

MUNICIPAL ADMINISTRATION AND URBAN DEVELOPMENT DEPARTMENT

2.2 Information Technology Audit of Soukaryam – an e-Governance initiative of Greater Visakhapatnam Municipal Corporation

Highlights

Greater Visakhapatnam Municipal Corporation (GVMC) implemented ‘Soukaryam’ (meaning facility), an e-Governance project to provide civic services to the citizens in a speedy and transparent manner. IT audit of the implementation of Soukaryam revealed inadequate efforts in project planning, application development, back up recovery/ disaster recovery plans, absence of controls, logs and policies resulting in breach of security and integrity of data, exposing the system to possible manipulation. Inadequacy of an audit trail made it difficult to identify and fix responsibility in the event of unauthorized access and subsequent manipulation of data/application. Irregularities in data were noticed during data analysis. GVMC still depends on manual procedures to a significant extent and hence was not deriving full benefits of the IT application.

System Requirement Specification (SRS) was prepared five years after the implementation of Soukaryam defeating the very purpose.

[Paragraph 2.2.5.2]

Soukaryam did not have a built in module for an audit trail, and the logs maintained were incomplete thereby exposing the system to inadequate accountability.

[Paragraph 2.2.7.3]

Most of the Bulk/ Semi-bulk water meter readings were not fed to the computer database, indicating deficiencies in implementation.

[Paragraph 2.2.8.2]

Annual budget figures of GVMC did not tally with the computer database figures, depicting inconsistencies.

[Paragraph 2.2.9.4]

Revenue collections such as property tax, water charges and lease charges amounting to Rs 1.85 crore were not accounted for.

[Paragraph 2.2.9.5]

e-Procurement facility was not utilised in order to take benefits of competitive prices, etc.

[Paragraph 2.2.10.2]

‘Redressal of citizens’ complaints through website based complaints module was ineffective.

[Paragraph 2.2.12.1]

2.2.1 Introduction

Greater Visakhapatnam Municipal Corporation (GVMC)⁸ is responsible for discharging civic functions like town planning and provision of water supply, sewerage, roads, slum improvement, public health etc. GVMC fixes and collects property tax, water charges, advertisement tax, etc.

GVMC launched an e-Governance project - 'SOUKARYAM' (meaning facility) in 2000, for delivering civic services on-line. Soukaryam provides access to citizens through its web site⁹ for information on various services offered by GVMC, details of tax dues/ payments and for making payments and lodging complaints. Soukaryam consists of modules such as Revenue, Accounts, Engineering, Public Health, Planning, General and Human Resource covering functions of tax collections, accounting, web application for public use etc. Some of the banks, eSeva centres and the City Civic Centre have been put on the network for accepting payments online. A Local Area Network (LAN) of the GVMC forms the backbone to this network.

On an average, expenditure on providing services through Soukaryam was Rs 30 lakh per year. The IT wing of GVMC was headed by an Officer on Special Duty assisted by a Jr. Assistant and group of technical personnel drawn from a private firm for developing, implementing and maintaining the IT applications/software/ hardware.

2.2.2 Audit objectives

The IT audit of GVMC was conducted with the following objectives:

- evaluating the achievements of the project vis-à-vis the goals set.
- analyzing the data for completeness, integrity, reliability, accuracy and security.
- examining the adequacy of general and environmental controls and IT application controls in Soukaryam project.

2.2.3 Audit criteria

The audit criteria adopted were:

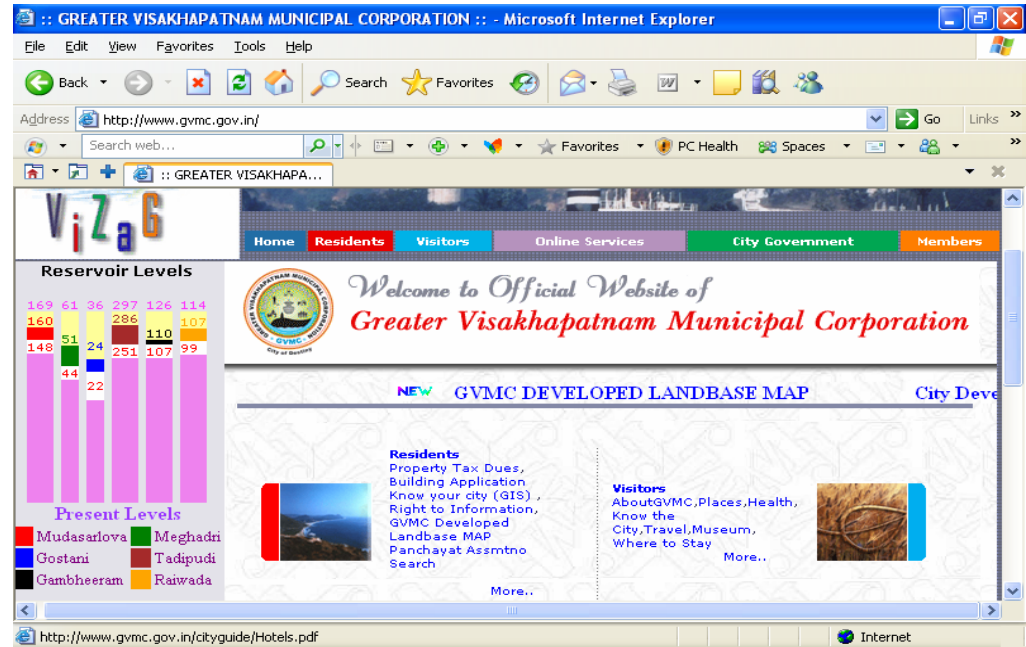
- Rules and provisions under the Hyderabad Municipal Corporation (HMC) Act, 1955.
- Instructions issued by the Government of India and Government of Andhra Pradesh.
- Instructions issued and rates adopted by the GVMC.
- Best practices for a computerized system.

⁸ Became 'Greater' in 2005, covering 540 Sq. Km areas with 14.5 lakh population

⁹ <http://www.gvmc.gov.in>

2.2.4 Scope and Methodology of Audit

IT Audit was conducted by examining the controls and through a review of an IT related practices. Data was analysed for the period 2001-07 (as of November 2006) using a computer assisted audit technique, IDEA¹⁰.



Audit findings

Important points noticed in audit are summarized in the succeeding paragraphs.

2.2.5 Design and development of application

2.2.5.1 Inadequate efforts in planning and development of the system

Adhoc approach in development of the application resulted in unreliable system

Audit examination revealed that the efforts in planning and development of a critical IT application like Soukaryam were inadequate as evident from the following:

- No feasibility study was conducted.
- There was no record of existence of any oversight mechanism in the development process in the form of minutes of the steering committee, review meetings to support the development etc.
- Adhoc and undocumented practices coupled with weaknesses in controls and irregularities were noticed, in the context of which no reliance could be placed on accuracy of data and adequacy of processes in the Soukaryam project.

¹⁰ Interactive Data Extraction and Analysis

2.2.5.2 Preparation of System Requirement Specifications (SRS) five years after the implementation of Soukaryam rendered it purposeless

SRS was prepared much after project implementation

SRS forms the basis for designing any system and its development. While, Soukaryam was implemented in 2000, SRS was prepared only in 2005, five years after implementation of the software. The work of preparation of SRS was outsourced to Andhra University (while the application was developed in-house) at a cost of Rs 1.80 lakh. Obtaining a document, which should ideally have proceeded, the design work, five years after development of the software served little purpose. GVMC also paid (2005-06) an amount of Rs 0.22 lakh to a private firm for guiding and obtaining the Standardization Testing & Quality Certification (STQC) for its software. However, Soukaryam project was not STQC certified till date.

2.2.5.3 Lack of integration of modules

Data could not be effectively used due to lack of integration of different modules

There was no integration of the different modules in GVMC. For example, while raising initial demand for trade licenses (in Public Health module), there was no provision to check if the property tax dues were paid for the premises at prescribed rates though the data was available in the same database. Similarly, while registering applications for approval of building plans (under Planning module), no programmed check was available with reference to existing data of the applicant either in the property tax or in the vacant land of the Revenue module to check that no dues were outstanding.

2.2.6 General Controls

2.2.6.1 Authorization controls

Multiple logins and access to ex-users to the application

User account management had deficiencies. Users who were no longer authorised to access continued to have access to the system. It was also observed in a particular e-Seva centre¹¹ that one user could login on any number of computers for accessing GVMC applications simultaneously, indicating weaknesses in security of data and application. When pointed out in audit, log in from e-Seva centres was restricted to a single system at a time by GVMC.

2.2.6.2 Segregation of duties

Lack of segregation of duties and dependence on contract personnel exposed the project to risk of potential misuse of critical data and application

Audit noticed that a group of individuals contracted from outside were performing various roles of DBA, DEO, System Administrator, Hardware engineers without segregation of responsibilities or any agreement to this effect. Apart from crucial jobs like programming, database, network and system administration, even the day-to-day functioning was being handled by contract personnel. In the absence of any form of agreement, the contract personnel could not be held accountable. For example, the contract person in-charge of database administration left without notice in November 2006 exposing the system to vulnerabilities resulting from inadequate DBA function.

¹¹ at Suryabagh

2.2.6.3 Change Management controls

Changes in the application without authorisation from authorities, exposed the application to internal threats like malicious codes, etc.

There was no documented change management policy or accepted procedure for making changes to the software. Frequent and adhoc changes were made exposing the system to manipulation. Though the system generated application logs, these were never reviewed. Audit also noticed gaps in the application logs. In a project where the programmer who developed the application was also responsible for day-to-day operations. A well defined procedure to control the changes made and maintaining logs of such changes was essential to prevent potential frauds, misuse etc. GVMC replied (January 2007) that the changes were made based on the oral orders of higher authorities, indicating poor change management practices.

2.2.6.4 Password policy

No specifications existed for password management

There was no password policy for the application, database or the operating system. The password practices indicated that desirable practices of good password management were not implemented. Even retired employees continued to remain enabled to log in from the members tab of the GVMC website.

2.2.6.5 Preparedness for adverse circumstances

No plans or resources existed to continue financial transactions in case of failure of server/network

There was no business continuity and disaster recovery plan for continuation of the operations of GVMC in the event of a disaster. Performance was not monitored and server down time report too was not maintained. In case of a disaster taking place there was a likelihood of the computerized system coming to a halt leading to disruption of services, as there were no backup servers, backup routers, fire alarm systems and second line of personnel.

There was no contingency plan for continuing the financial transactions from the various counters of Civic centre/eSeva centres in the event of server/intranet's failure. In all such events, the financial transactions were being stopped causing inconvenience to the public.

2.2.7 Application Controls

2.2.7.1 Input controls and Master data

Even after computerising the functions GVMC had to depend on manual procedures due to deficiencies in data

It was noticed that input controls were either missing or inadequate at both application and database level. Some instances of inadequate input controls are detailed below:

- In the Human Resource (HR) module, the Basic pay field accepted amounts, which were not in the time-scale and amounts much greater than the maximum of the scale. The application also did not provide date validations in date of birth, date of joining service, date of retirement, etc. Crucial values like Professional tax, Provident fund, etc. were being manually fed.

- In the Birth and Death registration module, the system accepted future dates. In 1742 records, the date of birth was greater than date of registration.
- In the Water charges table there were 1667 records where pay mode was cheque, but no cheque number was recorded.

Further, master data tables were also incomplete as indicated below:

- Of the 5759 records in the employee master table of the HR Module, in 1035 records there was no joining date, in 1006 records date of birth was blank and in 2030 records the category of employee was blank.
- Out of 226743 records in the Property Tax master table of the Revenue Module, parameters like plinth area, tax rate and other details which are essential for assessing the property tax demand were updated in only 79781 cases. It is necessary to update all the records so that in case of revision of tax rate in future, the system would be able to compute tax demand. Further, there were 1994 records where door numbers were not available, 41 records without name of the assessor, and 54842 records with duplicate door numbers.
- In the Water charges table there were 11392 records with duplicate door numbers, 205 records where name of the consumer was not available and 33745 records without 'Type of connection' details.

2.2.7.2 Error handling

Improper management of errors made the application cumbersome

There was no documented error handling procedure and thus *ad hoc* measures were resorted to, rendering it impossible to verify whether all the errors had been adequately rectified or not. It was also observed that whenever an error had occurred, the operators were forced to exit the application and re-login resulting in increased response time apart from the abrupt termination of the task.

2.2.7.3 Audit trail

Application log suffers from deficiencies

The application did not have a built in module for an audit trail. Payments made to the GVMC through the Revenue module could not be traced in the Accounts Module due to incomplete capture of challan numbers and dates and the fact that the field pertaining to transaction ID was not available.

Application log maintained in the Revenue module also suffered from deficiencies. There were no values in key fields like 'Type of transaction' and 'Remarks' column (in 210208 out of 239963 log records, both the values were blank).

Thus, due to non-availability of a proper Audit trail in the application, there was no way for fixing responsibility in cases where security of the data was infringed.

The Commissioner while accepting the audit observation assured (January 2007) those necessary precautions would henceforth be taken.

2.2.8 Revenue Module

2.2.8.1 Assessment key not codified properly

Assessment key is a unique code for the property and facilitates identifying the locality (ward/ circle) in which the property lies. It was observed that the 16 digit assessment key was not designed properly and properties could not be located easily using it. The Commissioner replied (January 2007) that the Assessment key would be codified so as to identify the location by seeing the number.

2.2.8.2 Irregular generation of water bills

All the water charge meter readings were not being fed to the database leading to deficient data giving scope to misuse

In July 2006, hand held meter reading devices were introduced for 1271 bulk and semi-bulk water connections ('M' series). However, it was observed that very few meter readings were being recorded monthly. From July 2006 to November 2006, the number of readings ranged between 45 and 610.

On this being pointed out, GVMC replied that 'when the consumption was less than 60 per cent of the agreement quantity, the meter reading was not fed in the computer'. The reply is not tenable. Data should be fed in the application and minimum demand raised even in cases where the water consumption was below 60 per cent of agreed quantity. Leaving the decision to meter readers to decide whether the meter reading was less than or above 60 per cent could lead to misuse.

2.2.8.3 Transfer of collection from e-Seva not traced in GVMC account

GVMC was unaware of the amounts to be received from e-Seva towards its revenues

A test-check of the Bank scrolls (of ICICI) with the invoices issued by the Administrative Officer, e-Seva, transferring the amounts to GVMC account, revealed that the following amounts had not actually been transferred to GVMC account.

Sl. No.	Proceeding No.	Amount Rs
1.	Rc.no. 1310/2004/A1 dated 02 January 2006	71,49,285.90
2.	Rc.no. 1310/2004/A1 dated 02 January 2006	1,45,08,746.00
3.	Advice dated 15 June 2006	3,14,342.00
4.	Advice dated 26 September 2006	23,19,473.00
	Total	2,42,91,846.90

The Commissioner admitted (March 2007) that the amounts had not been received as of March 2007. This indicated that apart from being unaware of the non-receipt of amounts till it was pointed out by Audit, GVMC had also been losing interest on this amount.

2.2.8.4 No action on bounced cheques

No action was taken by GVMC against cheque bounce cases

There was no evidence of any action being initiated/contemplated by GVMC against the consumers whose cheques had bounced, even though the list of bounced cheques was available on the intranet. GVMC under the provisions of the Negotiable Instruments Act, 1881, had been sending notices and collecting Rs 75 towards legal fees in addition to the demand in such cases. Audit noticed in 61 cases (pertaining to property tax collections) that the assessee's cheques had bounced 10 times or more, and yet no action had been taken by GVMC. During the period 2003-06 there were 668 bounced cheques valuing Rs 1.31 crore.

2.2.9 Accounts Module

2.2.9.1 Misclassification of revenue collections/ expenditure

Misclassifications and failure to take rectificatory action

Test-check of the data relating to remittances of tax collections, etc., pertaining to four days¹², revealed that there were instances of some tax collections being remitted into the non-tax account while the non-tax collections were remitted into the tax account due to inadequate input control validations. There was also no evidence of misclassifications being rectified promptly and on a regular basis. Thus, the collections shown under tax and non-tax heads cannot be considered to be accurate. The Commissioner admitted (January 2007) that misclassifications were due to data entry mistakes.

2.2.9.2 Spill over of unspent (budgeted) amounts to subsequent years

Unspent amounts were allowed to be carried over for several financial years

The Hyderabad Municipal Corporation (HMC) Act, 1955 was extended to GVMC. As per Rule 11 of HMC Budget Estimates Rules 1968, all allotments made in the budget shall lapse at the end of the financial year, subject to provisions of Section 190 of the Act, wherein the approval of the Standing Committee is essential for carrying forward of unspent amounts for a period of two years for completion according to the original intention of sanction. The amount proposed to be carried forward should be taken as the opening balance of the Municipal Fund for that year. Contrary to these provisions, the sanctioned amounts pertaining to budget years from 1996 were carried forward even up to the financial year 2006-07. Indefinite carrying forward of the sanctioned amounts would result in the amount not being utilized while not being available for any other purpose either.

2.2.9.3 Duplicate Examiner of Account numbers

System allowed duplicate EA numbers leading to risk of double payments not being detected

To ensure that each voucher has been pre-audited by the Examiner of Accounts, a unique Examiner of Accounts number (EA number) was to be generated for every voucher. However, during 2002-06, 7 duplicate EA numbers were generated. Due to duplicate EA numbers double payments if any, could not be identified nor could the cent per cent scrutiny of all vouchers

¹² Third November 2005, 3 January 2006, 14 February 2006 and 17 February 2006

by EA section be ensured. While accepting the audit observations, the Commissioner stated (January 2007) that it was due to a programming bug and that it would be rectified in the software.

2.2.9.4 Unreliable system providing inconsistent data

Different sources like Accounts and Revenue modules of database etc., did not tally and no reconciliation existed

GVMC was totally dependant on computerized data for receipts and payments reports since inception of the project. All collections were made online and GVMC was not maintaining the cash book for its receipts, thus making it impossible to ascertain the correctness of the tax collections as the computerized data showed incompleteness and variations between modules. The various sources for tax collections for the years 2004-05 and 2005-06 showed different figures, indicating huge variations as detailed below:

Item	Final figure (actuals) shown in Budget document Rs	Figures on the intranet Rs	Figures from Revenue module in database* Rs	Figures from Accounts modules in database** Rs
2004-05				
Water Charges	2,71,33,000	2,71,32,754	2,71,63,404	2,71,65,835
Lease	2,90,30,000	1,73,22,986	1,85,89,511	1,62,67,919
Property tax	33,72,10,000	34,38,51,314	33,79,52,274*	28,85,85,176
Semi bulk – bulk water charges	42,88,81,000	41,92,70,079	41,44,66,234	41,44,66,234
2005-06				
Water Charges	3,27,16,564	3,27,16,564	3,27,09,274	3,26,96,254
Lease	1,68,00,115	1,68,00,115	2,02,03,445	1,62,62,198
Property tax	36,05,97,000	29,63,53,907	29,83,64,310*	28,89,13,841
Semi bulk – bulk water charges	43,00,03,064	43,00,03,064	46,49,92,810	46,49,92,810

* Total transactions recorded against individual tax payer. ** The figures included offline transactions also.

Thus the data available in the database in different modules (Revenue and Accounts) did not match, indicating lack of referential integrity and the fact that relationships and constraints in the database were not defined properly. These could render the modules unreliable.

Red flags to indicate areas susceptible to fraud

2.2.9.5 Cash transactions not accounted for in the accounts

Revenue collections such as property tax, water charges and lease charge amounting to Rs 1.85 crore were not accounted for; suspicion of fraud not ruled out

All cash transactions of Tax and Non-tax revenue were received only through counters of e-Seva and City civic centre. All such transactions were accounted for in the Accounts apart from the demand, collection and balance of the concerned receipts in Revenue module. It should be possible to track every transaction of revenue in the Accounts module (either in table which records online transactions or in a table which records offline transactions). However, the transactions in the Transaction table (Revenue module) could not be traced to either of the other tables of Accounts module. These have been indicated as red flags (areas susceptible to fraud) and discussed below:

Property Tax: Cash transactions through the application could be carried out by either e-Seva or City civic centre. The only other entity that had access to the database was the GVMC computer centre (manned by contract personnel). In the Revenue module, during the period April 2003 – November 2006, there were a total of 13,97,546 transactions dealing with property tax. Of these, in 997 cash transactions¹³ (made by 19 User IDs) amounting to Rs 88.26 lakh, the demand amounts were collected at neither e-Seva nor at the City civic centre. This indicated that these transactions were made by the computer centre from the back end in the database and not through the application. Of these 997 transactions, only 114 transactions amounting to Rs 1.03 lakh were accounted for in the accounts module (bank_trans table) while 883 transactions amounting Rs 87.23 lakh were not accounted for.

Further in 1821 (out of 1825 records¹⁴) records, there were no details of the challan no., receipt no. or even the Bank ID. As credits from e-Seva and City civic centre were made to GVMC only from the day-wise and head-wise scrolls, lack of payment/ receipt details, could have resulted in these amounts not figuring in the scrolls sent to the banks by the collection centres indicating possibility of fraud in the GVMC computer centre.

Water charges: Similarly, in 482 cases of day-wise totals (up to November 2006), an amount of Rs 45.66 lakh relating to water charges collection had not been accounted for in the Accounts module (bank_trans table). The Commissioner admitted (January 2007) that there were certain loopholes in the system and these would be rectified soon.

Lease charges: An amount of Rs 51.65 lakh pertaining to 3560 cash transactions (up to November 2006) had also not been accounted for in the Accounts module (bank_trans table).

In all the above cases, possibility of fraud could not be ruled out. The Commissioner, assured (April 2007) that the matter would be got investigated.

2.2.9.6 Cheques not accounted for

Same cheques had been accounted for more than once

In the Revenue module for property tax, it was observed that in case of 1600 assesses, payments were made by cheque as per the Transaction table, but there was no corresponding entries in either the Bank transaction table of the accounts module or in the Counter master table (for cheques received by post) of Accounts module.

Test-check also disclosed that, in one case, a single cheque was used for more than one transaction. The cheque dated 06 October 2003 for Rs 8501 deposited by an assessor (no.1788) was used several times as detailed below:

¹³ excluding Gajuwaka – 828 records amounting to Rs 5.83 lakh

¹⁴ 997 (vmc) + 828 (Gajuwaka) records

	Assessment No.	Cheque No.	Amount (Rs)	Date	Year part
Original payment	1788	807886	8501	6.10.2003	2003-04 1 st
Fraud payment			4250	28.10.2003	2001-02 1 st
			467	27.10.2003	2001-02 1 st
			4250	28.10.2003	2001-02 2 nd
			467	27.10.2003	2001-02 2 nd

It was also not known how the payment was allowed to be made for a later period when dues for the earlier period were yet to be cleared.

The Commissioner assured (April 2007) that an enquiry would be conducted into the matter soon.

2.2.10 Engineering module

2.2.10.1 Incomplete Contractors' database

Deficiencies in data and improper design of the application made contractors' database ineffective

In the contractors' table each contractor was allotted a code with details of the contractor. Subsequent transactions of the contractor are monitored with the code allotted. It was, however, observed that when a contractor's class was upgraded, a new code was allotted. As a result, details of works allotted/completed, abandoned, pending (in the old code no. of the same contractor) could not be monitored through the system. Further, the table did not contain contractor's information like Bank account number, PAN number, e-mail address, which are useful for various purposes.

Thus, the contractors' database was not comprehensive and as a result, the desired information was not available. The Commissioner replied (January 2007) that the database would be modified in due course.

2.2.10.2 e-Procurement not adopted for tenders

GVMC could not derive the advantage of 'e-Procurement'

The State Government had taken up 'e-Procurement' as one of the core IT initiatives of e-Governance. All tenders above Rs 1 lakh were to be processed through e-Procurement alone. It was, however, seen that out of a total of 3,196 contracts (Rs 488 crore) awarded by GVMC during 2004-07 (November 2006), only three tenders (0.1 per cent) were initiated through e-Procurement and even these three tenders were actually processed manually. On the other hand, an amount of Rs 87 lakh (approximately) was spent on publication of tender notices in different newspapers during May 2005 to November 2006 alone, which would have been much lower under e-Procurement. Further, non-adherence to Government orders defeated the objectives of e-Governance which were transparency, competitive prices, global bidding, expertise etc.

The Commissioner, while accepting the audit observation, stated (April 2007) that GVMC had started using e-Procurement now.

2.2.11 Planning Module

2.2.11.1 Improper application controls

Building plan applications were processed through the Planning module and approvals accorded. It was observed that the application allowed the user to modify the data pertaining to the buildings, the plan of which has already been approved, thus making room for improper modifications to the data subsequently. The Commissioner agreed (January 2007) to incorporate changes in the application to this extent.

2.2.12 General Module

2.2.12.1 Ineffective monitoring of Website Complaints module

GVMC provides a facility for the citizens to register complaints online through its website. The complaints were to be attended by the authorities concerned of GVMC. The status of the registered complaints is also displayed on the website. It was, however, observed that:

- key fields like applicant name, applicant address, ward no. were not mandatory.
- unlike a call center system (through telephone), there was no automatic escalation to higher officials.
- in 2005 and 2006, out of a total of 3,803 registered complaints, only 787 complaints had been disposed off leaving 3,016 complaints (79 per cent) pending (November 2006).

The above points indicated ineffective monitoring of the 'Complaints module' at all levels in GVMC.

2.2.13 HR Module

2.2.13.1 Mandatory subscription towards Provident Fund not enforced from staff of GVMC

Mandatory Provident fund deduction was not enforced through the application

As per the provisions of the MCH Act, 1955, made applicable to GVMC, Provident fund deduction was to be made from employee's salary mandatorily at the rate of six per cent of basic pay. It was, however, observed that all PF deductions were entered manually instead of an enforced six per cent deduction by the system. The employees subscribing to less than six per cent ranged from 85 to 91 per cent during 2002-06. Non-enforcement of the mandatory deduction has resulted in the short recovery of PF from the staff of GVMC to the extent of about Rs 2.93 crore during the five year period 2002-06 alone. The Commissioner replied (March 2007) that the PF would henceforth be deducted at a minimum of six per cent of the basic pay by modifying the HR module.

2.2.14 Conclusion

Soukaryam was conceived as a path breaking e-Governance initiative to deliver civic services online in a user-friendly format using Information and Communications Technology (ICT). The project had the potential to transform existing processes to bring in transparency and accountability while improving the speed and quality of delivery of services to citizens. However, Soukaryam suffered from many deficiencies primarily due to poor planning, design and implementation. Integration of various modules was not ensured. Dependency on contract personnel exposed the data and applications to serious risks especially in the absence of proper password management, change management and segregation of duties. Design of the application did not provide for an Audit trail. GVMC continues to depend on manual procedures and hence could not derive the full benefits of the IT application.

2.2.15 Recommendations

Soukaryam project can redefine the quality of service delivery to citizens and facilitate good governance in the jurisdiction of the civic body. The limitations/ observations reported in this review can be overcome by concerted efforts by the project implementation team. To facilitate the strengthening of Soukaryam project, the following recommendations are made:

- Scientifically designed codification has to be devised for identifying properties.
- Adequate input controls should be enforced at application and database level.
- Unique transaction ID has to be devised with proper audit trail.
- Figures of all revenue collections from Revenue and Accounts modules should be reconciled immediately to rule out the possibility of frauds. Non-accountals of revenue collections should be got investigated immediately.
- There is an urgent need for establishing an appropriate business continuity plan and a disaster recovery plan.
- Training should be imparted to the employees of GVMC so as to decrease the level of dependency on the contract employees.
- Web based complaint monitoring system should have an automated escalation and redressed procedure for time bound complaint redressal.

The points mentioned above were discussed (March 2007) with the Additional Commissioner and officers of the GVMC. The Additional Commissioner accepted the audit points and assured that suitable changes/modifications would be carried out/ incorporated in the system.