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### World's biggest data network

INDIA will soon have the world's largest government-owned data communication network. In February, Nicnet, as the Delhi-based National Informatics Centre's satellite-linked network is called, connected practically all of India's 439 districts.

Today, district officials can communicate with each other at any time, between any two districts, over the network using their computers. There is also a district level data base called Disnic that has information on 27 subjects, like health and water management, that all districts may share. District officials are required to constantly feed and update Disnic data.

"The next step will be to take Nicnet from the district to the village-block level," says Dr N. Seshagiri, the National Informatics Centre's Director-General who is the brains behind Nicnet. By then Nicnet will also have its own satellite, called Nicsat. It will then become the world's largest government-owned data communication network. And many remote villages that you can't access by road or railway will become accessible by computer.

Although there is some criticism that the network is underutilised, Nicnet's success has been astounding. Indeed, many experts abroad are surprised that a third world nation could set up something so impressive.

Compiled by

Mohan Raj

# Computers

A DATABASE ON THE TECHNOLOGY REVOLUTION

Computerisation of land records

## Breaking fresh ground

The computer revolution goes to the grassroots, despite the danger of a funds squeeze.

The protagonist (Raghubir Yadav) is a simple peasant, whose little patch of land is being greedily eyed by the greedy zamindar. The latter produces some tattered, but official-looking, documents before the village panchayat to stake his claims to the plot. For his efforts, the peasant is unable to get the cunning village patwari to give him the original land records to prove his ownership.

Even as the peasant loses all hope, he hears of a mysterious new officer in a nearby town which might be able to help him out. Fighting time and his tears, he makes his way there, and explains his plight to a friendly clerk - with a PC/AT in front of him. Almost before he finishes his tale of woe, the clerk prints out a copy of the controversial land deed, which eventually wins the day for our little underdog.

Story board for a video film made by the Madhya Pradesh Government, Gwalior, January 1990.

five years time, or the end of the Eighth Five Year Plan.

In technological terms, there's nothing really spectacular about using computers for data storage and management; after all, that's the least that even PCs can do. Nor is software for such purposes unavailable - typical database management packages like dBase III can be easily modified to fit the bill.

It's the frills which may prove difficult - standard digitisation software to produce maps, language interfaces to enable data entry in the vernacular, packet radio for data transfer, and image processing packages for aerial photography rectification. As well as improved instruments for field surveys (such as electronic theodolites) and optical storage media. And all this, with both eyes open to the bottomline.



LAND RECORDS COMPUTERISATION: IN THE FIELD						
State	District	Number of plots	Hardware platform	Terminals	Cost of hardware	Date of completion
Andhra Prad.	Ranga Reddy	13 lakh	PC, PC-AT	14	Rs 17 lakh	Dec. 1989
Gujarat	Ahmedabad	—	PC, PC-AT	8	—	—
Orissa	Mayurbhanj	40 lakh	PC, PC-AT	Nil	Rs 24 lakh	March 1990
Bihar	Singbhum	40 lakh	68030/Unix	6	Rs 17 lakh	October 1990
Madhya Prad.	Morena	13.6 lakh	PC, PC-AT	24	Rs 15.4 lakh	Dec. 1989
Rajasthan	Dungarpur	13 lakh	PC, PC-AT	2	—	January 1990

Already, various government agencies - like the Pune-based C-DAC whose low-cost GIST card will be used to break the language barrier on PCs: ET&T which may develop a multi-lingual low-cost PC which could form the base-level hardware; ISRO, which has already developed digital image processing boards and software, and C-DOT which is developing various other software packages - have begun work on what is commonly regarded as one of the most ambitious computerisation projects in the country.

The reasons for this are simple. For one, land records in this country constitute one of the most diverse and to the layman, incomprehensible, pieces of documenta-

tion. In many states, even information on whether maps (which are typically 50 years old) and the relevant records are actually available, is anybody's guess.

Moreover, until now, it is the all-powerful patwari, with his khatha, who has been vested with the sole charge of maintaining the land records. How will this powerful village-level personage react to the entry of computers? And what of the rural vested interests, who are bound to view this as a major threat.

APART from the sociological dimensions, there's also a major debate under way about the nature of the systems and the software packages which will be

necessary to cope with the demands of this project. For, in each of the districts where land records are being computerised, a plethora of approaches have been utilised. In Ranga Reddy district of Andhra Pradesh, the state-owned Andhra Pradesh Technology Services Ltd was entrusted with the task of carrying out the project. 14 systems have been installed, each consisting of a PC/AT, the GIST card, a high-resolution monochrome monitor, and a 24-pin printer. Typically, the menu-driven software is built around dBase III, compiled using Clipper.

In Ahmedabad district of Gujarat, eight systems (each consisting of a PC/AT and a 24-pin printer) have been installed. While

data entry is being done in English, GIST cards and Gujarati keyboards are now being acquired. So, data will have to be re-entered by operators. Once again, the software is a variation on dBase III, used directly in an interactive screen mode.

Meanwhile, in Dungarpur district of Rajasthan, the Indian In-

procured as well as eight 9-pin and 16 24-pin dot matrix printers. Developed by the Bombay-based RASS Infogen, the dBase III kind of software can also be used as a MIS package.

Perhaps the most ambitious and expensive attempt in the application sphere has been undertaken in Mayurbhanj district of Bihar. CMC Ltd, the public sector company, has set up a Unix-based mini-computer (Impact 8930) with software developed using Unify's Accell RDBMS package. Interfaced with this is CMC's own language software called Biltren and Indo GKS, the graphics kernel.

As ever, the key to success lies in standardisation. And a recent review of the on-going pilot projects has drawn up some fairly inexpensive parameters for every state to follow. For instance, rather than costly mini-computers, it's the PC and its derivatives which have been chosen to provide the hardware platform. As a semi-official involved with the project points out: "At all three tiers - the tehsil level, the district level at the state level - we believe that PCs are fast enough to perform the job. Of course, there will be some differences, such as the use of 38 based machine at the state level which should also be equipped with a scanner and a VGA box for map creation. Likewise, the software will be standardised around dBase III, compiled using Clipper.

Economies of scale are not only reason for working around common standards. For, once common format databases are created, the powers-that-be will further designs on them. According to available indications, it will form the nucleus of the long-planned Geographical Information System (GIS) - a specialised national database networked to NICNET, that will prove a crucial tool in the country's planning.

So, after much debate and false starts, the PC revolution is set to sweep the rural administration. At a macro level, computerisation of land records seem to be a poor substitute land reforms. However, as a viable demonstration of what computers can actually do for the village, this project is likely to prove a pathbreaking effort. And one more myth around microprocessor - that it is esoteric urban technology - forever crumble.

Anand P. Raman & Manjari Shah in New Delhi

There's also a major debate under way about the nature of the systems and the software which will be needed to cope with the demands of the project.

Institute of Management (Ahmedabad) has taken over the implementation of the project. While different hardware configurations for the district center and the tehsil center have been worked out, the software route followed is interesting. Based on MS-DOS, the IIM-A team has chosen to take the software approach for local language support. An attempt has also been made to digitise maps and link them to the database using C language.

In Morena district of Madhya Pradesh, where progress has been spectacular - 16 PCs (640 KB memory and two floppy drives) and 8 PC/ATs (640 KB memory, 1.2 MB expanded memory and one 1.2 MB floppy drive) have been