Informatics

Current issue: January 1998

Computerized Service for Utility Management

Utility services provide us the essentials of life. Water, power, waste disposal, conveyance, telephone, they are what keep us going. But we seldom give thought to how complicated and complex each of these systems are. Take, for example, the water supply system in a city like Delhi. Imagine the network. Countless pipes, running into millions of metres in length, criss-cross the entire City to bring precious water to your home. Yet this massive system was hardly ever planned. It grew with, and much the same way as the population --- in a haphazard and unplanned manner! So is the case with all the other utility systems. Superimpose them on each other, and we have a situation that is not only truely mind-boggling but utterly confusing in itself.

Utility Mapping plays a crucial role in the management and planning of utility service systems. It lends order and meaning to the chaos by generating detailed and precise digital maps of these systems.

NIC is the Country's leading organization in the field. We present a profile of its activities in Utility Mapping.

NIC established its Utility Mapping Group at its Headquarters in New Delhi in 1989. Comprising of professionals from various disciplines such as Computer Sciences, Information Science, Civil Engineering, Surveying and Photogrammetry, Transportation Engineering, Town Planning, Remote Sensing, etc., the group was entrusted with the responsibility of introducing utility mapping in the Country to aid the process of planning and management of utility services. To do so, the Group set out with the objective of mapping various utilities on large-scale common digital basemaps. It was also its endeavour to create an integrated database of all the utilities, along with digital basemaps, for their proper management.

Eight years since, today, NIC has succeeded in redefining utility management and planning to a large extent. Its Utility Mapping Group has grown from strength to strength by successfully completing a number of important projects. The Utility Mapping Project for Delhi is one of the most important.

The Delhi Project

The Utility Mapping Project for Delhi was conceptualized in co-operation with various Departments of the Delhi Administration including the Delhi Development Authority(DDA), Delhi Water Supply and Sewage Undertaking, Delhi Fire Service, Delhi Traffic Police, Public Works Department and Mahanagar Telephone Nigam Ltd. The basic problem in implementing such projects is non-availability of large-scale base maps of cities. Consequently, it was decided to establish a large-scale (1:1000) map for a pilot area of about 30 sq km in Delhi.

To prepare the basemaps of the pilot area, it was essential to fix ground control points inside and in the periphery of the area, for establishing a local grid for Delhi. A reconnaissance survey of the area was conducted, and about 19 Ground Control Points (GCPs) were selected and monumented. Levelling routes were finalized for densification of height control. Global Positioning System (GPS) was used for establishing planimetric control (i.e., Easting and Northing).

Pre-pointing of GCPs and Utility Objects: All the GCPs were marked by specially designed targets prior to aerial photography of the pilot area. In addition, about 3,000 utility objects were pre-marked with white paint so that their image would appear sharply on the aerial photographs taken on a scale of 1:6000.

Preparation of Basemaps: After network adjustments, the GCPs were transferred on to the aerial photographs for further photogrammetric control extension and were used in Block Adjustment program for the preparation of the digital basemap. During the process of preparation of the basemap by digitizing the aerial photographs on Analytical Stereoplotter), every feature on the ground was assigned a feature code.

The digital basemap thus created was again verified in the field, and some details like house numbers, street names, locality names etc. were added.

Basemap Storage: A mapsheet indexing system is required for organized storage and retrieval of basemaps. The Utility Group developed the mapsheet indexing system for various plotting scales. All the basemaps were stored in GINIS/MAPMAN software. Various layers for different utilities were created and superimposed on the basemap layer. The basemap and utility layers could then be stored and retrieved seamlessly.

Utility Mapping Services of NIC

AM/FM/GIS:

- Consulting
- Feasibility studies
- Turnkey Implementation of AM/FM/GIS projects
- Data conversion
- Software Evaluation
- Specifications for H/W and S/W requirements
- Application Software Development and Customization
- Object oriented relational database design and development
- Networking Applications and Front-end Graphics for various utilities organization

Surveying and Photogrammetry:

- Consulting
- Feasibility studies
- Establishing Ground Control Network for various Surveying and Photogrammetric applications using GPS technology.
- Digital Basemap Production
- Contours Generation
- Digital Terrain Modelling

Utility Mapping Facilities at NIC

	Equipment	**Software**
Surveying	Global Positioning System Total Station TC1610 Level NA24	GPSurvey,Trimplan Trimnet, Gemini Wild Soft
Digital Photogrammetry	Analitical Sterioplotter PLANICOM P3 with Videomap	PHOCUS,PATMR
AM/FM/GIS Application Software	VAX-Alpha PENTIUM SUN WORKSTATION PC BASED	Sysdeco Mapping Software GINIS VISION TELLUS VISION ARC/INFO
Scanning	Raster Scanner(A0)	PIXTOOLS
Plotters	Raster Plotter A0 size Penplotter (HP) A0 size	

A **P3 Analytical Sterio Plotter** used by the NIC Utility Mapping Group

Incorporation of Utility Network data: The data related to various utilities such as water, sewer and fire were collected from old records, plans and maps. The utility lines and the objects which were underground and exposed were again field checked for their positional accuracy with Metrotech detectors and Ferromagnetic line tracers. The measurements so obtained were then incorporated again in the respective utility layers by using the GINIS package.

Other Projects

- *Computerization of Pre-paid taxi service for Delhi Traffic Police:* This project was implemented for the Delhi Traffic Police for computing fares for pre-paid taxi services from important locations such as railway stations and airports. Fares were computed by measuring the optimum distance between the starting point and the destination on a digitized map of Delhi. Optimal routes were identified by using the PC ARC/INFO Network module.

- *Railway Route Alignment of the Udhampur-Katra section:* Alignment for the 25 km railway route from Udhampur to Katra, was carried out in 1996. For the first time in India, GPS technology was used for railway route alignment.

- *Development of GINIS VISION package:* GINIS VISION is a software package for structuring and manipulating cartographic data. It enables the production and maintenance of maps and spatial information to keep all data in one place and maintain full control over it. This application was developed using QBE Vision.

Projects in the Pipeline

- *Utility Mapping Project for Delhi:* A ground Control Network (main grid) has already been established for entire Delhi (40 km x 40 km) using the Global Positioning System. Further densification of Ground Control Points is being carried out in many parts of Delhi.

- *Digital Basemap for Okhla Extension:* A digital basemap for the Okhla Extension of Delhi, covering an area of 180 sq km, is under production.

- *House Registry Application:* It is a GIS application that is designed to enable emergency services to be at the scene of crime or incident without losing any time. An integrated database of all addresses in Delhi is being created in Oracle. The exact physical locations of these addresses will be identified against a basemap as the background. This will enable police personnel to be directed to a particular address from a central control point. This solution will be available on both Pentium PC and Mainframe platforms.

- *Utility Mapping System for the Chandigarh Electricity Department:* A feasibility study has been conducted for automation of the electricity network of Chandigarh City. The feasibility study envisages the implementation of a cable route network which would help in proper documentation, planning, analysis and trouble shooting. Load flow analysis and short circuit analysis would help in raising the efficiency of the electricity system.

- *Utility Mapping System for Tamil Nadu Electricity (TNEB), Chennai:* A feasibility study has been conducted for automation of the electricity network in Chennai.

- *Preparation of Digital Basemaps for the State of Sikkim:* A feasibility study was conducted recently for mapping the state of Sikkim for incorporation of land records in a digital basemap.

Training Programmes

Personnel from various utility organizations are imparted training on the GIS software developed by NIC.A week-long computer training programme on AM/FM, with special reference to utility mapping, is conducted every year in September. An appraisal programme in city infrastructure management is conducted for senior officers every year.

Over the years, NICÕS Utility Mapping Group has gained expertise in various aspects of digital mapping technology. The digital mapping techniques that it has developed can be replicated in other cities of the Country as they face similar problems in management of utilities. Utility Mapping has the potential of making life much more comfortable for the common man. NIC intends to exploit this potential to the fullest.

For further information, please contact:

Utility Mapping Group,
National Informatics Centre,
2nd Floor, A-Block, CGO Complex,
Lodhi Road, New Delhi - 110 003.
Ph: 91-11-4364635
Email: mchandra@alpha.nic.in

Around the NIC world

TRIPURA ON THE WEB

Agartala: The National Informatics Centre has developed and hosted a web site for the State of Tripura.The State's Information, Cultural and Tourism departments offered invaluable help to NIC in creating the site.The web site contains exhaustive information on tourism, culture, geography and topography of the State.
The web site can be accessed at **http://www.nic.in/tripura/.**

IIC's WEB PRESENCE

Delhi: NIC has developed and hosted a web site for the Indian Investment Centre (IIC), a Government organization for investment promotion.

With information on India's investment climate, economic policies and the Union Budget, along with useful contact addresses, the site is expected to draw potential investors.

The IIC website can be accessed at **http://www.nic.in/iic/**

TRAININGS ORGANIZED

New Delhi: As many as forty training programmes in computers and network utilization were organized by NIC in the course of one year, starting from October 1996, for personnel of the Ministry of Labour. About 300 Ministry personnel have so far been benefitted by these programmes.

Conducted with active co-operation from the Career and Management Training (CMT) of the Labour Ministry, this array of training programmes was a practical sequel to the implementation of a Local Area Network (LAN) in the Ministry.

KVIC AUTOMATION TAKES OFF

Mumbai: October 27, 1997 saw the coming together of the traditional and the modern when the

On-Line Accounting System (OLAS) developed by NIC for the Khadi and Village Industries Commission (KVIC) was inaugurated by Mr Surendra Mohan, the Chairman of the Commission, at Mumbai.

The inaugural function, at KVIC Headquarters, was presided over by the Chief Executive Officer of KVIC, Mr RK Bhragava.

What, however, lend the icing on the cake was the fact that NIC had completed the development of the software package five weeks ahead of schedule!

The inaugurattion of the software package marks but the first milestone in NIC's endeavour to computerize KVIC activities which primarily fall in the domain of financial business. NIC has identified 20 such activities to be computerized in the first phase of the computerization effort. Accounting was the first activity to be taken up.

KVIC, under the Ministry of Industry, promotes Khadi and Village industries by providing financial assistance to individuals and organizations engaged in these industries. Its operations are spread all over the Country. Computerization is thus imperative for KVIC.

A demonstration of OLAS for the Chairman and other KVIC personnel, in progress.

ROLE OF IT IN CO-OPERATIVES MOOTED

Delhi: A national workshop on Co-operative Statistics and Informatics was organized jointly by the Department of Agriculture and Co-operation, Ministry of Agriculture and NIC, at the Scope Convention Centre, on September 5, 1997.

The Union Minister of State for Agriculture Dr S Venugopalachari who inaugurated the workshop, underlined the key role IT could play in the Co-operative Movement. He emphasized that a database on co-operative societies would help state governments in monitoring and aiding these

societies.

The Minister, Dr S Venugopalachari (second from right)being welcomed by the Secretary, Mr K Rajan.

Speaking on the occasion, Mr K Rajan, Secretary, Ministry of Agriculture, said that the induction of IT in the Co-operative Movement would not only serve the needs of planners and policy makers, but also of those at the grass root level.

A computer-based information system was proposed by NIC and the views of the states were obtained in the deliberations of the workshop.

EXPO-INDIA RELEASED

Delhi: NIC has released EXPO-INDIA, a CD containing profiles of 1,18,000 companies belonging to various export promotion councils and major trade bodies.

The CD is a valuable source of infornmation for importers and exporters alike.

EXPO-INDIA comes with an in-built windows-based query module for details based on specific parameters and their combinations.

WORKSHOP HELD

Rajasthan: A two-day workshop on Network and Internet was conducted by the NIC Tonk District Unit at the Central Sheep and Wool Research Institute, Avikanagar, Tonk, on September 17 and 18, 1997. Around 120 scientists participated in the workshop.

The objective of the workshop was to improve utilization of computers and computer networks in the Institute.

NIC OFFICIAL AWARDED

Pune: Ms P P Joag, Senior Technical Director, NIC, was conferred with the 1997 award for the Woman making outstanding Contribution to the IT industry in Pune instituted by the Pune Chapter of the Computer Society of India (CSI), on October 3, 1997.

COMPUTERS FOR HC

Chandigarh: The Chief Justice of India, Mr JS Verma, inaugurated NIC computer facilities in the Punjab and Haryana High Court at Chandigarh, on November 30, 1997.

The computer setup, implemented by NIC Haryana State Unit, span three sites in the High Court, and is linked through a Local Area Network (LAN) based on thick ethernet. Computers will now be available for use by judgement writers and private secrertaries of Judges.

Products/Services

Down to the Grassroots

The NIC Madhya Pradesh State Unit has developed and implemented the Village Information System (VIS) in the districts of the State. VIS is a decision-support information retrieval system based on DISNIC-PLAN village-level data. A Hindi version of the package has also been developed.

VIS provides an interactive and user-friendly interface for instantaneous retrieval of village-level information from DISNIC-PLAN data, besides providing block and district-level aggregates on certain selected parameters. The system also facilitates quick generation of various statistical reports when queried on the basis of the names of villages or even the first few letters of the name of a village.

DISNIC-PLAN codes have been mapped with Census-91 codes, taking into due consideration the creation of new tehsils, and also their reorganization. The system generates a check-list giving matched and un-matched records to help update un-matched records.

Besides updating relevant fields of DISNIC-PLAN data with Census-91 data, the more recent All India Education Survey (AIES) data has also been used for updation.

VIS has seven modules, related respectively to Education, Health, Transport & Communications, Drinking Water, Land Holdings, Other Facilities and Census-91 Data.

The most important feature of the package is the Query Generator which, for example, can generate a list of village having a facility within a specified range in distance, in ascending or descending order. VIS has certain built-in abilities for limited statistical analysis. A graphic interface has also been embedded to display frequency distribution.

The Hindi version of VIS is expected to provide a better user interface for field-level functionaries and district users in the Hindi-speaking regions of the Country.

Personnel Management made Easy

The NIC J&K State Unit has successfully developed and implemented a Windows-based software named Personnel Information System (PIS) to help maintain a database of employees and to assist in easy retrieval of a variety of information in various formats. The package is designed to meet the requirements of the J&K Secretariat and its subordinate offices.

The package has been implemented in two ways: as a stand-alone system to cater to the needs of offices outside the Secretariat, and as a client-server system for use within the Secretariat.

This user-friendly system uses very attractive data-entry forms, and is supported by a very powerful query system. It is very easy to install and can be ported on any machine having Windows 3.11 or a higher version.

UP breaks Barriers in Revenue Computerization

Modernization of the Revenue Sector has always been a top priority for State Governments. Responding to this important requirement, The NIC Uttar Pradesh State Unit took up the challenge, and has successfully computerized the UP Budget Directorate and the treasuries of all districts in the State.

The project aimed at co-relating money allocated, to the actual payments and receipts in the case of each department. This would also lend transparency to all government transactions. In addition, NIC also envisaged that computerization would introduce several other invigorating factors such as an accurate and speedy accounting pattern, proper budgeting and timely reporting.

The Budget Directorate and the District Treasury Offices have been adequately equipped with the latest in information technology tools. Appropriate application software packages have been developed and implemented.

In fact, computerization of the Revenue Sector is the end result of a number of projects put together **:**

- ***State Annual Budget***

  One of the major achievements of the project has been the preparation of the Budget for the year 1997-98. The Budget Document which consists of six khands Ñ 17 books of around

4,500 pages Ñ was completed within a record time of 25 days against the scheduled time of 90 days Ñ thanks to the use of computers! The Document covers the complete spectrum of the finances of the State.

- ***Contingency Fund Monitoring***

  The Project has computerized the monitoring of the Rs 600 crores in the annual Contingency Fund of he State Government. This fund is used for emergency expenditures, and the spent amount is recouped in the annual budget.

- ***Budget Release and Expenditure Monitoring***

  After the Budget is approved, the amount sanctioned is released to the individual heads of the departments concerned. NIC has developed a software to monitor the budget released and the monthly expenditure of each head of department.

- ***Monitoring of Loans and Guarantees***

  State and Central Government loans to different corporations, boards, etc. are monitored with the objective of reducing state liabilities on loans and guarantees.

- ***Treasury Information System of NIC (TISNIC)***

  This user-friendly information system takes care of two important aspects: it prepares accounts up to the standard object level and helps in management by providing all reports required by the Accountant General, Allahabad and the State Government for monitoring and analysis of expenditures.

And that is not all. NIC has developed a Budget Control System to enable a treasury to specifically monitor the expenditures in a particular scheme allotted to a particular Drawing and Disbursal Officer. This package is under implementation.

Projects

A smooth Ride in the offing

The Haryana Transport Department has entrusted NIC with the responsibility of computerizing many of its important functions. These include **:**

- Issue of Driving Licenses
- Registration of Vehicles
- Issue of Permits
- Collection of Road and other taxes
- Enforcement of various provisions of the Motor Vehicles Act

The NIC Jind District Unit has been selected for detailed study on the development and implementation aspects of the project.

NIC has already gone ahead with the project by connecting all Roadways depots in Haryana with the Office of the State Transport Commissioner through NICNET. A Email address has been provided to each of the 21 depots for the purpose.

A one-day workshop on NICNET facilities, organized by NIC on November 19, 1997, was attended by General Managers of Haryana Roadways, the State Transport Commissioner and senior officers of the Transport Department. A five-day training programme on word processing and e-mail utilization was organized for officials of the Transport Department as a prelude to the project.

IT to play crucial role in Watershed Planning

Impressed by its overwhelming success in a turn-key pilot project for the development of an Integrated Information System for Watershed Projects (IISWP) covering five divisions and 27 sub-divisions in Maharashtra, the Government of Maharashtra has entrusted NIC with the responsibility of developing and implementing similar information systems in 70 locations of the State during 1997-98. The project envisages computerization of watersheds from the sub-division level. It is however so planned that the databases created at the sub-divisions satisfy the basic information requirements at the divisional, regional and state levels also.

Senior Officers of the Maharashtra Government undergoing training on use of computers in Watershed Planning.

The watershed play an important role as the unit of economic development of any area. Its management is however rather complex as it involves multifarious activities. Reports of projects for economic development, giving details of activities, cost estimates, time schedules and estimated benefits; are prepared based on parameters such as the geographical features, social conditions, rainfall and manpower availability of the watershed in which the project is implemented.

More than 14,000 watershed projects, funded by different sources, are being implemented in the State of Maharashtra. Add to that the fact that it takes considerable time to complete the total development of each watershed, and the significant role that a computerized integrated information system can play in such a situation hardly needs any further substantiation.

In the pilot project which NIC completed successfully in 1995-96, computerization of each site covered preparation of water estimates, presentation of statistical reports, office automation, payroll processing, etc. The package generates an exhaustive database consistent with all voucher-level information. Staff members from each site were also trained intensively on use of the IISWP package.

Going by its performance in the pilot project, NIC is all set to usher in a new era of development by developing and implementing a holistic integrated information system covering all the watershed projects in Maharashtra, and, in the future, also in other parts of the Country.

Salient Features of IISWP Pilot Project

The IISWP package for the pilot project was developed in Foxpro under Windows. It is utilized for **:**

- Initial preparation of watershed database using backlog data.
- Maintenance of watershed database using voucher-level documents on budget expenditure according to different heads and on technical work measurement information.
- Cross-checking the expenditure on different works.
- Creation of works database, interlinked with funds sanction and expenditure.
- Monitoring of watersheds implementation, based on budget allocated and targets fixed.
- Making queries for information.
- Generating reports for maintenance of registers, day-to-day management and decision support.

Chhindwara: Setting Milestones all the Way

Lush green forests, colourful tribal communities and attractive tourist spots make the Chhindwara District of Madhya Pradesh an alluring proposition. Situated in the Satpuda Hills range, ChhindwaraÕs economy is fueled by its vast coal reserves and the many industrial giants that it houses.

The District has a population of 15,68,700 spread over an area of 11,815 sq km. It has 1,984 villages distributed in 11 development blocks. The population density is 132.77 persons per sq km, and the literacy rate is 44.9 per cent.

The Inception

It was in this setting that the NIC Chhindwara District Unit was commissioned in 1989. The first move, as in all other NIC District Centres, was to familiarize the District Administration and its departments with the relevance and advantage of computers so that they would adopt the computerized way of doing things. To do so, the District Unit organized several training programmes for the staff of almost all departments.

At the District Level

The Chhindwara District Unit has come a long way since. Numerous projects were executed by NIC to extend computer support to a host of departments: the Time Limit & DO Letter Monitoring System caters to the requirement of weekly review of the disposal of time limit papers by various departments. The Zilla Nazarat is benefited by the Recurring Deposit Monitoring System, Temporary Advances Reporting System and the Database on Firearms.

The project for office automation of the Satpuda Saksharatha Samiti (SSS), Chhindwara, is a major responsibility which the District Unit has taken up in the recent past. Four software packages have already been developed and implemented for the project. The Advances Monitoring System monitors the advances paid and generates monthly reports; the Expenditure Monitoring System generates expenditure reports according to minor heads every month; the Balances Reporting System monitors withdrawals and payments and generates a report on balances, from vouchers; and the Ledger Monitoring System generates the monthly Ledger Statement and the Balance Sheet at the end of each financial year. All the four software found instant success, and the District Unit

became an integral part of the Literacy Campaign.

Other projects developed for local use include the Public Grievances Monitoring System and the Anganwadi Inspection Monitoring System which reviews the inspection details of Anganwadi Centres. On several occasions, merit lists were prepared for selecting candidates for different posts in departments such as Forests, Education, Land Records and Health.

In tune with the Nation

Several state and national-level projects have been implemented in the District. Among them are the National Watershed Development Programme for Rural Development (NWDPRA), Integrated Child Development Scheme (ICDS), Prime MinisterÕs Rojgar Yojna (PMRY), National Sample Survey Organization (NSSO), Target-Free Approach for Family Welfare, MP Local Area Development Scheme (MPLADS), Treasury Accounting Information System (TRACIS), Treasury Receipt and Payment Information System (TRINFO), Death and Birth Registration System, Malaria Monitoring System, Epidemic Monitoring System, Animal Disease Surveillance Information System (ADSIS) and MLA Local Area Development Scheme (MLALADS).

During Elections

An integral part of the success story of the Chhindwara District Unit is the efficient computer and communication support it provided to the District Administration in the Assembly Elections of 1993, the Parliamentary Elections of 1996 and again in the Bye-Elections of 1997.

The NICNET Factor

NICNET has become an indispensable means of communication for the Chhindwara District Administration. Moreover, the District Unit has provided dial-up connectivity to OILFED and DRDA. The Central Excise Department and the Zonal Research Institute of the Jwaharlal Nehru Krishi Vishwavidyalaya are also to be hooked up with NICNET in the near future. The list of NICNET users in the District is growing longer and longer with time.

Other Services

The NIC Chhindwara District Unit is facilitating widespread use of Census-91, DISPLAN and GISTNIC data among a wide cross-section of people, viz. researchers, advocates, freelance writers and others in government departments and private offices, by providing data in user-defined formats.

Immersed in work : A day in the Chhindwara District Unit

The unstinted efforts of the NIC Chhindwara District Unit has won the confidence of not only the Government machinery, but also of people from other walks of life who had had the occasion of seeking NIC assistance. Several unexplored areas, however, still pose new challenges. Computerization is yet to lend its soothing touch to many a important development scheme and department. As Robert Frost had put it so eloquently: "... and miles to go before I sleep..." But, at the same time, the distance that the NIC Chhindwara District has covered is indeed remarkable. And it has marked the whole way with milestones of achievements.
