

Chapter-III

Information Systems Audit

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Department Personnel and Administrative Reforms

3.1 e-Procurement

3.1.1 Introduction

Government of Karnataka (GoK) envisaged a project to provide unified end-to-end e-Procurement solution to cover all procurement processes from preparation of estimate/indents to final payment of bills to the contractors. The main objective of the e-Procurement project (project) was smart governance, improvement of efficiency, cost saving, ensuring consistency in cost of goods, providing fair competitive platform, arresting cartel formation of suppliers/ contractors/bidders *etc.*

All the departments of the State Government whose tender value is more than ₹ five lakh are mandated to float tenders through the e-Procurement portal. The work relating to e-Procurement was awarded (December 2006) to M/s. Hewlett Packard Sales India Private Ltd (Partner) as Application Service Provider adopting Public Private Partnership model where the bidder pays for using the services. The revenue earned is shared between the Partner and the Centre for e-Governance, Department of Personnel and Administrative Reforms (DPAR), the implementing agency as per agreed rates. The project went live during March 2011. The project consisted of the following modules.

- | | |
|--------------------------|----------------------------------|
| 1. Supplier Registration | 6. e-Auctions |
| 2. Indent Management | 7. e-Payments |
| 3. e-Tendering | 8. Accounting |
| 4. Contract Management | 9. Management Information System |
| 5. Catalogue Management | |

The Secretary to Government, DPAR is the head of the department and is assisted by the Additional Secretary to Government. There are two subordinate organisations under DPAR: the Centre for e-Governance (CEG) and the Directorate of Electronic Delivery of Citizen Services. The CEG is a society which implements various projects relating to DPAR (e-Governance). The e-Procurement project is administered by CEO, e-Governance.

3.1.2 Audit Objectives

The audit of e-Procurement was undertaken to ascertain whether:

- The project had achieved its intended objectives of transparency, efficiency, smart governance and cost savings through increased competition in public procurement.

- The overall control of the application and database were adequate to ensure security, reliability and integrity of data and the system.
- Mapping of business rules into the system was provided.

3.1.3 Audit criteria

The criteria for audit were:

- Karnataka Transparency in Public Procurement Act, 1999 (KTPP Act)
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- Government orders, circulars and guidelines issued by the State Government relating to procurement.
- eSAFE-GD220-Assessment Guidelines Ver 1.0 issued by the Department of Information Technology, Government of India.
- Open Web Application Security Project (OWASP) – Top Ten. This represents a broad international consensus about the most critical web application security flaws.

3.1.4 Audit Scope and Methodology

Entry conference for the audit was held in March 2015 and exit conference was held in November 2015. The audit was conducted during December 2014 to June 2015.

The methodology adopted included analysis of data and testing of application interface. Dump of the data provided (from March 2007 to December 2014) by the CEG was analysed using Mysql.

The e-Procurement portal consists of several components such as the database server, the databases, various objects in the database, the web application and the operating system. The configuration/content of each of these components decides the behaviour and functionality of the e-Procurement portal. Documentation on configuration management⁴⁹, its baselining and change control was not produced to audit. Also, the database provided did not contain information on the uploads by departmental officers as well as suppliers. The scope of the audit enquiry was therefore limited to data analysis of the database and testing of the portal interface. The audit was concentrated on the Indent Management, Supplier Registration, e-Tendering and Contract Management modules.

⁴⁹ Configuration Management refers to the process for recording and updating information that is related to the IT infrastructure.

3.1.5 Audit findings

3.1.5.1 Transparency objectives not met

(a) Tender evaluation reports not published in the portal

Section 14 of KTPP Act, 1999 read with Rule 26 of the KTPP Rules, 2000 states that Evaluation Report of the tender has to be published in the Tender Bulletin.

Audit, however, observed that the system had not ensured that such information is made available in the portal. For instance, audit found that when the tender submitted by a bidder was rejected, the system, except for showing the status of the bid of the bidder as rejected, did not display reason for rejection. Thus, the system lacks transparency.

The Government replied (November 2015) that e-Procurement portal provides option to upload the proceedings of tender evaluation which could be viewed by the participating bidders. Since the upload option was not made mandatory, the e-procurement portal did not display the tender evaluation and hence the bidder was unaware of the reasons for his rejection. It is seen that some of the appeals arising could be attributed to this which could have been avoided by *suo motu* disclosures. This is discussed in **paragraph 3.1.5.4**.

(b) Incomplete/Incorrect Status of tenders

The life cycle of a tender starts with its publishing and ends with completion of the procurement process. The status of tenders at various stages was extracted by Audit from the portal. The data revealed inconsistencies. For e.g. the number of tenders which were under evaluation as on February 2015 was shown as 22,279. An analysis of these tenders showed that the earliest tenders were of Feb 2009 which cannot be the case, as the bid validity period of these tenders has expired. This incorrect status has a cascading effect on the data regarding the number of tenders for which evaluation has been completed and the number of tenders which have been awarded.

Audit observed that the tender inviting authorities had not updated the status of the tenders after the evaluation of the tenders was completed which has led to incorrect/incomplete status being depicted in the portal. The Government had not insisted that the tender inviting authorities update the status of the tenders. As a result, the information about the works completed or the works in progress could not be ascertained from the portal. Hence, no reliable database on goods, services, works and contractors was available from the portal.

The Government replied (November 2015) that periodic directions to user departments were being issued to utilise the e-Procurement portal for completion of all the tender activities which would result in automatically updating status of tenders. The reply is not acceptable as instructions will not be effective unless government makes it mandatory for all user departments to use the downstream workflows.

(c) Incorrect disclosure of goods tenders

The e-Procurement portal provides an interface to view the details in respect of bidder selected for the purpose of transparency and availability of pertinent information. In respect of goods tenders, however, it was seen that the information presented by the portal about the bidders selected was incorrect and ambiguous. A few illustrative instances are detailed in **Appendix-3.1**.

The Government replied (November 2015) that the audit observation was noted and would be placed before Change Management Committee for implementation.

(d) Area wise information regarding tender not available

While inviting tenders through the portal, the District and Taluk fields were not made mandatory, thereby giving a choice to the tender inviting authorities to either type in the same or not. This resulted in a possibility of the tender inviting authority not filling this data, thereby leading to insufficient data to provide information about ongoing works or completed works in a particular district/ taluk. Hence the district wise search in the portal was non functional. The user had to browse across all the departments and subordinate offices to filter all the tenders called for in a particular area. This resulted in lack of provision for viewing and for searching tenders area wise.

The Government replied (November 2015) that since the works could pertain to several districts/taluks, capturing of data was made optional. The reply is not acceptable as the system could have been designed to capture multiple districts.

3.1.5.2 Efficiency and Smart governance objectives not met

Smart governance aids in increased transparency, monitoring and control of procurement processes. Issues of efficiency and smart governance arising due to failure to map business rules in the system are discussed separately under paragraph 3.1.5.4.

(a) Contractors misleading the Government on tender capacity

The KTPP Rules, 2000, provides for pre-qualification of tenders on the basis of financial status and capacity. In addition, the State Government in its circular and guidelines (December 2002 and October 2008) had laid down the method of calculation of Assessed Available Tender Capacity which involved value of completed works, existing commitments and ongoing works.

In order to assess the financial status and capacity of the bidder, a statement on existing commitments and ongoing works was made part of the bid document by the tender inviting authority. Also, functionality was provided in e-Procurement to assist the tender inviting authority to verify the tender capacity. Audit, however, observed that these functionalities were ineffective for the following reasons:

- The supplier history information in the e-Procurement merely displayed details of supplier such as tender number, tender status, bid value and evaluation completion date. It did not show information on final bid amount, anticipated date of completion, stipulated date of completion, actual date of completion, quantity of work completed, status of work *etc.* In the absence of this vital information, the system could not calculate existing commitments, ongoing works or value of completed works of a contractor/supplier. Hence, the statement provided by the bidder was accepted as true.
- Regarding financial turnover of the bidder, the portal required the bidder to upload scanned documents supporting his financial turnover. The portal did not capture the financial turnover information in fields designed for that purpose. Since portal did not provide for appropriate fields which are inputs to calculate the financial turnover or the tender capacity, the eligibility with respect to financial capacity had to be worked out manually by the Tender Inviting Authorities.
- On account of not making the qualification criteria *viz.*, tender capacity and past performance mandatory in the system, the tender inviting authorities did not consistently incorporate these requirements in their notice inviting tenders.

All the above, resulted in the works being awarded to ineligible supplier/contractors. It is observed that out of 2,69,652 tenders that have been processed by the portal and out of 67,883 suppliers in the system, financial turnover of only 291 suppliers were available.

Thus, the incomplete and contextually inadequate information in the system would provide an opportunity for the bidder to suppress existing commitments and enhance his tender capacity, which ultimately would rule out new competition. Audit undertook a time consuming exercise of viewing web page after web page and downloading the scanned images uploaded by the bidders and identified a case of suppression of information and resultant award of tender to the ineligible contractor as shown below.

A contractor had submitted a bid (28 January 2013) for Tender notification KPWD/2012-13/RD/WORK_INDENT13589 which was decided in his favour. As part of the bid documents uploaded, the contractor had disclosed that he had already submitted a bid for a work for ₹3.75 crore. On the contrary, Audit observed from the database of the e-Procurement portal that as on that date (28-Jan-2013), the said contractor had at least six bids (**Table-3.1**) which were under consideration amounting to a total Estimated Value of more than ₹52 crore. The contractor, however, had not disclosed about other bids. All the six bids were submitted between 17 December 2012 and 23 January 2013 which are listed below. Out of these, the contractor had won five works estimated over ₹44 crore (Sl.No. 1, 2, 3, 5 & 6).

Table-3.1 : Details of bids

Sl. No.	Tender notification	Estimated Value in ₹	Bid submission date	Bid number	Whether disclosed
1	KRRDA/2012-13/KS 22-10	11,70,87,401	2013-01-23 14:09:11	B530897	No
2	KRRDA/2012-13/KS 21-10	10,73,64,134	2013-01-23 14:07:41	B527544	No
3	KRRDA/2012-13/KS 21-06	10,57,03,719	2013-01-23 12:27:39	B531120	No
4	KRRDA/2012-13/KS 26-08	8,03,46,823	2013-01-23 12:26:46	B531200	No
5	KRRDA/2012-13/KS 26-05	7,78,04,701	2013-01-23 12:25:39	B531142	No
6	KPWD/2012-13/RD/ WORK_INDENT12307	3,75,26,075	2012-12-17 10:38:18	B494572	Yes

(Source: e-Procurement database)

Calculations shown below reveal that his bid for tenders amounting to ₹20.10 crore had to be rejected as his turnover was not sufficient to meet the requirements of the tenders.

The turnover of the contractor as per information available in the portal is shown in **Table-3.2**:

Table-3.2: Turnover of the contractor

Year	Turnover (₹)	Year	Turnover (₹)
2006-07	3,91,73,246	2009-10	20,03,12,601
2007-08	9,84,92,131	2010-11	28,71,37,532
2008-09	11,57,32,965	2011-12	24,74,93,502
Maximum turnover during these years 28,71,37,532			

(Source: e-Procurement portal)

The actual turnover requirement of the contractor is shown in **Table-3.3**

Table-3.3: Actual turnover requirement for the tenders

Tender number	Estimated cost (₹)	Finalisation date	Final turn over requirement in rupees (₹)	Cumulative requirement (₹)	Eligibility
KPWD/2012-13/RD/WORK_INDENT12307	3,75,26,075	23/02/2013 03:59 PM	7,50,52,000	7,50,52,000	Yes
KRRDA/2012-13/KS 21-06	10,57,03,719	25/02/2013 03:44 PM	7,92,77,790	15,43,29,790	Yes
KRRDA/2012-13/KS 21-10	10,73,64,134	25/02/2013 03:52 PM	8,05,23,101	23,48,52,891	Yes
KRRDA/2012-13/KS 22-10*	11,70,87,401	25/02/2013 04:28 PM	8,78,15,551	32,26,68,442	No
KRRDA/2012-13/KS 26-05*	7,78,04,701	25/02/2013 04:37 PM	5,83,53,526	38,10,21,968	No
KPWD/2012-13/RD/ WORK_INDENT13589*	64,63,299	21/03/2013 15:26:21 PM	67,40,000	38,77,61,968	No
* works awarded in excess of eligibility	₹20.10 crore				

(Source: e-Procurement database)

It can be seen that the contractor was awarded works worth ₹20.10 crore in excess of his financial capacity.

Thus, despite e-Procurement being in possession of all the information indicating that the tenderer is ineligible, these works were awarded to the ineligible contractor. This is because the e-Procurement system is ineffective in implementing the business rules of GoK.

For every tender awarded to an ineligible contractor in excess of his capacity, a deserving contractor was denied the opportunity and government lost its chance to increase the breadth of its contractor pool. This prevented e-Procurement from helping the Government achieve its objectives of cost savings through higher competition as competition is prevented from growing.

This is indicative of ineffective requirements gathering and requirements communication, inadequate customisation of the software to meet the business rules of GoK, and poor testing of the system. This impacts the objective of smart governance in implementing e-Procurement.

The Government replied (November 2015) that the above lapse would be taken care in the envisaged e-GP 2.0⁵⁰.

(b) Management of password

One of the objectives of the e-Procurement project was bringing about transactional effectiveness by eliminating or automating non-value adding steps within the procurement to enable efficient and effective processes.

We observed that about 900 to 1,200 requests for change of password per year had taken place between the stakeholders and the management due to users request or password being forgotten.

The service provider, however, had not taken steps to overcome this deficiency in the portal using alternative channels built into the online platform. This would have reduced the correspondence regarding resetting of password to a large extent and also ensured achievement of the envisaged objective mentioned above.

The Government replied (November 2015) that management of password by using Mobile One facility was being considered.

(c) Non-creation of centralised catalogue

The catalogue management module in e-Procurement has to ensure the best price of goods and services across all departments to achieve the objective of internal arbitrage. However, it was seen that the design of tables relating to the catalogue management module did not have the flexibility to permit this, as each department had a different catalogue organised hierarchically based on the items created under that department. Also, this defect in the design resulted in the system not being able to automatically display the last purchase rate of the item which was intended to be purchased by any entity presently. This was due to the same item being identified by different item codes and IDs in different catalogues by different departments.

The Government replied (November 2015) that centralised item code catalogue management was noted to be implemented in e-GP 2.0.

⁵⁰ e-GP 2.0 is the next generation e-Government Procurement System

(d) Submission of Earnest Money Deposit by way of Financial Instruments

The KTPP Rules, 2000, defines Earnest Money Deposit (EMD) as amount required to be deposited by a tenderer along with his tender indicating his willingness to implement the contract. Further, the EMD could be submitted in full cash or partly by cash and partly by instruments such as Bank Guarantee, Demand Draft, Savings Certificate *etc.*

When the EMD is collected partly by cash and balance through other instruments, the tenderer has to make online payment of the cash portion and attach scanned copies of financial instrument which has to be submitted to the tender inviting authority in original later.

Audit, however, observed that there was no uniform timeline prescribed for submission of EMD by means of financial instrument (original). Hence, each tender inviting authority prescribed different periods *viz.*, on or before the last date and time of bid submission, before the date of opening technical bid and at the time of opening technical bid.

On analysis of data, we observed that there were cases where a tenderer did not submit original bank guarantee in as many as 37 times and the EMDs were not forfeited.

The above scenario did not ensure adequate control with the tender inviting authority, and these weaknesses were misused by some of the tenderers by not submitting original bank guarantees. The Government replied (November 2015) that the issue was discussed in various Steering Committee Meetings and also stated that the CEG intends to develop a system required for implementation of electronic Performance Bank Guarantee (ePBG) in e-Procurement system.

(e) Work queue and prioritisation of tasks

The dashboard of the e-Procurement portal displays a chronological list of pending tasks pertaining to the user of a department who has logged in. Generally, the tasks are grouped into Indent, Notice inviting tender/Detailed tender schedule/ Addendum/Corrigendum, Purchase request, Purchase order, Contract Management-Bill approval, Contract Management – Contract approval *etc.* We observed that the user could attend to the tasks in any order in the pending list.

The Government replied (November 2015) that though each task was classified and placed chronologically, there was no hard and fast rule to dispose the task in the same chronological order. The reply is not acceptable as there was no exception report to monitor cases where tasks were disposed out of turn ahead of other pending tasks. Thus there was no way to monitor tasks disposed out of turn.

(f) Management of Earnest Money Deposit

The bidders along with bid documents, make payment towards tender processing and also EMD. In case of successful submission of bid through e-Procurement portal, EMD is retained till tender is awarded to successful bidder, and the EMDs in respect of unsuccessful bidders are to be refunded.

An analysis of the database pertaining to e-Procurement revealed the following:

- There were 7,371 cases where contractors had not completed submission of their bids. Since the system allows the users to make payments prior to submission, the system had accepted both the payments towards tender processing fee and EMD in all the above cases. The EMD with respect to the said cases worked out to ₹93.60 crore. Since the system had not been incorporated with automatic refund of EMD in such cases, the refund had to be initiated by the tender inviting authority. Due to delay in initiation of refund, as on December 2014, there were 5,858 cases pending with EMD amounting to ₹63.52 crore.
- Further, we observed that as of July 2014, there was EMD amounting to ₹1,123 crore with the CEG which was to be refunded to the unsuccessful bidders (1,37,415 bids). Year-wise breakup of such bids is detailed in **Table-3.4**.

Table-3.4: Year wise breakup of unsuccessful bids

Year	No of bids	Year	No. of bids
2008	101	2012	8,340
2009	810	2013	29,589
2010	2,848	2014	86,550
2011	8,356	Without date	821

(Source: Database provided by CEG)

The system, however, was not designed to issue any alert to the tender inviting authority about the pendency position.

- Analysis of the data in respect of refunds already made showed that in respect of 1,48,731 cases, the refund ranged between 10 to 2,099 days. In addition to the above, there was delay of 10 to 1,644 days in 7,508 cases from the date of instruction received for refund by the respective department and the actual date of refund.

The Government replied (November 2015) that CEG has taken action to inform the departments regarding pendency of refund of EMD. The reply is not satisfactory, as the CEG could consider automation of refund of EMD.

Recommendation-1: Scope for automatic refund of EMD should be explored to overcome the delay in the process.

3.1.5.3 Security and Integrity**(a) Bidder's identity disclosed prior to closing of tender date-Application did not implement security**

Rule 15 to 19 of the KTPP Rules, 2000 specifies procedures for receipt and opening of tenders wherein it states that the bidder's identity should not be

disclosed prior to the date of opening of tender. However, e-Procurement has not ensured free and fearless participation of bidder and participation with anonymity as envisaged in the KTPP rules.

Audit observed that it was possible to know the identities of bidders (such as name, address and phone number) who were participating in the tender, prior to closing of the tender. This was due to insecure coding practices in the application.

Instances where the audit could ascertain the identity of the bidders when bids were still open are brought out in **Table-3.5**.

Table-3.5: Instances where identity of the bidders were disclosed prior to closing date

Tender Number and name	Tender Closing time	Date and time when audit penetrated the system and accessed the bidder information
KPWD/2015-16/OW/WORK_INDENT20311 Improvements & Widening of Baloba cross to Khadaklat Kothali Shantigiri Chinchani road from Km No, 13.65 to 15.25, (Kothali to SH-18) 16.20 to 18.95 (Shantigiri X to Shantigiri) & 19.30 to 21.10 (Kuppanwadi to kuppanwadi X) In Chikodi taluka of Belagavi Dist under HoA:5054-Plan-MDR-Imp-2014-15-App-E	25/06/2015 16:00:00	24/06/2015 16:57
CEG/12/Sec-Lan/2015 Procurement of SPAM Filtering Software	30/06/2015 17:00:00	24/06/2015 12.45
CEG/15/SEMT/2015 ICMS PMU High Court of Karnataka	06/07/2015 17:00:00	24/06/2015 12.43 pm

(Source: e-Procurement portal)

The Government replied (November 2015) that the CEG has taken steps to rectify the problem during November 2015.

(b) Improper implementation of digital signature

According to the ‘Guidelines for Usage of Digital Signatures in e-Governance’ Version 1.0 (December 2010), Government of India, a digital signature is an electronic signature that can be used to authenticate the identity of the sender of a message or the signatory of a document, and to ensure that the original content of the message or document that has been sent is unchanged. Thus, digital signatures provide message authentication, message integrity and message non repudiation.

Analysis of the working of the portal showed that for each form various decisions were involved by various user categories. Illustrative forms are listed in **Table-3.6**.

Table 3.6: Decisions involved in various forms

Form	User category	Decision involved
Project Approval Decision	Departmental officer	Approve/Reject/Send back for clarifications/Delegate
Letter of intent acceptance or rejection	Contractor	Accepted / Rejected / Clarification
Performance Guarantee Submission	Contractor	Accepted / Seek clarification
Contract approval page	Departmental officer	Approve/Reject/Send back for clarifications/Delegate
Review performance guarantee submission	Departmental officer	Accepted / rejected

(Source: e-Procurement portal)

We however observed that the interface allowed the user to sign the form even prior to selecting the decision and thus the signature did not contain and bind the decision to the signer. Hence, all the data compiled from such forms suffered from uncertainty about message integrity and non repudiation was not captured reliably.

The Government replied (November 2015) that matter with respect to works tender was addressed and action would be initiated with respect to Goods and services tenders.

(c) Security risk due to defective implementation of two factor authentication

The e-Procurement portal has the option to enforce two factor authentication by way of user-id and password followed by digital signature of the user. The two factor authentication is used to prevent access to further application functionality such as menus or links that could be used by the authenticated users only. Audit, however, noticed that due to defective implementation of the two factor authentication system, the user was able to access application functionality bypassing the two factor digital signature authentication. This posed a security risk as the application was trusting the browser and not validating the browser requests at server side.

This occurred due to improper session⁵¹ management⁵² for authentication. The Government replied (November 2015) that issue was fixed by the Partner in July 2015.

(d) System vulnerable to hacking by hijacking tasks

The e-Procurement portal has implemented workflows for various items of work or actions to be performed by different users *viz.*, all Government officials and contractors. Activities such as initiation, forwarding approval, acceptance, rejection, appeal *etc.*, are presented to the users in the form of a dash-board, when they login to the system, which acts as a logical “in-tray” for the users.

Audit observed that the tasks lying in the dashboard of a user could be removed by any other user (attacker) and the task gets transferred to the attacker’s control. A security weakness in the e-Procurement workflow engine, availability of task reference (Task-Ids identifying the tasks are serially numbered and available in the URLs⁵³), and inconsistency in authorisation checks in e-Procurement application enabled attackers to hijack tasks belonging to other users. The application was not consistently verifying whether the user requesting a resource is authorised to access it, thereby violating the standard of security⁵⁴.

⁵¹ The user interacts with the web application by way of Hyper Text Transfer Protocol requests and responses. This is termed as a session

⁵² A3 Broken authentication and session management

⁵³ Uniform resource locaters

⁵⁴ OWASP 2013 A4 Insecure Direct Object Reference and A7 Function level access control

This weakness breached confidentiality, made tasks vulnerable to attacks, and affected the integrity and reliability of the system. This arose because the system generated the web pages with menus to execute only authorised functions but did not perform appropriate server side validation.

The attack was demonstrated by audit to the Department. After the issue was pointed out in audit, the Government replied (November 2015) that issue was fixed by the Partner.

(e) System vulnerable to hacking through session hijacking

Sessions provide the application the ability to establish access rights that apply to each and every interaction a user has with the web application for the duration of the session. Each session is identified by a session_id. In this regard, Audit observed that the system was not protecting user sessions and was permitting scripts to be injected in the system. This allowed the attacker to remotely collect the session_id of the victim, and enter into his session. Hence, the system was open to session hijacking which constituted a serious vulnerability. The vulnerability could be used to impersonate the victim, terminate their sessions, view their activities and menus, etc. In short, it compromised confidentiality as well as security in the system.

The Government replied (November 2015) that issue was fixed by the Partner after audit observation was issued.

Recommendation-2: Periodic security reviews should be conducted to plug security weaknesses in the system.

(f) Digital signatures not appended to the communications

All the correspondence in the portal had to be digitally signed by the Tender Inviting Authority as defined in Request for Proposal under Public Key Infrastructure Digital Signature Certificate. We observed that none of the communications issued by the tender inviting authority were digitally signed. They were either unauthenticated plain Word or Portable Document Format (PDF) files which were neither embedded with digital signatures nor accompanied by digital signatures. Hence, these unauthenticated documents did not bind the issuer to the documents issued.

The Government replied (November 2015) that some of the documents provided by the department could be used by the bidders without changing the format or content. It also stated that at any point of time the correctness of the documents could be verified from those available in e-Procurement portal. The reply is not acceptable as all the documents available in the portal were not digitally protected and hence were susceptible for alteration during transit.

(g) Disaster Recovery: Non-availability of disaster recovery site

Business continuity planning refers to working out how to stay in business in the event of a disruption. Disaster recovery is a critical component of business continuity planning. In respect of e-Procurement, though the disaster

recovery site has been envisaged to be set up at Suvarna Soudha, Belagavi, it is yet to be created. Instead, site replication is carried out at another storage system at State Data Centre, Bengaluru for faster retrieval of data in the event of a storage failure. However, this does not ensure continuity of business in the event of a disaster affecting the State Data Centre in Bangalore.

3.1.5.4 Mapping of business rules

(a) Poor implementation of Contract Management Module

The Contract Management module deals with the processes involved between the issuance of the work order and the final payment of bills to the contractor. The implementation of this module would *inter alia*, enable the Government to maintain an overview of works in progress and build a repository of information that could be used to measure the performance of a contractor.

The data generated by the contract management module is also used in the e-tendering module during the technical bids evaluation where bid capacity is to be assessed.

Analysis of e-Procurement data showed the following:

Total number of works tenders floated through the portal ⁵⁵	1,47,168 tenders
Number of tenders where the contractor selection has been completed.	1,28,453 tenders
Number of works whose contract management is handled in e-Procurement.	41 tenders

Thus, against 1,28,453 works where contractor selection has been completed, the contract management information was available in e-Procurement only in respect of 41 works. This indicated poor implementation of contract management module. Poor availability of contract management information had cascading impacts on tender evaluation processes as the latter requires contract management data for technical evaluation processes.

The Government in reply (November 2015) stated the following:

- The Contract Management Module was dependent on (i) treasury system to integrate with e-Tendering modules, (ii) banks to integrate with e-Payment system, (iii) capacity of contractor to enter milestones, (iv) availability of Information Technology (IT) and network infrastructure in all locations *etc.*, and hence could not implement the said module. The reply, however, is not acceptable. From the proceedings of the Tenth meeting of Steering Committee (March 2015) it is evident that the Contract Management Module was not used due to bugs in the application and that the Partner was unwilling to make changes to the software as required by the departments (business rules) but tried to enforce existing version of the software on the users. Further, it was noticed that there was negligible training in the area of Contract Management Module.

⁵⁵ Tenders in “Published”, “Closed”, “Under_Evaluation” or “Evaluation_completed” status

- Government has also conceded the poor uptake of Contract Management module and stated that a three member committee has been constituted to analyse the root cause for the poor uptake.

Recommendation-3: Government should ensure incorporation of the business rules relating to contract management processes and enforce the implementation and utilisation of the Contract Management Module to optimise the functioning of the tender process.

(b) Appeals pending

The KTPP Act, 2000, read with KTPP Rules provide for appellate authorities to hear appeal from any tenderer aggrieved by an order passed by the tender accepting authority. The authorities shall as far as possible dispose of the appeal within thirty days from the date of filing.

Analysis of the database of the portal showed the following:

- As at the end of December 2014, out of 1,665 appeals submitted by different tenderers, decision was taken only in respect of 431 cases. There was no response from the appellate authorities in respect of balance 1,234 cases. The appeals pending during the period December 2008 to December 2014 are indicated in **Table-3.7** below:

Table-3.7: Period of appeals pending

Year from which appeal pending	Number of appeals pending
2008	1
2009	21
2010	62
2011	126
2012	235
2013	299
2014	490

(Source: Database provided by centre for e-Governance)

- One of the reasons for appeals pending was due to appellate authorities not logging into the portal. The portal however, was not designed to alert the user automatically after completion of the period prescribed. As at the end of December 2014, against 634 appellate authorities, while 166 had never logged into the portal, 332 appellate authorities had not logged into the portal for over three months.
- The second reason for appeals pending was wrong mapping of appellate authorities in the portal. According to KTPP Rules, the Head of the Department was the Appellate Authority in case of tender accepting authority being subordinate to the Head of the Department. In case of tender accepting authority being Head of the Department, local authority, State Government Undertaking, Board, Body Corporate or any other authority owned or controlled by the Government, Government was the appellate authority. In this connection, we observed that in the e-Procurement system, the appellate authority role was assigned to the Government, irrespective of the tender accepting authority, which was contrary to the rules specified.

- Review of appeals showed that the interface does not provide for categorisation of appeals and most of the reviewed cases are seeking reasons for rejection which could have been addressed by publishing the tender evaluation reports in the portal which has already been discussed in paragraph 3.1.5.1(a) above.

The Government replied (November 2015) that the portal was designed as per the specifications under KTPP Act and the concerned departments had to ensure its utilisation.

Recommendation-4: Government should conduct training programmes for higher authorities to sensitise them to the importance of using the portal

(c) Blacklisting of Contractors

During the period 2012-14, eight contractors were blacklisted by various departments. Analysis of the supplier data in the portal, however, showed no such contractors to have been blacklisted. By not creating such facility in the portal, there was a risk of entrusting the works to blacklisted contractors.

The Government replied (November 2015) that various modalities of blacklisting contractors are being considered by them. The reply is not acceptable as the blacklisted suppliers are not shown as such in the portal.

(d) Work flow for handling short term tenders

The KTPP Rules, 2000, states that the tender inviting authority had to ensure that sufficient time is provided for submission of tenders. The minimum period for tenders up to ₹ two crore in value is thirty days and in excess of ₹ two crore in value is sixty days. Further, any reduction in time is to be specifically authorised by an authority superior to the Tender Inviting Authority and the reason for such reduction has to be recorded. Thus there is a difference between the approval workflows of short term tenders and full term tenders as the reasons for reduced tender period have to be specifically captured.

From the data, we observed that between November 2007 and December 2014, of the 2,69,941 tenders being floated through the portal, period in respect of 2,26,849 tenders was less than the minimum period prescribed in the KTPP Act, 1999. In this regard, we observed that:

- The system did not apply minimum default tender periods for tenders based on their estimated cost;
- The workflow did not mandatorily record reasons for calling tenders with less than the minimum period prescribed in the KTPP Act, 1999.

As the reasons for resorting to short term tendering were not consistently recorded, the objectives of transparency, increase in competition and smart governance were adversely affected.

The Government replied (November 2015) that long duration for bid submission did not ensure more participation. It further stated that e-Procurement portal was designed in accordance with functional requirements of KTPP Act, 1999. The reply was not acceptable as the provision under the said Act was envisaged to ensure more participation. Further, since the reasons for calling tenders with less than the minimum period prescribed in the KTPP Act, 1999 was not recorded mandatorily, the portal was not designed completely in accordance with the functional requirements of KTPP Act, 1999.

3.1.5.5 Inadequate testing

(a) Uploaded documents could not be viewed

Various documents such as technical proposals, corrigendum issued by the departments, addendums to the technical proposals called for *etc.*, are uploaded by tender inviting authorities. Similarly, documents are uploaded by bidders, which are to be viewed by the tender accepting authorities. Audit, however, observed that these documents could not be viewed by the bidders/department and hence resulted in incomplete information being available in the portal.

The Government replied (November 2015) that the issue was at the local computer and e-Procurement did not have control over local computer. It also stated that all bid documents signed and submitted by bidders were visible by the concerned departments. The reply is not acceptable as the issue was related only with respect to corrigendum, addendums and the like and hence it was not a local personal computer issue.

(b) Incorrect supplier history

Information on the supplier history is provided in the e-Procurement portal and we observed that the information so provided was incorrect and misleading. Instances are brought out below:

- The portal displays the supplier M/s. Tata Motors had been selected in respect of 73 tenders under one representative of the company, while it displays the same supplier to have been selected in 20 tenders under another identity. Since both the individuals represent the same supplier, the information provided by the portal was incorrect and misleading.
- The portal also gives incorrect information with respect to individual suppliers. The portal allowed an individual to have more than one account.

On carrying out a test-check of the database, we observed that such inconsistent data existed in the e-Procurement system in respect of 329 contractors. This defect in the design of the application not only provided incorrect and misleading information, it also indicated that the testing had been ineffective.

The Government replied (November 2015) that the audit observation would be placed before the Change Management Committee for approval so that the entire list of tenders against a company would be displayed to the Tender Evaluating Authority.

(c) *Incorrect Management Information System Report*

The Management Information System (MIS) is a critical component, which collects, records, stores and processes data from all the departments in an integrated manner. It also provides a feature known as MIS Reports from where the user can extract details of tenders. It has an option to filter the data on parameters such as tender status, date of publishing of tender, amount of tender *etc.* All such information with respect to the report are drawn from the table “mis_tender_details”. Analysis of this table showed that in 34,185 cases pertaining to 133 departments for the period from 2008 to 2014 were published even before Detailed Tender Schedules were approved. Audit further noticed that the table was used as input for two more MIS reports namely Tender Item Details Report and Prequalification Tender Details Report. The prevalence of such incorrect data led to unreliable MIS reports.

The Government replied (November 2015) that the Partner had fixed the issues.

3.1.5.6 *Other observations*

(a) *Managerial Controls: IT Governance*

IT Governance integrates and institutionalises optimal ways of planning and organising, acquiring and implementing, delivering and supporting, and monitoring IT performance.

We observed that the project was intended to go live in six months (June 2007) but failed to do so until 2011.

The project was to undergo third party audit and security audit biannually for acceptability and security of the project respectively. We, however, observed that the third party which was to assess and certify the acceptability of e-Procurement system failed to complete the audit within six months (December 2007). The guidelines for the audit were not firmed up until April 2009 and hence the audit was not completed until 2010. This prevented the platform from going live until 2011. Also, we observed that the security audit was not conducted during the last four years. This resulted in the portal running with inherent security weaknesses in its design.

(b) *Non-availability of System Requirement Specification*

A properly documented System Requirement Specification (SRS) by the software development team ensures that the needs of the users of the system have been taken care of and the software developed meets the business requirement.

As per the Master Services Agreement and Project Engagement Definition Document (PEDD), the responsibilities of the Partner included submission of

detailed documentation on the TO BE processes for each of the departments or organisations and getting sign-off on them.

These TO BE processes formed the basis for designing the SRS and developing the e-Procurement system. Further, the Partner was also responsible for getting sign-off on SRS processes from the departments or organisations. The said documentation was also to be updated as and when changes/ enhancements/bug fixing were made to the system. Thus, the updated SRS would have documented all the processes as implemented in e-Procurement. Without such documentation, the software cannot be developed nor maintained in a professional manner. In the current case, the narration /explanation/expansion/elucidation of the processes being followed and to be followed is the property of Government.

Audit, however, observed that the SRS was not available with the Government.

The Government replied (November 2015) that SRS was a detailed technical document typically not well understood by non-technical resources and hence sign-off on the SRS by departments would have caused delay in rolling out the software. The reply is not satisfactory as in the absence of detailed user requirements documentation, the SRS was the only document which could be used as the basis to ascertain whether the users requirements were elicited and incorporated in the application. In this regard, the Government stated that action would be taken to ensure all the required documentation of the existing system is obtained from the Partner at the time of Exit Management in order to avoid duplication of efforts in the proposed e-GP 2.0.

3.1.6 Conclusion

Delay and poor implementation led to the government not deriving full benefit of the unified e-Procurement solution. The off-the-shelf e-Procurement application was not adequately customised to suit the specific user requirements and KTPP provisions. Opportunities for using IT for improving efficiencies has not been utilised fully. Inadequate testing had led to incomplete supplier history and incorrect management information system reports. The application suffered from four out of the OWASP Top Ten⁵⁶ security vulnerabilities.

Although the Government had intended to implement an end-to-end procurement solution with benefits of transparency and smart governance, the e-Procurement portal had no information about contracts concluded, works in progress, works completed, goods supplies done, expenditure progress, abandoned works, letters of intent and works yet to be started. Thus, the project failed in achieving its intended benefits of transparency and smart governance, leading to a situation where the envisaged end-to-end procurement solution for Government of Karnataka was used only as a tender processing website even after eight years of its implementation.

⁵⁶ A2, A3, A4 and A7