Best IT Implementations of the Year 2009

Volume I: IT Project Nominations

**India's most comprehensive guide to Enterprise IT:
Over 230 Projects from 28 industries
Plus: IT Implementation trends**

Best Managed

Tamil Nadu Water Supply and Drainage Board

TWADNEST

TWAD or Tamil Nadu Water Supply and Drainage Board implements water supply and drainage / sewerage schemes at a cost of around Rs.1500 crores every year for all urban and rural local bodies in Tamil Nadu. To manage this huge task a good MIS was required which can also improve the productivity in achieving total transparency in the system. Before implementation of this project, data collection and compilation was done from 114 offices of TWAD Board spread across the entire state. Data were collected in each of 114 offices using standalone applications and it was sent to the head office and regional offices via email, CDs etc. The data collected at head office and regions were compiled using another standalone software manually. This process was very time-consuming.

Hence the department planned to integrate the whole process using a Internet/Intranet based app developed and implemented jointly by 'TWAD Board' and 'NIC, Chennai'. The aim of this project is to use IT to implement e-Governance in TWAD Board in order to attain improved productivity and transparency in the organization.

After the deployment of the project, due to centralized system, the data collection is done by automating the processes at the field offices. Now a lot of periodicals, statutory schedules, daily reports, MIS reports and board reports are generated by all offices online as and when required without the need for any manual compilation. The application also provides a single platform for automating financial accounting, HR management, project mon-

Q What were the key technical challenges that were faced while implementing this project?

Choosing right technology and platform for this kind of a mega project, and then adhering to the open standard were the main challenges faced by the development team. Using the Ajax technique without compromising on security issues to enhance the user experience was another challenge. Using broadband Internet connectivity to access the online application till the time TNSWAN was connected to TWAD intranet again another
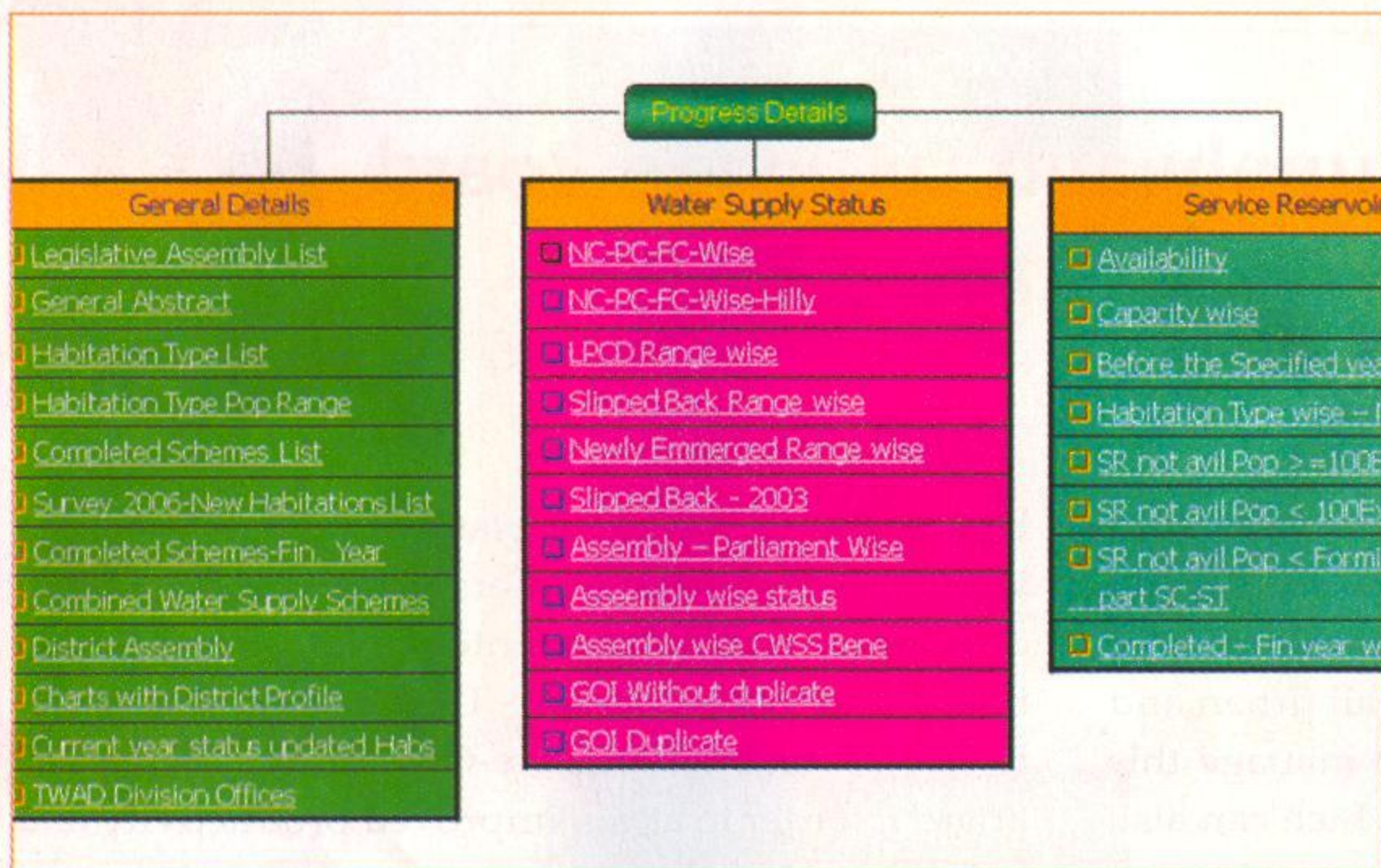
Q What according to you sets this project apart from any other in its class? What's the unique selling proposition (USP) of this project?

The kind of efforts that have gone in towards building a centralized database, establishing the network infrastructure, improving the hardware and peripherals infrastructure of 114 offices of TWAD Board, the development of ERP like application software make this project unique in Government sector. The very fact that this application is being accessed by all the 114 offices of TWAD Board spread across the state itself is an indication that this project deserves a special mention. A comprehensive database of more than 1.5 GB covering various functional activities of TWAD Board has been developed and maintained successfully since April 2007 is another reason that sets this project distinct.

Overall TWAD Board is the first government agency to implement this G2G e-Governance project of mega size in the state of Tamil Nadu.

Shri. A. Rajasekar, Manager (EDP)

Progress Details

General Details	Water Supply Status	Service Reservoir
Legislative Assembly List	NC-PC-FC-Wise	Availability
General Abstract	NC-PC-FC-Wise-Hilly	Capacity wise
Habitation Type List	LPCD Range wise	Before the Specified yea
Habitation Type Pop Range	Slipped Back Range wise	Habitation Type wise -- M
Completed Schemes List	Newly Emmerged Range wise	SR not avil Pop > =100E
Survey 2006-New Habitations List	Slipped Back - 2003	SR not avil Pop <, 100E>
Completed Schemes-Fin. Year	Assembly -- Parliament Wise	SR not avil Pop < Formin
Combined Water Supply Schemes	Asseembly wise status	part SC-ST
District Assembly	Assembly wise CWSS Bene	Completed -- Fin year w
Charts with District Profile	GOI Without duplicate	
Current year status updated Habs	GOI Duplicate	
TWAD Division Offices		

COMPANY SCENARIO

Before Deployment

- The mgmt of the projects and the money assigned for the project by 114 branch offices of TWAD board was very difficult and used to take a lot of time due to exchange of data over slow & unreliable medium.

After Deployment

- Now each office is connected through a WAN and exchange data over the TWADNEST MSI system saving time and enhancing accuracy.

Implementation Partner
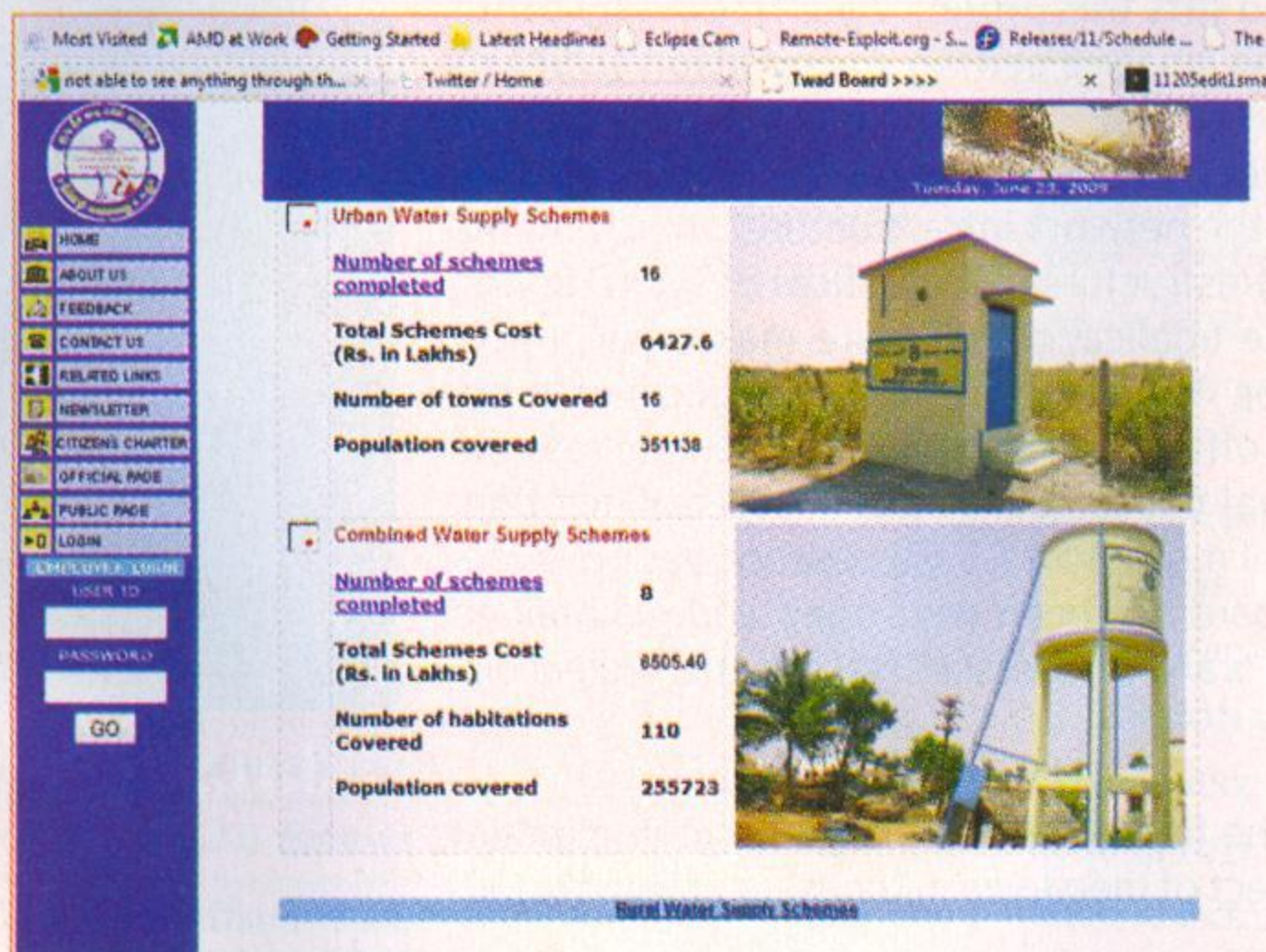
Thiru K.Srinivasa Raghavan, NIC

itoring and water quality management.

For the connectivity of all these 114 branches, TWAD had used NIC, BSNL and TNSWAN as backbone networks. This backbone offered some additional benefits such as a readymade platform video conferencing over IP. So TWAD had decided to deploy Tandberg desktop video conferencing solutions on each offices. TWADNEST can be accessed from the TWAD website which is a signal point of interface for G2G and G2C. For government, it can provide MIS data where departments can see the overall project status and money spent at a near real-time basis and can drill down to the smallest level of data if required. For the customers, it gives quite a few things. The first is the integration of this application with the water testing labs spread across the state. The complete report generation, test selection and billing for the labs is done through this system. Anybody can bring samples to these test labs and can get it checked for pollutants by paying a small fraction of money. At the same time, the board also conducts regular tests across the state. Once the tests are done, the report goes directly into a centralized database with the location information which is then ported on a GIS map of the state. And using this GIS map, anybody, even a visitor can immediately see the status and condition of water in different regions of the state.

As of the hardware side of the deployment, unlike other government bodies, TWAD hosts most of its application in its own datacenter situated at the Marina Beach, Chennai. For running TWADNEST, they are using Server Platform with 64-bit Dual Itanium2 processor of 1.5 GHz having 4MB L3 Cache per processor Intel E8870 Chipset / 16GB (2x8GB) DDR-SDRAM based servers on top of which Red Hat Linux Enterprise System -- ver.4 (64 Bit OS) is running. And for the database and application server they are using Oracle 10g Enterprise Edition for Linux Web Server and Apache-Tomcat 5.5 respectively. For building the interface they have used mainly Java/J2EE Technologies, AJAX, HTML, CSS, and XML etc to give the user a good and simple working experience. The board is expecting the life for this project to be at least to twelve years. □

TAMILNADU WATER SUPPLY AND DRAINAGE BOARD
A report on TWADNEST
TWAD board iNtegrated Egov SysTem

1. Overview

- The "TWAD Board Integrated e-Governance System (TWADNEST)' project is an Internet / Intranet based enterprise class of application developed and implemented jointly by 'TWAD Board' and 'NIC, Chennai' as part of G2G/G2E e-governance solutions for TWAD Board. The primary goal of this project is to leverage Information and Communication Technologies to implement total e-Governance in TWAD Board in order to attain improved productivity and transparency in the organization.
- TWAD Board is implementing water Supply and Drainage / Sewerage Schemes at a cost of Rs.1500 Crores approximately every year for all urban and rural Local Bodies in Tamilnadu. This necessitates a good online MIS to manage the above tough tasks effectively using ICT and to improve the productivity and to achieve total transparency.
- Before the implementation of this project, data collection and compilation from all the 114 offices of TWAD Board spread across the entire State. Data were collected in each of 114 offices using stand alone applications and the data were sent to Head office and Regional offices via email, CDs etc. The data collected at Head Office and Regions were compiled using another stand alone software and manual mode. This process was a very much time-consuming and a lot of precious man-hours was spent to achieve this.
- Now after these online initiatives, due to centralised system, the data collection is done by automating the processes at the field offices and a lot of Periodicals, Statutory Schedules, Daily Reports, MIS Reports and Board Reports are generated by all offices online as and when required without the need for any manual compilation.
- This Project was fully supported by Govt. of Tamilnadu and Department of Drinking Water Supply , Ministry of Rural Development , GOI

2. TWADNEST Components Implemented

- Established Centralised Data Centre at Head Office, TWAD Board, Chennai
- Upgradation of Hardware and software for all offices
- Setting up of LAN and WAN connectivity across all the 114 offices of TWAD Board spread across the State with NIC, BSNL and TNSWAN as backbone networks.
- Established Internet access to all 114 offices of TWAD Board as a redundant measure to access the central servers.
- Voice over IP (VOIP) technology is used for communicating among the TWAD Board offices.
- Development of Intranet Portal http://twadonline.tn.nic.in covering various major functional areas such as Financial Accounting, HR Management, Project Monitoring and Water Quality Management
- Information Dissemination through TWAD website http://www.twadboard.gov.in
- Established ICT Infrastructure at all the 114 offices of TWAD Board spread across the State. (Head Office, 4 Regions, 16 Circles, 93 Divisions)
- eTender system through TWAD Board Website and Government Tender Portal

- Established exclusive website for Rain Water Harvesting (RWH) technology http://www.aboutrainwaterharvesting.com which is first of its kind in South Asia. By adopting this RWH technology/ information, the ground water level has improved phenomenally in all the major cities and rural areas of Tamil Nadu State.
- Change Management concept is disseminated through an exclusive website at http://www.cmgtwad.gov.in This enhances the capacity of the community to be in the forefront to safeguard water resources and to establish self management for sustainable systems.
- CAD / GIS Software for specialized groups of TWAD Board.
- All the above links are available through the TWADNEST Portal http://twadonline.tn.nic.in
- TWAD Board is the first organisation in the State of Tamil Nadu to make use of the TNSWAN network and implementing the ERP level application software.

3. key business challenges faced during implementation

- This being a G2G/G2E e-Governance project there is no direct revenue generation as compared to commercial organizations. Therefore it becomes a major challenge in availing funding sources at the initial stage of the Project it self. Also it is being huge amount the Board itself is not in position to support the entire capital cost. Hence lot efforts were taken to get the funding from Govt. of Tamil Nadu and Govt. of India.
- As TWAD Board is having rich experience in adopting ICT in Water Supply Sector than any other state, it become possible to convince and get the funds sanctioned from the Department of Drinking Water Supply, Ministry of Rural Development, Govt. of India .
- TWAD Board being the direct beneficiary, the annual recurring expenditure of maintenance of ICT infrastructure established under this project is met out from TWAD Board annual budget.
- To win over the confidence of the officials on the issue of continuous availability of the system was another major challenge faced by the Implementation Team. The officers expressed their concern on total dependence on the system and they were apprehensive of failure of the Servers or Connectivity. This was sorted out after the assurance was given by way of providing alternate mode of connectivity at the Division level offices and multiple servers were maintained for fault tolerance at the Head Office. A continuous and sustained effort was made to associate all the users during each stage of this project in order to implement the project successfully.
- Capacity building is another major challenge faced during implementation. To address this, a series of training programmes were organized to induct confidence to the users in operating the application software. Planning and scheduling the training were another challenge faced by the implementation team. User Manuals were prepared and distributed. Core group of Trainers were formed to help the training programs organized in the Regional Centre. As persons are transferred periodically, the training was done on a continuous basis.

4. key technical challenges faced during implementing this project

- Choosing right technology and platform for this kind of mega project. After selecting the above, adhering the open standard is the main challenge faced by the development team
- Using the Ajax technique without compromising on security issues to enhance the user experience is the another challenge

- Using the broadband internet connectivity to accessing the online application till the time TNSWAN was connected to TWAD intranet

5. Highlight of the key business and social benefits delivered

- The systems with internet connectivity are made available in all the 114 offices of TWAD Board.
- Intranet(WAN) / LAN network facilitates easy service delivery
- Voice Over IP (VOIP) technology is used for easy communication among the TWAD Board offices like intercom
- Established the email services with a seperate mail server in TWAD data centre.
- The major functional areas such as Financial Accounting System, HR Management, Rural water Supply Information System and Water Quality Management of TWAD Board is made online to the following   online services.

Financial Accounting Information System

- Generation of Receipt/Payment Vouchers online for all offices
- Generation of Journal Vouchers
- Auto-Updation of Cash Book, General Ledgers, Sub-Ledgers
- Monthly Trial Balance Generation
- Fund Remittance, Fund Receipt, Inter Bank Transfer, etc
- Schedules, MIS Reports etc.

Human Resources Management Information System

- Online Maintenance of Offices Directory
- Online Maintenance of Staff Sanction Strength
- Online Employee Master Maintenance
- Online Employee Service Records Maintenance
- Online Generation of Transfers/Postings/Joining/Relieval Orders

Rural Water Supply Information System

- Habitation Info.
- Budget Proposals
- Division wise Progress Updation
- GOI Progress updation
- MIS Reports

Water Quality Management Information System

- Online Maintenance of Chemicals Stock at WQ Labs
- Online Maintenance of Sample Test Results
- All sample test reports
- MIS Reports

6. Unique selling proposition (USP) of this project
- The kind of efforts that have gone in towards building a centralised database, establishing the network infrastructure, improving the hardware and peripherals infrastructure of 114

offices of TWAD Board, the development of ERP like application software makes this project unique in Government sector.

- The very fact that this application is being accessed by all the 114 offices of TWAD Board spread across the State itself is an indication that this project deserves special mention.
- A comprehensive database of more than 1.5 GB covering various functional activities of TWAD Board has been developed and maintained successfully since April 2007 is another reason that sets this project distinct.
- The Information and Communication Technologies has reached all the 114 offices of TWAD Board. Intranet (WAN) / LAN network connectivity established and put into use. Voice over IP (VOIP) technology is used for communicating among the TWAD Board Regional offices. Established Data Center at Head Office of TWAD Board for providing corporate web and email services

- TWAD Board is the first government agency to implement this G2G e-Governance project of mega size in the State of Tamil Nadu. Enable the employees to carry out their work using appropriate sub-systems of TWADNEST software. This system empowers all the Officials, Management to take decisions quickly using MIS reports which are available online.
- Adoption of Open Technologies and Standards in building the e-Gov Applications.

7. Project Architecture and Technologies

a. Details of the hardware used in the project
Deployment Environment Hardware

- Server Platform with 64-bit Dual Itanium2 processor of 1.5 GHz having 4MB L3 Cache per processor
- Intel E8870 Chipset / 16GB (2x8GB) DDR-SDRAM
- Integrated on M/B dual channel Ultra 320 SCSI controller
- Dual channel Ultra 320 SCSI RAID controller with 128 MB cache with battery backup supporting Raid 0,1,2,3,5 levels
- Fiber channel Host-Bus Adaptor with 2 Gigabit support
- Dual (1 no. Integrated & 1 no. Add-On) server Gigabit Ethernet controllers
- Integrated Graphics controller with 8 MB display cache
- 6x144 GB ultra 320 SCSI Hot pluggable HDDs (10K or higher rpm)
- IDE DVD/CD Writer Combo drive / Ultrium 100/200GB Tape drive Operating System
- Red Hat Linux Enterprise System – ver.4 (64 Bit OS)

b. Details of the software used in this project
Databases and Application Server

- Oracle 10g Enterprise Edition for Linux Web Server
- Apache-Tomcat 5.5

c. Details of the services and support utilized for this project
- N I C, Chennai – Application Software Development
- ELCOT , Chennai – TNSWAN connectivity
- BSNL – Last mile Connectivity

d. **Details of key technologies that were used in this project**
   Development Technology
- Java/J2EE Technologies, AJAX, HTML, CSS, XML etc

   Development Environment
- Windows XP,
- JDK 1.5,
- JDeveloper 10.1.3,
- Jasper /iReporting 2.0.2

8. Change Management

a. Change management strategy

- Change Management concept is disseminated through an exclusive website http://www.cmgtwad.gov.in. This enhances the capacity of the community to be in the forefront to safeguard water resources and to establish self management for sustainable systems.
- In order to successfully implement the 'TWADNEST' project, TWAD Board formed State Level Co-ordination Committee to review the project at each stage. The coordination committee consists of top-level officials from TWAD Board and NIC/NICSI.
- TWAD Board also formed various core groups to study and approve the SRS documents. Key Resource persons were identified at Regional and Circle levels to give instant local support to Users of the system.
- Project Teams Apart from the Development Team from NIC, various subject specialists and officers from EDP wing of TWAD Board were actively engaged in this project to provide necessary inputs and guidance to the application development team.
- A series of training programme were organized for all the officials of TWAD Board on this application software. User Manuals were prepared and distributed. Core group of Trainers were formed and with their help, training programs were organized in the Regional Centre. As persons are liable for transfer, the training was done on a continuous basis.

b. Capacity building plan

- TWAD Board is having experienced IT team headed by the EDP Manager for the implementation of e-Gov projects and to manage all IT related activities.
- Experienced NIC team is available as principal consultant for all Technical support.
- A series of training programmes were organized to induct confidence to the users in operating the application software.
- Continuous and sustained training programmes were conducted for new users and to sustain the usage of the system.

c. Leadership support & visibility

The Secretary to Government, Municipal and Water Supply Department of Tamil Nadu State Government and Chairman cum Managing Director of TWAD Board provided top-level Leadership Support. The software development team was formed by NIC with the

direct supervision of Senior Technical Director under the overall guidance of the State Informatics Officer, NIC, and Tamil Nadu. TWAD Board formed the implementation support team with the direct supervision of EDP Manager, under the overall guidance of the Managing Director, TWAD Board.

9. Project Monitoring

a. Monitoring & Evaluation process

- TWAD Board also formed various core groups to study and approve the SRS documents. Key Resource persons were identified at Regional and Circle levels to give instant local support to Users of the system.
- Project Teams and various subject specialists and officers from EDP wing of TWAD Board were actively engaged in this project to undertake necessary monitoring and evaluation of the project at every stage.

b. User Feedback, project assessment mechanism

- Online Issue Tracking and Management Systems is in place right from the start of the project wherein the all users are allowed to raise any issue and the solutions are provided online to overcome the same

10. People Involved in the project

a. Main implementation partner for this project

National Informatics Centre, Chennai,

b. Other project consultants, vendors, and service providers

- ELCOT   - Intranet using TNSWAN
- NICSI   - Consultant for HARWARE / Peripherals
- BSNL   - Network Bandwidth

c. Internal team of this project.
- The in house EDP wing is well versed with the software development for the last 15 years in various technologies including visual basic , SQL server, Oracle and web technologies.

11. Users and beneficiaries of the project

- This G2G / G2E / G2C eGov Project is meant for employees, Officers and top level management of TWAD Board and Government of Tamilnadu.

- The users for this project are the Engineers(JE/AE/AEE/EE/SE/CE),   Accounting Officers (Acct.Ast /AAo/AO/ DCAO/CAO) , Admininistrative Officials (JA/Assit./Supt./Admin.Officer) and top level management of TWAD Board (Chairman/MD/JMD/ED/FD/GM).

- Dissemination of information to general public