

Empowering Dairy Farmers: A Portal and Dairy Information and Services Kiosk Case Study

Milk production is important to India, as milk is one of the main sources of proteins and calcium for a largely vegetarian population. Dairying provides a livelihood for millions of Indian farmers and additional income for a large number of rural families as well as a means for women to participate in the economic activity in rural areas. In 1999 India became the largest producer of milk primarily due to the efforts of the co-operative movement initiated by the National Dairy Development Board (NDDB). The movement, which started at Amul Dairy in Gujarat, is now replicated in 70,000 villages in about 200 districts of India. Following the repeal of the 'Quantitative Restrictions' on food products by the Government of India under a WTO agreement, the Indian dairy sector faces a 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.

The National Dairy Development Board has drawn up a program to double milk collection in the next six years. This kind of increase requires an extensive educational program that reaches millions of farmers and dairy workers. This case shows how the needed education can be delivered via rural Internet kiosks created for the dairy sector.

The dairy sector already uses computers in 2500 rural locations for processing milk buying/selling transactions in a transparent manner and exposes 500,000 people daily to the benefits of IT. The Indian Institute of Management, Ahmedabad (IIMA) recognised the opportunity to build on this infrastructure. Several pilot projects have been undertaken by IIMA to upgrade the application at these centres and connect them to the Internet to access a specialised dairy portal with content delivered in the local language. The project has been developed through extensive collaboration with the co-operative dairy unions of Gujarat.

Operations of a Village Milk Co-operative

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 after agreeing to sell milk only to it. Members elect a managing committee headed by a chairperson responsible for recruitment of staff in charge of day-to-day operations. Each society has a milk collection centre where farmers take their milk in the mornings and evenings. There are 1m farmers organised into village milk producers' co-operative societies and daily procurement of milk is 13m litres per day.

Automation in Milk Collection Societies

Milk is collected at the co-operative milk collection centres located within 5-10 km of the villages supplying the milk. The number of farmers selling milk to these centres varies from 100 to 1000 and the daily milk collection varies from 1000 litres to 10,000 litres. Each farmer is given a plastic card as ID. At the counter he drops the card into a box that reads it electronically and transmits the identification number to the PC. The milk is emptied into a steel trough kept over a weighbridge. Instantly the weight of the milk is displayed to the farmers and communicated to a PC. The trough is connected by a pipe to a can, which transports milk to the dairy. One operator is required to fill the cans. Another operator sitting next to the trough takes a 5-ml. sample of milk and holds it up to a tube of an Electronic milko-tester (a fat testing machine, which is a local adaptation of an expensive and sophisticated tester made by M/s.A/SN Foss Electric, Denmark.) A hand lever in the machine is moved three times for the milk sample to be tested for fat content. The whole operation takes a few seconds. The fat content is displayed to the farmer and communicated to the PC, which calculates the amount due the farmer based on the fat content of the milk. The total value of the milk is printed on a payment slip and given to the farmer who collects the price from the adjoining window. The payment is automatically rounded to the nearest rupee and the balance due to the farmer is stored so it can be added to the farmer's payout for the next day.

In many centres the above transaction takes only 20 seconds. The system costs around \$2000 and is currently being supplied by at least two private companies. Nearly 600 such systems are in operation in Kheda district in Gujarat. There are 70,000 village societies in India, of which 2500 have been computerised.

The farmers benefit as payment is now based on an a quick and accurate measurement of fat content and weight and is not subject to

the malpractice and underpayment common with other systems in use. Traditional methods require hours to calculate fat content, as the measurement process (the conventional Gerber method requires laboratory equipment and corrosive chemicals) is much more cumbersome, and payment to farmers was made every ten days due to the inability of the collection centres to calculate the payment immediately. The IT system enables prompt, accurate, and immediate payment. The queues at the centres are short despite the number of people selling their milk being quite large. As 2500 centres receive milk from 400,000 farmers daily, a ten-minute savings per farmer each day amounts to a total savings of 180,000 man-days per month.

The system also reduces the number of employees and increases the availability of daily accounts immediately at the milk collection centre. The society's profit is calculated on the basis of data received from the dairy regarding the payment made by the dairy to the society for the previous day's collection. These accounts can be kept over months to maintain an up-to-date balance sheet and account of profit and loss. The software can incorporate the revenue from daily milk sales to the local villagers and expenditure incurred by the society. Since the accounts are kept accurate and up-to-date there is less likelihood of fraud and corrupt practices (e.g. temporary use of the funds by individuals).

The IIMA E-Governance Centre has built upon the existing application by expanding the database at the milk societies to include a complete history of every 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. The data history on milk production by individual farmers is also available in the database at the collection centres.

Dairy Information System Kiosk (DISK)

The DISK project was conceived with two components; 1) an application running at the society level that could be provided Internet connectivity and, 2) a Dairy Portal at the district level serving transactional and information needs of all members and staff in the district co-operative structure. The software used at the society level was developed to provide:

- Data analysis and decision support to help a rural milk collection society in improving its performance i.e. increasing milk collection.

- Data analysis to improve productivity and yield of milch cattle.
- Farmers with facilities to place orders for goods and services offered by different agencies in the co-operative sector and seek information on subjects of interest.

The services to be offered at these centres would include; 1) Delivery of information related to dairying, including best practices in breeding and rearing milch cattle, scheduling of government and other private sector agency services, and collecting feedback on the quality of service provided to the catchment area; 2) Access to a multimedia database on innovations captured by SRISHTI (an NGO working with IIMA) from hundreds of villages, covering agricultural practices, medicinal plants, home remedies, tools and implements, etc., and a multimedia format that has captured the description of the innovations provided by innovators and a visual presentation of the innovations; 3) use as a communication centre offering services like email, fax and Internet telephony (if Internet telephony is permitted); 4) Internet Banking Services and Automated Teller Machines (ATMs), which will enable the milk societies to credit payments directly to sellers' bank accounts. (The sellers already have plastic card identifiers. The card identifier may have to be upgraded to smart cards carrying biometric identification. The cards can be used to withdraw cash from ATMs); 5) a way for farmers to download Government Forms, receive documents (from a Government site) and order supplies and agricultural inputs from manufacturers; and 6) a means of communicating with farmers via the automatic printing process of daily payment slips.

A large amount of detailed history on milk production by farmers is now available in the database in the milk collection centre. DSS's can be built to forecast aggregate milk collection and monitor the produce from individual sellers. The application has access to data on farmers, their milch cattle, and the past record of transactions. Up-to-date data about each farmer's milch cattle and service delivery can be collected interactively during the farmer's daily visit to the society. This can improve the quality of data and also provide complete data for those societies that have been computerised. With availability of complete data and its analysis, both services and productivity can be improved substantially.

The focus of the project is on improving delivery of artificial insemination, veterinary services, education, and the purchase and sale of milk in order to increase milk productivity and collection. NDDDB would be interested in seeing the widespread use of this application.

Some upgrade of hardware/software and an Internet connection would be required. For the portal at the unions, a small server and a leased line connection would be needed. The union portal can be implemented at a central location at one of the NDDDB web servers.

Scalability

The DISK application has been tested for two societies on the IIMA E-Governance centre platform. A portal with illustrative content in Gujarati and English has been developed and is accessible as a beta site [URL: www.iimahd.ernet.in/egov/disk.htm] Currently the application is being pilot tested in two co-operative village societies of Amul dairy in Kheda district. The pilot is being implemented in Uttarsanda, a large village of 25000 people. Agriculture is the primary occupation. The society has 2200 members, of which 1300 are active. There are 4000 cattle and milk worth \$350 is collected daily. The chairman of the society has served as chairperson for 20 years and has international exposure. The society celebrated its 50th anniversary on October 5, 2000 and has applied for ISO 9002 as part of the TQM movement launched by Amul. The MD of Amul made a commitment to provide financial assistance for the pilot implementation and promised DISK would be implemented at all societies of Amul union. Eleven one-day workshops were conducted by IIMA to sensitise 500 managers of the co-operative dairy sector to the potential of using IT at society and district levels, which created excitement and support for DISK among the participants. Estimates indicate that about 1000 milk collection centres could opt for the application.

Obstacles to the Growth of Rural Kiosks: Need to involve developmental agencies

If the Internet can be accessed from rural areas, useful information and government and other institutions' services can be delivered to the rural population via information kiosks. Several state governments are planning to establish kiosks in rural areas. To set up rural Internet kiosks it is imperative that a communication service (cable, fixed line telephone, mobile phone) reaches rural India. Telecommunication investors, financial institutions that provide telecom loans, urban telecom operators, and telecom equipment vendors are generally reluctant to get involved in rural operations because they perceive telecom ventures in rural areas, especially those in developing countries and emerging markets, as high-risk, troublesome, or not worth significant effort.

Part of the investment can come from users provided that they can be shown the value of the information and services that kiosks can

deliver. Building useful content in local language is absolutely necessary. In the dairy sector the district unions will spend because they stand to gain as the system increases the efficiency and effectiveness of the services delivered to the rural farmers. Organisations like Grameen Bank (which has already invested) or other NGOs can also invest in rural kiosks. This will come from areas with a reasonable level of economic activity. Subsidies will be needed in areas inhabited by the poorest of the poor.

For rural kiosks to become a reality, partnerships will be required between development organisations, telecom companies, small IT service companies and government agencies. The role of the committed volunteer (in this case the office bearer of the society) who intermediates between the computer screen and the rural farmer is also important. Most of the current success of rural kiosks has been built around the enthusiasm of this intermediary.

The automation of milk societies, initially built around a microprocessor, has taken a decade to diffuse on a large scale. Two entrepreneurs who started offering the integrated system to milk societies provided a significant impetus for this activity. They marketed their systems aggressively, sometimes offering to install the system free of cost 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 bearers of the milk collection societies. Motorcycle-borne service engineers who could quickly attend to faults provided maintenance of the IT systems. The IIMA initiative has chosen to involve small private sector companies in taking the DISK project to a large number of rural areas.

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