Municipal eGovernance Systems for Urban Local Bodies in India

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Contents

Introduction

The topic of eGovernance has been covered extensively in papers, books, workshops and conferences globally. This paper focuses specifically on municipal eGovernance and looks at needs of municipalities and their citizens towards improving city governance and the use of ICT to delivery public services. The source of much of the paper is from the experience of the authors in implementing eGovernance modules in over 200 cities across India as part of their work at the eGovernments Foundation.

Many municipal eGovernance projects have been implemented in cities and towns across India. Most municipalities have procured computers and connected themselves on the internet, several have created websites with information on the municipality, and some have even gone so far as to provide transactional capability such as registering grievances, collection of property tax etc. In spite of these various efforts the impact of egovernance has been limited to a few pockets, we have not seen wide spread use of ICT to obtain leaps in municipal operational efficiency and service delivery. This paper tries to take a strategic view of eGovernance and tries to list the key essential components of a municipal eGovernance implementation. It also goes into the outcomes from such a well designed system and closes with a couple of case studies of a successful and a not-so-successful-implementation of municipal eGovernance.

The paper is structured in four parts:

a) Ingredients of municipal e-governance – Discusses the key ingredients that are essential to a Municipal eGovernance system
b) The municipal eGovernance platform – Goes over the specific eGovernance modules that are necessary to manage a municipality.
c) The outcomes of municipal eGovernance – The outputs and outcomes from a good municipal egovernance implementation.
d) Couple of case studies on a successful and a not-so-successful implementation

What are the ingredients of municipal e-governance?

What are the underlying ingredients of a good municipal eGovernance implementation, after the purchase of computers, creation of a city website and using office productivity tools such as MS/Open Office how does a municipality truly embark on a robust platform that can systematically improve administration, how can citizen services be made more friendly, how can these ICT interventions be useful in spite of the fact that most citizens do not have access to the internet presently.

Integrated Approach to Municipal e-Governance

In the initial thrust towards e-Governance in municipalities there is a drive towards automating department level operations. The focus is typically on specific functions, such as:

- Property tax collection – Revenue Dept.
- Financial Accounting – Accounting Dept.
- Works Management – Engineering Dept.

- Building Plan Approval – Engineering Dept.

While creating e-governance systems for each of the above departments generates certain improvements and efficiencies, the true need is to take an integrated approach. These systems need to be integrated to each other and work as a cluster of interdependent modules.
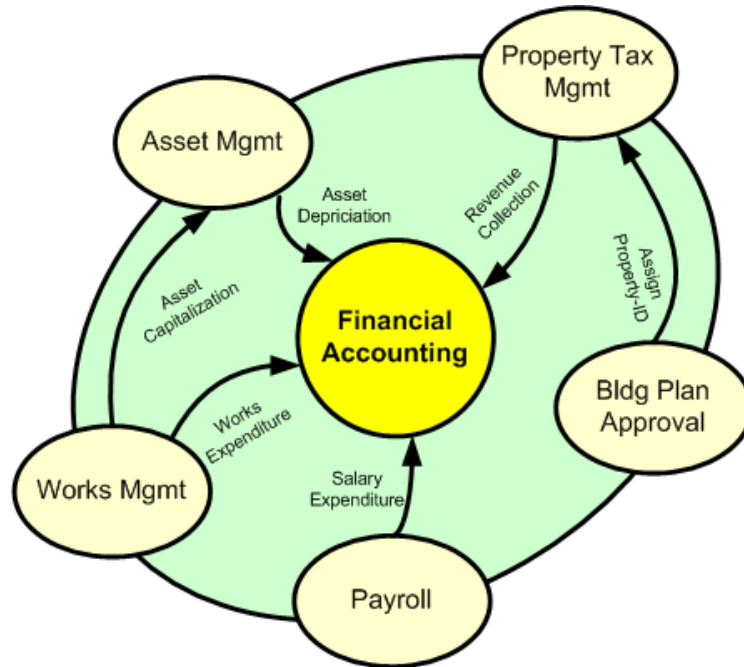

Figure 1. Integration between municipal e-governance modules

For instance the property tax management system that collects property tax needs to update the financial accounting system each night on the ward-wise collections. This will ensure that the revenue officials and administrators have up to date information on the total collection with ability to drill-down (into a particular ward) if anomalies are found.

1. Let's take for instance the property tax management module that collects property tax, this system needs to update the financial accounting module each night on the ward-wise collections so that the next morning administrators can see how much was collected in each ward of the city. This will ensure that the revenue officials and administrators have up to date information on the total collection with give them the ability to drill-down (into a particular ward) if anomalies are found.

2. Let's consider the undertaking of ward works projects - civic works (e.g. Asphalting a road) at the ward level. A well designed Municipal eGovernance system will integrate the Works Management module with the financial accounting module. This will ensure that the contractor who is chosen through a procurement process is entered into the approved vendor list that is managed in the financial accounting module, so that when it comes to paying he vendor for services delivered, the bills of the vendors can be entered into the accounts payables sub-module of the financial accounting module (bills cannot be entered if

the vendor is not in the approved vendor's drop-down list). When the check is cut for say part-payment then the work-code (from the works management system) can also be referenced in financial accounting system to ensure links in both directions for drill-down – ensuring strong referential integrity.

3. When the above work is taken up – such as asphalting a road, the municipality creates and asset. This asset needs to be capitalized in the accounting system, as well as depreciated each year. This is automatable if the works management module and financial accounting module are tightly integrated.

Hence it is very important that all the eGovernance modules are integrated with one another, esp to the financial accounting system in order to get a holistic view of the efforts of the various depts. and eventually the delivery of services to citizens.

Government Process Re-engineering

Govt. Process Reengineering: Business Process Reengineering (BPR) is defined as " the fundamental rethinking and radical redesign of business processes to achieve dramatic improvements in critical contemporary measures of performance, such as cost, quality, service, and speed". In the Govt. context the term Govt. Process Reengineering (GPR) is used to indicate a similar redesign that produces 'leaps in operational efficiency' in the context of service delivery.
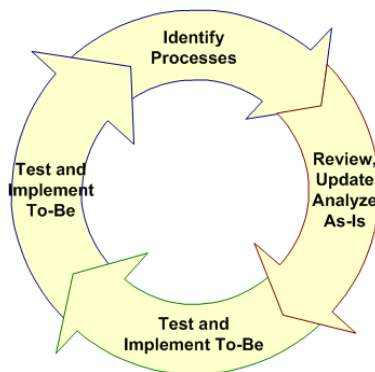
Process Reengineering Cycle

BPR/GPR derives its existence from different disciplines, and four major areas can be identified as being subjected to change - organization, technology, strategy, and people - where a process view is used as common framework for considering these dimensions. It involves the identification of specific processes that are being reengineered, doing an as-is analysis of the current process, based on the desired outcome and the technology intervention in question (introducing ICT tools and technologies in the case of eGovernance) creating a to-be design and finally test and implement the to-be process.

Far too often e-Governance projects take the process of 'computerization' (technology change) as useful in itself without going to into the other aspects of process reengineering namely – organization, strategy and people. Buying computer hardware and employing it for office automation is a initial first step which gives some benefits – improves office productivity and communication. But to really derive leaps in operational efficiency one needs to look at the aspects of organization, strategy and people. An interesting fact that emerges from govt. ICT spend is that for the first time in 2006 the

Example: Let's take the example of water billing in a medium sized city (municipal corporation). In the past a water bill collector would come to each house, take the meter reading, using the previous month's meter reading (in his handbook) would calculate the water usage and using a formula calculate the water bill. He would also prepare a bill (then-and-there) and even collect payment and dispense a receipt for the same – this was before the advent of computers.

After computerization, the water bill collector comes to each house, takes the meter reading, and then returns to his office to input the meter reading in a computer, The computer computes the

charges and generates a water bill, the bill is mailed/delivered to each house, and the citizen has to come over to water bill collection offices to pay their bill. What was a simple 1 step process without computerization has now turned into a 3 step process (2 – administration, 1 – citizen) with computerization. What is wrong with this picture?

Well the problem is that an efficient manual process has been shoe-horned into 'computerization' without looking at process reengineering - people, strategy and organization issues. This has actually resulted in making a fairly efficient manual process quite inefficient after computerization. It is important to identify the key underlying goal/objective and then reengineer the roles/responsibilities of people keeping in mind the nature of new computer and communication technologies and its usefulness in achieving the desired objective. There are also several ground realities such as poor computer infrastructure, sparse network connectivity and limited capacity w.r.t ICT technologies in govt. offices. These need to be taken into account while designing a process for govt. service delivery.

Implementation Strategies

There is enormous diversity in the composition and structure of local self-governments, even within a state. The large corporations (e.g. the JNNURM cities) operate with large organization structures with complex workflows (e.g. Chennai Corporation has 31 fully functional departments, with each department with its own set of processes); specialized processes (e.g Mumbai Corporation relies on Octroi as a source of revenue) and citizen delivery services from multiple para-statal agencies (e.g. Water Boards responsible for Supply of Water in large cities). On the other end of the spectrum, there are the smaller local bodies at the Town Panchayat level where the local self-government is a small, cohesive unit responsible for almost all the civic services. The functional requirements and the capacity of the end-users to absorb an e-governance solution are typically much lower than that of the large ULBs.

It is therefore very important to adopt an implementation strategy that factors these intra-state variations. Over the last few years, two major implementation strategies have emerged:

1. **Large City implementations**, which as the name suggests, is typical of a large JNNURM city implementation. These implementations are characterized by:

   a. Full-scale deployment of multiple, integrated applications covering all the functions.

   b. Complex workflows (within and across departments)

   c. Self-contained within the organization, mostly because the Commissioner and the HODs are the primary decision maker and the 'consumers' of the data for Decision Making.

2. **State-wide implementations**, which are typically a centralized implementation at the state-level which aims to cover all the ULBs within the state, from Corporations all the way to Town Panchayats.

a. Phased implementations, typically starting with Financial Accounting and Budgeting and then slowly expanding the footprint. This is largely because of the vast coverage of the implementation. For instance, the state of Karnataka (Urban Development Department) is currently involved in an implementation covering 230 ULBs across the state.

b. The centralized authority (e.g. DMA in Karnataka) is critical in driving the implementation, given the geographical diversity and the organizational capabilities and commitments across the ULBs. Moreover, most of these implementations appear to be geared towards reporting of data to the state UDD, which would explain the importance of the centralized authority in the implementation.

The table below summarizes some of the key defining characteristics and observations of the alternative implementation strategies.

	Process	Technology	People
Large City Implementations	Complex processes within and across departments Large Scale re-engineering opportunity	Typically 2nd generation users. Willingness to provide budgetary allocation to explore newer technologies (e.g. mobile access) Citizen service delivery is a primary requirement. Integration with third-party service providers is usually a requirement.	Well trained personnel. Heads of Department are key to the successful implementation.
State-wide Implementations	Policy framework is extremely important – to ensure that processes and data reporting standards are consistent across the state. Opportunity to standardize processes across the state. Organization structures are relatively flat and hence processes are not very complicated.	Typically 1st generation users. Technology barriers (chiefly power and connectivity) result in slow implementations. Administrative Efficiency (ability to report data to the state-UDD on time) is a key driving force.	Limited Capacity at the ULB level. Implementation Support organizations (e.g. Field level implementation consultants) are important to build capacity. Implementation is driven largely by the state level (DMA).

Change Management

The most important thing in e-Governance is not the 'e' but the Governance part is an oft repeated cliché. Unfortunately, it is true and it has been well documented and widely accepted that capacity constraints pose the single biggest threat to the successful implementation of e-governance systems. The nature and scale of the capacity constraints depend on the nature of the ULB. The matrix below conceptually captures the Change Management complexities in a typical municipal e-

governance implementation. It is apparent that the complexity is heavily dependent on the size and the scope of operations of the local self-government body.

Change Management in this context can be divided into four major components:

1. **Training:** Training of end-users on the software and where relevant, new principles (e.g. double entry accounting) and processes (e.g. bottom-up budgeting)
2. **Implementation Hand-holding:** Post training, the implementation hand-holding component needs to focus on providing technical (both software and processes) as well as organizational support (e.g. data entry)
3. **Capacity Building:** In many cases, there is a need to augment capacity to ensure better implementation. The reasons are primarily that of insufficient manpower (a serious issue in the smaller ULBs where there have been caps on recruitment for several years) and a skill-set mismatch (e.g. most accountants in the smaller ULBs are not familiar with double-entry accounting – and to cover that gap, fresh recruitment of qualified accountants is increasingly becoming a necessity).
4. **Policy Frameworks:** This is typically the most complex part and in some cases, could involve legal framework changes (e.g. amendments to the Act to switch to accrual basis of budgeting).

Institutional Changes

Introducing Municipal eGovernance esp. state wide (in a large number of municipalities) takes more than the adoption of new technology such as computers and mobile devices. While these new technology tools provide significant improvements in record keeping, searching, generating bills/receipts, storing large number of records and processing large number tasks etc. There are several institutional changes that are required to make an eGovernance project successful.

- **Institutional commitment towards eGovernance is required**. While several eGovernance projects are initiated by champions, not many of them survive after the project champion has been transferred to another job. Hence it is not sufficient to have champions, a large critical mass of managers and decision makers need to be convinced of the usefulness of the eGovernance project being taken up.

- **Training and Capacity Building taken-up in a war-footing**. Changing from age-old-methods of book and pen to computer based governance is a significant change that comes with resistance and considerable anxiety in municipal staff. This requires training municipal staff on basic computer skills, learning to use office productivity tools and most importantly the use of eGovernance applications that deliver specific municipal services. There are several allied areas that city engineers and planners need to be trained in such as mapping, surveying and Geographic Information Systems.

- **Creating a cadre of IT staff in municipalities to implement eGovernance.** One of the recurring problems that in seen in Govt. agencies hiring IT resources, is that the Govt. pay scales are not much lower that the IT engineers salaries paid by the industry. It is important to create institutional ways in which this issue is addressed.

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much lower that the IT engineers salaries paid by the industry. It is important to create institutional ways in which this issue is addressed.

- **Monitoring Progress** It is important that a monitoring system track the project progress. During the deployment of the Nirmala Nagara – Municipal eGovernance project rollout in 50 cities in Karnataka (which the authors were part of) an electronic monitoring system was developed to track the progress of each city on the various project metrics and also rank the cities based on these metrics. This ranking report were generated each week and was sent out electronically to all the cities – thereby creating healthy competition between the cities.
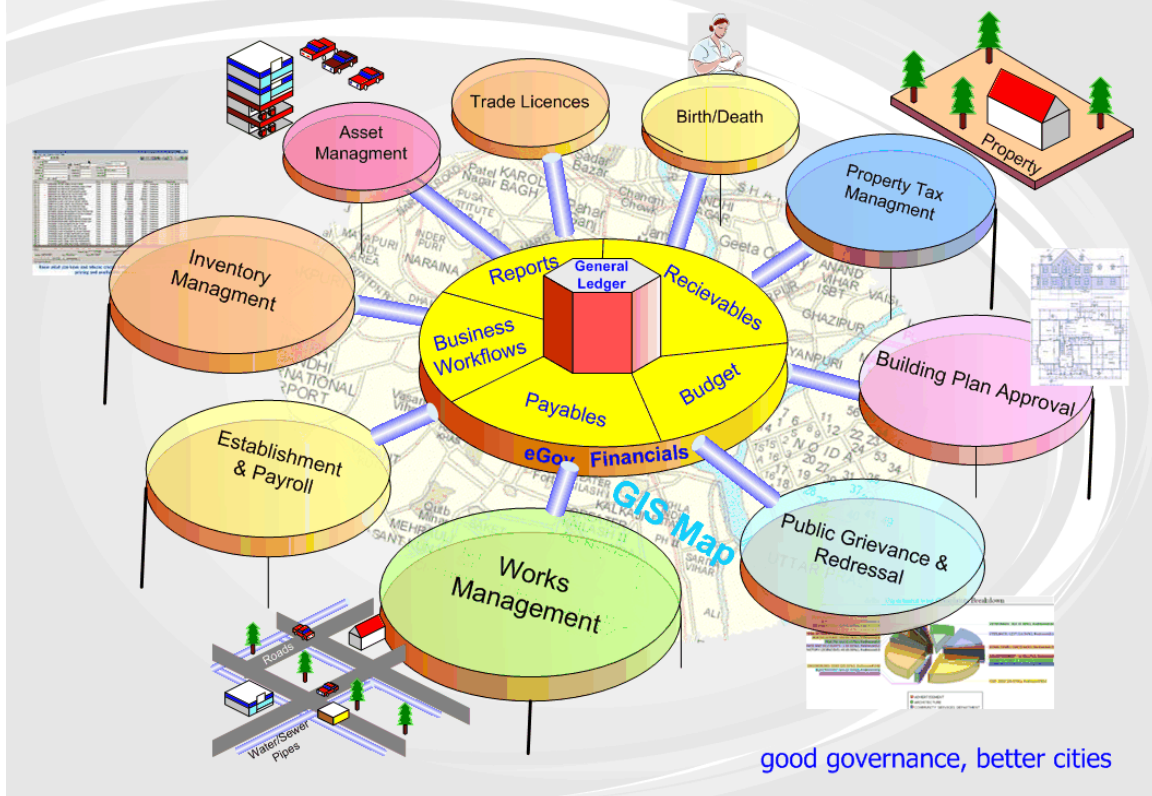
The Municipal e-Governance Platform

Overview

A fully integrated municipal e-governance platform must serve the three main ingredients of any effective e-governance implementation:

1. Administrative Efficiency

2. Transparency and Accountability

3. Citizen Service Delivery

Municipal eGovernance Product Suite

good governance, better cities

In the current product roadmap, the focus is two-fold:

- o **Finance (Revenue and Expenditure):** Design and development of IT applications which would help streamline the financial accounting, expenditure and revenue management for the ULBs. The following applications fall under this category:
    - o **Financial Accounting and Budgeting:** Financial accounting and reporting system, which conforms to the best practices recommended by CAG and UDD.
    - o **Payroll:** Employee Information System and automated Payroll System to streamline the establishment operations and expenses.
    - o **Ward Works**: Ward Works Management system which provides the citizens visibility to the Ward Action Plan.
    - o **Property:** Comprehensive property tax valuation and collection system with full GIS integration.
    - o **Stores/Purchasing:** Comprehensive Stores Management System to track and manage the material stocks in any ULB.
    - o **Collection System:** Collection Management System supporting multiple billing systems.
    - o **Payment Gateway:** An Integrated Payment Gateway System for integrating with multiple bank gateways for Credit Card payments.
- o **Service Delivery:** Design and development of IT applications which would improve the quality of services provided to the citizens by the ULBs. The following applications fall under this category:

- o **Grievance Redressal:** Provides a mechanism for citizens to submit complaints against a department and subsequently, track the progress of the complaint through its lifecycle.
- o **Birth/Death:** Provides a mechanism for online registration of birth/death and quick certificate issuance.
- o **City Website:** Provides a website for the corporation/municipality which provides not only static content but also a delivery channel for dynamic transactions such as checking and payment of Property Taxes over internet, ordering Birth/Death certificates etc.
- o **GIS:** Provides a platform to capture a ULB's geographic data based on ground surveys. This, when integrated with other eGov applications, provides a powerful tool for efficient governance.

The table below summarizes the full list of modules and one of the many examples of how each one of them impacts each of the key areas of governance:

	Module	Administrative Efficiency	Service Delivery	Transparency and Accountability
1	Financial Accounting and Budgeting	Online availability of financial data for improved decision making		Annual Financial Statements published in real-time for citizen review
2	Property Taxation	Centralized database of properties with fully digitized demand and collection history	Pay-tax anywhere, including online for improved citizen experience	Online property level demand and collection history available to each citizen
3	Trade Licenses	Centralized database of licenses with an alert system for renewal of licenses	Pay-licenses anywhere, including online for improved citizen experience	Online establishment level license status and history available to each citizen
4	Land/Estate Management	Centralized database of ULB properties with fully digitized history of rentals and collection history by property	On-line auctioning, pay-rent anywhere, including online for improved citizen experience	Online property level earning history available to each citizen
5	Works Management	Fully online, automation of Estimate to Completion for each Project	Online contractor portal for tenders, submission of bills, electronic payments	Online work-level and contractor-level history to enable better citizen monitoring of contractor performance
6	Stores/Purchasing Management	Fully online, automation of the procurement processes from indent to supplier payments	Online supplier portal for tenders, participation in Rate Contract tenders etc	Online history by supplier delivery to enable better citizen monitoring of govt procurement
7	HRMS/Payroll	Automation of the HR and payroll processes for efficient processing of monthly payroll.	Employee Portal for real-time availability of salary, benefits (e.g. GPF), outstanding advances/loans, leaves etc.	Online availability of establishment expenses to enable better citizen monitoring of the single largest revenue expenditure line-item

	Module	Administrative Efficiency	Service Delivery	Transparency and Accountability
8	Asset Management	Enumeration of the ULB assets, with their valuation and complete tracking of the asset lifecycle.		Asset lifecycle data available to citizens (most notably, the total expenditure – capital and revenue on maintenance, improvement and upkeep of assets).
9	Legal Case Management System	Database of legal cases with a centralized repository of legal cases for easy search and data retrieval.	Improved response times to stakeholders (citizens, suppliers, contractors) for all legal case related issues.	Legal case history available to citizens to better monitor the ULB's response to specific legal issues.
10	Collections System	Computerized, online collection of revenues (tax, non-tax) leading to improved revenues.	Citizen centric processes which offer conveniences like pay-anywhere, pay-anytime.	Collection data (tax, non-tax) available to the citizens to better monitor the ULB's revenue intake.
11	Public Grievance and Redressal	Automatic routing of complaints to the relevant departments with automatic status monitoring of complaints.	Citizen feedback system for citizens to provide feedback on the ULB functions.	Department-wise complaint and redressal rates are available to the citizens to better monitor the performance of the ULB in its various statutory and regulatory functions.
12	Birth/Death Registration	Centralized database of births/deaths and online recording of statistical data allows for improved record-keeping.	Online retrieval of birth and death records in addition to integration with hospitals allow for citizen convenience.	
13	Building Plan Approval	Online and digitized building plan documents and online approval workflow improves the operational efficiency of the department.	Citizen can submit and check the progress of building plan approvals online.	The entire building plan approval process is completely transparent with full audit trails.

Management of Core Operations

Implementation of Accrual Based Accounting and Budgeting is one of the key reform areas under the JNNURM. In addition, it is widely recognized that an efficient and stream-lined financial management system is key to better governance. Keeping this in view, Financial Accounting and Budgeting is the key module in any municipal e-governance implementation.

However, it is also evident that improved quality of information and reporting from the Financial Accounting and better budgetary controls are possible when all the departments of the Corporation capture data efficiently and accurately. To enable this, any municipal e-governance system must

focus on implementing a fully integrated suite of applications covering all the aspects of the Corporation's activities. Integration with a Financial Accounting System, in turn, ensures that the financial impact of all the transactions is captured immediately. In the following sections, the solution is described in greater detail.

The Financial Accounting System should be an integrated fund-based double-entry accounting system that manages the financial accounting and reporting, budgeting and Asset Management for a ULB. Given the fact these implementations are addressed at first-generation users with limited exposure to software as well as the intricacies of double-entry accounting, the system needs to be based on simple, easy to use screens and in addition, should be fully internet-enabled which would make it possible to easily and rapidly deploy the system across multiple locations (say all the offices of a large city or in case of a state-wide implementation, all the ULBs within the state from a central data center). Transition to a fully online accounting system will ensure that the data is captured in the system at the point of creation and is immediately available for effective decision making. Perhaps most importantly, the system must be fully integrated to the ULB's portal which would enable the administration to provide citizens with easy-to-understand reports summarizing the ULB's key financial indicators.

As part of the implementation, easy rules must be incorporated to automate some of the repetitive transactions. This would be expected to greatly reduce data entry errors and improve productivity. The system provides for all the necessary management controls like voucher approval before G/L posting, security with role-based access control and approval workflows. A fully integrated Budgeting module has the potential to improve the budgeting process by supporting the creation and approval of detail budgets by department and function with a ward and then aggregating these budgets into the overall ULB budget. Once approved, budgetary controls can be enforced on all transactions.

The **Asset Management** module allows for the creation and tracking of assets throughout their lifecycle, automatic depreciation calculation, asset revaluation and disposal. With the objective of improving the asset visibility, tracking and control for a government body's asset base. This is obviously a key step in building the balance sheet for the ULB. The system should also capture the full asset lifecycle – creation, capitalization, improvements, revaluation and finally, the disposal of the asset (either by a sale or a write-off), i.e. all the activities impacting the Asset value. In an integrated environment, the **Works Management System** would automate the end-to-end process starting from the conceptualization of a project (e.g. civil works) all the way to the capitalization of assets created from the project. Integration with a **Procurement System** supports the capitalization of procured assets (e.g. vehicles). And perhaps most significantly, integration with **Financial Accounting System** would ensure that the financial impact of transactions on an asset (e.g. depreciation, revaluation) is immediately and accurately reflected in the financial books.

Expenditure Management

Establishment expenses constitute one of the largest expenditure areas for any government. In addition, the government is one of the largest employers in the country. Efficient management of the staff, coupled with prompt and accurate payment of salaries is one of the primary responsibilities of the government.

A **Payroll Management System** needs to have the following features that are expected to be a valuable productivity tool for the government:

o   Definition of an employee record, with assignment of a role to each employee. Role history for an employee will be maintained.
o   Definition of itemized earning and deduction heads.
o   Salary computation, with provision of formulas for calculation of each head.
o   Loan/Salary advance management
o   Definition of salary template for each role, which can then be modified for individual employees. The salary template can be configured using earning and deduction heads.
o   Automatic calculation and generation of a standard payslip, including multiple payslip printing
o   Maintenance of individual salary payment history (with break ups).
o   Automatic generation of reports:
    o   MIS: Salary summary by department
    o   Regulatory: PF, gratuity reports.
    o   Automatic integration to the Financial Accounting System

Expenditure on capital (building new assets and improving existing ones) and repair Works constitutes a significant proportion of a municipality's expenditure. In terms of service delivery, there is a huge impact of the Works carried out by a municipality on the quality of services delivered to the citizens. A **Works Management System** aims to streamline the execution of Works within a ULB by providing two covering two broad areas:

o   Works Management
    o   Indent Management: Capturing the information related to the development of the proposal for a Work, followed by the technical and financial approval process.
    o   e-Procurement: Managing the tendering process electronically, including the technical/financial review of the contractor bids.
    o   Works Lifecycle Management: Once the Work is awarded, the entire lifecycle of the Work is managed, including tracking of actual outcomes; the billing/payment process, leading up to the capitalization or revaluation of Assets.
o   Reporting/Analysis
    o   Internal Reporting: Reports on quality/performance on a variety of parameters (e.g contractor performance) can provide valuable decision support tools to administrative decision makers.
    o   Knowledge Base: Data collected over time and across municipalities within a state can be used for analysis. This can include correlation of data across different eGov modules (eg. PGR and Works to understand the perceived impact of Works out on the citizens).
    o   Transparency: Integration of data from the Works module to the City Portals can improve the transparency of operations by giving the citizens at large, a clear insight on the nature of capital expenditure carried out by the administration.

Purchasing and Stores Management is a fully integrated Procurement and Inventory Management system designed to automate the procurement of goods and subsequently, tracking them from

receipt to consumption. Stores Management and Procurement are areas of weak controls for most governments – while they handle significant quantities and values of material as part of their stores, there is poor visibility and control in their processes, leading to significant losses in terms of wastage in addition to poor working capital management. eGov Inventory aims to improve the procurement and inventory management processes to enable better visibility, tracking and control of inventories. This has the potential to reduce costs by reducing wastage while improving the accuracy of inventories managed by the government.

Service Delivery

On of the most common (and often most inefficient) interface for citizens with the ULB administration is the issue of birth and death certificates. An e-governance initiative in this area can go a long way in improving the quality of citizen experience. A **Birth and Death Registration System** is the birth and death system based on RGI standards to streamline the registration and certification of Births and Deaths. The System complies with the latest forms published by the ULB and takes boh the legal and statistical information. The system allows online registration of birth and death certificates from the ULB office and the through registered hospitals after validation by the ULB Officials. Appropriate checks and validation prevents errors by the operator. The Registration numbers are generated by the system for each of the registration units. The system generates the mandatory reports required by the State registrar office easing the ULB work. The system also has a rich set of reports on births, cause of death, still births, parents' literacy/education and other demographic data which can be used for statistical analysis.

The **Public Grievance and Redressal** System provides a channel for citizen involvement in governance by providing the opportunity to submit grievances/suggestions. The PGR System takes structured complaints through multiple access channels like Internet, Phone and Paper forms. The citizen is issued a unique Compliant tracking number using which he can track the complaint status online from anywhere. The complaint is automatically routed to the ULB User based on the complaint type and compliant location. The Citizen can have a communication channel with the User Officer and they can communicate by posting messages to each other about the complaint. The ULB user can update the status of the complaint after attending to the complaint. The complaint gets automatically escalated to the next higher official if the complaint does not get processed with in the specified time. This improves the compliance rates in the system and forces the officials to attend the complaints with in the specified time.

The PGR system should be integrated with the Mail and SMS systems. The Citizen can get automatic updates about any status changes if he wishes. Complaints in PGR systems are structured to enable better problem analysis and come with patterns for proactive complaint redressal. The system also publishes citizen-friendly reports with GIS integration for snapshots of the spatial distribution and density of grievances (e.g. pie-charts, GIS reports)

Revenue Management

Trade License is a centralized web based application for issuing Trade Licenses to the users. It allows for accepting the trade license requests/renewals from any Citizen service center and gives a unique application number to each of the applications. The application is sent to the concerned ULB official based on the Trade category, license type and the location of the business. The ULB Official can accept or reject the application. The Citizen service counter can print the application after collecting

the requisite fees from the Citizen. It also provides powerful MIS reports of Collections and Business location allowing the ULB Officials a complete overview of the Trade Licenses issued in the ULB. eGov Trade License thus streamlines the flow with in the Health department of the ULB while improving the transparency and efficiency of the ULB.

Estate Management is a System that manages the complete rental properties of the ULB. It aims to create a master database of all the rental properties in the ULB to improve asset visibility with integration with the Asset Management System and increase the collection efficiency. This can reduce the costs of maintaining the Estate data, improve the collection efficiency while improving the accuracy of the assets, ultimately leading to a more accurate representation of the government's assets.

What are the outcomes?

Accountability

One of the criticisms of city governments in India is that they have very little accountability to their customer - the citizen. Between an opaque systems that doesn't share information to an *us*(govt) v/s *them*(people) mentality, accountability suffers.

The key drivers of accountability are role definition, cross-system linkages and transparency.

Role Definition: Due to the very nature of govt. institutions where administrators are often transferred from their posts, roles do have a fairly good deal of clarity – since they have to rely on roles and their specific responsibilities and not on specific individuals and their core competencies (Note: while this may make the role less personality-dependent it does not make it more efficient). The IT system embeds and administers the concept of roles/responsibilities through underlying RBAC platform – Role Based Access Control. IT systems with RBAC create user accounts (most people know them as user-id/password) and assign a 'Role' to the user-account – such as a 'Commissioner', 'Revenue-Officer', 'Assistant-Executive-Engineer'. Each role is assigned a set of access-control privileges that list out the set of things they are able to perform in the IT system.

Cross-System-Linkages (referential integrity): To make a process end-to-end track-able you need cross-linkages between modules (e.g. works management, financial accounting, property tax management) and their objects (contractor, work-order, bill, check, property etc). For instance when a bill is received from a specific contractor for the work that s/he has executed, we need to first find the contractor in the Accounts Payable (AP) sub-module of the accounting system, before the bill can be entered into AP, this is likely to be implemented as a drop-down-list of contractors in the AP, bill entry screen as opposed to simply typing the contractor's name in the bill entry screen. The former retains referential integrity whereas the later does not since text strings don't match exactly to unambiguously create the link. It will be explained below as to how this referential integrity creates strong accountability.

Transparency & Disclosure: While Role definition and cross-system-linkages are supply (administration) side drivers of accountability, Transparency is the best know driver of accountability from the demand (citizen's) side. Transparency can be achieved at different levels (city-wise income/expenditure, ward-wise collection of property taxes, contractor details of specific works etc) and can be implemented through different channels – city website (although a small portion of the citizenry have access to the web), newspaper articles, budget reports etc. ICT in general and Municipal eGovernance in particular can have a hugely positive impact on transparency and hence accountability. A point of contention on the use of technology for transparency that is often brought up is the fact that India's internet penetration is very low at about 6% and the point being - therefore the number of people who can access the information putout on websites is very small. When we talk about Municipal eGovernance there are 2 important aspects of the solution

- eGovernance server modules that help administer the city better
- ICT technologies that are able to share/disclose the data from the servers with everybody

The first aspect of eGovernance that enables servers to help improve record-keeping and and improve citizen service delivery are very important irrespective of whether this information can be accessed by everybody over the internet or not. When we talk about citizens accessing the backend data then we need to be sensitive to the fact that all sections of the populations are not computer literate or connected to the internet. Hence the job of data dissemination to the public v/s the job of running backend servers implementing eGovernance are 2 different aspects which should not be clubbed together.

Accountability through Referential Integrity and Role-based-access-control (RBAC)

Accountability through transparency in the form of newspaper reports is well understood in the Indian municipal context. This is the long loop of accountability, which assumes that governance problems are highlighted by media and people and civil society take up these issues with the city government in order to redress them. Given the absence of a good platform for such issued based discussion between civil society and administration in the urban context (the ward committee as envisioned in the 74th constitutional amendment is either non-existent in many cities or dysfunctional in most) other systemic ways to achieve accountability are of paramount importance.
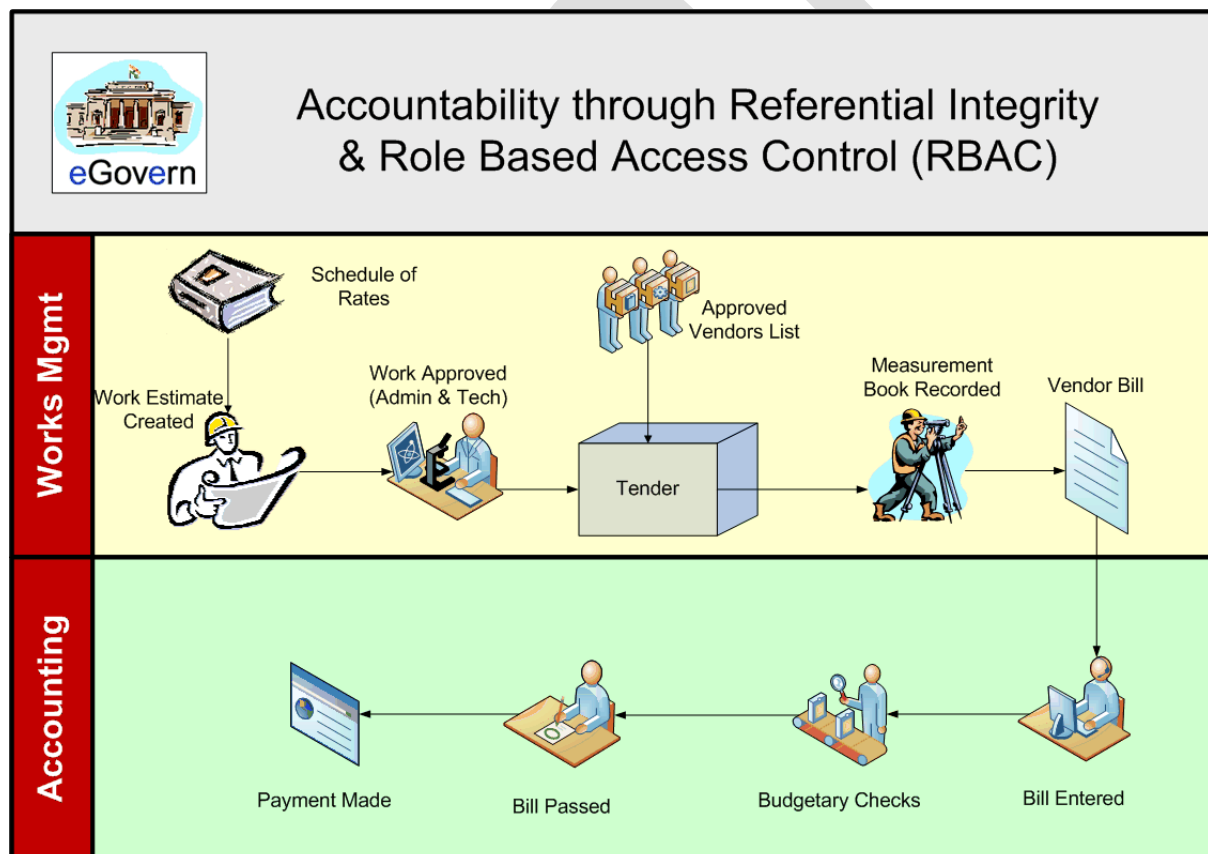

Figure. Ward Works Management and Financial Accounting Process Flow

There is a backend supply side (administration) route to accountability if the backend eGovernance modules are designed for accountability. *Please note this is not an argument for accountability*

through supply side (administration) over demand (citizen) side, this is an observation that in the absence of strong pressure from the latter, the former can still be implemented to ensure accountability.

Let's focus on the diagram above that illustrates the workflow involved when work is taken up in a municipality. The upper works management track describes the below steps:

- Work estimate - created using the schedule of rates. (Junior Engineer)
- Work approved – administratively and technically (Accounts Officer Works, Exec Engineer)
- Tender Process – Choosing a vendor from approved vendor list (Procurement Officer)
- Monitoring progress – through the measurement book (Asst Exec Engineer)

After which the work flow gets into the accounting steps:

- Enter Bill – in AP – accounts payable module (Accountant)
- Budgetary Checks – to check fund availability (Chief Engineer, Accounts Officer Works)
- Bill Passed – Approve the bill for payment (Chief Accounts Officer)
- Payment made – cut a check to pay the vendor (Accounts Officer Payments)

If each of the above steps has its own application screen and a specific role (Junior Eng, Accounts Officer etc) is required to perform each of these steps (role based access control – RBAC), then to a large degree it ensures that the system cannot be gamed by a single (or a small group of) individual(s). Now on top of RBAC if we ensure that each step needs to be completed before the next can begin as well as we daisy-chain the data elements in such a way that a dependency sequence is built – then we have enforced referential integrity which strengthens accountability. E.g. Take for instance that to enter the bill (by role accountant) in the Accounts Payable module the vendor's name has to be picked from a drop down list (can't simply type the vendor's name), if for instance the vendor is not in the drop-down list then the accountant cannot just enter the new vendor, a procurement officer will need to enter the vendor in the approved vendor's list after due process. If the bill cannot be entered then it can never reach the payment stage – this daisy-chaining of steps and distributing access control over different user-accounts of varying roles at different levels enforces strong accountability in the system as a whole.

Case Studies

Vijayawada Municipal Corporation: A Success Story

Background

Vijayawada Municipal Corporation (VMC) is the third largest municipal body in Andhra Pradesh, with an annual income of around Rs. 150 crores. It is one of the 64 cities (with a population of a million plus) covered under the JNNURM project. Of the mandatory reforms prescribed by JNNURM (http://jnnurm.nic.in/nurmudweb/reforms.htm), VMC opted to take up Municipal Accounting reforms in 2007-08. This was driven by the Commissioner of VMC, with active support from the

Examiner of Accounts (equivalent to the Financial Advisor). The key reforms that this initiative requires are:

1. Migrate to a Double-entry, Accrual based Accounting and budgeting system.
2. Valuation of the Assets and Liabilities and generating the Opening Balance Sheet for the ULB
3. Production of financial statements (Balance Sheet, Income-Expenditure Statement)
4. Audit of financial statements by an independent auditor
5. Complete re-vamp of the Public Financial Management (PFM) cycle which includes internal controls
6. Credit Rating of the ULB, if the ULB chooses to do so.

Implementation

Centre for Good Governance (CGG) is a para-statal government body setup to assist the Government of AP implement governance transformational initiatives. Under this mandate, CGG was brought in by VMC as the implementation agency for Municipal Accounting reforms. CGG was also responsible for developing the Andhra Pradesh Accounts Manual, which itself was based on the National Municipal Accounts Manual (NMAM). NMAM was released by the Government of India in 2004 with an objective of setting standards for accounting and budgeting in the ULBs across the country.

As part of its implementation planning, CGG felt that a technology enabled transformation of accounting reforms would be the best route to take for VMC. The two major reasons for this were:

1. Implementation of double-entry accounting systems in a manual book-keeping system is tedious at best and impossible to maintain at worst.
2. The government systems have traditionally been trained in single-entry, cash based accounting systems. While a transition to a double-entry accounting system can be enabled through training and capacity building, it was generally felt that the exposure of the end-users to the complexity of double-entry book-keeping should be minimized. A software system could help in managing this from an end-user point of view.

CGG, after a brief survey of the market, decided to choose eGovernments Foundation as the software provider for the Accounting system. The key reasons for this were:

1. eGov Financials was already the biggest software solution for Financial accounting and budgeting for municipal government bodies. By 2007, it was running in over 50 Municipal bodies.
2. eGov Financials was based on the NMAM, which would automatically give VMC full compliance with the reform requirements.
3. eGov Financials was built on open standards, which would allow VMC to integrate with third-party applications.

The implementation itself was started in February 2007, with the following:

1. A local Chartered Accountant was hired as the implementation support agency. This firm was responsible for training the end-users and hand-holding for a period of 12 months.
2. The software was hosted in a data centre at CGG.
3. The end-user community was trained in two phases:

a. Training on Accounting principles. This covered the Accounts department and one representative from each line department.
b. Training on eGov Financials. Two rounds of hands-on training sessions were organized for the end-user community.

The software was deployed in a record 3 months. Data entry was managed by the CA firm which was responsible for ensuring that the 2007-08 data was entered. This essentially involved the gathering of vouchers (manual, based on the single-entry accounting system codification structure) and mapping them to the new NMAM based vouchers. The vouchers were then entered into the system. This exercise was completed in around 5 months and the balance sheet was formally released to the Council in July 2008 (http://www.hindu.com/2008/07/03/stories/2008070358520300.htm).

Change Management

All the key stakeholders (CGG, Commissioner VMC and eGov) identified change management as a key driver early in the implementation. The Change Management process was initiated early in the process and continued throughout the implementation. This was done through a variety of well-synchronized initiatives:

1. Training and Awareness:
   a. The most important Change Management component was the key stakeholder education with regard to the complete cycle of Municipal Accounting Reforms, starting with a switch to double-entry accounting. Two separate sessions were organized – one with the Commissioner and the HODs and a second, most importantly, with the Council members. The latter ensured an early buy-in from the political stakeholders.
   b. This was followed by a three-day classroom training session on Double Entry Accounting, Asset Valuation and Opening Balance Sheet preparation to the Accounts Department and key representatives from all the line departments.
   c. The classroom training was followed up with a 2-day hands-on software training. Here real-life scenarios were presented and the teams were expected to develop the corresponding accounting treatments and record them in the system to generate the Trial Balance.
2. Capacity Building:
   a. A Chartered Accountant firm was appointed on a retainer basis for a period of one year. Their task was three fold:
      i. Translate the existing books of accounts into the double entry accounting standards and generate the balance sheet for 2007-08.
      ii. Assist the line departments in preparing the Opening Balance Sheet, which included the Asset Valuation process as well.
      iii. Hand-hold the end-users (Accounts department and the user departments) in the form of a local help-desk. This was key in ensuring that issues were resolved early and on the spot.
   b. Two refresher training sessions were held during the year – both on accounting principles and software usage.

c. The single most important factor was the active interest taken by the Commissioner throughout the implementation process.

On hindsight, this emphasis on Capacity Building, Awareness and Training went a long way in ensuring that the System was implemented successfully.

Current Status of the implementation

The system is widely in use in VMC. Data (bills, receipts etc) are directly entered in the individual departments and once approved by the department (HOD), they are available for review by the Accounts Department. An online system also ensures that all the financial statements are updated as of the last transaction and this data is available across VMC. In the next few months, the following initiatives are planned:

1. Integration with the Citizen Service Centre application to enable the automatic update of financial statements based on daily collections. Currently this data is entered manually.
2. Implementation of an HRMS and Payroll System to manage the 4500+ employees and 13000+ pensioners.
3. Displaying the financial statements on the VMC website as a Public disclosure mechanism. Currently, static snapshots of the Balance Sheet and Income Expenditure are available on the website. (http://www.ourvmc.org/general/fstmt.htm)

Case Study-2: 'Not a Success'

Background

This ULB in question (name not disclosed) is one of the 64 cities a population of over a million and it is covered under the JNNURM project. As part of the JNNURM reform process, the ULB opted to go in for a comprehensive e-governance solution, covering the following key functions:

1. Accounts and Budgeting
2. HRMS and Payroll
3. Engineering Department (Projects)
4. Purchasing and Stores Management System
5. E-Procurement System
6. Asset Management System
7. Trade Licenses
8. Legal Case Monitoring System
9. Land and Estate Management
10. Solid Waste Management

In addition to the above, the e-governance system covered the following shared services:

1. Collection Management System
2. Integrated Payment Gateway System
3. Document and File Management System

The project was initiated in 2008 with an aggressive 12 month implementation timeframe.

Implementation

From its very inception, the project was treated as purely a Systems Implementation initiative. It was driven mostly by the personal initiative of the Assistant Commissioner (AC) with peripheral interest from the Commissioner. The ULB does not have a formal IT department and moreover, a formal project team structure was not setup for the implementation. In other words, there was no single department which could be made accountable for the whole implementation.

In addition to the above, the following organizational dynamics ended up impacting the implementation:

1. The Assistant Commissioner ended being the Chief Sponsor of the project. Since the AC had a peer relationship with other Heads of Department, it turned out that he could not leverage his authority during the implementation process. This resulted in low levels of departmental interest and hence, participation. **This could be paraphrased as the 'chain-of-command' problem which is quite common in a highly hierarchical organization structure.**
2. To get around the 'chain-of-command' problem, the AC had to work with levels below the HOD, which could end up creating longer-term issues in terms of ownership. For instance, the Chief Accounts Officer has not taken ownership of the implementation of the Financial Accounting Reforms. To circumvent this problem, the AC has hired a third-party Chartered Accountant to generate the accounts in the new formats mandated by the JNNURM reforms. While this would generate the necessary financial reports and may also achieve JNNURM compliance, the system will collapse as soon as the third-party contract terminates. This is typically a problem in most e-governance implementations and appears in almost all cases where the change management component is completely ignored.
3. The peculiar nature of the state-level administrative dynamics (with its extremely high levels of political interference) has had an unfortunate impact on the project. While the Commissioner under whom the project was initiated was interested, KMC has seen 3 Commissioners in the last 18 months, and they have not been able to sustain the initial interest levels. This could be paraphrased as the **'Ownership-problem'** where the highly transient nature of the Commissioner's job creates disincentives for the person to take any active interest in any long-term reform process.

Change Management

As is obvious, there is practically no Change Management as part of this implementation. In fact, the RFP for the solution explicitly excluded Change Management from the scope. This coupled with the organizational constraints and the absence of any stakeholder involvement has had a negative impact on the overall implementation.

Current Status of the implementation

The implementation is progressing at a very slow pace – it is in fact surviving solely because of the single-handed efforts of the Assistant Commissioner. It is almost certain (and acknowledged by most people in the ULB) that if and when the AC is transferred, the project is in danger of being completely scuttled.