FINANCE DEPARTMENT

3.6   Information Technology Audit of 'Koshwahini System'

Highlights

With a view to design and develop a Management Information System from data received from the Treasuries and the Pay and Accounts Office, Mumbai to aid various departments in monitoring, decision making and improvement in budgetary controls a web-based application package called "Koshwahini" was developed at the Directorate of Accounts and Treasuries. The package in the present form was unable to serve the desired purpose although Rs 15.03 crore was spent on the system during the project period of five years.

The system development methodology adopted was purely ad-hoc and in the absence of proper documentation the Department could not manage and monitor the development and implementation of the system and was completely dependent on the National Informatics Centre, the developer of the system.

(Paragraph 3.6.7)

No Master Plan was prepared for each approved project for maintaining control over the project and for monitoring the time and cost incurred throughout the life of the project. This necessitated replacement of the existing hardware costing Rs 2.35 crore within a short span of three years.

(Paragraph 3.6.8)

The accounting requirements, records and functions at the treasury level still remained to be computerised. Due to non-completion of Bank Reconciliation module by the Pay and Accounts Office, reconciliation was done manually and was in arrears from June 2003. As such, the correctness of receipts and payments was not verifiable.

(Paragraph 3.6.9)

As the Drawing and Disbursing Officer register was incomplete and not authenticated, 12,554 Drawing and Disbursing Officers appearing in the Drawing and Disbursing Officer master table were not verifiable. Drawing and Disbursing Officers were allotted two codes. Of these some had operated both the codes and drawn bills.

(Paragraphs 3.6.11 and 3.6.14)

There was no one-to-one link between the cancellation of original and issue of fresh cheque in the system. As such, the correctness of 232 cheques amounting to Rs 1.89 crore drawn by the Pay and Account Office could not be verified.

(Paragraph 3.6.16)

There was no proper disaster recovery plan; validation checks and security controls were also not properly laid down and followed resulting in high risks in the System.

(Paragraphs 3.6.17, 3.6.18 and 3.6.19)

3.6.1 Introduction

A web-based application package namely Koshwahini was developed (2002) under DB2/PHP[*]/Linux platform at the Directorate of Accounts and Treasuries (DAT), Mumbai through the National Informatics Centre (NIC) for storing the receipt and payment data received from the Treasuries and the Pay and Accounts Office (PAO) daily through e-mail and for generating various Management Information System (MIS) reports relating to receipts and payments, bills under process, major head-wise budget and expenditure, region-wise, treasury-wise and Drawing and Disbursing Officer (DDO) wise expenditure.

Initially the computerisation of treasury system was taken up by the DAT, Mumbai at Pune Treasury in 1996-97 with an Integrated Online application package for Expenditure, Audit, Accounts, Cheques and Tokens (EXAACT) developed by the NIC, Pune in FOXPRO/Novel Netware platform with a server for storing data and dumb terminals for data entry. The package was subsequently implemented in other regional treasuries namely Amravati, Aurangabad, Nagpur, Nashik and Thane during 1998-99 and remaining 27 treasuries and 295 sub-treasuries during 2002-03. A separate application package for the PAO was developed (2002) under DB2[1]/VB[2]/Linux[3] platform.

An amount of Rs 15.03 crore received from the Central Government as per recommendations of the 11th Finance Commission during 2000-01 was spent on the project up to March 2005.

3.6.2 Objectives of Koshwahini

The objectives of the Koshwahini was to design and develop a Management Information System around the database received from the treasuries and the PAO, Mumbai to aid various departments in monitoring, taking decisions and improvement in budgetary controls.

3.6.3 Organisational set-up

The DAT, Mumbai was responsible for implementation of the computerisation project in the office of DAT, 33 treasuries and 295 sub-treasuries there under and the PAO, Mumbai.

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[*] A widely used scripting language for Web Development
[1] Database software
[2] Visual basic - A computer language
[3] A Network operating system

The treasury offices at district level and sub-treasury offices at taluka level make payments to DDOs after scrutiny of bills submitted by them and account for receipts submitted through challans. Sub-treasuries submit daily sheets of receipts and payments along with the challans and vouchers to the Treasury Officer for compilation. The treasuries prepare the major head-wise list of payments twice in a month and the cash account of receipts realised during the month for the treasury and sub-treasuries under it. These are submitted along with the vouchers to Accountant General (AG) (A&E)-I, Mumbai and AG (A&E) –II, Nagpur. Similarly, the PAO Mumbai makes payment to DDOs after pre-audit of the bills received by them. Subsequently, after compilation of vouchers and challans, the PAO submits monthly consolidated account to AG (A&E)-I, Mumbai.

3.6.4 Audit objectives

The audit objectives were to evaluate the efficiency and effectiveness of the system in achieving the stated objectives and to assess the adequacy of controls to ensure the integration of data and to examine the management direction of IT activities.

3.6.5 Audit Criteria

Application package developed and implemented for the treasuries, the PAO and the DAT were evaluated with respect to Maharashtra Treasury Rules and PAO Manual. Planning of computerisation programme, methodology of development of the application packages, data management and monitoring were also examined with good practices of IT governance under Control Objectives in Relative Information Technology (COBIT) framework.

3.6.6 Scope of Audit and Audit Methodology

Since the documents relating to various stages of system development life cycle such as feasibility study, user requirements, data flow charts, input process and output requirements of IT systems were not produced to audit, the scope of the IT audit was limited to scrutiny of files/records/information furnished by the DAT, the PAO and the treasuries and reports generated from the IT systems. Accordingly, test-check of records in the offices of the DAT, the PAO, Mumbai and three[*] out of 33 treasuries alongwith two sub-treasuries under each treasury was conducted during April to August 2005 and the audit findings are discussed in the succeeding paragraphs. Structured Queried Language (SQL) was used to export the data from DB2 database system to Interactive Data Extraction Analysis (IDEA) package and the audit analysis was done using IDEA package.

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[*] Treasuries at Nasik, Thane and Pune
Sub-treasuries at Kalyan, Konkan Bhavan, Maval, Saswad, Dindori and Sinner

Audit Findings

3.6.7 Documentation

The System development methodology adopted is not discernible and is purely ad-hoc

The application packages were developed by the NIC as per discussions held with the DAT. The documentation relating to feasibility study, user requirements, programme specifications, data flow charts, input requirement definition, processing requirement definition, output requirement definition, operational requirement and service levels, change initiation request and control, major changes made to existing system, testing of changes, data conversion, risk analysis report and evaluation of meeting user requirement had not been done. Thus, the system development methodology adopted is not discernible and is purely ad-hoc.

The DAT stated (July 2005) that the information and details were not available as software was developed through discussions with the NIC and the relevant documents would be obtained from the NIC and furnished to Audit.

In the absence of any documentation, the Department could not properly manage and monitor the development and implementation of the system and was completely dependent on the NIC. The lack of documentation also constrained audit in analysing the methodology adopted. Consequently, the risk involved in the system was very high.

3.6.8 Planning

Strategic plan for a computerisation programme included the long and short range IT plans *i.e.,* hardware changes, capacity planning, information architecture, new system development, testing and implementation, disaster recovery planning and installation of new processing platforms. No such planning was done and the DAT implemented the project in piecemeal through the NIC as detailed below:

Replacement of existing system costing Rs 2.35 crore necessitated within a short span of three years

↘ DB2 based package was implemented at the PAO in 2002-03. At the same time EXAACT package based on FOXPRO which was developed in 1996-97 and already implemented in six regional treasuries was also implemented in the remaining 27 treasuries during 2002-03 at a cost of Rs 2.35 crore. Later a generalised package namely 'Treasury-Net' was developed for replacement of both EXAACT and DB2 based package during 2004-05. It was implemented in the PAO (April 2005), Aurangabad (July 2005) and Pune (August 2005).

The DAT stated (August 2005) that the software package Treasury-Net based on DB2/Linux was not ready in 2002-03 and was difficult to launch totally new software in all the treasuries.

The reply was not tenable as the Department displayed lack of foresight when it decided to adopt the 1996-97 FOXPRO based EXAACT in 27 treasuries in

2002-03 and purchased hardware costing Rs 2.35 crore while the new DB2 based application was being implemented in the PAO. The DAT has now decided (October 2005) to implement Treasury-Net based on DB2 in all treasuries and made a budget provision of Rs 6.48 crore for the year 2005-06 for implementation of Treasury-Net in remaining 27 treasuries. Thus, DAT will have to replace EXAACT in 27 treasuries within three years of its implementation along with the change of hardware.

↘ For implementation of Treasury-Net at six regional treasuries, hardware costing Rs 1.16 crore was purchased (January-March 2005) and the Treasury-Net was implemented at Aurangabad (July 2005) and Pune (August 2005) treasuries. The same was not implemented in the remaining four regional treasuries as of September 2005.

The DAT stated that the issue of implementation was still under consideration of the NIC as they were of the opinion that it would be better if the Treasury-Net was implemented in centralised mode so that software and other technical support could be given from one place only.

Thus, hardware purchased for four regional treasuries remained unutilised. It also indicated lack of proper planning and non-consideration of all decision variables before the purchase of hardware.

3.6.9 Structured approach to project development

System Development Life Cycle methodology (SDLC) is a structured approach that divides an information system development project into distinct stages, which follows sequentially. It was necessary to adopt a SDLC methodology governing the process of developing, acquiring, implementing and maintaining computerised information systems and related technology. Due to non-adoption of such methodology, the system remained incomplete despite lapse of a project period of five years and incurring Rs 15.03 crore. It could not deliver the desired services to improve monitoring as detailed below:

↘ The registers and records required for pre-audit such as DDO-wise audit registers for pay bill, travelling allowance bill, medical bill, contingency bill, abstract contingent bill, detailed contingent bill and grants-in-aid bill were maintained manually as the requisite module was not developed.

↘ As modules required for compilation section were incomplete, subsidiary registers relating to the head '2049 Interests', journal of transfer entry, debt, deposit and remittance (DDR) heads of accounts of payment and receipt and detail book were prepared manually. Therefore, consolidated monthly account of the PAO was still prepared manually and submitted to the AG (A&E), Mumbai.

⊿ The module for bank reconciliation by PAO was still incomplete and the reconciliation report was not generated through the system. As such the reconciliation work was being done manually and was in arrears from June 2003. Further, the data entry of encashed cheques was not done for the period from November 2004 to March 2005. As reconciliation was in arrears, the correctness of data on receipts and payments at the PAO and fed into Koshwahini system was not verifiable.

3.6.10 Difference in Reserve Bank Deposit figures

The Reserve Bank Deposit (RBD) (MH–8675) worked out from the Koshwahini data did not tally with the monthly account figures of the PAO and Thane Treasury and there was a difference of Rs 1188.07 crore and Rs 3.26 crore respectively for the month of March 2005 as under:

(Rupees in crore)

Treasury	As per Koshwahini		As per Monthly Account		Difference
	Receipt	Payment	Receipt	Payment	
PAO	--	1697.63	--	509.56	1188.07 (Payment)
Thane	161.21	--	164.47	--	3.26 (Receipt)

The PAO stated (July 2005) that reconciliation of encashed cheques was in arrears and encashment could not be recorded hence there was a difference.

The reply is not tenable because if the same data was sent from the PAO/treasuries for inclusion in Koshwahini, there should not be any difference. This indicated that the data sent by the PAO and treasuries for inclusion in the Koshwahini was incomplete / incorrect. Thus, requisite input controls were absent in the Koshwahini system.

3.6.11 Maintenance of DDO master

Proper procedure was not followed in maintenance and updation of DDO master with complete and correct data on the DDO codes. Consequently, the purpose of having a master table for validation was not served.

On extraction and analysis of DDO master table from the Koshwahini system, 12,554 DDOs were found. Since the register maintained at DAT was incomplete and no officers had attested the entries, the correctness of these figures could not be verified.

A DDO register maintained manually in Thane Treasury contained 965 DDOs whereas the DDO master table contained only 787 DDOs.

No register/records were being maintained for monitoring the changes in the DDO code either manually or in the system at the PAO and Treasuries. Department stated (September 2005) that the registers would be updated.

3.6.12   Generation of DDO-wise reports

On generation of DDO-wise payment reports for the year 2004-05 from 'Koshwahini' it was noticed that payment data in respect of two DDOs[*] amounting to Rs 18.19 lakh appearing in the PAO system, was not available in Koshwahini.

↘   The codes allotted to the DDOs are required to be entered in the system for processing the bills submitted by them. It was, however, observed that there was no link between old and new DDO codes which were changed within a financial year. Therefore, reports generated in respect of such DDOs showed partial information, taking into account the new codes only.

↘   As per provisions contained in Maharashtra Treasury Rules (MTRs) 1968 monthly reconciliation of remittances was required to be done by the DDOs with Treasury Officer (TO) and TOs had to issue certificate to that effect. DDO-wise receipts reports were, however, not generated from the Koshwahini, the PAO system or the Treasury system. The PAO stated (September 2005) that the data was not captured due to non-availability of DDO code on challan.

↘   There was no provision to capture and generate DDO-wise grants and expenditure monitoring reports. The DAT stated (August 2005) that the matter was under consideration.

↘   In addition to DDO-wise expenditure, one additional row is appearing as 'DDO Total' which is included in 'Grand Total' as detailed below:

Name of treasury	DDO Total (Rs)	Grand Total
Pune	64882406011	103440353603
Nasik	27819987850	4356872421
Thane	87101442816	50732767789
PAO	15377417	383219859606

The Department could not explain the expenditure shown against 'DDO Total'.

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[*] Secretary, Bombay Education Societies and Under Secretary to Government of Maharashtra, Third Finance Commission.

3.6.13 Complete particulars against DDO codes

Reports generated from Koshwahini revealed blank DDO names against DDO codes in 248 cases in the PAO, Mumbai; 222 cases in TO, Pune; 99 cases in TO, Nashik and 37 cases in TO, Thane.

Several DDO names were found without full particulars such as office name and addresses in the PAO system. Some instances are given below:

DDO code number	DDO particulars
002194	Accounts Officer, Greater Mumbai
003194	Assistant Director
005643	Child Development Project Officer
005781	Child Development Project Officer
002013	Chief Minister, Deputy Chief Minister

It indicated that DDO master has not been properly maintained at the DAT and the PAO.

3.6.14 Allotment of two codes to several DDOs

Eighty two DDOs in the PAO, Mumbai, 10 DDOs in Thane and eight DDOs in Pune were allotted two DDO codes. Of these, some DDOs had operated both the codes and drawn bills during the year 2004-05. Some of the instances are shown below:

(Amount in Rupees)

Name of treasury	DDO name	DDO code	Amount drawn
PAO, Mumbai	a) Assistant Commissioner of Sales Tax (Administration), Andheri Division	002987 2452973	18363 11752086
	b) Administrative Officer, ESIS, Andheri	002584 022580	200784 120611747
	c) Minister of Labour	480011 550011	113453 944573
Pune	Commissioner of Police (OS) Commissioner of Police	450 453	929165825 203605
	City Survey Officer-1, Pune	887 888	98825 3934095
	Administrative Officer, ESIS Hospital, WMR Administrative Officer, ESIS Hospital, AUNDH	2590 2581	96937436 14724329

Though DDO code number 48 assigned to the OSD in the office of the Divisional Commissioner was closed with effect from 21 June 2000 an amount of Rs 79600 was drawn under the code in 2004-2005.

The PAO stated (July 2005) that the old DDO code was wrongly entered in the system and to avoid such cases, the NIC was requested to lock the old DDO codes. TO, Pune (August 2005) stated that the matter was taken up with the

concerned DDOs for initiating remedial measures. TO, Thane (August 2005) stated that the allotment of two DDO codes would be reviewed and rectified.

In order to avoid such discrepancies, the control of the master data should be with the DAT and should be validated as soon as data was received from the PAO/Treasuries.

3.6.15   Procedure in exceptional changes of data

Scrutiny revealed that bill numbers 327654 to 327674 dated 31 March 2005 were entered in the system subsequently on 15 April 2005. In 52 cases the cheque drawal date was 3 April 2005 which was subsequent to the cheque delivery date of 31 March 2005.

The PAO stated (July 2005) that these bills were processed in the system by changing the system date being exceptional cases as per instructions of higher authorities and request received from DDOs for renewal of cheques.

The reply was not tenable as there was no document of such exceptional changes made in the system. Such changes should be monitored and controlled to avoid misuse in routine manner during other months. In view of above inconsistencies of data, there should be a separate module for the purpose of change management of data.

3.6.16   Procedure in issue of cheques in the PAO

There was no one-to-one link between the cancellation of original cheques and issue of fresh cheque in the system

It was noticed that there was no one-to-one link between the cancellation of original cheque and issue of fresh cheque and the same was not traceable in the system. Also, the register relating to fresh cheque issued in lieu of cancelled cheque was not maintained. In this regard the cheque delivery table for the year 2004-05 showed 232 cheques with zero amount whereas the cheque master table showed these cheques with money value amounting to Rs 1.89 crore.

The PAO explained (September 2005) that as these cheques were issued in lieu of cancelled cheques and delivered under MH-8670 with zero amount voucher as the expenditure was already booked in the monthly account in which the original cheque was issued.

Such weakness in the system is vulnerable for errors and irregularities.

3.6.17   Validation check and system design

Bills are presented to treasuries in prescribed Forms with one Form_ID. It was noticed in many cases that invalid Form_ID such as 10000, 10237, 109089, /19, .35 and 1*9 have been entered by the officials receiving bills. This would result into MIS reports not being generated based on correct Form_IDs. It

shows that there are no proper validation checks in the system. Accepting the fact, the PAO stated that the Form_IDs would be updated as early as possible.

As per Civil Budget Estimates, the detailed head "047 Advances" was mentioned under major head "7610 – Loans to Government servants" and not related to any service head. It was, however, noticed that in 126 cases expenditure amounting to Rs 5.76 crore was wrongly classified under other service major heads such as 2055 and 2014.

Proper validation check in the system is required to avoid such misclassifications.

During analysis of cheque delivery table, duplicate voucher numbers were found in 206 cases which shows that there are no validation controls put in place. The PAO stated (July 2005) that the actual reasons would be located and the defects in application package would be rectified with the help of the NIC.

3.6.18   Security controls in the PAO system

Security control were not properly laid down

Data analysis made in respect of the PAO system revealed the following lacunae:

↘   Operator password was same as the user ID in 91 cases.

↘   Operator password should be of eight characters. Passwords of three to four characters were, however, used.

↘   Generalised operator names were used in many cases.

↘   The user name was attached to the counter and the section. Even after transfer of the user, the same ID and password were used by the new user.

The PAO stated (July 2005) that since the software was in the process of stabilisation and users were not familiar with computer operation, the required security procedures were not followed. Also, as the NIC programmers and personnel from this office shared the DBA function, security issues were not strictly observed.

Department's reply was not tenable as standard security procedures were not observed though risk involved in the system was very high.

3.6.19   Disaster recovery plan

Back-up and restoration plan was to be prepared by the department as per their requirements considering development, implementation, testing and documentation of the recovery plan. The data files, software and related documentation should be stored both on-site and off-site. No such plan was prepared and intimated to Treasuries and the PAO by the DAT and the NIC.

On data analysis of the PAO system for the year 2004-05, 5,612 gaps were detected in bill numbers and 1,009 gaps were detected in transaction numbers of cheque delivery. The PAO stated (July 2005) that the gaps were mainly due to batch generation process getting aborted and occurred when the data was re-entered. The matter would, however, be referred to the NIC for rectification.

Bills numbering 8,232 entered in the system were without any scroll operator details such as operator code, section and counter. The PAO stated (September 2005) that this was due to system memory corruption and stoppage of system at the point of acceptance in the scroll module and the matter was referred to the NIC for taking remedial action.

Further, no register or records were maintained in the treasury and the PAO in respect of frequency and period of back-up taken, type of back-up and persons responsible for taking back-up. The back-up taken in tapes was kept on-site in Pune and Nashik Treasuries and in PAO, Mumbai. In Nashik Treasury, the on-line mirroring of data in the second server (data back-up server) was stopped from May 2005 due to some problem in the second server. The same was not yet repaired (August 2005). It could thus be seen that no uniform system was being followed.

Un-interrupted power supply was not ensured in the sub-treasuries rendering the system inefficient and risk prone

The department should assess the need for uninterrupted power supply (UPS) regularly for its IT applications to secure against power failures and fluctuations. It was, however, observed that UPSs were not provided in the test checked Sub-Treasuries at Pune and Nashik. Consequently, the data gets lost and is required to be re-entered making the system inefficient and risk-prone. STOs agreed (August 2005) that UPSs were essential for smooth functioning and stated that their requirement was intimated to higher authorities.

3.6.20 Submission of monthly account to the Accountant General and data to Koshwahini

As per the prescribed procedure the due dates for submission of monthly account and classified abstract by PAO to AG (A&E) were 18 and 20 of the subsequent month respectively. It was, however, observed that the accounts were submitted late by the PAO and the delay ranged from three to six days in the months of April, May, June and February during the year 2004-05.

On data analysis for the year 2004-05, it was observed that there was delay in incorporating the daily accounts of the sub-treasuries in the treasury account. The delay ranged from two to 18 days in Thane, two to 10 days in Pune and two to eight days in Nashik. There was also delay in transmission of data by the various treasuries for incorporation into the Koshwahini.

The department stated (August 2005) that delay in submission of daily sheets by the sub-treasuries was mainly due to lack of network connectivity between the sub-treasuries and the treasuries and electricity failures.

3.6.21 Internal control and monitoring

Management should monitor the effectiveness of internal controls in the normal course of operations through management and supervisory activities, comparisons, reconciliations and other routine actions.

It was noticed in PAO system that 675 bills were objected but not delivered to the concerned DDOs and 27 bills without any indication of being objected or passed, remained undelivered. The PAO stated (September 2005) that the bills wrongly entered in the system were objected and re-entered as a new bill and the old bills remained in the system as undelivered.

The reply was not tenable as the objected bills, which were wrongly entered, should also be monitored and disposed through the system as an output and should not be left unreconciled in the system.

3.6.22 Conclusion

The Koshwahini application package in the present form is not in a position to serve as a reliable information system to aid monitoring and decision making. The structured approach of the system development life cycle methodology was not adopted resulting in system remaining incomplete. The system has not provided for foolproof masters and reconciliation of data flowing into the system from various levels. The security features did not generate the desired levels of confidence. Lack of documentation was a big handicap resulting in complete dependence on the developer. The accounting requirements and many records and functions remain to be computerised. Proper disaster recovery plan, procedures in exceptional changes in data and validation checks were not in place. As a result, it only served the purpose of partly depicting data on receipts and payments on a given date.

3.6.23 Recommendations:

↘ Structured procedure and documentation for the development, modification and implementation of the system should be followed to achieve the objectives and user requirements.

↘ DDO code should be made mandatory in respect of departmental remittances and relevant reports should be available in the 'Koshwahini', PAO and the Treasury System.

↘ Authorised and authenticated DDO master should be maintained at the DAT and the same should be made available to all the treasuries and the PAO.

↘ Policy procedure regarding data security, documentation of data, back-up and restoration should be prepared and implemented accordingly.

↘ Pre-audit module for the PAO should be developed.

↘ The DAT may train its own technical persons for project management and data management instead of fully depending on the NIC.