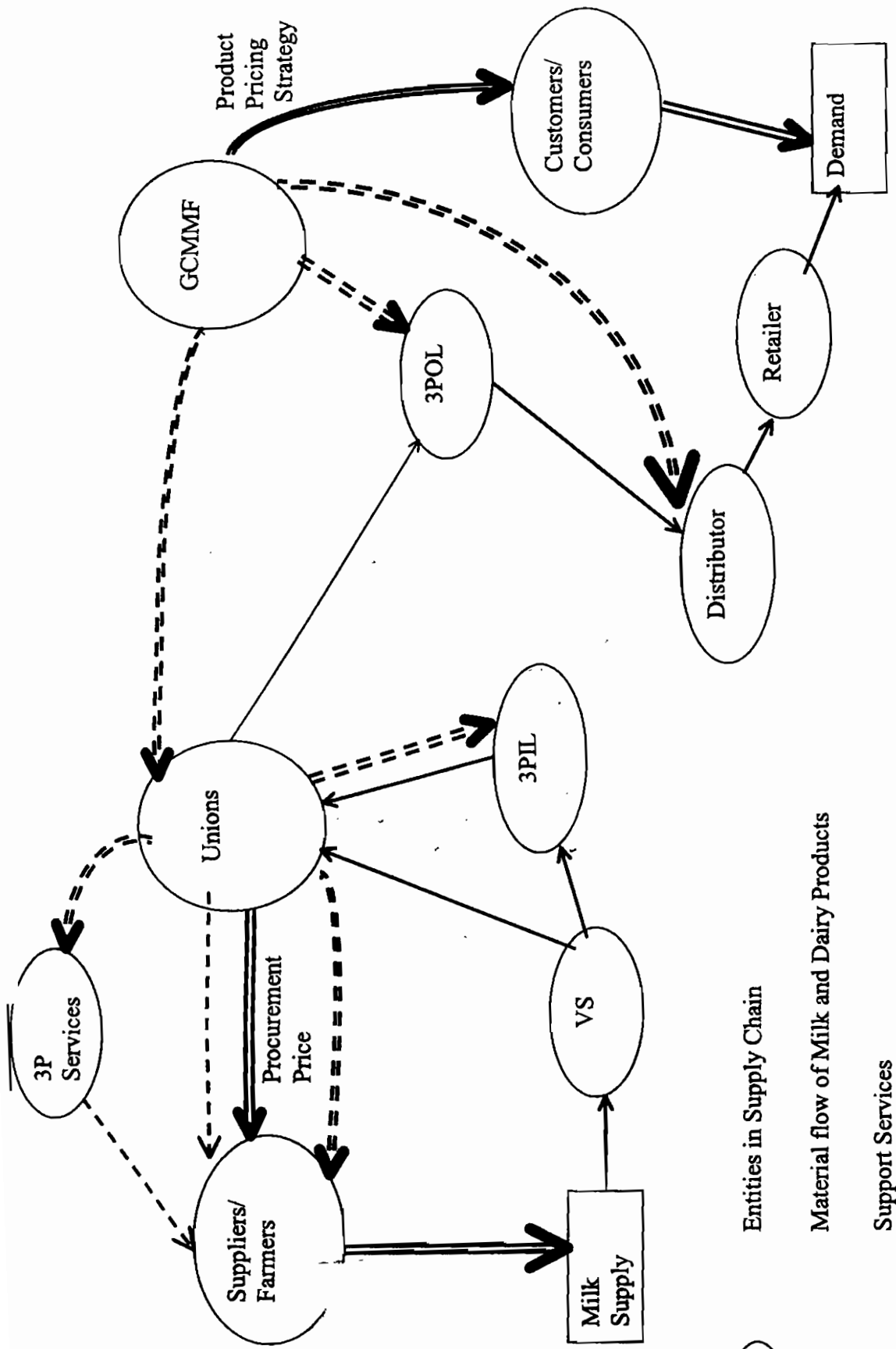
Source: Business Today, September 30, 2001.

**Figure 1: Dairy Cooperative Structure and details for State of Gujarat**



**Figure 2: GCMMF's SUPPLY CHAIN**





- Legend**
- Entities in Supply Chain
  - Material flow of Milk and Dairy Products
  - - - Support Services
  - ⇨ Primary/Major Influencing Factors
  - ==> Coordination & planning activities

3PIL Third party in-bound logistics  
 3POL Third party out-bound logistics

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