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## CHAPTER 9

# A Wired Village: The Warana Experiment

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The primary objective of the Wired Village project is to demonstrate the effective use of information technology infrastructure in the accelerated socioeconomic development of villages around Warana Nagar in the Kolhapur and Sangli districts of the state of Maharashtra. This paper describes the activities involved in setting up the wired village and the applications that have been implemented.

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### Introduction

Ushering in the information technology (IT) revolution to villages where more than 70 percent of the Indian population lives is a dream that has come true at Warana in the Kolhapur District of Maharashtra. The special IT Task Force set up by the Prime Minister recommended modernizing the cooperative movement through use of state-of-the-art information technology. This led to the “Wired Village” Project initiated by the Prime Minister’s Office.

The key objective of the project is to demonstrate the effective contribution of an ICT infrastructure to the socioeconomic development of a cluster of 70 contiguous villages around Warana Nagar in the Kolhapur and Sangli Districts of Maharashtra.

The project aims to:

- Utilize IT to increase the efficiency and productivity of the existing cooperative enterprise by setting up a state-of-the-art computer communication network;
- Provide agricultural, medical, and educational information to villagers at Facilitation Booths in their villages;
- Provide communication facilities at the booths to link villages to the Warana cooperative complex;
- Bring the world’s knowledge at the doorstep of villagers through the Internet via the National Informatics Centre Network;

- Provide distance education to both primary and higher educational institutes; and
- Establish a Geographic Information System (GIS) of the surrounding 70 villages leading to greater transparency in administration especially in matters related to land.

## Project Partners and Costs

The Warana Project is jointly carried out by the National Informatics Centre (NIC) (on behalf of the Central Government), the Government of Maharashtra and the Warana *Vibhag Shikshan Mandal* (Education Department). The estimated cost of the project is around \$600,000 (Rs 2.6 crores). Of the total cost of the project 50 percent is being borne by the Central Government, 40 percent by the Government of Maharashtra and the remaining 10 percent by the Warana *Vibhag Shikshan Mandal*.

## The Project Area

Warana Nagar, situated on the banks of the Warana river, lies in a green valley about 35 kms (21.86 miles) from the city of Kolhapur, and about 400 kms (250 miles) from Mumbai. The transformation of Warana from a barren to its current prosperous and fertile region began with the setting up of a cooperative sugar factory near the village of Kodoli in 1959.

The Warana Co-operative Complex was a forerunner of integrated rural development involving the cooperative movement that has had a classic ingredient of success – people’s participation. The Warana Co-operative Sugar factory initiated this movement that has resulted in the formation of over 25 cooperative societies related to sugar, milk, and poultry production. The total annual turnover of these societies exceeds \$1.5 million (approximately Rs 6.5 crores). Most of the societies are located within a radius of 4 kilometers (2.5 miles). The complex has its own EPABX facility for voice communication between various centers and societies. Some of the societies such as sugar and dairy have computerized their routine operations.

The sugar factory is the backbone of the Warana complex. “Weaker” sections of society have experienced economic growth and a level of prosperity unimagined earlier as a result of direct employment. The sugar factory has won several awards for its efficiency and productivity. The Warana paper mill was set up to utilize the waste products of the sugar factory. A distillery has also been set up in the complex. An electricity generation unit has been set up using the waste water of the paper mill and the distillery. The energy generated by the unit is used by the paper mill.

The Warana complex is designed to look after all the basic needs of the workers. They have been provided with living quarters, filtered water, inexpensive electricity, schools, physical training and cultural centers.

## The Sugar Administrative Building

The sugar administrative building, situated in the heart of Warana Nagar, houses the administrative staff of the sugar, distillery and paper factories. The sugar factory is located around 500 meters from this building. The sugar cane for the factory is obtained from roughly 70 villages located in the districts of Kolhapur and Sangli.

## Warana Co-op, Milk Producing Society—Dairy

The factory for processing milk-related products is situated approximately 3 kms. (1.86 miles) from the sugar administrative building. This office of the dairy has stand-alone computers for its data processing. (Some of the important milk products include pasteurized milk, milk powder, ghee, butter and *sreekhand* (a sweet dish made of curd (yogurt) and sugar). Approximately 2 metric tonnes of *sreekhand* is sold in Mumbai daily. The factory processes about 200,000 liters of milk per day collected from the surrounding 176 villages in the districts of Sangli, Satara and Kolhapur). Factory management has shown a keen interest in computerization and networking, and to complement these tasks, has emphasized training of staff.

## Warana Grahak Mandal (Warana Bazar)

This is the largest *bazar* in Warana with an annual turnover of \$7.3 million (approximately Rs 31.4 crores). It has two department stores in Warana Nagar and Wadgaon in addition to 29 retail outlets in the 78 villages spread across Kolhapur and Sangli. Managing the flow of goods like *bazar* purchases directly from various factories requires a reliable communications network to book the orders and follow up through e-mail. Daily statistics from each of these retail outlets is also required by the management.

## Goods Processing Society

This society has been set up for processing agricultural goods in packaged form. The raw material for this is obtained from a large number of villages in various districts. The machinery has been imported and the installation is nearing completion.

## Mahatma Gandhi Medical Trust

This modern, 200 bed hospital equipped with state-of-the-art technology, is located 10 kms. (6.25 miles) from the Sugar Administrative Building.

## **Warana Co-operative Bank**

The main branch of the bank is a two storied building located about 1 km. (1.59 mile) from the main Sugar Administrative Building. It has 20 branches in Kolhapur and Sangali districts. Most of these are within a 30 kms. (18.75 miles) radius from the main branch. The annual turnover of this bank is nearly \$7 million (Rs 30 crores).

## **Warana Vibhag Shikshan Mandal**

The college is spread across 500 sq. mts at a distance of around 750 mts from the Administrative building. It houses the Engineering College, Polytechnic and the College of Arts and Science. The Engineering College offers courses in mechanical, chemical, civil and electronics engineering. A course in Computer Science will be offered starting the next academic year. The Engineering College has over 1,000 students. The colleges have ample space for the installation of a VSAT that can be utilized by a large number of users of the institute. The Engineering College has about 100 Pentium and 486 based computers out of which about 50 systems are connected in a LAN. The college authorities plan to have a campus-wide fiber-optic LAN to facilitate faster communication to be paid for with their own funds.

## **Project Responsibilities**

To make sure that the work is carried out smoothly the responsibilities of various departments have been identified.

The responsibilities of NIC are to: (1) supply the hardware, networking sub-systems and associated software; (2) design, supply and establish the communication infrastructure with Internet access; (3) install and configure and Intranet; (4) provide site preparation guidelines; (5) design, develop and implement the application software; and (6) provide training on application software.

The responsibilities of the Government of Maharashtra are to: (1) bar code product/items at Warana Bazar; (2) design and prepare the multipurpose identification number card with hologram and bar code for a villager's database; and (3) purchase the GIS.

The responsibilities of the Warana Vibhag Shikshan Mandal are to: (1) provide sites and site preparation; (2) provide 10 telephone lines at Sugar Administrative Building, and one at each IT Centre and Facilitation Booth; (3) enter and validate all data; (4) recruit technical manpower for managing the centers; and (5) provide necessary infrastructure support to the staff of NIC on tour to the sites.

## **Project Implementation**

Two committees have been established to oversee implementation of the project, a Project Co-ordination Committee and a Project Implementation Committee. The Project Co-ordination Committee has responsibility of planning, designing and coordinating implementation of the project. The Project Implementation Committee looks after day-to-day tasks and ensures speedy implementation. The Project Co-ordination Committee, after detailed discussions with the villagers, the staff at the engineering college, government officials and other Warana officials, prepared the implementation plan.

These two committees met at regular intervals during project preparation to follow up the work progress, technology, and to review and reallocate resources. The committees invited experts in communication technology, government administration, and academics to ensure quality and to reach the best possible solution in the proposed environment.

## **Wired Warana—The Infrastructure**

With a view to provide complete connectivity to the 70 villages in the Warana region, a three-tier structure was implemented. The Sugar Administrative Building (SAB) and the Engineering College form the main hub center, the first tier. The business centers (6) and the IT centers (6) at the next level and the Facilitation Booths (70) provide connectivity down to the village level.

The SAB was selected as the hub for the business centers. Facilitation Booths have access to the SAB and the business centers through a dial-up network. To provide a rugged and reliable network a high-speed wireless LAN is provided at the business centers. The VSAT and Mast for omni-directional antenna of the wireless LAN has been installed on the SAB. A high speed IPA VSAT is connected to a hub for Internet access. A 30-foot mast on the roof of the building has been constructed for installation of an omni-directional antenna for a wireless LAN with a bandwidth of 2 Mbps. The radio modem of the wireless LAN is connected to the hub. The wireless LAN technology has been used to provide reliable Intranet/Internet connectivity to the business centers. All existing machines are integrated in a LAN environment with two additional NT servers and four Win-95 clients. A proxy server is also installed which acts as a firewall.

The Engineering College was chosen as the hub for the Intranet accessed by all village booths. A high speed IPA VSAT is installed, connected to a hub. The Warana Web-server is installed at the college. It hosts the web-based applications. A bank of 10 dial-up lines with modems is interfaced through a router to provide SLIP/PPP connectivity. All existing machines are integrated in the LAN environment, and a proxy server is installed which acts as a firewall to the Internet. The same server also functions as an e-mail server. E-mail accounts are created in this server, for all users at the facilitation booths, IT and business centers.

The business center sites includes the dairy, Warana Bazaar, WAGPCOS, Mahatma Gandhi Hospital, and the Warana Co-operative Bank. The business centers access the wireless LAN via a unidirectional antenna installed on the rooftop of each of the centers. A wireless LAN is setup at the centers which can communicate with the central VSAT installed on the Sugar Administrative Office. The Bank is also connected to the networks through a unidirectional antenna located on the roof of the main branch.

Six villages at a distance of nearly 10 kilometers (6.25 miles) from Warana Nagar have been identified as sites for the IT centers. The idea is to provide IT facilities as close to the villages as possible. The computers are set up in a room 20 ft. x 20 ft. in size.

The centers provide facilities for distance education, computer assisted instruction, and access to Indira Gandhi Open University. Each IT center has a LAN environment using structured cabling, with a “receive only” VSAT (DirecPC) and a dial-up link. Eudora e-mail client is configured for the simple mail transfer protocol mail service. The operating system on the computers is Windows-95, and HTML browser is installed for accessing the Web-server. Currently six villages have IT centers: Mangale, Pargaon, Dhole, Nagaon, Satwe, and Kodoli.

Facilitation Booths are being set up in 70 villages (more than 30 booths are currently operational). They have a dial-up facility to link to the central hub located at the Sugar Administrative Building. Each booth has a Win-95 multimedia computer equipped with a modem (33.6 Kbps) for the dial-up link. It is configured for SLIP/PPP. The computer has multimedia facility, a hand-held scanner, a bar-code reader and a 132 column printer. An HTML browser is installed for web access. Eudora e-mail is configured for the simple mail transfer protocol mail service.

## **The Software Applications**

From the requirements analysis carried out by NIC, 15 applications were identified for implementation. These can be grouped as web-based and network-based applications.

### **Web-based applications**

Six applications can be accessed by villagers from the facilitation booths. They provide information about employment and agricultural schemes, government procedure information, automated assistance in completing applications for government certificates such as ration cards and birth and death certificates, crop information, information on bus and railway services, medical facilities, and water supply details. From the booth the villager can interact with the Warana Management to register grievances and seek redressal. Agricultural marketing

information is available from the Warana web-server giving market arrival and daily rates of various regulated commodities. It is possible for students to seek guidance from the booths by accessing educational and vocational information.

## Other applications

The sugar factory is actively involved with farmers in cultivation, cutting, testing and transportation of the crop. These activities ensure an information exchange between the factory and farmers, which are manpower intensive. A management information system for sugarcane cultivation developed by NIC leads to speedy and accurate data exchange between the factory and the farmers using the village facilitation booths. The land records application permits villagers to view and print extracts using data from a land database stored on a compact disc, or from the *tehasil*<sup>1</sup> site right at their village booth. Dairy is the mainstay of the Warana Complex. The computerization of dairy activities will permit milk collection and analysis to be made available to villagers at the booth as soon as it is generated.

The Warana Bazaar (*Warana Grahak Mandal*) is a cooperative with the largest departmental store in Warana. The maintenance of this inventory is a major activity. A bar code based computerized inventory system is being developed for the *bazaar*.

A GIS was developed as well. It includes a base map of the neighbouring 70 villages, socioeconomic information like schools, population, land under cultivation and linking cadastral maps and 7/12 extracts in *Marathi* (the regional language of Maharashtra) to the GIS.

The IT centers have been set up with a view to provide computer based education facilities to the village children. AUTNIC, a computer based self-learning and testing aid, is provided at the IT centers to support the course curriculum. The Warana *Vibhag Shikshan mandal* plans to prepare a multiple-choice question bank for all school grades for each subject using AUTNIC. This question bank will help the students gain insight into their courseware with a better understanding of the concepts covered.

## Implementation

In order to comply with the time schedule of six months and establish the basic network, NIC deployed professionals from various fields. Twenty engineers put in over a man-month each in Warana, to ensure functioning of the sites at the business and IT centers, the village facilitation booths, and the overall network.

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1. A *tehasil* is a unit of administration above the village and below a subdivision.

Over fifty software professionals have been involved full-time in application development since June 1998. Each team handling an application has been interacting regularly with their Warana counterparts, visiting the Warana site, discussing and finalizing the specifications, the implementation strategy and delivering as per the approved strategy signed and agreed upon by NIC, the government of Maharashtra, and the Warana Vighag Shikshan Mandal. On the basis of specifications drawn up with end users, prototypes of the applications have been built, demonstrated at the user sites and further modifications made. All the applications have been installed at Warana, after approval and acceptance by the users.

The software developed for Warana is the single largest set of applications developed in the client-server/web-based environment in *Marathi*. The software has been delivered complete with detailed operational manuals in *Marathi* for the local Warana users.

## **Human Resource Development**

Extensive training on the applications and administration of the network has been provided to the Warana users on site as well as at Pune. Selected teaching staff of the engineering college are trained to manage the network.

The training aims at creating an awareness in the villagers regarding the utility and benefits of the state-of-art equipment made available at Warana. It has also provided the required skill level to the operators to handle the machines and assist the villagers. The operating level staff at the hub centers have been given sufficient training on site as well as at NIC to confidently manage the network.

This project has proved helpful in generating employment opportunities for the local population. The facilitation booths in each of the seventy villages will employ an operator each, and the five business centers will have two qualified computer experts each to manage web and e-mail administration, Windows-NT and database administration. Apart from this, each of the six IT centers will employ two skilled computer operators. Fifteen operators have already been recruited for the IT centers and village booths to assist users in using e-mail, data transfer, and other applications.

The Warana Project is the forerunner to many such rural development projects envisaged by the IT Task Force. It would enable villagers to access sources of both local and global knowledge, and help provide transparency in administration.