	3.5	**Information Technology Audit of Integrated Treasury Information System of Punjab**

Highlights

Information Technology Audit of Integrated Treasury Information System of Punjab manifested improper planning as no Information Technology strategy, System Development Life Cycle approach and Information Technology security policies were formulated. Non-implementation of input controls resulted in passing of bills without removal of objections, with duplicate bill numbers, on dates prior to the date of its receipt, etc. Despite a plan and availability of funds, web based linkages with banks and Finance Department could not be established, thereby affecting monitoring for ways and means and non-optimal utilisation of computerisation.

FINANCE DEPARTMENT

↘ *The software was got developed and implemented without formulation of Information Technology strategy, adoption of a System Development Life Cycle approach and Information Technology security policies. There was no evidence to suggest that comprehensive acceptance testing was done before implementing the computerised system.*

(Paragraph 3.5.6, 3.5.7 and 3.5.19)

↘ *The Directorate failed to incorporate input/ validation controls in the iTISP despite adoption of software six years ago thereby causing passing of bills without removal of objections, with duplicate bill numbers, on dates prior to the date of its receipt, etc. The data generated was unreliable to some extent.*

(Paragraph 3.5.11, 3.5.13 and 3.5.14)

↘ *Due to lack of coordination between the Directorate and National Informatics Centre, mapping of some business rules, one to one link between cheques issued in lieu of cancelled cheques and audit trails provisioning could not be done in the software so far.*

(Paragraph 3.5.16, 3.5.18 and 3.5.20)

↘ *The objective of providing web-based linkages with banks and Finance Department was also not achieved, though planned in October 2004, thereby affecting monitoring for ways and means.*

(Paragraph 3.5.17)

↘ *Password policy, back-up policy, disaster recovery and business continuity plans was not framed and documented.*

(Paragraph 3.5.22 and 3.5.24)

3.5.1 Introduction

The Punjab Finance Department (Department) is responsible for maintaining fiscal discipline and exercises financial control over public spending by Government Departments in the State through the Directorate of Treasuries & Accounts (Directorate). There are 21 District Treasuries and 69 Sub treasuries. A plan for computerisation of treasuries was made in June 1997 and application software 'Integrated Treasuries Information System of Punjab

(iTISP)' was developed through National Informatics Centre (NIC), Punjab State Unit, Chandigarh .

iTISP was designed as a client/server application with Window 2000/2003 as operating system, MS SQL server at the back end and MS Visual Basic at the front end. The first version was developed and implemented (2001) in phases at treasury/sub-treasury level, thereafter software was updated regularly.

3.5.2   *Organisational Set-up*

The Directorate is headed by a Special Secretary cum Director Treasuries and Accounts under overall administrative control of Principal Secretary, Finance Department. The Director Treasury and Accounts, is assisted by an Additional Director and one Deputy Director. In the field, 21 District Treasury Officers (DTOs) are assisted by Treasury Officers (TOs) and a Superintendent with supporting staff at district level and technical assistance is provided by Assistant Programmers, deputed on contractual basis, at treasury/sub treasury level.

3.5.3   *Objectives of computerisation*

The objectives of implementing iTISP were as under:

* ∗ Efficient monitoring of expenditure & revenue.
* ∗ Position of actual payment made by Bank.
* ∗ Online inclusion of sub treasury data at district treasury.
* ∗ Monitoring position of pendancy of bills with amount under different major heads at different treasuries.
* ∗ To prevent the possibility of fraud/ embezzlement.
* ∗ Ascertaining the position of cheques issued by treasuries but not cleared by banks.

3.5.4   *Scope of Audit*

Out of the 21 district treasuries, five[49] District Treasury Offices (DTOs) were covered in Audit. The data maintained in selected treasuries for the period from 2005-06 to 2006-07 was analyzed to assess the control environment for ascertaining completeness, regularity, authenticity, consistency and reliability. Interactive Data Extraction and Analysis (IDEA) package and Structured Query Language (SQL) was used in audit for analytical review of data.

AUDIT FINDINGS

3.5.5   *Unplanned implementation*

The Directorate devised a plan of computerising all 21 district treasuries and 69 sub-treasuries in June 1997. Accordingly, application software-'Integrated Treasuries Information System of Punjab (iTISP)' was developed by National Informatics Centre (NIC), Punjab State Unit, Chandigarh, and after site preparation, hardware/ software were purchased. iTISP was implemented (2001) in different phases during 1997-2006 and the total expenditure on

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[49]   **Chandigarh, Hoshiarpur, Jalandhar, Ludhiana, and Ropar**

software development, software licenses and purchase of hardware amounted to Rs 6.22 crore.

Audit scrutiny of the records of Directorate disclosed that out of 69 sub-treasuries, 54 were computerised during 1997-2006 at a cost of Rs 6.22 crore, thereby leaving 15 sub-treasuries un-computerised. The Directorate could not undertake computerisation all the sub treasuries of the districts and 15 sub treasuries pertaining to 11 districts were left un-computerised. The Government of Punjab sanctioned Rs 2.46 crore for expansion of the existing system and computerisation of remaining 15 sub treasuries, for which the action was initiated only in February 2007 resulting delay in creation of intended infrastructure during 2006-07.

The Directorate in its reply stated (August 2007) that delay in computerisation of remaining sub treasuries was due to non-provision of online linking of these sub-treasuries with the district treasuries in the Software Requirement Specifications (SRS). The reply of the Directorate is not tenable as it was the major objective of the computerisation to include sub treasury data at district level.

3.5.6   *Non- adoption of a structured approach in software development*

It was necessary to adopt a structured approach with a methodology governing the process of developing, acquiring, implementing, evaluating and maintaining computerised information systems and related technology with documentation at all stages.

Audit scrutiny revealed that there was no evidence to suggest that any structured approach for development of iTISP was used in absence of its documentation. In absence of any documentation, the Directorate could not monitor the development and implementation of the system and was completely dependent on NIC. Non-adoption of structured approach to project development resulted in non-involvement of the users as no User Requirement Specifications (URS) apart from Software Design Document (SDD) were prepared, and each DTO/ TO had to maintain records manually despite implementation of project rendering non-optimal utilization of the available resources acquired at a cost of Rs 6.22 crore.

The Directorate in its reply stated (August 2007) that NIC adopted prototyping and evolutionary model of SDLC in line with Directorate's culture and low IT literacy rate in the Directorate. The Director, NIC also stated that documents such as User Requirement Specifications (USR), Software Design Document (SDD) were neither required nor prepared under the said model.

The reply is not tenable as non-adoption of the system development life cycle methodology resulted into unsystematic development without the involvement of users and absence of documentation.

3.5.7   *Implementation of iTISP without testing*

The Directorate is to ensure that only authorised and fully tested application software is placed in operation. Audit observed (March 2007) that the Directorate neither formed any expert group or committee for testing the software nor documented any test data or test reports before its

implementation in the field offices. The Directorate in its reply stated (August 2007) that NIC replicated the software in all treasuries after successful testing at two treasuries. The reply is not tenable as the Directorate was to ensure proper testing of software and its documentation through an expert committee before its implementation. Further the Director, NIC admitted in the meeting that there was no documentation regarding test data and test reports to corroborate the claim of the Directorate.

3.5.8 Change Management procedures

Though the software was developed by NIC, and had been implemented by the Directorate in phases since 2001, the Directorate had not prepared a documented procedure to control changes in the software and project documents, record keeping of changes during entire project life cycle and impact analysis of changes during project life cycle and impact analysis of changes incorporated till May 2007.There were no documentation relating to testing of changes made to the system before replication of the software.

The Directorate in its reply stated (August 2007) that a well-defined procedure is followed for change management. Director NIC stated that procedure though followed but no documentation is being done in this regard. In absence of any documentation for change control, it was not possible to ascertain the effectiveness of any procedures that are stated to have been followed.

Analytical review of data

The data captured & processed through iTISP in five treasuries for the period from April 2005 to March 2007 was analysed using IDEA, a Computer Assisted Audit Technique. The major findings showing deficiencies in the database and the functioning of the treasuries are detailed below:

3.5.9 Retention of bills for more than prescribed period.

The Standing Orders issued by Director Treasury and Accounts envisages that all activities including passing of bills and preparation of cheques should be completed within four days. The four days period include the day on which the bill is presented and the day on which the cheque is prepared. Further no bill should be retained without action in the treasury/ sub-treasury beyond a period of four days of its receipt.

Audit observed (May 2007) that though the software itself was implemented in 2001, it was possible to input the dates from 01-01-1900 and computerised data showed passing of bills even after delay of 54 years due to non-provision of input controls.

The Directorate in its reply stated (August 2007) that bills are passed with in stipulated period of four working days and salary bills, though, received before 20th of each month, are distributed on the last two days of the month.

The reply of the Directorate is not tenable as the delay emanates from wrong dates being entered and accepted by the software due to non-provision of input controls adversely affecting the reliability and accuracy of the data.

3.5.10 Irregular functioning of treasury on public holidays

The Punjab treasury rules under rule 86(3) provides that the treasuries shall be closed for public business only on those days which are notified by Government as public holidays for observance in public offices. Notwithstanding anything contained in Rule 86, the Deputy Commissioner of a district may order the opening of a treasury on public holidays.

During audit (May–June 2007) it was observed that there was no provision in the software to regulate the functioning of the treasuries on public holidays as such three[50] DTOs out of five test checked functioned on public holidays as detailed below:

Name of district	Activity Involved	No. of bills involved on Saturdays	No. of bills involved on Sundays
Hoshiarpur	Applying Token no. of bills	5611	7
	Passing of bills	143	14
Jalandhar	Applying Token no. of bills	4037	97
	Passing of bills	474	3
Chandigarh	Applying Token no. of bills	40	1
	Passing of bills	274	4

The DTO, Chandigarh in its reply (May 2007) stated that due to heavy rush of work the token clerk inadvertently clicked the wrong dates, which happened to be holidays. The Directorate in its reply stated (August 2007) that treasuries as a routine do not accept the bills on public holidays, however, assured the compliance of the rule by imposing restrictions through the software. Regarding clicking of wrong dates by token clerk such type of clerical mistakes would continue to recur due to non-provision of any input controls, affecting the accuracy and reliability of the data in the Software.

3.5.11 Non-compliance of standing orders

As per standing orders, the Assistant dealing with the bills is required to maintain a register of objected bills containing details of the objections raised on a particular bill. All the objections are raised under the signatures of Superintendent at the first opportunity and no piecemeal objection was to be tolerated and the objections raised should be as per prescribed checklist. Punjab Treasury Rules under Rule 192(a) Note 2 further provides that when any objection is revised, the bill or other document should be returned to the claimant.

Audit scrutiny (May-June 2007) of records disclosed that:

∗   7135 bills relating to three[51] DTOs were objected in piecemeal during 2005-07 in contravention to the provisions.

∗   63963 bills relating to four[52] DTOs for the years 2005-07 were having the objection code 'E-15' (others) whereas there were specific objections.

∗   1851 bills relating to five[53] DTOs were passed during 2005-06 without

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[50]   **Chandigarh,Hoshiarpur and Jalandhar.**

[51]   **Chandigarh 1881, 383, Hoshiarpur 3493,296 and Jalandhar 960,122 during 2005-06 and 2006-07 respectively.**

[52]   **Chandigarh 15322, 7775, Hoshiarpur 9759, 5361, Jalandhar 14941, 8070 and Ropar 68, 2667 during 2005-06 and 2006-07 respectively.**

[53]   **Chandigarh 276,187, Hoshiarpur 51,60, Jalandhar 635,134,Ludhiana 253,204 and Ropar 3,48 during 2005-06 and 2006-07 respectively.**

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handing over the bills to the claimants, though carrying objection, for removal of objection and resubmission, rather were passed with the same token number in violation of provisions of Treasury Rules.

Thus, absence of adequate checks and controls in the software coupled with non-identification of correct objection code by users and incomplete check lists of objections designed by NIC allowed passing of bills under objections in violation of standing orders.

The Directorate while admitting (August 2007) the lapse assured compliance in future.

3.5.12 No DDO code allotment policy was made

In the application software 'iTISP' there is a master data file designed for capturing the data of operational DDOs in treasuries for monitoring DDO wise budget and expenditure.

Audit scrutiny (May-June 2007) of records of five DTOs revealed that

(i)   No mapping of DDOs with the heads, which they were authorized to operate, was done.

(ii)   DTOs, (Hoshiarpur, Jalandhar, Ludhiana and Ropar) used even the dummy DDO code "000".

(iii)   753 inoperative DDOs relating to five[54] DTOs were not deactivated from master data file during 2005-07.

The Directorate in its reply stated (August 2007) that NIC would be approached for mapping of DDO codes so that sub treasury can use district DDO codes so that dummy DDO are not used.

Audit Findings on the Application Controls

Application controls are those built in checks in the software, which ensure that transactions are processed according to the rules and regulations governing them. These are absolutely essential to ensure accurate and reliable data. Audit observations with respect to deficiencies in the application controls, are highlighted below:

3.5.13 Lack of validation controls.

The bills from DDOs are received through messenger, at the token window and the net amount of bill is fed into the system by Token clerk. In further processing, the Assistant on receipt of bill from Token Clerk makes a detailed entry including gross amount and deductions (BT). After the bill is passed a unique voucher number is allotted.
Audit scrutiny (May-June 2007) of records disclosed that

(i)   All the five DTOs test checked passed 95 bills during 2005-07 where gross amount was lesser than the net amount due to bugs in the software.

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[54]   **Chandigarh 142, 156, Hoshiarpur 149,156 and Jalandhar 15, 19, Ludhiana 29,42 and Ropar 10,35 during 2005-06 and 2006-07 respectively.**

      (ii)   Three[55] DTOs passed 84909 bills during 2005-07 on dates prior to the date of issuance of token number due to lack of validation controls.

Thus, absence of validation control and bugs in the software was indicative of the fact that the software was not tested before implementation, which caused incorrect acceptance of dates rendering the data generated through the software inaccurate and unreliable.

The Directorate in its reply stated (August 2007) that NIC would be asked to provide checks so as to control such mistakes in the software.

3.5.14 Acceptance of duplicate bill numbers

In a computerised environment maintenance of serial number on bills by each DDO while presenting bills for payment to the respective treasuries is essential to prevent duplicate payment.

Scrutiny (May-2007) of records of DTO Chandigarh revealed that during 2005-07 due to non-availability of such input controls in the software 22 bills (20 in 2005-06 and 2 in 2006-07) were passed with duplicate bill numbers. Though, such input controls were provided in 2007-08, yet these were inadequate as two bills were passed with duplicate bill numbers by suffixing/prefixing special characters with bill numbers.

The Directorate while admitting the facts stated (August 2007) that NIC was approached to provide checks in the software to disallow the duplicate bill numbers.

3.5.15 Lack of checks for preventing double payments

PFR Vol. I (Rule 8.13) provides that sub-vouchers above Rs 500 are required to be attached with the contingent bills in support of the claims presented. In IT environment defacing the original document by stamping at the time of computer input in order to check duplicate processing is essential.

During scrutiny (May-June 2007) audit observed that the Directorate vide rule 4.2 of standing orders allowed acceptance of photocopies of sub-vouchers attached to contingent bills in departure from the provisions of PFR, but failed to issue instructions to deface by stamping the original sub vouchers. As such, duplicate payments could not be ruled out in audit.

The Directorate while admitting the facts stated (August 2007) that Standing Order will be amended.

3.5.16 Non-mapping of business rules in the software

The Standing Orders stipulates that the bills should be disposed of strictly in the order of receipt on first come first serve basis and any disturbance of the seriatim would amount to misconduct for the purpose of initiating disciplinary

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[55]   **Chandigarh ,Hoshiarpur and Jalandhar.**

action against the defaulting officials. The DTO /TO was also required to ensure that bills are passed strictly in the order of receipt.

Audit scrutiny (May-June 2007) of records of five DTOs revealed that bills were passed by ignoring the seriatim of token as a result of non-mapping of business rule in the application software.

The Directorate in its reply stated (August 2007) that standing orders are followed in letter and spirit, however, some urgent payments on the directions of Court and Finance Department is made on priority. The reply is not tenable as the rule can be mapped in the software so that dealing clerk is not able to break the seriatim unless the bill is objectionable or payment are to be made on priority under the approval of DTO/Superintendent.

3.5.17 *Establishment of Data Centre at the Directorate.*

NIC brought out (October 2004) an expansion plan to be completed within ten months from the date of approval (October 2004). As per the plan all district treasuries and sub-treasuries were to be linked to a Data Centre at Directorate, Chandigarh through ISDN and PSTN to establish well integrated financial system using web technologies and linkages with external agencies like banks, Finance Department, etc. The data was to be used to generate information for macro level budget monitoring for effective ways and means control. The NIC was also required to map checks and controls in the iTISP, for registration of Pension Payment Orders (PPO), generation of entitlements, capturing of disbursements made by banks and generation of discrepancies between entitlement and disbursement.

Audit observed (March 2007) that though a centre had been set up at Directorate and linked to district treasuries at a cost of Rs 12.93 lakh to receive the data. But this data could not be consolidated at Directorate due to non-availability of required software. Poor ISDN connectivity necessitated updation of master data files at all the 75 locations instead of at Directorate level, leading to scope of error and delay in effecting changes. Audit further observed (June 2007) that despite lapse of two and half years NIC failed to establish linkages with banks as a result of which not only the receipt challans received from banks were manually fed into the system but also led to over payment of Rs 16.74 crore detected by the Directorate itself up to March 2007. Out of this, Rs 15.21 crore was recovered from the banks in piecemeal leaving a balance of Rs 1.53 crore un-recovered. Thus, non-providing of linkage with banks, the Directorate could not register PPOs, generate entitlements, capture disbursements made by banks and detect discrepancies concurrently.

The Directorate in its reply stated (August 2007) that Punjab Government is establishing its own Wide Area Network (PAWAN) and as soon as it is established the matter regarding connectivity with banks and other organisations will be possible.

3.5.18 *Procedure in issuance of cheques*

As per Standing Orders issued by Directorate, duplicate cheques are issued when the original cheque is reported to have been lost or destroyed. A fresh cheque shall be issued in lieu of lost /destroyed cheque by giving a cross-

reference on counterfoil of lost/destroyed cheque as well as on the counterfoil of fresh cheque to be issued.

Audit observed (June 2007) that no one to one link between cancellation of original cheque and fresh cheque issued in lieu of original cheque was provided in the software by NIC. Software also did not include the sub-module to computerize record relating to fresh cheques issued in lieu of cancelled cheques.

The Directorate while admitting (August 2007) the facts stated that NIC has been requested to do the needful.

Major Audit Findings on General Controls.

General controls are the policies and procedures, which govern the environment in which Information Technology is used in an organisation. The deficiencies noticed by audit are given below:

3.5.19 Lack of IT security policy

The Directorate had not formulated and documented any IT security policy regarding the security of IT assets, software and data security even after six years of implementation of iTISP.

The Directorate while admitting (August 2007) the facts stated that Department of Information Technology, Punjab (DOIT) has been approached for preparation of IT-Security policy.

3.5.20 Non -provision of Audit Trail

Audit trail is incorporated into an IT System for tracing an item from input through its final stage and depicts the flow of transaction at every point of processing up to the output stage.

Scrutiny of software (March 2007) disclosed that:
(i)   Directorate failed to include the audit trail options to capture details of terminal logon, start up time, activities of users, etc. in the iTISP.
(ii)   No system administration register and daily activity register was maintained.

Due to non-provision of audit trail in the software the Directorate could neither entrust the periodic review of audit trail to any responsible officer nor could documented procedure be evolved for regular monitoring of audit trail/logs to watch deviations in access trends and to ensure compliance of instructions relating to system security.

The Directorate in its reply stated (August 2007) that NIC has initiated the action for incorporation of audit trails.

3.5.21 Manpower management

The Management, in a computerised environment, must ensure that organisation has competent and trustworthy data management personnel because IT personnel aware of control weaknesses may alter transaction/ data with an ulterior motive.
Audit scrutiny, revealed that;
   1. Directorate had not prepared any organizational policy for clearly segregating duties of its officers/officials working in computerised

environment.

2. The Directorate had not deployed the skilled regular staff rather it was solely dependent on the contractual staff and NIC for maintenance of the software posing a threat to the integrity and security of the data.

The Directorate in its reply stated (August 2007) that no new staff is appointed as the existing staff has been trained to operate the computer systems and for IT Managerial staff Finance Department would be approached for creation of post of System Analyst.

3.5.22 Physical and logical access controls

Application Software and data should be protected from unauthorized alteration by the use of appropriate physical and logical access controls. Physical controls include restriction on entry of unauthorized persons to the client's site, buildings, computer rooms and each piece of IT whereas Logical access controls are restrictions imposed by the computer software.

Audit scrutiny (May-June 2007) of five DTOs revealed that the Directorate failed to restrict entry of unauthorized persons to the server room/client site

1. The server room at Hoshiarpur had no door and the room was not fully covered with the walls.
2. The server room at Chandigarh was also not isolated with a view to restrict entry of unauthorized persons to the server room.

Scrutiny (May 2007) of records of DTOs Chandigarh revealed the following discrepancies indicating logical access risks;

1. Five similar passwords were being used by 16 users, as there was no password policy in vogue.

2. Passwords of two or four characters were being used by the users against requirement of eight digit alphanumeric characters.

3. The software had no inbuilt arrangement for compulsory changing of password after a specified period.

Absence of physical and logical access control policy may attract unauthorized uses and poses threat to the integrity and security of the data and system as a whole.

The Directorate while admitting the facts stated (August 2007) that DTOs have been instructed to restrict the entry of unauthorized persons/outsiders in the server room and NIC has been requested to provide guidelines for making password policy.

3.5.23 Internal Audit in computerised treasuries

Internal Auditors have an important role in protecting the IT Systems by detecting deviations in prescribed procedure, identifying threats to information system, suggesting safeguards for timely rectification. One Deputy Director at the Directorate is responsible for Internal Inspection of Treasuries.

Audit observed (June 2007) that neither Internal Inspection Teams were trained in iTISP nor new methodology of audit in the computerised environment was devised by the Directorate. As such, no internal audit of IT System was conducted.

The directorate while admitting the facts stated (August 2007) that detailed guidelines have been issued to Internal Audit staff regarding inspection of treasuries.

3.5.24 Lack of disaster recovery and business continuity plan

The iTISP being a critical system, it was necessary to evolve a Business Continuity and Disaster Recovery Plan encompassing documented procedures for back-ups, restoration, anti virus mechanisms, redundancy, etc. It was observed in audit that the Directorate failed to formulate and document disaster recovery policy, causing;

1. Backups being taken in test checked treasuries at irregular intervals
2. Non testing of stored backups was being done to check data restoration.
3. Non-storing of backup data off site in fire proof cabinets.
4. Non-formulation of anti virus policy.

The directorate in its reply stated (August 2007) that DOIT would be approached for guidelines on disaster recovery.

3.5.25 Conclusion

Though the Directorate implemented iTISP in phases since April 2001 and spent Rs 6.22 crore on computerisation till 2007, yet it could not complete computerization of all the sub treasuries. Inadequate input controls led to passing of bills, without removal of objections, with duplicate bills numbers, on dates prior to the date of its receipt and ignoring chronological order. Lack of input/validation controls adversely affected the reliability and accuracy of the data. There existed no password and IT security policy to safeguard data and system. Disaster recovery and business continuity plan and back up policy were also not in vogue. As envisaged, linkages of treasuries and Directorate with banks and Finance Department was also not achieved causing manual feeding of challans and updation of master files in district treasuries and sub treasuries thereby defeating the major objectives of computerisation.

Recommendations

↘ The remaining sub-treasuries should be computerised on priority.

↘ The directorate should get the software updated by incorporating input controls and test these changes before implementation.

↘ The directorate should formulate well-defined IT security, password and data back-up policy besides disaster recovery plan.

↘ The task of linking of treasuries with the banks and Finance Department is of utmost importance so as to minimize manual inputs and optimize the benefits of computerisation.