SEVENTEEN

Unified End-To-End e-Procurement Platform

D S Ravindran

I) Project Overview

The State Government of Karnataka (GoK) has taken the initiative to implement a unified e-Procurement system (accessible at the url: *www.eproc.karnataka.gov.in*, which will be used as a shared infrastructure by all procurement entities (i.e. government departments, city and town Municipality Corporations, Societies and Companies under control of the State Government) in the State. The system has been designed to handle all procurement related processes required for procurement of goods, works and services entirely electronically in a fully integrated manner. Further, a single instance of the application will be configured to handle delegation of powers and workflow requirements of about 100 different procurement entities in the State. Such extensibility and flexibility of the software is an essential requirement if meaningful MIS reports have to be generated at the State level. This project is being implemented in a Private-Public-Partnership (PPP) mode, wherein the private partner is Hewlett Packard India Sales Private Limited.

The end-to-end e-Procurement system under implementation in GoK is conceptually divided into the following 5 key modules: i) Indent Management ii) e-Tendering iii) e-Auction iv) Contract Management and v) Catalogue Management.

As per amendments made to the Karnataka Transparency in Public Procurement (KTPP) Act, the project Steering Committee headed by the Additional Chief Secretary of the State notified Sarva Shiksha Abhiyan (a Society in GoK) to handle all its procurement valued Rs.50 lakhs (about 125,000 USD) and above from the 13th of November 2007 using the unified e-Procurement

system only. The notified entity used the Indent Management (goods) and e-Tendering modules to successfully float a tender for procurement of computer and server infrastructure. Thus, the project went live.

The key drivers for envisioning a unified end-to-end e-Procurement system are as follows:

(i) Development of infrastructure required for effective procurement policy implementation

(ii) Enhanced transparency in government procurement

(iii) Ease of access for contractor community

(iv) Availability of advanced procurement software to big, medium and small procurement entities alike

(v) Software to handle entire end-to-end procurement processes and not just tendering.

The pilot experience in GoK has shown that the procurement procedures adopted by government entities are more similar than they are different. The differences (e.g. delegation of powers and approval workflow) could be handled in a unified e-Procurement system through parameterization and software design. The pilot experience has provided the GoK's e-Procurement team with rich insights on the multiple different ways adopted for estimate approval and tendering.

A dedicated e-Procurement cell has been set-up by the Government to manage centralized operations (i.e.) e-Procurement system administration, registration of contractors, issuance of digital signature certificates and overall project management.

A 3rd party audit agency (Ernst & Young Private Limited) has been selected to conduct acceptance testing and security audit of the unified e-Procurement system. The selected agency has already completed most of the audit work. A principal bank has been selected to handle centralized electronic receipt and electronic refund (e-Payment payment-in) of tender processing fees and Earnest Money Deposit (EMD).

Key statistics on usage of e-Procurement platform as on June 2009:

– The system has over 2000 registered suppliers and 1500 government users

– More than 1500 tenders tender worth Rs.30,000 Crores have been successfully published

– 25 user departments have been notified to use the e-Procurement platform.

II) Result Indicators

1. Key Performance

a. Stakeholder-wise Services and Benefits of ICT/eGov Initiatives

Benefits to the Business (contractors/suppliers) Community

- Tender opportunities in the State of Karnataka can be obtained from a single source of information
- Free download of tender documents
- Registered contractors can bid for any of the tenders floated in the platform (i.e.) single sign-on facility
- Anonymous submission of proposals from using the Internet anywhere
- Enhanced transparency in tendering and procurement
- Reduction in travel and other miscellaneous expenditure
- Electronic submission of bills/measurement book
- Electronic payment of bills
- Ease of access.

Benefits to the Government

- Tender opportunities effectively publicized amongst contractor community
- Enhanced competition for government tenders
- Cost savings on account of competitive bids
- Development of track-record on contractor's performance
- Rich MIS data on various aspects of procurement at the State government level (both as-on-date and accumulated MIS)
- Potential for inter-agency demand aggregation
- Faster file movements and integrated file monitoring system

- Enhanced efficiency measure through faster completion of procure-to-pay cycle
- Standardization of procurement procedures.

Benefits to Citizenry

- Better utilization of tax-payers money
- Real-time access to the status of works, goods and services procured by the State
- Transparent view of public procurement procedures adopted by procurement entities in the State.

b. Implementation Coverage (geographical areas covered under pilot, roll-out, next steps, % of total services covered under the lifecycle of projects processes, % of total branches/departments covered by the project)

Geographical coverage: As on June 2009, 25 user departments have been notified to "Go-live" in the unified e-Procurement platform. As per the "Go-Live" notification typically issued, user departments shall handle all procurements valued Rs.10 Lakhs and above in the unified e-Procurement platform. The e-Procurement system is being rolled out in a phased manner to new departments. It is expected that by March 2010, all major departments will be notified to handle their procurement in the unified e-Procurement platform.

Functional coverage: The first two modules viz. Indent Management and e-Tendering are actively being used by all notified departments. First few live transactions are being handled in the Contract and Catalogue Management modules in selected pilot departments.

Procurement spend: Tenders valued Rs.3000 Crores were published in e-Procurement system from funds allocated under plan expenditure as against an estimated Rs.15,000 Crores spent by government for procurement from plan funds each year.

Number of users: As on date, the system has 2000 registered contractors and about 1500 government users as against the originally estimated 10,000 government users and 10,000 contractors.

In the first year of operation, about 20% coverage has been achieved as per the indicators listed above. Efforts are being made to increase coverage from 20% to 50% in the next financial year. In two more years, it is expected that 80% of procurement spend of the State will be handled in the unified e-Procurement platform.

2. Efficiency Improvement

a. Time and Cost Efficiency Improvements in the Delivering the Above Set of Services

b. Time and Cost Savings for the Key Stakeholders to Avail the Above Set of Services

A concerted effort to measure ROI for this project has not happened yet. Efforts are underway to specifically gather the following benchmark data in the manual system:

- Average time taken to complete procure-to-pay cycle
- Average number of bidders per tender
- Average increase/reduction in awarded price as against estimated price
- Average time taken to make payment to contractors after bill submission
- Number of queries raised by citizenry seeking procurement related data citing the Right to Information (RTI) Act 2000
- Average number of visits made by a contractor to participate in a tender.

The data on the above listed criteria will be collected for a sample of tenders floated through the e-Procurement system. The benchmark data will then be compared with the e-Procurement data to calculate the ROI for this project.

Besides the readily quantifiable benefits, there are a few key benefits which are hard to quantify but very important:

- Enhanced transparency in procurement
- Rich MIS data
- Development of track-record on contractor's performance (i.e.) contractor database

- Provision of real-time access to citizenry on the status works, goods and services procured by the State
- Digital inclusion of government users and contractors.

With the increase in uptake of the e-Procurement system, it is expected that the implementation of e-Procurement will bring about significant benefits in a number of areas. Given the high value of procurement spend incurred by the State, the quantifiable benefits obtained will far out-weigh the costs incurred for implementation of the unified e-Procurement system.

c. Specific Innovative Ideas Implemented in e-Governance Area; Best Practices Implemented Initiatives Integrated with Other Departments

Unified end-to-end e-Procurement platform and connected thinking: Generally, software systems developed to handle procurement processes focus on a limited process area such as the tendering and catalogue administration. The idea of implementing a unified end-to-end e-Procurement system represents a paradigm shift in usage of software systems in the procurement domain. The adoption of a single (instance) platform to handle the horizontal procurement function by all procurement entities in the State represents connected thinking.

Entirely PKI enabled, electronic system designed to effectively replace manual file movements: The e-Procurement system implemented in GoK is entirely Public Key Infrastructure (PKI) enabled. Both government officers and contractors using the system will be required to sign using Digital Signature Certificates (DSC) issued by one of the Certification Authorities (CA) authorized by the Controller of Certification Authorities (CCA) under the IT Act of 2000. An estimated 10,000 government users and 10,000 contractors are expected to use the e-Procurement platform. Of the estimated 20,000 users, about 1500 users have already registered and using the platform. Such extensive implementation of PKI will make pervasive the use of DSC not only in the government sector but also amongst the contractor community paving way for the digital age.

Integration: The Reserve Bank of India (RBI) has developed the following two systems to enable electronic account-to-account transfer of funds: Real-Time Gross Settlement (RTGS) and National Electronic Fund Transfer (NEFT). The e-Payment functionality in the e-Procurement

system of GoK has been designed to accept and automatically reconcile EMD, tender processing fee and supplier registration fee payments paid through RBI's NEFT and RTGS system. The logic for integrating the NEFT & RTGS payment modes in e-Procurement system was developed grounds-up specifically for this project.

Since e-Procurement is an e-Commerce software, care is taken to ensure that a supplier is registered only once and that a supplier is not registered in the system as a duplicate. To avoid registering a supplier in duplicate, the applicant seeking supplier registration is required to input his/her/company PAN number. The PAN entry is validated and verified by e-Procurement system for duplicate entries. If the PAN number is unique, the supplier is allowed to submit the application. Upon receipt of the application, the 'registrar' in e-Procurement cell will prepare an XML query and submit it with the Income Tax department to obtain company name/individual name details. If the name details obtained from the PAN database matches with the name details submitted by the contractor, the PAN check is found to be successful. Going forward, the XML generation and querying process will be fully automated; wherein e-Procurement system will automatically generate an XML upon receipt of an application and obtain a response from the Income Tax department and automatically validate the PAN.

In the near future, the e-Procurement system will be integrated with the Khajane (treasury system of the State) system such that the information (bill, approval and head of account details) required by Khajane for processing payments will be provided automatically by e-Procurement software after the procuring entity provides the necessary approvals.

III) Enabler Indicators

1. Project Roadmap

a. Vision & Objectives Defined

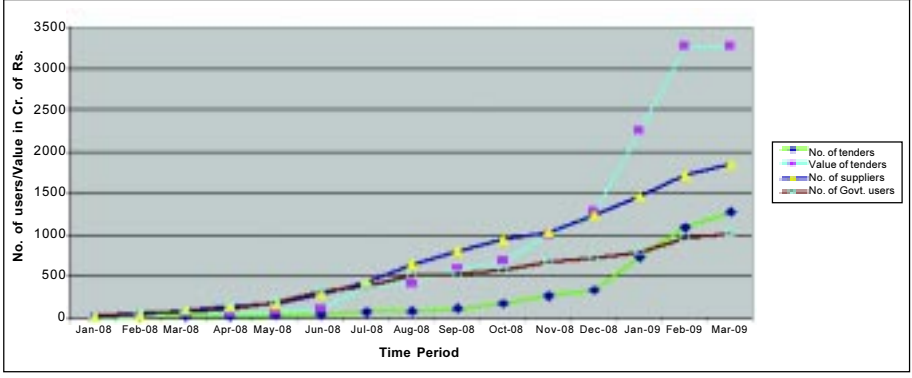
To bring about transparency, efficiency, accountability, process standardization and MIS generation capability in the entire "procure-to-pay" cycle through establishment of a single electronic platform that will be used as a share infrastructure by all government agencies in the State. The following key processes will be dealt with in "procure-to-pay" cycle: estimate/indent preparation and approval, tendering, contract/catalogue management, bill submission, bill approvals and payment management.

b. Measurable Objectives

The following measures could be used to study the progress made in this project:

- Number of entities notified to 'Go-live'
- Number of government users and contractors registered
- Number of tenders and estimates created
- Standardization of procurement procedures

Progress Made in e-Procurement Project



It may be noted that after 'Go-live' notification is issued, it will take about 3-4 weeks to create a new estimate and publish the 1st tender. This latency is due to the effort involved in issuance of digital signature certificates to government officers in the notified entity and workflow customization to be done in e-Procurement software to spawn the newly notified entity within the unified e-Procurement system.

By all the 4 measures listed above, this project has progressed well. The number of notified agencies has increased from the original 6 envisioned earlier to 25. Further, efforts are underway to notify 2 new agencies each week. As shown in the above figure, the number of contractors registered in e-Procurement system has steadily increased to about 2000 users from a single digit number registered during Jan. 2008. On an average, 50 contractors are getting registered in e-Procurement system each week. Though many agencies were notified earlier, the surge in number of tenders published in e-Procurement system has happened only recently. Given that a large number of estimates are in the pipeline, it will be logical to assume that the number of tenders published in e-Procurement software will increase at a good pace.

c. Project Milestones

As per the initial roll-out plan prepared during the project development stage, it is envisioned that all procurement covered under the guidelines of KTPP Act will be handled in end-to-end manner in the unified e-Procurement platform 66 months (i.e. 5.5 years) after the project Go-live date. Efforts are underway to expedite the roll-out of e-Procurement systems to all user departments by December 2010 (i.e. 36 months after project Go-live date).

2. Process Reengineering & Legal Reforms

Process reengineering: Though not very quantifiable, standardization of procurement procedures has also happened. For example, 4 different path-ways have been defined for e-Tendering based on the pilot experience. All the 13 agencies using the unified e-Procurement platform are using one of the 4 path-ways and newly notified agencies would be required to fit in to one of the 4 path-ways already defined. If a newly joining government agency requires the inclusion of an additional pathway, such a request will be closely scrutinized by a team of experts and the requirement will be adhered to only if it was found valid. Just as standardization of procedures has happened in case of indent/ estimate approval procedures and tendering, it is expected that the Contract and Catalogue Management procedures too will get standardized with active usage of the unified platform.

Legal reforms: Recognizing the criticality of the unified e-Procurement platform, the State Government effected a change in Karnataka Transparency in Public Procurement (KTPP) Act acknowledging the implementation of unified e-Procurement platform in a phased manner. The implementation of e-Procurement platform backed with proper amendments to legislative acts and rules has been done by only a pioneering few. No such instances in India have been reported thus far. A draft of the e-Procurement rules is already ready and the process to approve the rules is underway.

3. Project Sustainability

a. Financial Model (funding pattern, business model, PPP, etc)

A unique Private-Public-Partnership (PPP) model has been adopted to implement the e-Procurement system. As per the model, the Private Partner gets paid for the effort invested in development and customization of the software through transaction fees to the extent the various modules of software are used by

procurement entities in the State. The Government on its part has invested in up-gradation of IT and Network infrastructure across all procurement entities in the State to the extent required for participation in e-Procurement. The model has been adopted primarily with the intent to outsource the software development and customization work to the Private Partner. Further, since the transaction fees due to the private partner is paid by contractors using the system, separate budgetary allocations need not be made by the Government. Given this arrangement, it is easier to attract user agencies to use the e-Procurement platform since they do not have to pay for the software and in addition to that they will get the IT and network infrastructure required to embark on e-Procurement.

The e-Procurement platform is built entirely upon open source technologies (Programming Language: Java; Operating System: Linux; Database: MySql). Since the software is entirely built upon open source technologies, the GoK need not pay any licensing fees towards software. However, a vendor to administer the entire software system will be required. As of now, the project is being deployed on a PPP mode and payment due to the private partner for provision of the software is paid through transaction charges collected from supplier using the software. This arrangement will last for a period of 5 ½ years.

The Government has invested about Rs.12 Crores for provision of IT infrastructure (Computers, Printers, Scanners and UPS) and Internet Connectivity. Further, an e-Procurement cell has been created to register contractors, facilitate issuance of digital signature certificates, e-Procurement accounting, system administration, initiate and implement process & legislative reforms and for day-to-day project management. The e-Procurement cell will earn 5% of the transaction fees earned from the provision of e-Procurement as a service. This money will be used to manage the operations of e-Procurement cell.

b. Technology Maintenance

The unified e-Procurement platform implemented in the State of Karnataka is enterprise level software. The design of the software has to be very flexible to address the unique workflow requirements of different procurement entities using the software. The latest version of Java Business Process Management (JBPM) engine was used to design the workflow and the engine was innovatively implemented to address the various workflow requirements. Besides JBPM, the

e-Procurement system runs entirely on open source software: JBOSS application server and MySQL Database. The adoption of open source software was encouraged by the Government in the Request for Proposal (RFP) floated to select the private partner. The adoption of Open Source Software (OSS) allowed the software programmers to view and even modify software code at the framework level required to address the complex technological requirements for implementation of a unified e-Procurement platform. The key to success in adoption of OSS is the availability of technically competent resources, which in the case of this project is provided by the Private Partner: HP India Sales Private Limited.

c. Disaster Recovery Center (DRC)

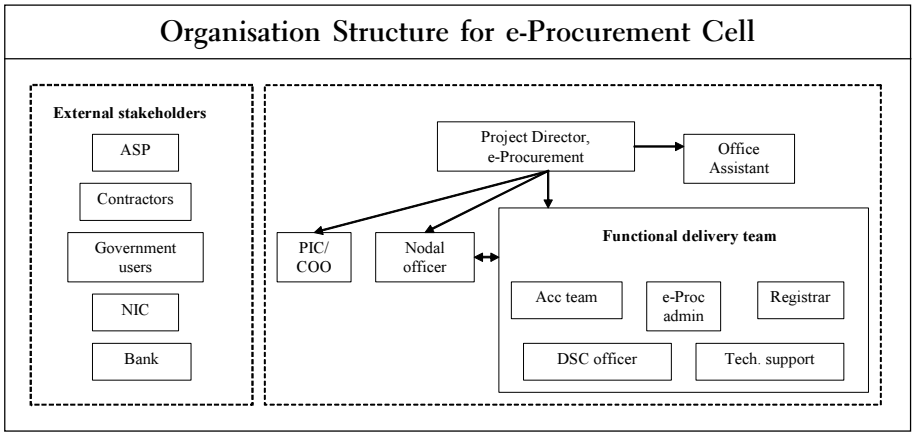
A well-defined back-up policy has been defined and rigorously followed to back-up data generated and stored in e-Procurement system. Further, e-Procurement software is versioned properly and kept ready in case there should be a system crash. A DRC is yet to be established.

d. Project Management Team (full time department officials/consultants)

A dedicated e-Procurement cell (Project e-Governance Mission Team) has been constituted to manage the roll-out of e-Procurement system. The cell is managed by a dedicated All India Administrative Services officer. Details about the organisation structure for e-Procurement cell the team size approved for the cell are provided below:

Approved Team Size for e-Procurement Cell as per Number of Agencies Notified

No. of agencies notified	Team strength							Total
	Registrar	e-proc admin	DSC officer	Acc team	Nodal officer	Tech support	PIC/ COO	
10-20	1	1	1	2	2	4	1	12
20-30	1	1	1	3	3	6	1	16
30-40	1	1	1	4	4	6	1	17
40-50	1	1	1	4	5	8	1	21
50-60	1	1	1	5	6	8	1	23
>60	1	1	1	5	7	10	1	26



4. Change Management

a. Change Management Strategy

b. Capacity Building Plan

The implementation of e-Procurement is looked at as an opportunity to address computer illiteracy amongst government users and contractors alike. Since the software is very process oriented, both stakeholders have to learn to use computers and work over the Internet to complete their procurement related work. All necessary training and hand-holding support has been provided by the e-Procurement team to enable both the stakeholders to participate in e-Procurement. A large number of government users and contractors have already been trained and extensive hand-holding support has been provided in the pilot stage of implementation. The institutional set-up required for provision of training and hand-holding is now ready and the e-Procurement team has developed a good understanding of the challenges involved in provision of training and hand-holding support.

c. Leadership Support & Visibility

With the approval of the State Cabinet, a Steering Committee has been constituted under the Chairmanship of the Additional Chief Secretary of the State to implement the unified e-Procurement platform for all procurement entities of the State. The KTPP Act was also suitably amended November 2007 to facilitate implementation of e-Procurement by the State Government of Karnataka. To enhance visibility, workshops are routinely conducted to obtain feedback from existing users, to share experience amongst.

5. Project Monitoring

a. Monitoring & Evaluation Process

The project is reviewed regularly by Project Monitoring Committee (PMC) headed by Principal Secretary, e-Governance and Steering Committee headed by Additional Chief Secretary.

b. User Feedback, Project Assessment Mechanism

Hands-on training on using e-Procurement system is provided to both contractors and government officials at regular intervals. Feedback obtained from trainees is taken into consideration for evolving the software. Further, based on experiences in using software, end-users register their feedback either in helpdesk or in writing to e-Procurement cell. The feedback collected is studied by e-Procurement cell and a decision is taken on addressing the concerns raised.

c. Third Party Overall Project Audit Mechanism

A reputed consultancy firm has been selected as the 3rd party to perform acceptance testing, security audit, systemic infrastructure audit and load testing. This audit work is mostly complete and it is expected to get fully completed in a couple of months time.

(Dr. D S Ravindran, Chief Executive Officer, Center for e-Governance, State Government of Karnataka, Room No. 108, Center for e-Governance, Gate Number 2, M.S. Building, Near Vidhana Soudha, Bangalore, Karnataka. Telephone no. 080 22371090 Fax no: 080 22371089, email: cegkarnataka@gmail.com).