URBAN E-GOVERNANCE
IMPLEMENTATION

Commissioner and Director of Municipal Administration
Government of Andhra Pradesh

Powered By
eGovernments Foundation
The state of Andhra Pradesh has truly been a pioneer in the use of technology to drive better governance. The state has always been focused on Good Governance and recognises the importance of e-Governance in delivering SMART (Simple, Moral, Accountable, Responsive, Responsible and Transparent) Governance. Starting with eSeva in 1999 and with various services being delivered through initiatives like Passport Seva, e-Procurement, FAST, CARD etc., the state has been at the forefront of the e-Governance wave in India.

The current project of e-Governance was conceptualized by the Municipal Affairs and Urban Development department of the Government of Andhra Pradesh, to provide an Information Technology Platform for all the Urban Local Bodies (ULBs) under the purview of the Commissioner and Director of Municipal Administration (CDMA). DIGIT open governance platform, developed by eGovernments Foundation, has been deployed in all the 110 ULBs across the state, starting in 2015.

As of March 2018, the eGovernance platform has been working successfully and has metamorphosed into an application stack that is serving an increasing number of internal and external users and increasing integrations with multiple applications and dashboards. The extent of success against stated objectives is summarized below.

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<thead>
<tr>
<th>Improved Service Delivery to citizens</th>
<th>Increase in revenue</th>
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<tr>
<td>36 citizen services offered over multiple channels – CSCs, web portal, mobile app</td>
<td>25% to 30% year on year increase in revenue collections since FY 16</td>
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<td>Single integrated bill across services</td>
<td>Demand generation within the first week of the financial year</td>
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<td>SLA visibility and compliance</td>
<td>Insightful reports for targeted collection</td>
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<td>Status tracking through SMS</td>
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<tr>
<th>Standardised processes</th>
<th>Data Driven Governance</th>
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<tr>
<td>Standardised workflow and integrated processes across the state</td>
<td>Integrated, state-wide dashboards to track KPIs in each area like tax collections, public grievance redressal etc.</td>
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<td>Integrated modules, effective data management and tracking</td>
<td>Repository of reports in each module to drive day to day actions</td>
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<th>Transparancy and Accountability</th>
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<td>Well defined workflows and employee specific logins, driving accountability</td>
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<tr>
<td>Tracking of SLAs along the process cycle</td>
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<td>Smart notifications and alerts to all stakeholders with appropriate escalation mechanisms</td>
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In addition to delivering on the stated objectives, eGovernance platform has also brought in the following impactful changes in urban government.

- All 110 ULBs covered under the project are now AMRUT compliant
- Citizen data available with ULBs has been checked and cleansed
- Given the availability of a stable platform and clean data, various enhancements and integrations are becoming possible. For example, mobile app for Public Grievance Redressal, IVRS for citizen feedback management, integration of GIS survey data to improve the quality of data availability etc.

While the project has largely been a success, there have been many lessons learnt, like in any other large scale project. The implementation teams have constantly pushed the boundaries, unearthed new areas of improvement and worked relentlessly to deliver the full benefits of the solution to the citizens.

This document is intended to record the processes and approaches followed during the project implementation. We hope this will serve as a guide and handbook for other government agencies as well as implementation partners that embark on such ambitious, large scale and complex projects.
CURRENT STATUS OF E-GOVERNANCE PROJECT

DIGIT e-Governance platform is currently operational in all the 110 ULBs across the state of Andhra Pradesh. Over 36 citizen services are being delivered through various channels like MeeSeva, Citizen Service Counters, PuraSeva mobile app, ULB portals etc. The following infographic shows the various modules currently live on the platform.

Revenue modules
Revenue modules include Property tax management, Water/sewerage charges management, Trade license system, Advertisement tax management etc.

Expenditure modules
These include works management, stores and inventory, personnel management

Administration
Dashboards and MIS, Legal case management, Council management, solida waste management

Citizen services
Channels like Pura Seva citizen service counters, ULB web portals, PuraSeva mobile app for citizens to access services, Public Grievance Management
KEY FEATURES OF THE E-GOVERNANCE SOLUTION

Variety of channels for easy access to citizens

Citizens can access municipal services through various channels – Pura Seva Citizen Service Counters setup for this specific purpose, channels like eSeva and MeeSeva which have been active from before the implementation of the platform, directly from the ULB webportals and most conveniently, from the Puraseva Mobile Application.

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<th>PURASEVA SUPER APP</th>
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<tr>
<td>Unified interface for citizen to interact with the ULB. Citizens can seek services, pay dues, track status of applications, and report grievances.</td>
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1. To make a complaint, citizen takes a picture, chooses the category of complaint, the location and submits it.
2. The service request reaches appropriate functionary directly to his to-do list – on mobile app and also as an SMS
3. ULB functionary can get more details about the request and also call the citizen
4. Functionary attends to the request, posts evidence of resolution, with a comment.
5. Citizen can see this – can reopen the complaint if resolution is unsatisfactory
6. In case of delays, complaints is automatically escalated.
7. Dashboards enable sr. Officers to track and monitor performance.

Citizen App
- SLAs & Escalation matrix
- Google maps integration

Employee App
- Evidence based handling
- Dashboards and reports

Integrated workflows, uniform across ULBs

The moment a citizen makes a service request, it enters the same workflow, irrespective of the channel chosen. Every step thereafter is tracked. The workflows are well defined and individual employees are mapped to their functional roles. Each employee has his/her own credentials to access the platform.

The process to be followed to service each type of request is standardised and automated. Time taken by each functionary is monitored for SLA compliance. Citizens are automatically notified at set points about the status of their request.

This feature makes it easy for citizens to access services without having to visit the ULB premises multiple times. The state level leadership can also track the performance of different ULBs, compare them and set goals effectively.
Dashboards and MIS

Various Key Performance Indicators can be tracked from state level dashboards with drill downs available to identify key action areas. For example, revenue collected by the department of municipal administration can be seen on a dashboard as below.

Trends in performance are displayed automatically. The overall performance can be drilled down to district level, further to ULB level, to ward and bill collector level to enable effective action to drive performance. ULB heads and state level property tax division use this information on a daily basis to drive collections.

Similar dashboards are available for different modules – Public Grievance Resolution Dashboard gives information on number, nature, resolution status of grievances; Finance Dashboard on income and expenditure, assets and liabilities; Municipal Services dashboard on nature, source and status of various service requests etc. In addition to these, dashboards can be enabled for specific initiatives and schemes like GIS surveys, Blackspot management etc.

These dashboards provide relevant information to the functionaries at various levels in realtime, enabling data driven tactical and strategic decision making.
Integration across modules
Data across modules is integrated, enabling single point entry of data, ensuring there are fewer opportunities for errors to happen. For example, data is integrated between Vacant Land Tax and Property tax modules such that when a vacant land is converted to new property, the old entry is automatically moved. Similarly, when a property is specified as ‘demolished’, it is automatically changed to Vacant Land.

Similarly, processes across modules are integrated - Tax Revenue collected in different revenue modules is automatically fed to the Finance module as income and allocated to various internal income heads to enable better tracking of income and expenditure. Similarly, expenditure requests made from different departments and approved by the Heads are directly logged into the Finance module.

Platform thinking, enabling integrations
The E-Governance solution has been thought of not as a collection of various software pockets, but as an integrated platform that can comprehensively accommodate, clarify and improve various processes involved in municipal governance and their dependencies, thereby improving the quality of governance. Currently, a variety of services and 3rd party applications are integrated into the platform – statewide GSI survey data, 3rd party works management, building plan approval, payment integrations, various channels etc. The following infographic illustrates some of the integrations.

The platform has been active for about 2 years now and as the administrators and functionaries began appreciating the power of the system, new requirements, features and integrations are emerging.

Future plans for the platform include leveraging emerging technologies like drones, IoT and AI to automate municipal functions, using the rich data generated by the system to improve urban amenities and services, as well as driving efficiencies in urban governance.
PROJECT CONTEXT AND FORMULATION

PRE-IMPLEMENTATION STATUS OF E-GOVERNANCE

The state Andhra Pradesh started a number of technology initiatives aimed at providing good governance. Two notable initiatives in the area of municipal services have been eSeva, started in 1999 and eSuvidha started in 2004.

Eseva was a citizen service channel which was largely limited to paying bills. Esuvidha was meant to be an e-governance solution but did not take off as expected. As of 2009, a performance audit found that only one module was being used across the state, two more modules in about 50% of the ULBs and the rest was not being used.

While these and other such initiatives were pioneering and brought in technology to municipal governance, they were not suitable for the kind of e-governance needed by 2020. The performance audit concluded it was not possible to improve the performance of the system and recommended a complete redesign and a fresh implementation.

A few of the key challenges and their impact on the objectives of e-governance are summarized below.

- Inability to scale: The applications were disjointed and could not be leveraged to deliver services through channels like web portals, mobile apps etc. This impacted the objective of improving citizen’s access to services.

- Inability to integrate: Various solutions and modules within solutions were not built for integration. Data and processes could not flow within and across functional modules. This hampered efforts to improve efficiency of ULB processes.

- Data resided in silos: Due to the above two features, data was residing in silos, MIS and reports were not easy to access. This impacted data driven decision making as relevant and timely data was not always available to guide decisions.

- Lacking comprehensive functional coverage: The solutions did not comprehensively cover the municipal functions, leaving scope for manual interventions in the maintenance of data and process flows. This impacted efforts to bring in transparency and accountability at the ULB level.

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**E-Suvidha**

E-suvidha was intended as a state level e-governance solution with 16 modules but did not take off beyond property tax and water tax modules.

- Each ULB was treated as an independent unit. Within ULB, different modules did not interface with each other. Data had to be moved manually.
- Even in modules like Property Tax, e-suvidha was focused on maintaining records of collections, the functional processes were offline. There was no scope for process standardisation, SLA tracking or efficiency improvements.
- Citizen interaction was limited to paying bills through the system.
- Could not support the evolving needs of SMART e-governance.
PROJECT OBJECTIVES AND APPROACH

The MA & UD department clearly understood that a comprehensive approach is needed to achieve objectives like delivering superior citizen services, improving the efficiency of ULB processes, data driven decision making, building transparency and accountability. One needs to think beyond just software solutions and focus on building a capable platform that can support an ecosystem of key services and applications.

The following key components were identified:

1. Software, data and hosting
   I. Development of the software platform
   II. Data migration from legacy systems
   III. Data hosting
2. Training and capacity building
   I. Trainings for ULB functionaries
   II. Ongoing support to the users
3. Infrastructure creation at ULB level
4. Software support and maintenance

Software, data and hosting

The core platform needed to be robust, flexible, scalable and future proof to meet GoAP’s requirements. Key features required were:

1. The platform needed to comprehensively support the municipal functional processes, including workflows, their dependencies, ULB specific variabilities etc. while maintaining consistency across the state.
2. Visual dashboards to access and manage various aspects of running the ULBs
3. Integrations with third party applications and services to cater to emerging needs

Existing municipal data was scattered across systems and a few ULBs were still paper based. This data needed to be collected, verified and made available to the system.

The data and applications were required to be hosted in a private cloud to ensure 24/7 access and availability to all users across the state over Internet through multiple devices. This then removes any dedicated bandwidth requirement.

Training and capacity building

Municipal administrators, officers and end users across levels needed to be trained on using the system. In addition, it was decided to deploy dedicated personnel at each ULB to provide hands on help to the end users.

Infrastructure creation at ULB level

It was decided to provide new computers, printers and high speed internet bandwidth at the ULB level.

Software support and maintenance

A robust mechanism to support post-implementation and enable integration with other applications as required was critical to the continued success of the implementation. So, application support for a period of 3 years post the implementation, and maintenance including bug fixes, patches and upgrades were envisaged.
Once the project was formulated, an RFP was floated to identify vendors for the project. The first RFP envisaged a single entity that would execute all the components of the project. The following was the articulation of the services required:

- Software development / Customization as per the Requirement
- Supply, Installation and Configuration of Data Centre hardware, system software and also to other IT Infrastructure at all the ULBs.
- Data Migration and Rollout of the Solution in all the ULBs.
- Training and Capacity Building
- Operations and Maintenance for a period of 3 year after Go-Live.

The tendering process was not successful in identifying a single entity that could execute the entire project. Meanwhile, eGovernments Foundation, which has significant experience in developing applications for municipal governance, made a swiss challenge bid for the Application Development part of the project, which was accepted.

The project was reassessed and it was identified that the competencies required to successfully execute different components of the project may be different and a single entity may not have all the qualifications. With this in mind, the project was reformulated into three distinct components, to be executed by three entities - SystemIntegrator (SI), Application Implementation Partner (AIP) and Cloud Service Provider(CSP). The responsibilities of the three vendors were articulated as below:

**Application Implementation Partner:**
- Development and customization of the complete software solution
- Training of trainers training to SI to handle overall training component
- Maintenance and support of modules post go-live for a period 36 Months including L2 & L3 support for the application and training to SI to handle L1 support.
- Preparatory activities for Data Migration to enable SI for the actual field level data gathering related activities
- Preparatory activities for Cloud Infra to support procurement of CSP services
- Overall Program Management for the e-Governance project implementation including coordination with SI and CSP for the successful project implementation

**System Integrator:**
- Procurement of ULB Premise Hardware and Associated Software and OS etc.
- Training and capacity building of end users
- Data gathering, validation, loading/migration of data on the production server(s)
- Field level support for a period of 3 years post successful acceptance and Resolution of user queries, L1 support to the end users.
- Project management for the SI scope
- Support to AIP for the Software implementation
- Monitor SLAs as per the contract

**Cloud Service Provider:**
- Cloud services to CDMA for hosting the solution on Cloud
- Enterprise Management System for SLA measurement
Vendor selection
The vendor selection was made following World Bank guidelines and processes. Karvy Solutions was selected as the System Integrator and Control S was chosen as the Cloud Service Provider for the project.

As the AIP was chosen through Swiss Challenge and then the SI and CSP were selected through tendering process, there was a delay in procurement of their services. The SI came onboard a full year after the AIP was selected, thus impacting the implementation.

Impact of Procurement Decisions on the Project

While it is desirable to have a single entity execute the project, it is also true that a single entity may not have all the capabilities required for different components of the project. Having said that, the following key questions can be thought of while making procurement decisions.

Should Data migration be separated from Application Implementation?
The capabilities required for these two things are not very different from each other. It is better to have the same entity that is developing the application, handle the data migration as well, as there are significant synergies in doing so..

Is there a benefit to having an independent cloud service provider?
While an application developer may not have the capabilities to provide cloud services, these two are closely linked and it is important that these two entities work closely together for the project to be a success. It would be ideal to have the AIP identify and manage a CSP partner, instead of these being two different vendors to the project sponsor.

How about training and capacity building? Should this also be handled by the AIP?
Training and capacity building needs a very different set of capabilities compared to application development, data migration or cloud service provision. This function needs someone with local presence, preferably a team with knowledge of local language. Also, training and capacity building is not only about the software. Very often, end users also need some functional training. Thus, this function is best managed by the government department through a dedicated entity, rather than expecting AIP to manage this.

Is it desirable to have different entities handle L1 and L2 support?
This is a more tricky question. While there is a benefit to having the same entity handle L1 and L2 support, this may not be practical as the nature and capabilities required for L1 and L2 support are different. L1 support requires working closely with the end users, knowledge of local language and local government systems. In the context of AP project, L1 support also includes managing a network of ULB level support personnel, numbering in excess of 100 in total. It would be difficult for an Application Implementation Partner to manage this. Thus, while it may not be the best arrangement, it may be necessary to engage a separate entity for L1 support while L2 is managed by the AIP. In an ideal case, AIP can be expected to manage L1 support through a local partner.
PROJECT IMPLEMENTATION PLAN

PROJECT MANAGEMENT STRUCTURES

In order to ensure that the platform was implemented in a time bound manner and delivered against the prescribed goals GoAP implemented a two-tier governance structure for the initiative.

A steering committee was established to help set the vision and provide strategic direction and inputs to the project team. The Steering committee also helped coordinate between various departments and agencies to ensure that the platform was configured to meet the strategic goals and objectives of ULBs and agencies. The composition of steering committee:

- Director, CDMA
- IT Director, CDMA office
- Program Director, eGovernments Foundation

The Program Management Office was responsible for all aspects of the project implementation, ranging from the functional requirements definition, system design, development, platform implementation, and ongoing maintenance and enhancement. The composition of program management office:

- PMO APMDP
- IT Director, CDMA Office
- Program Director, eGovernments Foundation
- Program Director, Karvy

PLANNING FOR APPLICATION DEVELOPMENT

The broadly stated objective were broken down into smaller, clearly defined outcomes and these were further broken into sub-goals to enable translation of the vision into well-articulated software/ process deliverables. Some examples are given below.

Improved Service Delivery to the Citizen

- Provide access through multiple channels - Mobile, Web Portals, CSC
- SLA visibility, smart notifications and alerts for status tracking

Increase in Revenue and Timely Collection

- Simplify the process of assessment and demand generation
- Ease Citizens Payment
- Dashboards to monitor collections

Standardized processes across ULB’s in the State

- Clarify and standardise processes across functions, build for flexibility
- Build workflows into the applications
- Integrated Applications - single time data entry, reduced manual intervention

Data Driven Governance

- Dashboards for Pubic Grievances, Services and Works modules
- Revenue Dashboard – Property Tax, Water Charges, Other Revenue

Transparency and Accountability

- Employee specific logins for tracking and accountability/ audit
- Tracking of SLAs along the process cycle
**Delivery Phasing**  
The implementation was structured in a phased manner to make allowances for both priority of the applications required and the complexity involved in implementation.

The entire exercise was structured in 3 phases. While applications were rolled out in phases, each of these rollouts happened across all 110 ULBs simultaneously. The phases addressed both applications to be implemented as well as channels of delivery. The diagram below presents an indicative view of the delivery phasing.

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<tr>
<th>Phase I</th>
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<tbody>
<tr>
<td>• Property Tax</td>
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<td>• Vacant land Tax</td>
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<tr>
<td>• Integration – eSeva, MeeSeva, AP online, &amp; Payment Gateway</td>
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<tr>
<td>• Water Charges Management</td>
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<td>• Public Grievances</td>
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<td>• Inter Departmental Integration</td>
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<th>Phase II</th>
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<tr>
<td>• Mobility</td>
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<tr>
<td>• Works Management</td>
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<tr>
<td>• Finance and Accounts</td>
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<tr>
<td>• Advertisement Tax</td>
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<tr>
<td>• Trade Licenses</td>
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<tr>
<td>• Portals (ULB and CDMA)</td>
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<tr>
<td>• Business Analytics and dashboards</td>
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<th>Phase III</th>
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<tr>
<td>• Land and Estate Management</td>
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<td>• Legal Case Mgmt</td>
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<td>• GIS Integration</td>
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<td>• Citizen Services</td>
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<td>• Legal Case Management</td>
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<td>• Marriage Registration</td>
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<td>• Council Mgmt</td>
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<td>• HR</td>
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<td>• Citizen Portal</td>
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<td>• Sewerage</td>
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**IMPLEMENTATION STEPS**  
The following steps were agreed on for the project implementation.

- Project Kick off & Planning
  - Forming the PMO Office
  - Finalising team structure and assembling the team
- Requirements Gathering
- Application development & Customization
  - Conducting UAT
- Preparation for Going Live
  - End User Training
  - Pilot
  - Fixing anticipated problems
  - Data Migration
  - Establishing Help desk
  - Cutover Planning checklist preparation
  - Communications about going Live
- Cutover & Going Live
- Supporting the Implemented software

**IDENTIFYING PROGRAM TEAMS**  
Joint Director, IT at CDMA office was identified as the Program Head to drive the exercise. This was a key role with responsibility for the entire project.

It was decided to constitute committees of subject matter experts from various ULBs to help develop functional requirements and develop software requirement specifications.

Program teams were identified from the SI and the AIP for the project, as shown in the diagrams below.
The respective leaders from the Department, AIP and SI - formed their teams with specific skills/capabilities as per the structure finalized.
APPLICATION DEVELOPMENT

REQUIREMENTS GATHERING – FRS AND SRS

This is a crucial part of the development process, where the CDMA and the AIP worked together to develop a shared understanding of the functional processes followed and the features required from the system. Based on this understanding, Functional Requirements Specifications and System Requirements Specifications were developed, which were subsequently used as the basis for application development.

SRS development process evolved during the implementation of the project, as the AIP and the CDMA gradually developed an understanding of the process together. The following case study of Property Taxes module illustrates the approach to SRS development followed at the beginning of the project and the issues faced.

Case study: Property Taxes Module

Property tax module was the first module to be taken up for development as part of the project. This module was taken up first as it was a key module, accounting for a large share of tax revenues. Parts of this module were already digitised as part of the e-suvidha project. Egovernments Foundation, the AIP, also had significant experience having developed this module for other clients before.

SRS development process

- Egovernments felt they had an understanding of the module based on their earlier work. APMDP came with their understanding of eSuvidha implementation.
- AIP demonstrated their existing module to an expert committee. Comments by the committee were incorporated into the SRS for the module but the composition of the expert committee kept changing.
- Master data was taken from the eSuvidha master data

Module development and outcomes

- The module was developed within 3 to 4 months of contract signing, based on SRS developed using the above process.
- UAT was done and some issues observed were fixed. The module was rolled out across a couple of districts.
- As the ULB functionaries used the module, more issues were observed.

Issues observed

- The methods of calculation copied from eSuvidha modules did not work correctly. This was because eSuvidha addressed each ULB as a different instance and the methods of calculating penalties and interests were not uniform across ULBs.
- The tax rates and methods of calculations in the master data were not correct for all the ULBs. This led to one round of standardising the master data where each ULBs slabs and rates were checked against their rules and regulations as approved by their councils.
- The categories used for master data were not standardised, leading to issues when aggregating data across the state. This led to another round of standardising and data cleansing where all the master data categories were collated, standardised and all changes were made to the data by all ULBs.
- The SRS did not address all the processes and the functional flows. Many revisions were required subsequently.
Case study: Property Taxes Module

Impact on the project and timelines

- The module was expected to be completely stable within 6 months. It took more than a year to actually stabilise it, causing time and cost overruns.
- When completed, the actual module looked significantly different from the SRS prepared. These were so different that the user manuals developed along with the module became completely unusable!

As the property tax module was developed first and many of the issues were tracked back to the SRS development stage, sufficient care was taken in the subsequent modules. The process of SRS development as it evolved is described below.

Documenting Functional Processes

This is the first step of the requirements gathering process. While ULBs across the state performed the same functions and provided the same services, they have considerable leeway in deciding how to do it. For example, in Trade Licenses module, each ULB had their own, slightly different from others, definition of different trades. They also had variations in the way license fee was charged – some charged flat rates, some charged variable rates based on capacity of the unit, type of machinery employed, number of people employed etc.

This stage of requirements gathering involved a Business Analyst travelling to ULBs, interacting with ULB functionaries and also the expert committee constituted for the module, to develop an understanding of the processes and their variability across ULBs.

Standardise the Functional Processes

Standardising functional processes is the most important part of the FRS and SRS preparation process. This is also the stage where the Application Developers and the Department Functionaries have to work closely together to clearly define the processes and outcomes.

Standardising the master data

Master data refers to the definition of categories, the method of calculation of taxes or fees and the actual rates that the ULB decides to charge. This data also includes various other charges like penalties and interests on late payment etc. While the actual rates charged by different ULBs can be different, the overall structure of the master data needs to be standardised. For example, different categories of buildings like RCC structures, tile-roofed structures etc. need to be called uniformly by the same name, while the rates of taxation may be different for different ULBs. Similarly, if some ULBs tax using flat rates and some others charge proportionately based on some parameter, both these calculation methods need to be identified and built into the FRS, so that each ULB can choose and use its own method.
Another aspect of standardisation of master data is ensuring that each ULB’s categories and rates are in line with its own acts, rules and resolutions. While creating the SRS for the project, it has been found that some ULBs were using a rate structure that is not line with their own resolutions. These instances need to be identified and corrected.

Standardising the workflows

The workflows for different functional processes need to be standardised so that a uniform software process can be created. This starts with identifying the various tasks performed within the function and their dependencies. For each task, one needs to identify the process steps, the sequence in which these should happen, the documentation required for each step and the functional role responsible for each step. These then need to be documented and built into the SRS.

Standardising the documentation

Citizen interaction with the ULBs and ULB processes rely heavily on documentation. Citizens submit applications which need to be entered into the system. During the workflow, output documents like demands, circulars, notices, acknowledgements and receipts are also generated. All of this documentation was also standardised across the state so that these documents could be easily entered and generated from the software modules.

Develop Functional and System Requirements

Based on the understanding developed as above, the AIP and the Department Functionaries work together to develop the FRS and the SRS.

The following case study of SRS development for Trade Licenses module illustrates how the process worked.

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**Case study : Trade Licenses Module**

- Business Analysts visited a few ULBs to understand the variations in practices followed by different ULBs for Trade Licensing.
- They noticed that different trades were called by slightly different names across ULBs. Also, the method of calculation could be either flat rate or based on parameters like number of people employed, equipment specifications etc.
- Gazette notifications detailing the descriptions of different trades, tax calculation methods and rates, were collected from all the ULBs.
- The gazettes were compared, standardised and reorganised into 6 categories and 376 sub-categories. For each sub-category, Unit of Measurement (UOM) were identified and defined. An option to calculate tax either by UOM or use a flat rate based on range was built into the calculation logic. This matrix was developed in excel.
- Regional level meetings were organised for ULB functionaries. Joint Director, IT and the team went to each region and checked each ULBs categorisation against the standard matrix. The ULB categories were mapped to the standard categories, changes were made as necessary.
- At the end of the exercise, a standard Trade License master data matrix, complete with standardised category names, UOM and flat rate ranges was ready.
- Various tasks for Trade License issue and renewal were identified and workflows were standardised by the central team, with inputs from ULB representatives.
- Based on this understanding, an SRS was put together.
SRS DEVELOPMENT – KEY THOUGHTS

As the two case studies above illustrate, the process of SRS development is a key step that needs to be approached with appropriate level of seriousness and commitment. The following key ideas can be thought of while making decisions related to the SRS development phase.

SRS Development by committee

In many cases, development of FRS and SRS is done by committees of experts drawn from the user base, across levels. This works best when the committee members have the necessary expertise that goes beyond being a user of the system. Committees also need to be fixed for the tenure of development, they should sign off on the requirements finalised, guide the development team through the development process and finally signoff on the application once developed. In the absence of this continuity, SRS development by committee does not work.

Importance of domain knowledge – Functional and Legal aspects

In addition to being an expert user of the system, people involved in the SRS development should have a broad knowledge of the functional and legal aspects involved. In many cases, different ULBs take different interpretations of the rules and regulations and standardising these different approaches, while staying true to the legal aspects is a huge challenge.

Importance of sign-off from key functionaries and follow through

While having a cross sectional team drawn from across ULBs is likely to bring in different points of view and build ownership in the user base, it is important to involve senior functionaries who have the authority to resolve issues, who can take ownership for the solutions proposed and can follow through to make sure the solutions are widely accepted and the application is eventually adopted.

SOFTWARE DEVELOPMENT

Standard software development processes were followed by the AIP during the development phase. The following is a simplified version of the process, as seen by the users.

- Features mentioned in the SRS were discussed and prioritised for delivery.
- Each feature was elaborated and mock screens developed, detailing user interactions, background calculations and expected actions.
- Software was developed feature by feature.
- After each batch of features developed, the module was demonstrated to the expert committee and senior functionaries for comments. Any suggestions for changes were taken up.
- Once a usable version of the module was ready, it was demonstrated to the expert committee and senior functionaries, signed off and prepared for rollout.
APPLICATION ROLL-OUT AND CAPACITY BUILDING

Once a module was developed, it was rolled out in a phased manner across the state. The following process was followed for the roll-out for each module.

- User Acceptance Testing
- Data migration
- Capacity building
- Roll-out monitoring

These processes are detailed out in this chapter.

User Acceptance Testing

Once a module was developed and signed-off by the central team, it was rolled out in one district for user acceptance testing. For a period of one week to ten days, the functionaries across the district used the system and gave feedback on various aspects. Changes were made as required.

Data Migration

In Andhra Pradesh, eSuvidha system was in place for some modules like Property Taxes and water charges. Data for these modules was available in digital form for many ULBs. 30 new nagar panchayats were designated as ULBs after the bifurcation of the state. These did not have digital data. The following processes were followed to get the data into the application.

- In cases where data was available in the eSuvidha system, the data tables were downloaded, converted into data tables needed for the application, and loaded into the application modules.
- While migrating the data, control points like revenue ward summaries were used to ensure fidelity.
- The Nagar Panchayats that did not have digital data entered their data from registers into data tables. Some of the ULBs used local data entry operators for this.
- Once the data was migrated, ULB representatives handling the specific module were assembled at the headquarters and verified the master data entered in the systems against their own rules and regulations. Master data was corrected as needed. This exercise was conducted by region.

Capacity Building

Training was conducted for each module as it was rolled-out. For each module, the relevant ULB staff, along with the ULB manager were trained. The training was conducted at the headquarters and was organised by region. The following approach was used:

- For each module, the application developer prepared a user manual along with the module.
- The module was demonstrated to the head of PMO, Joint Director IT.
- Systems Integrator team was trained on the module. These were used as trainers that trained the ULB staff.
- Online workflows were a new feature of this implementation. Joint Director IT prepared training materials to explain the functional processes and the workflows for the module. These were generally in the form of presentations.
- Test environments were prepared for the ULB staff to try out the module.
- During training, functional processes were explained first, doubts clarified and the workflows were introduced and explained by the Joint Director IT.
- Then the modules were demonstrated step by step, feature by feature and screen by screen.
- ULB staff was then given the test environments to practice.
Roll-out monitoring

Once the training was conducted, ULB data was migrated on to the application and they went live in phases. Application Developer created roll-out dash boards to help senior functionaries monitor how roll-out was going. An example of a roll-out dashboard, for the Public Grievance Roll-out is given below.

Key Issues

Data Migration

- In the initial period, System Integrator was not onboard. Application Developer Team had to migrate the data.
- Master data tables migrated from the eSuvidha system were not always correct. These needed to be verified manually against ULB rules and regulations, especially for Property Taxes module.
- In addition to verifying the rates, even the labels used for different categories needed to be verified and standardised. This led to a large scale data verification and cleansing exercise.
- Many of these issues were fixed for the later modules.

Capacity Building

- ‘Training’ is not part of the organizational DNA in the municipal system and continues to suffer
- No ‘take-home’ material is given as part of the training, this impacts retention
- While presentations used as part of training and video tutorials are made available online, there is not much evidence of these being used either to refresh own memory or to pass on the knowledge at the ULB level after the training
- The training manuals are in English, not in the local language. Easy to use handbooks are not available. Some ‘cheat-sheets’ are available for some modules.
- The biggest training needs identified on the field are, basic computer knowledge and Knowledge of English Language. The training plans do not address these in much detail.
- Most of the training is left to be conducted by the DPOs – trainers from the System Integrator team embedded into the ULBs. Each ULB has one of these. While this system is good for trouble shooting and support, it works variably in fulfilling the training needs.
POST ROLL-OUT – ADOPTION AND SUPPORT

Once each module was developed, staff trained and the module was rolled-out across the state, it was still necessary to take specific actions to encourage adoption. Providing support to users was an important element of encouraging adoption.

Adoption

A variety of innovative approaches were used to encourage ULBs to adopt the system. A few of them are outlined below.

Dashboards and Teleconferences

Teleconferences are the standard way senior functionaries keep in touch with the field staff in Andhra Pradesh. Weekly conferences where information available on roll-out dashboards and application dashboards was discussed with the field staff were very effective in increasing adoption. The dashboards provided a way to identify ULBs that were lagging. Senior functionaries could directly connect to these ULBs and discuss the reasons. Any issues identified were solved as soon as possible.

Nodal Officers

As the number of modules implemented increased, the need to have more people to monitor the implementation was felt. Around 14 senior officers were designated as nodal officers, each being assigned to a district. Each of them was also assigned a module. This way, each nodal officer was responsible for the implementation of all available modules in his/her district and also for one module across the state. These senior officers visited the ULBs in their designated district frequently, monitoring the implementation, identifying issues, proposing solutions etc. Since each of were part of the headquarters team, coordination and monitoring was effective.

Support

System Integrator was largely responsible for support function. A multi-level structure was used as below.

Data Processing Officers (DPOs)

DPOs provide the first level support and training. There is one DPO embedded into each ULB. Each DPO is trained by the Central Team of the SI and deputed to a ULB. They provide ongoing support and training. By all accounts, having DPOs available at the ULB all the time is a key success factor for the project.

SI Central Team

Any issues or requests that DPOs need help with are escalated to the SI central team. It is estimated that about 70% of the issues get taken care of before this level.

AIP Field Team

Application Implementation Partner maintains a field team that can handle queries that need more functional or technical expertise. This is the L2 support.

Current support process

An open-source called JIRA is configured to support the help tickets process. All the DPOs, Nodal officers, SI central team, AIP central team, AIP development team, AIP onsite support team have access to this. The process works as follows:

- Create a ticket
- Choose a classification
- Tickets come to SI central team
- SI central team assigns the tickets to SI support team
- Either close the ticket or escalate to AIP onsite team
- They either close or escalate to BA
- BA closes or escalated to dev team lead
- Dev team lead closes it.
SUCCESS FACTORS AND TAKEAWAY

In summary, here are a few Key Success Factors for a project of this nature.

Strong sponsor at the senior level

In the case of AP project, there has been strong support for the project from the Director of Municipal Administration. This support was crucial to ensure implementation and adoption.

Dedicated team of officers

The director has been ably supported a strong team of committed officers. These officers ensured the directions of the DMA were carried out and followed across the state.

Knowledgeable and empowered head of PMO

Day to day work on the project has been carried out by a capable officer at the helm of affairs, the Joint Director of IT. His knowledge of the legal, procedural and practical aspects of municipal systems and the ability to find solutions to issues has been widely credited as a key success factor.

Vendor committed to project success

The Application implementation Partner, eGovernments Foundation is a not for profit entity that worked despite the challenges and time and cost overruns to make the project a success.

Strong monitoring of processes

A variety of approaches like dashboards, nodal officers, teleconferences etc. Were used to monitor different processes and ensure success.

ULB level support

The DPO system of having a dedicated resource to train, support and speed things along at the ULB level has also been widely identified to have been a key success factor.

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**From the Director**

Director of Municipal Administration, Mr. K Kanna Babu, IAS has been the project sponsor and has been instrumental in the success of the project. Here is his points of view about the project.

Do you think this project has been a success?

Partially, yes. In terms of bringing standardization of service delivery across the state, we have been successful. We have also been able to push the envelop on developing the software application in accordance with the requirements of the citizens. Now, we have a platform that makes the system transparent for everyone.

Having said that, we still have more work to do to ensure that the citizens adopt this system and get the full benefit of a project of this size and scope.

What are the key metrics for success, for a project of this nature?

Feedback from various sections of the society is a key metric. We are also trying to gauge citizen satisfaction through our Public Grievance Redressal module. We also have various metrics on our dashboards like number of service requests being processed, performance of different ULBs etc.

What are the key success factors, in your opinion?

- Great team – a project of this size is always a team effort
- Domain knowledge – the functionaries in the system need to have the domain knowledge to guide the software developers. We constituted domain wise committees of experts.
- Flexibility from the vendors – In a project of this nature, it is unlikely the scope of work will be defined clearly upfront. Requirements evolve and the vendors need to be flexible to accommodate these changes without the necessity of long processes. Egovernments foundation has been very accommodative in this respect.
**SUCCESS FACTORS AND TAKEAWAY**

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<th>From the Director</th>
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<tr>
<td><strong>What would be your advice to government functionaries attempting a project of this type?</strong></td>
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<tr>
<td>Assemble a great team and get your senior functionaries on board. One cannot expect great domain knowledge from the vendor. It has to come from the team.</td>
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<td>Commercial vendors should be picked carefully, one should be able to persuade them to work well with you. If the commercial vendor is too focused on containing time and cost, it is difficult.</td>
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<td>This is not just about developing an application, it is about changing people's behavior so that the system gets used and takes root. It helps to have 2 to 3 years to change behaviors and make functionaries and citizens get accustomed to the new systems. When functionaries and citizens start tasting the fruits of the work, no one can reverse these changes.</td>
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