Tamil Nadu Water and Drainage Board Integrated e-Governance System (TWADNEST)

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1. Goals and Objectives

The 'TWAD Board Integrated e-Governance System (TWADNEST)' project is an Internet/Intranet based enterprise class of application developed and jointly implemented by the 'Tamil Nadu Water Supply and Drainage Board' and 'National Informatics Center', 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 within the organization.

The core objectives of the projects are:

- Development of web-enabled application titled 'TWADNEST' covering major functional areas of TWAD Board such as Project Monitoring, Financial Accounting, HR Management and Water Quality Management

- Establishing network connectivity among all the 114 TWAD Board offices at various hierarchical levels spread across the State

- Establishing the Network infrastructure at the Head Office of TWAD Board for providing web and e-mail services

- Establishing Data Center and Up-gradation of Hardware with the provision of peripherals for all the offices

- Development of a centralized and comprehensive database on all aspects of Schemes/Finance/HR/WQ Labs with integration among its sub-systems, thus enabling the employees to carry out their day-to-day work effectively through TWADNEST software

- To make information available to all the stakeholders over the Intranet/Internet.

2. Spread of Project Service Users

The 114 offices of TWAD Board at various hierarchical levels, located across the State:

- Head Office – 1

- Regional Offices – 4

- Circle Offices – 16

- Divisional Offices – 93.

Access this web-enabled application using broadband connectivity and leased line connectivity. The web application is accessible at *http://twadonline.tn.nic.in.*

3. Services Provided

Being a G2G/G2E e-governance application, this software mainly focuses on automating various activities associated with the major functional areas of TWAD Board.

The following are some of the essential services provided as part of the Phase-1 of TWADNEST software:

- Financial Accounting Information System
  - Generation of Receipt/Payment Vouchers online for all the 114 offices
  - Generation of Journal Vouchers
  - Auto-Updating 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
  - MIS Reports

- Water Quality Management Information System
  - Online Maintenance of Chemicals Stock at WQ Labs
  - Online Maintenance of Sample Test Results
  - MIS Reports

4. Geographical Spread of Project Implementation

All the 114 offices of TWAD Board, Head Office at Chennai, 4 Regional Offices (CE Office), 16 Circle Offices (SE Office) and 93 Divisional Offices (EE Office), spread across the State of Tamil Nadu access the software.

All these offices are located across all the 31 District Headquarters and taluks, connected *via* broadband connectivity and Leased Line network.

5. Project Timelines and Milestones

Project Period for Phase-1: 2005-06 to 2006-2007

Important Milestones Project Start/Sign on – April 2005

Hardware Upgradation – December 2005

SRS Finalization – March 2006

Development of Phase-1 – October 2006

Pilot Run of Phase-1 – November 2006

Rollout to all offices – April 2007

6. Direct Cost and Time Savings to Avail Services

Being a G2G/G2E kind of application focusing on automating, the functional activities of TWAD Board, the users for this application are the employees of TWAD Board and hence, there is no direct charge involved to avail these services. However, the existing broadband connectivity at each office is used for accessing this web-enabled application.

- Being an online system, the employees are now able to generate the required MIS reports and regular reports instantaneously, which used to take more than a month for consolidation of reports.

- Implementation of this system has enabled the employees to avoid redundant works like data collection, compilation, typing, mailing etc., thereby increasing productivity although the manpower has come down by 50%.

- Earlier, the monthly accounts, employee vacancy positions, report on transfers and postings, service details and other MIS reports were finalized after a month, by collecting data through e-mail, floppies etc., and compiling at the Head Office. Now, after the implementation of the system, all the above reports are generated on the first day of every month.

7. Direct Cost and Time Savings to Deliver Services

The cost of development of the phase-1 of application software 'TWADNEST' is Rs.16.10 lakhs involving more than 72 man months of programming work. The cost of procurement of new hardware such as Servers, Desktops, Printers, Scanners and Upgradation of existing Desktops is about Rs.250 lakhs for all the 114 offices of TWAD Board.

Even though the time taken for implementing the above project right from the conceptualization to implementation has taken 24 months, by virtue of web-enabled architecture, the time taken to fulfil the request from the users for all the services forming part of the software is almost instantaneous.

8. Replication

The Phase-1 of this project is fully rolled out in all the 114 offices spread across the 31 Districts capitals and Taluks. As the system is developed based on Government rules & regulations and procedures, the system can be customized for other States in India.

9. Implementation Model

This project is a Government owned project. The entire funding for this 'TWADNEST' project was funded by 'Rajiv Gandhi National Drinking Water Mission', Department of Drinking Water Supply, Ministry of Rural Development, Govt. of India.

TWAD Board has chosen NIC as their principal consultant for this project. The application software is developed by the National Informatics Center and implemented by TWAD Board. NICSI & ELCOT supplied the required hardware.

Apart from NIC/ NICSI as hardware and software providers, BSNL services were used for establishing network connectivity.

10. Technologies

The software, AJAX enabled, is developed using Java/J2EE technologies with Oracle 10g as backend database and deployed on Red Hat Linux Enterprise Server.

Development Technology

- Java/J2EE Technologies, AJAX, HTML, CSS, XML etc.

Development Environment

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

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
- Fibre 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).

Databases and Application Server

- Oracle 10g Enterprise Edition for Linux Web Server

- Apache-Tomcat 5.5.

End-User Environment

Windows XP/Linux with IE/Fire fox Browser

11. Capacity Building

Governance Structure

In order to successfully implement Phase-1 of the 'TWADNEST' software, 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 the 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.

Training and Change Management

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 Center. As persons are liable for transfer, the training was done on a continuous basis.

12. Process Reforms

Lot of process re-engineering was carried out like the Manual Preparation of Receipts, Sub-Ledger, General Ledger, Trial Balance Reports; Schedules are replaced with System Generated documents/reports. Necessary approvals were obtained to do away with the Manual Ledgers and Files in all 114 offices.

In the HR domain, system generated Joining and Relieval reports, Generation of Transfer Orders, Reposting Orders etc., were introduced. Also, the collection of periodical reports was done away with.

13. Project Financials/Sustainability

Being a G2G project, the entire capital cost was funded by Department of Drinking Water Supply, Govt. of India. The annual recurring expenditure on account of maintenance is to be funded by TWAD Board. Being an intranet G2G application, there is no direct revenue generation envisaged from this project.

14. Project Teams and Leadership

The Principal Secretary, Municipal and Water Supply Department of Tamil Nadu state government and 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.

15. Key project Outcomes

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

- The Information and Communication Technologies has reached all the 114 offices of TWAD Board

- Intranet (WAN)/LAN network connectivity is established and put into use

- Voice over IP (VOIP) technology is used for communicating among the TWAD Board Regional offices

- Established the Network infrastructure at the Head Office of TWAD Board for providing web and e-mail services with a separate mail server in TWAD data center

- Data Center and up-gradation of hardware with the provision of peripherals for all the offices is very useful for online system implementation

- 'TWADNEST' software covering various major functional areas such as Financial Accounting System, HR Management and Water Quality Management of TWAD Board is made online and it saves lot of time, manpower etc.

- Centralized and comprehensive database on all aspects of Schemes/Finance/HR/WQ Labs with tight integration among its sub-systems is readily available for any reporting with online updation

- Enable the employees to carry out their work using appropriate sub-systems of TWADNEST software to complete work in time

- This system empowers all the officials, management to take decisions quickly using MIS reports that are available online

- Telephone charges and postage charges are reduced very much by VOIP and email services.

16. Service Users Feedback Mechanism

Online Helpdesk option is provided for the users to communicate the issues faced while using the system and solutions were provided immediately through online Helpdesk.

17. Implementation Challenges

To win over the confidence of the officials on the issue of continuous availability of the system was one of the major challenges 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. A series of training programmes were

organized to induct confidence to the users in operating the application software. Planning and scheduling these activities was another challenge faced by the implementation team.

18. Key Lessons Learnt

- The technology gaps must be handled carefully with meticulous Planning

- Provides a lot of enthusiasm to implement second phase of this Project

- Gives confidence to take new projects in our organization and for others also

- Learnt a lot about ICT Solutions that can be used for the betterment of people, process and organization

- Learned to manage issues among the employees, officials and management during implementation.

Project Contact Details

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