Empowering Dairy Farmers through a Dairy Information & Services Kiosk

Abstract

In recent years, the milk co-operative movement initiated by India’s National Dairy Development Board (NDDB) has led to a substantial increase in milk production in India. The two main reasons for this increase are more efficient collection of milk and higher profits for producers, both of which have been influenced by IT. This case describes the automation of the milk buying process at 2,500 rural milk collection societies. It also describes the extension of the co-op database through the creation of a Dairy Information Services Kiosk (DISK). The Kiosk makes it possible for co-operatives and farmers to manage a database of all milch cattle and access a dairy portal with information about valued services. The case demonstrates the willingness of rural farmers to invest in technology, provided that it can deliver real value.

Application Context

The co-operative movement began at Amul Dairy in Gujarat and is now replicated in 70,000 villages in about 200 districts of India. The village milk co-operative is a society of primary producers formed under the guidance of a supervisor or milk supply officer of the Co-operative Dairy Union (district level co-operative owning the processing plant). A milk producer becomes a member by buying a share from the co-operative society and agreeing to sell milk only to the society. Co-op members elect a managing committee and a chairperson responsible for the recruitment of staff to manage the day-to-day operations of the society. Each society has a milk collection centre where farmers take their milk in the mornings and evenings. The number of farmers organised into village milk producers’ co-operative societies is now over one million, and the daily procurement of milk by the co-operatives is 13 million litres per day.

Following the repeal of quantitative restrictions on food imports by the Government of India under a WTO agreement, the Indian dairy sector faces a strong challenge from the large organised dairies in the developed world. To meet this challenge, the co-operative dairy sector has to further improve the production, collection, processing and marketing of milk and milk products.

A New Approach

The productivity increases that are needed require an extensive education program to reach millions of farmers and dairy workers. This case demonstrates that education on such a massive scale can be facilitated through rural Internet kiosks created for the dairy sector. Of particular interest is the fact that the dairy sector is already using computers in 2,500 rural locations to buy milk from the farmers quickly and transparently.

The number of farmers selling to their local co-operative milk collection centre varies from 100 to 1,000 and the daily milk collection varies from 1,000 litres to 10,000 litres. Each farmer is given a plastic card as identification. At the counter he/she drops the card into a box, which reads the card electronically and transmits the identification number to a personal computer. The milk is then emptied into a steel trough kept over a weigh bridge. Instantly, the weight of the milk is displayed to the farmer and communicated to a PC. Then, an operator sitting by the side of the trough takes a 5 ml. sample of milk and holds it up to a tube connected to an electronic fat testing machine. (This machine is a local adaptation of an expensive and sophisticated tester manufactured by a Danish company.) By moving the machine's hand lever three times, the fat content of the sample is determined in just a few seconds. The fat content is displayed to the farmer and is communicated to the PC.
The computer calculates the amount due to the farmer on the basis of a rate chart that indicates the price for milk with different levels of fat content. The total value of the milk is then printed out on a payment slip and given to the farmer, who can collect the payment at an adjoining window. In many centres this entire transaction takes no more than 30 seconds.

This application is used in approximately 2,500 rural locations, exposing half a million people daily to the benefits of information technology. The E-Governance Centre of the Indian Institute of Management (IIMA) has worked to extend the benefits of this application by developing a Diary Information System Kiosk (DISK) software which will replace the existing application at the milk collection centres. It has two major components - an application with enhanced database and reporting running at the society level and connectivity to a Dairy Portal serving transactional and information needs of all members and staff at various levels in the district co-operative structure.

This DISK database includes a complete history of all milch cattle owned by the farmers. The basic details of breed and a history of disease, inoculations, artificial insemination and pregnancy are maintained in the system. Longitudinal data on milk production by individual farmers is also available in the database. Decision support systems have been developed to forecast milk collection, and provide feedback to the farmers.

Through the Dairy Kiosk farmers may place orders for a variety of goods and services offered by different agencies in the co-operative sector, and seek information on a variety of subjects of interest (e.g., best practices in breeding and rearing milch cattle, schedule of services provided by the co-operative, government and other private sector agencies). The computer-printed receipts that farmers receive each time they deliver milk provide an additional means for co-ops to communicate with their farmers. For instance, if one or more of a farmer's milch cattle requires an inoculation on a specific day (information provided by a veterinary service database) this fact can be printed out as a reminder on the farmer's payment slip.

Farmers will also have access to a multi-media data base on large number of innovations captured by SRISHTI (an NGO working in co-operation with IIMA) from hundreds of villages. These innovations cover agricultural practices, medicinal plants, home remedies, tools and implements, etc. The multimedia format has captured the description of the innovations provided by the innovators and a visual presentation of the innovations.

The DISK application has been pilot tested in two co-operative villages of Amul dairy in the Kheda district. A portal with illustrative content in Gujarati and English has been developed and is accessible on the IIMA E-Governance Centre platform by clicking here.

The focus of DISK and dairy portal is on improving the delivery of artificial insemination, veterinary services and delivering functional education about the dairy sector. The pilot was preceded by eleven one-day workshops in which 500 mangers of the entire co-operative dairy sector were sensitised to the potential of using IT at society and district levels. Based on the success of the pilot the DISK application could be rolled out to 1000 societies which are already computerised.

**Implementation Challenges**

It is interesting to note that the automation of milk societies has taken a decade to diffuse on a large scale in India. A significant push to this activity came from two small entrepreneurs. They aggressively marketed their integrated systems to milk societies, sometimes offering to install the system free of charge initially until the customers were satisfied. They used these free installations to demonstrate to neighbouring societies the utility of the automated milk collection centres. Intensive training in operating this system was provided to two or three office workers of the milk collection societies. Maintenance of the IT systems was provided by motorcycle borne service engineers who could quickly attend to the faults.

**Benefits and Costs**

The milk vending system costs around $2,000 per centre. Two private manufacturers currently produce the equipment. Nearly 600 such systems are in operation in the Kheda district in Gujarat. There are 70,000
village societies in India, of which 2,500 have been computerised.

The benefits to milk farmers include payments that are now based on a reliable and transparent measurement of fat content and weight. Under the previous system the fat content was calculated a few hours after the milk was received because the measurement process was cumbersome. Malfeasance and under-payment to farmers were commonly alleged, but difficult to substantiate. In addition, milk for testing was stored in plastic bottles, which led to unhygienic conditions.

Farmers may now receive immediate payment for their milk, rather than waiting ten days as under the previous system. Moreover, queues at the milk collection centres are short, saving farmers considerable time.

Among the benefits to the co-operative societies is a reduction in the number of employees. The computer system also is able to keep accurate and up-to-date records, reducing the likelihood of fraud or corrupt practices (e.g. temporary use of the funds by individuals). With Internet connections these frequently visited co-operative centres could be used as a communication point offering services like email and fax. Farmers also could download government forms, receive documents (from a government site) and order supplies and agricultural inputs from manufacturers.

Key Lessons

A large part of the success of this venture has come from the use of appropriate technology. The adapted milk-testing machine costs $500 as compared to $4,000 from the original manufacturer. It works better in heat and dust, but needs a human hand to operate the machine - which is not a disadvantage in rural India. Simple and rugged plastic cards with holes are used as personal identifiers, rather than smart cards. The key was to keep the cost to affordable levels, without sacrificing any essential requirement.

If the Internet could be accessed from rural areas, the pilots demonstrate that useful content and services from the government and other institutions can be delivered to poor rural populations through information kiosks. Several state governments are indeed planning to establish such kiosks in rural areas. In building these applications in rural areas the role of small private sector is extremely important. The effort required for motivating rural communities to use IT, and the logistical problems of maintaining communication links and hardware and software generally keep the large companies away from such rural ventures. Knowledge of local dialects and conditions can help to mitigate these problems. The balance between costs and payoff also favors small companies.

The author's interactions with hundreds of dairy sector managers and a large number of farmers indicates that part of this investment can come from the users, provided they are shown the value of the information and services that rural kiosks can deliver. Building useful content in local languages is absolutely necessary. In the dairy sector the district unions are willing to spend because they stand to gain as the system described above increases the efficiency and effectiveness of the services delivered by them to rural farmers. In other arenas, organisations like Grameen Bank (which already has invested) and other NGOs can find it advantageous to invest in rural kiosks. For rural kiosks to become a reality, partnerships are needed between development organisations, telecom companies, small IT service companies, and government agencies. The role of the committed volunteer who acts as intermediary between the computer screen and the rural farmer is also extremely important. Most of the current success of rural kiosks has been built around the enthusiasm of this intermediary.

In extending the network of rural kiosks it is important to build upon the work done by other agencies than to start afresh. The fact that 2500 rural locations were already using IT offered a great opportunity to extend the application and its utility. Even though the existing application was very successful, careful analysis provided several opportunities to enhance the value of the system by extending the data base and the capacity to analyze the data. A larger part of the effort went into understanding the needs of the farmers and collection center staff, and in building the content on the portal.

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Information used to develop the case: This case is based on an action research project undertaken by the author at IIMA, which involved several visits to milk collection centers and interaction with a large number of dairy sector managers. Further details about this case can be obtained from the author or a
volunteer at a Milk Collection Society.

Date submitted: December 19, 2000