

MSEB's Secured e-Tendering Solution

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ABSTRACT

Procurement, which takes up a large portion of an organisation's cost and time, can yield quicker and, often easier, savings. To achieve these savings, companies must develop a systematic approach to purchasing, which involves aggressive management of product specifications and negotiations with suppliers. Existing processes and practices lack transparency and accountability and are vulnerable to some non-ethical interest of few persons. It is therefore apparent that successfully switching government purchasing processes to an e-procurement system can substantially reduce their expenditure. Governments being the largest purchasers in economies, it is generally accepted that, for both ethical and political reasons, their procurement systems ought to be fair, efficient and transparent.

Tendering is a significant part of the procurement cycle. e-Tendering is the purchasing of goods and services using the internet. It automates and integrates the buyer and supplier processes leveraging the internet. It automates the complete procurement process right from tender preparation to purchase order, invoicing and electronic payment. e-Tendering has the capability to drive transparency, deliver large cost reduction and process efficiency throughout the tendering process of any corporation.

The objective of the project was to bring e-Tendering into action and invoke a fair and transparent environment for vendors. To achieve these objectives the Maharashtra State Electricity Board faced several internal, external and technological issues and challenges, which are briefed here.

Introduction/Background

The Maharashtra State Electricity Board (MSEB), being one of the biggest electricity boards in terms of installed capacity and consumption, requires huge supplies of materials from vendors. Traditionally, the procurement practice involved a large vendor community from whom the quotes were evaluated and followed by procurement. The vendor community took advantage of the dependencies involved, manipulated the prices and dictated terms. Obtaining a better price and providing a level playing field became prime challenges. To bring transparency and accountability to the procurement process of organisation and compliance with the Central Vigilance Commissioner's (CVC) guideline (order no. 98/ORD/01), MSEB realised the need to look for an information-technology-driven solution as a way to overcome these problems.

With the futuristic vision of the Executive Director, Arun Chavan and initiatives taken by the earlier executive directors, the organisation finally launched the Secured e-Tendering System project with the help of Maharashtra Knowledge Corporation Limited (MKCL) (solution provider). The system came into operation with vendor registration process starting from 23 November 2004. The actual e-tendering process started from 14 October 2005.

The project falls under the G2B (government-to-businesses) category, and the primary stakeholders are suppliers and the corporation itself (i.e., MSEB).

The scope of the project encompassed the creation and implementation of the e-tendering application for the activities of the Central Purchase Agency (CPA), MSEB HQ, Mumbai. The application's main focus was to automate most of the tasks involved in the entire tendering cycle. Some of the key activities that the system automates and integrates are as follows:

Pre-Tendering	Tender publication and communication
<ul style="list-style-type: none"> • Supplier registration • Indent preparation/Consolidation • Tender document generation • NIT creation 	<ul style="list-style-type: none"> • NIT publication on the web • Tender communication through e-mails and SMS • Sale of tender document • Issue of corrigendums
Tender processing	Virtual tender opening
<ul style="list-style-type: none"> • Bid status tracking • Filling of bids by suppliers • Submission of bids by suppliers • Receipt of bids in electronic tender box 	<ul style="list-style-type: none"> • Tender opening and evaluation • Preparation of comparative statement (CST) • Generation of management information system (MIS) reports

Objective

In addition to compliance with CVC guidelines, the primary objective of the project was to create a favourable image of the organisation by improving transparency and accountability in the public procurement process. This in turn should motivate suppliers to participate and empower officials of the organisation to cut down the cost and bring internal efficiency and economy by using automation of the complex manual activities. The system should introduce a paperless environment in the organisation by covering end-to-end activities in the tendering process and yet provide enough control over planning and management of different tendering activities. The following is the summary of objectives for the project.

1. Compliance with the government regulations
 - a. CVC order
 - b. IT Act 2000 compliance
2. Increase in efficiency and productivity
 - a. Elimination of manual mistakes
 - b. Free human resources to do productive task
 - c. Increased tender planning and monitoring
3. Transparency and accountability in the process
 - a. Invoking a fair and transparent evaluation system
 - b. For being more responsive and quicker to the vendors
4. Expanding the reachability of advertisement
 - a. Anytime, anywhere access to information
 - b. Addition of new vendors without geographical segregation
5. Speed up the process
 - a. Shorten the tender cycle
 - b. Elimination of duplicity of the same manual task
 - c. Automating the time-consuming manual process
6. Vendor relationship management
 - a. Obtaining better price from vendors
 - b. Guidance to vendors for filling tender (minimising chance for rejection)
7. Cost savings for supplier and sourcing agency
 - a. Printing cost (photocopy, printouts, stationary, etc.)
 - b. Communication cost (telephones, postage, advertisements, etc.)
 - c. Time (standing in queue, travelling, waiting for officers, etc.)

Implementation

The complete project was developed and made functional for suppliers and management in three phases. The implementation in each phase is as follows:

Phase I. This phase covers the procurement of the transmission section. The development of the infrastructure, skilled workforce and business process systems is done in this phase for utilisation in Phase II. A major part of the cycle involving publishing, filling and opening of the limited as well as open tenders is carried out in this phase along with some basic reporting. This is finally supported by user training for effective usage of the system.

Phase II. In this phase the system developed in Phase I is made functional for activities related to generation and distribution.

Phase III. This final phase integrates the in-house applications to the e-tendering system wherever it is required. It captures all associated data related to pre-tendering and post-tendering processes of e-tendering like inspection reports, delivery schedules, purchase proposition. It provides the complete MIS, workflow automation, document management and other similar services.

Technology

MSEB's secured e-tendering solution is developed using state-of-the-art technologies. The use of cutting-edge technologies based on widely accepted standards and compliance made the system inter-operable, scalable and replicable.

1. Compliance of the project to open standards and use of open-source software systems

- The MSEB's secured e-tendering solution application-server software is developed using J2EE technologies.
- Operating system is RH-Linux AS 3.0/Windows 2003, Enterprise Edition.
- Application server and database server is Oracle 10g, Enterprise Edition.
- Message Queue Open-JMS.
- Open standards like TCP/IP, ODBC and HTTP are used.

2. Technologies for secured electronic transactions

- **Digital Certificates:** This feature based on PKI ensures authentication, validation, non-repudiation and ease of use (just one click for many documents).
- **Audit Trail/Log Report:** Maintains record of users who access the data base. The modified original content can be viewed with original content at the time of audit. Ensures no unauthorised modification.
- **SSL Certificate:** SSL ensures that the supplier-submitted document and bid is first encrypted on his computer, before it travels over the internet and gets decrypted at the server end.

3. System architecture and external system

The software architecture and physical architecture are based on well-accepted standards and technologies. The MSEB's secured e-tendering solution interacts, either directly or indirectly, with the following significant external systems:

- Payment gateway, which is the server system that provides a common interface to the numerous processors of e-payment authorisations and transactions.
- SMS gateway for effective and proactive communication with vendors.
- Digital signature distribution and management system for authenticity of documents.
- Workflow system for MSEB's internal document flow.
- Document management system for storing all types of documents uploaded by vendors/MSEB users or created by the application.

Training

The MSEB's secured e-tendering solution is a customised solution addressing specific needs and procedure of standard process of tendering in MSEB. Therefore, all the users should have a very good understanding of their roles and responsibilities in the system. Every user performs the same role that they were actually carrying out in their traditional system—only the manner in which they will now (electronic) accomplish their duties has been changed.

All the prospective users of MSEB's secured e-tendering solution were involved while carrying out the system requirement study and preparation of system requirement study (SRS). During the development and deployment phase, the system was tested by prospective MSEB users, and their feedback/suggestions were obtained to further improve the system, which resulted in greater acceptance and convenience of users.

MSEB took another step to support the vendors by helping them in using of the system to accomplish their tasks. An IT cell is set up specially for the purpose of helping vendors accomplish their tasks and use the e-tendering system. Six computers were specially placed in the IT cells for the purpose of e-tendering; vendors may come and use them freely for tendering purpose and may get help from the official in case any problem arises while using it. The following table summarises the description of training provided to different groups for using the system.

Batch/Group	Material provided	Functional description
Inspection wing users (inspectors)	On-site demonstration of functions	Physical verification of document
Group users (purchase executive, scrutiny, finance operator, etc.)	Automated flash demonstrations, on-line demonstration of functions, user manual	Sign/co-sign a file, generate reports, prepare dynamic tender document, send tender document for approval
Management users (auditors, chief engineer)	Online demonstration of functions	Final physical verification process, tender approval process, sign/co-sign the bids
Administrator	Online demonstration of functions, user manual	View reports, create user profiles, maintain masters, maintain public notices, maintain tender templates, etc.
Vendors/suppliers	Vendor training kit, online vendor demonstrations, support from special computer cell set up for this purpose	Vendor registration process, tender purchase procedure, tender filling and submission procedure, participating in virtual tender opening

Some user groups and individual officials of MSEB are assigned to conduct regular review of the services offered for continuous improvement. The details of which may be briefed as follows:

Name and Designations	Group name	Responsibility
Chief engineer	PRC (Progress Review Committee)	Monitoring the progress in the project, scheduling of activities, providing suggestions for enhancement of functionality
Assistant engineers, junior engineers, engineers	Group users	Checking/testing the required functionality, giving suggestions for improving the interfaces,
Chief engineers, engineers	CPA (Central Purchase Agency) Management	Organising brain storming sessions for decision making, defining and approving procedures, approving the changes in existing procedures, defining roles and responsibilities of users

Growth

With the passage of time, more and more suppliers are getting registered in this system. The addition of new suppliers is a great achievement for MSEB to ensure the acceptance of the system by the vendor community as well as securing a source for revenue generation even from its procurement activities.

Quarter	Maha Discom	Maha Transco	Maha Genco	Total registered
June 1, 2006, to August 31, 2006	328	174	54	556
March 1, 2006, to May 31, 2006	62	100	31	193
December 1, 2005, to February 28, 2006	93	51	70	214
Before December 2005	62	16	61	139

These figures are based on approximations from the data base.

Quarter	Maha Discom	Maha Transco	Maha Genco	Total
June 1, 2006, to August 31, 2006				
Published tenders	16	16	8	40
Opened tenders	23	32	10	65
March 1, 2006, to May 31,2006				
Published tenders	8	16	3	27
Opened tenders	7	18	7	32
December 1, 2005, to February 28, 2006				
Published tenders	7	4	2	13
Opened tenders	6	6	6	18
Before December 2005				
Published tenders	6	2	4	12
Opened tenders	4	2	1	7

These figures are based on approximations from the data base.

Economic Sustainability

In the following table, we have tried to present a brief view of the situations after adoption of the e-tendering system:

Cost Factor	After adoption of secured e-tendering solution
Tender advertising cost	70% reduction (reduction in size of newspaper advertisement)
Number of visits of suppliers to MSEB	Once in a year for document verification only
Number of corrigendum issued due to manual mistakes	Number of manual mistakes
Stationary and Printing cost	Not a single piece of paper is being used for tendering purpose – totally paperless environment.
Increase in registered vendors	More than 25% increase (presently more than 500)
Processing time for tender-to-contract cycle	Nearly 60% (earlier it took 6 months for one tender to be completed. Now it takes less than 2 months).
Processing cost for tender-to-contract cycle	Reduction of 5–10% assumed as per e-procurement's basic characteristics

The above quantitative data are based on the feedback of MSEB's officials to MKCL and studies of prestigious agencies for e-procurement.

For using the simplified services, MSEB introduced nominal charges on the supplier for enhanced convenience. To anticipate the income from suppliers it is worth mentioning that at present there are nearly 600 registered vendors. All the payments are now accepted through the electronic payment gateway.

1. Vendor registration fee in the e-tendering system is only Rs 25,000/vendor one time or Rs 2500/vendor yearly.
2. Cost of electronic tender document depends on the total estimated cost of tender (percentage basis).

Future Plans

After having successfully implemented the e-tendering system, MSEB is looking forward for the possible improvement and automation of related activities by extending the scope of the e-tendering system.

The e-tendering framework is now being implemented at all the power plants in Maharashtra. Earlier only the CPA (central purchase agency) was using it.

Extending the scope of existing e-tendering application to automate the process of 'procurement of works and contracts' for the Project and Planning Section of the Maharashtra State Power Generation Company Limited (MAHAGENCO)

Conclusion

The e-tendering system proved to be beneficial to both MSEB and suppliers. The automation dramatically reduced flow of paper files and follow up, while online payment transactions accelerated the tender process, thereby reducing the lead time for procurement. The most important aspect is that suppliers are no more required to come to the MSEB office for tender purchasing, submission and opening, thereby reducing the cost of tendering. The online system has offered fast and more transparent tendering process.

The implementation of e-tendering system requires involvement of users from all levels in the organisation hierarchy and commitment from the top management. e-Tendering has shown a way to boost internal savings and enabled corporations to cut down the final cost of their products. The uses of e-tendering system do not require sophistication in computer knowledge, and vendors and officers with different background can successfully participate in the process.