LABOUR AND EMPLOYMENT DEPARTMENT

2.3 Information Systems Audit on Computerisation of District Employment Offices

Executive Summary

The primary function of District Employment Offices (DEOs) is to register job seekers, renew their registration periodically and update their qualification as and when requested. DEOs also select candidates based on their seniority and qualification and furnish lists of eligible candidates to employers. Information Systems Audit on Computerisation of District Employment Offices revealed the following significant audit findings:

Out of the nine modules, only two modules (Registration Module and Vacancy Module) have gone live even six years after the entrustment of the work to the developer.

Large-scale manual interventions were made in the selection process due to inadequacies in the Vacancy Module.

There were errors in selection lists generated by the Vacancy Module due to errors in input/process/data migration.

National Code of Occupation (NCO) and seniority date in respect of 1.47 lakh candidates registered during 2011-14 were not available in the relevant table. There were discrepancies in seniority date between candidate NCO table and Selection Detail table. Discrepancies were noticed in input of fields due to absence of validation controls. Multiple registrations of candidates were noticed.

Therefore, Audit could not derive assurance that the candidates were recommended for jobs, in accordance with the rules and regulation in force, through the system.
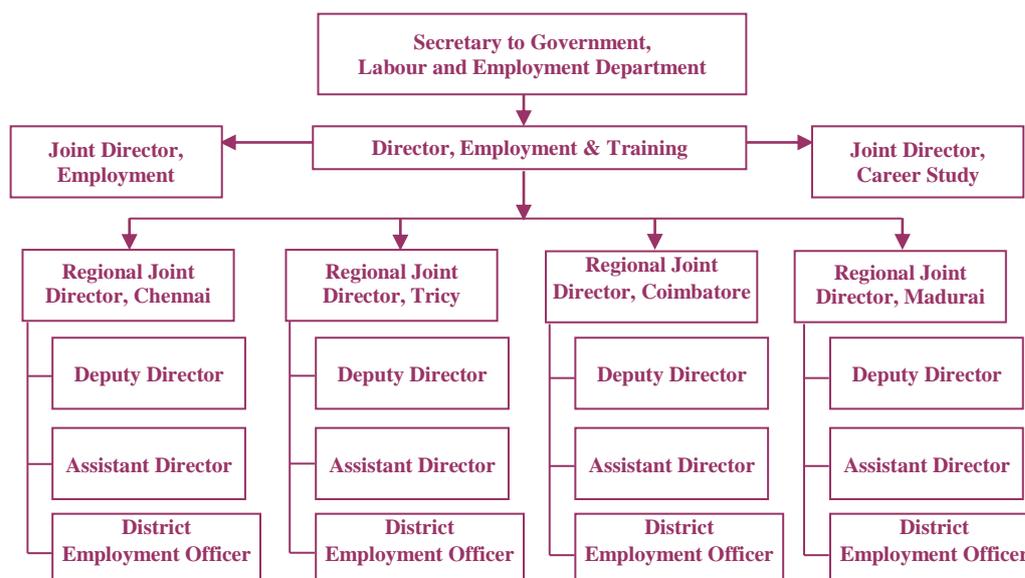
2.3.1 Introduction

The primary function of District Employment Offices (DEOs) is to register job seekers, renew their registration periodically and update their qualification as and when intimated. DEOs also select candidates based on their seniority and qualification and furnish lists of eligible candidates to employers. Apart from this, DEOs collect data and compile Employment Market Information (EMI).

2.3.2 Organisational set up

Each of the 32 districts in the State has one District Employment Office. A Special Employment Office for registering differently abled candidates and two District Employment Offices, one for technically qualified candidates and another for unskilled candidates, are functioning at Chennai. Besides, two

Professional and Executive Employment Offices (PEEOs) are functioning at Chennai and Madurai. The organisational hierarchy is depicted in **Chart 2.2**.

Chart 2.2: Organisational hierarchy

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                    ┌──────────────────────────────┐
                    │   Secretary to Government,    │
                    │ Labour and Employment Department │
                    └──────────────────────────────┘
                                   │
┌──────────────┐    ┌──────────────────────────────┐    ┌──────────────┐
│ Joint Director, │◄──│ Director, Employment & Training │──►│ Joint Director, │
│ Employment   │    └──────────────────────────────┘    │ Career Study │
└──────────────┘                   │                     └──────────────┘

┌──────────────┐  ┌──────────────┐  ┌──────────────┐  ┌──────────────┐
│ Regional Joint │ │ Regional Joint │ │ Regional Joint │ │ Regional Joint │
│ Director, Chennai │ │ Director, Tricy │ │ Director, Coimbatore │ │ Director, Madurai │
└──────────────┘  └──────────────┘  └──────────────┘  └──────────────┘
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Regional Joint Director, Chennai	Regional Joint Director, Tricy	Regional Joint Director, Coimbatore	Regional Joint Director, Madurai
Deputy Director	Deputy Director	Deputy Director	Deputy Director
Assistant Director	Assistant Director	Assistant Director	Assistant Director
District Employment Officer	District Employment Officer	District Employment Officer	District Employment Officer

The Director of Employment and Training is the Head of the Department, who is assisted by two Joint Directors in charge of Employment and Career Study respectively. There are four Regional Joint Directors situated at Chennai, Tiruchirappalli, Coimbatore and Madurai. At the District level, District Employment Offices are controlled either by a Deputy/Assistant Director or a District Employment Officer.

2.3.3 Computerisation

The Labour and Employment Department (LED), which maintained their system in FoxBASE till 2009, decided to move to a web-centric platform so as to link all DEOs in the State. Electronics Corporation of Tamil Nadu (ELCOT) was appointed the nodal agency for the project titled "Project Empower". Between 2008-09 and 2014-15, the GoTN sanctioned ₹ 7.98 crore for the project towards purchase of hardware, development of software, Tamil Nadu State Wide Area Network (TNSWAN) connectivity, manpower requirement, procurement of additional servers, security auditing, recurring cost for Annual Maintenance Contract (AMC) and supply of consumables etc. Out of ₹ 7.98 crore, ₹ 7.01 crore was released to ELCOT to implement the project (cent *per cent* advance payment) during the period 2008-15. ELCOT spent ₹ 5.03 crore on the project and a sum of ₹ 1.98 crore remained unutilised with them (March 2015). The 'Project Empower' System has been developed with Java J2EE as front-end and PostgreSQL as back-end database. As of March 2015, ₹ 0.58 crore was spent for development of application software.

Registration for employment, renewal of registration (once in three years), addition of qualification etc., can be done by the candidate by visiting DEOs or

through on-line mode and the captured data gets stored in the servers placed at National Informatics Centre, Chennai.

2.3.4 Objectives of Computerisation and Networking

"Project Empower" consisting of nine modules detailed in **Appendix 2.9,** was to be completed within two years from the date of signing of the agreement (May 2009) i.e. May 2011.

The objectives of computerisation and networking were to:

➢ allow online registration with DEOs, online updation, online renewal of employment registration for job seekers;

➢ develop data bank of highly qualified candidates from the live register of DEOs;

➢ allow private sector employers easy access to the database to fill vacancies arising in their establishments;

➢ provide online information on application deadlines, hot track and future trend of employment;

➢ facilitate manpower planning and analysis through effective implementation of Employment Market Information; and

➢ promote employability of students and job seekers through vocational guidance.

2.3.5 Scope of audit and methodology

The Information Systems (IS) audit covered only two modules *viz.* Registration and Vacancy Modules, out of the nine modules, since only these modules were completed by the developer so far (March 2015). The IS audit covered the period from 1 January 2011 to 4 December 2014. Apart from scrutiny of records/ files maintained at the Directorate of Employment and Training (DET), examination of data pertaining to the entire State was carried out through Structured Query Language queries and Computer Aided Audit Techniques (CAATs). The working of the two modules was assessed in eight DEOs[32] selected through random sampling. The audit objectives were discussed with the Secretary to Government, Labour and Employment Department in an Entry Conference held on 3 February 2015 and the findings of audit were discussed with the Secretary in the Exit Conference held on 1 September 2015. Replies wherever received have been taken into consideration while finalising the audit findings.

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[32]   Chennai, Coimbatore, Dindigul, Pudukottai, Salem, Thiruvarur, Tiruchirappalli and Villupuram

2.3.6 Audit Objectives

Audit objectives were to assess whether:

➢ the application software was functioning effectively towards achieving the intended objectives;

➢ the business rules were properly mapped in the application software; and

➢ Information Technology systems were effectively monitored by the top management

2.3.7 Audit Criteria

The IS audit was benchmarked against criteria derived from the following sources:

➢ Instructions issued by GoTN in the form of Government Orders/Circulars.

➢ Instructions issued by the Directorate of Employment and Training in the form of Proceedings.

➢ Best IT Practices followed.

Audit Findings

The audit findings are grouped under General Controls, Application Controls and Monitoring and brought out in the succeeding paragraphs.

2.3.8 General Controls

2.3.8.1 *Delay in completion of modules*

The development of the application software consisting of seven separate modules[33] was entrusted (May 2009) to M/s. Emergys Software Private Limited at a cost of ₹ 11.97 lakh. Subsequently, two more modules[34] were also entrusted to the firm at a cost of ₹ 6.24 lakh (September 2009). The Candidate Profile module was put up for User Acceptance Test (UAT) (May 2010) and it was launched and dedicated to public in September 2010. Due to sudden hike in load and software issues, the application could not be accessed by public and departmental users. The developer could neither address the application and database issues nor come up with a solution to arrest the frequent disruption of the website. But the firm attributed (February 2011) inadequate testing of the data migration process, enormous pressure placed on the implementation team to complete the task within a short span and insufficient testing of application

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[33]   Candidate profile module (Registration module), Employment Exchange module (Vacancy module), Employment Market Information module, Administration module, Unemployment allowance module, Human Resource module, Budget and Accounting module.

[34]   Vocational guidance module, Grievance Redressal module

codes for production level performance to the poor performance of the application software.

ELCOT terminated (February 2011) the contract with the developer and awarded the task of development of all the modules afresh to M/s. Onward e-Service Limited, Chennai, the L2 firm. An agreement was signed (March 2011) by ELCOT with the firm for development of all modules at an all-inclusive cost of ₹ 13.87 lakh, to be completed within two years from the date of signing of agreement. Though the firm was required to complete all modules before March 2013, the firm had so far (March 2015) completed the "Registration module[35]" and "Vacancy Module[36]" only (gone live). The other seven modules were still in the initial stages/development/testing stages even after two years (March 2015) beyond the prescribed deadline (March 2013). Of these, one of the modules *viz.,* Employment Market Information Module, development of which was commenced in October 2012, is still in roll out stage due to non-freezing of the requirements by the department.

Due to non-implementation of another module *viz.,* Unemployment Allowance (UA) module, the entire process had to be carried out manually. The manual process is initiated by maintaining a separate dossier for each candidate which contains the candidate's application, a copy of employment registration card, copies of educational qualification certificates and a copy of income certificate issued by the Tahsildar on the annual income of the family. Name of the candidate, Registration Number, date of application, next renewal date, date of attainment of maximum age limit, etc., were written in the front sheet of around 3,000 dossiers in each DEO. All the dossiers were manually checked (during each quarter) for eligibility and on obtaining the approval of the DEOs the details of the eligible candidates were sent to the Treasury for payment of UA to the eligible candidates.

Scrutiny of records revealed that payment of UA to ineligible persons amounting to ₹ 12.99 lakh was made in five test-checked DEOs as detailed in **Appendix 2.10**.

Audit observed from the records produced that no effective steps were initiated by the department to ensure completion of development of the rest of the modules. Though the agreement with the developer provided for recovery of liquidated damages up to two *per cent* on the contract value, no penalty had been imposed against the firm so far.

2.3.8.2 *Non-establishment of Disaster Recovery site*

GoTN approved (December 2013) a revised comprehensive proposal for ₹ 4.90 crore for purchase of additional servers, hardware, AMC (for fourth and

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[35]   Registration module had been developed to register all the fresh candidates either through online mode or in the DEO's office

[36]   Vacancy module had been developed which is used for generating vacancy list for employers and also for sending the short listed candidates selected through system on the basis of inputs received from the Employer.

fifth years), Disaster Recovery (DR) setup, data migration, application software, on-site support, contingency and consultant charges etc., and sanctioned a one-time capital expenditure of ₹ 1.99 crore and recurring expenditure of ₹ 0.97 crore for the financial year 2013-14. The sanctioned amounts were released (February 2014) to ELCOT to meet the expenditure for 2013-14. The capital expenditure of ₹ 1.99 crore included ₹ 50 lakh proposed for establishment of a disaster recovery site. It was mentioned in the proposal that the DR setup was proposed to be installed at the DET in order to maintain a backup of the employment database in case of any data loss due to unforeseen contingencies or natural calamities. The technical infrastructure like minimum servers with UPS and bundled bandwidth of 8 mbps of TNSWAN were included under the component. It was also indicated that the DR site (servers) could also be used as a staging server for testing and training purposes. The very purpose of establishing a DR site is that in the case of any eventuality in the original site, the DR site should take up the entire functions of the original site without any loss of time. However, the proposed DR site is yet to be established (March 2015), though funds were released to ELCOT in February 2014 itself.

The Department replied (April 2015) that steps were being taken to deploy the newly procured servers and that study for DR setup was going on.

2.3.8.3 *Excess release of ₹ 59 lakh to ELCOT for application software*

GoTN sanctioned and released ₹ 5.02 crore (₹ 2.90 crore in January 2008 and ₹ 2.12 crore in August 2010) which included ₹ 58.83 lakh towards development of application software. The funds were released to ELCOT being the nodal agency. After incurring an expenditure of ₹ 21.35 lakh on development of software, ELCOT had an unspent balance of ₹ 37.48 lakh. In addition, based on DET's revised proposal (April 2013), GoTN approved (December 2013) ₹ 4.90 crore for additional servers, hardware, DR setup, data migration, application software, etc., including ₹ 59 lakh for development of application software.

Thus, the Department without taking into cognizance the unspent amount of ₹ 37.48 lakh, also released ₹ 59 lakh to ELCOT in February 2014, which is unwarranted. The break-up details of expenditure relating to application software were not furnished to audit.

In reply, the Department (March 2015) has merely drawn reference to year-wise release and expenditure details of the project without furnishing the break-up details.

2.3.9 Application control

The department migrated to a web-centric platform with PostgreSQL as the back-end database in September 2010. The legacy data which was maintained in FoxBASE system was also migrated to the new system. Since the primary functions of the department include registration of job seekers, their renewal and nomination of eligible candidates to the employers (based on the request

received), the data is critical. Any error in the data will have a direct bearing on the selection process of the candidates.

The database, as on 4 December 2014, was provided to audit for examination purposes. Examination by audit disclosed that the application software lacked vital validation (input/process) controls leading to many types of errors in the database which resulted in incorrect selection of candidates through Vacancy Module.

2.3.9.1   Selection of candidates through Vacancy Module

The Vacancy Module was introduced and rolled out in February 2012 with a view to select the eligible candidates through the computer system. This module (integrated with candidate profile module) reflects the basic functionality of the department. The module was introduced mainly to improve efficiency, transparency, eliminate manual intervention and to reduce the time taken to select the eligible candidates based on their seniority for the requisite qualifications from the database. Requests were received periodically through correspondence by DEOs/PEEOs from employers for selection of eligible candidates from the database of the department. Such employers also communicate to the DEO/PEEO the nature of post, age criteria, qualifications, crucial date for reckoning the age limit, whether priority or non-priority candidates, caste details etc. These inputs were fed by the DEOs/PEEOs concerned in the computer system and the selection process was run so as to generate the list of eligible candidates from it. The DEOs were ultimately responsible for the selection of candidates made through the computer system. The lists of selected candidates were communicated by the DEO concerned to the employer for further action at his end. The employer has to communicate the results of the interview to the concerned DEO in order to enable him to move "Placed" flag in the database for candidates who were appointed so that such candidates do not figure in the subsequent selection process run through the system.

During field visit to eight DEOs, audit conducted a system study of the selection process and also examined 17 cases (selected through random sampling method in the test-checked DEOs) to ensure whether the outputs generated from the system were correct. The following observations are made:

(a)   **Large-scale manual interventions in selection process**

In all the eight DEOs visited by audit, it was noticed that the list of candidates generated from the vacancy module was exported to MS-Excel for manual tagging of the ineligible candidates. The final list was arrived at based on the ratio adopted for each post and the list was communicated to the employer. A list of six cases of selections made, wherein large-scale manual intervention was made is given in **Appendix 2.11**.

The reason for large-scale manual intervention was inability of the application software to handle the following business rules/situations:

(i)   Age relaxation to below Secondary School Leaving Certificate (SSLC) candidates: Candidates with qualification below SSLC are given age relaxation

of one year on regular renewal up to a maximum of five years provided such candidates acquire no additional qualification. The application software does not handle the above situation due to which candidates with less than SSLC qualification but with additional qualifications were also included in the "Selection List".

(ii)   Inability to handle order of Priority: The selection of candidates is based on two important criteria *viz*., "Priority Selection" or "Non-Priority Selection". Under Priority Selection of candidates, the candidates are to be selected according to the order of priority[37]. Audit found that the system could not handle the situation and the selection list generated from the system is not on "Order of Priority" of the candidates but based on the "Seniority"[38] of the priority candidates. Further, the system could not handle the order of priority applicable to Central Government/State Government/Quasi Governments also.

(iii)   Inability to handle apprenticeship certificate holders: The National Code for Occupation (NCO) 87310 and 87311 represent "Sheet Metal worker" and "Sheet Metal Worker - NAC[39]" respectively. It was observed that if a selection process is run in the computer system, where the requirement is only "sheet metal worker" (NCO – 87310), the computer system selects the candidates with NCO 87311 also. In the Selection Module Screen, the user can opt for NCsO with "Consider all the Selected NCO" or "Consider Any one in Selected NCO" only. Due to this, the list generated would have candidates with either of the NCsO opted / candidates with all the NCsO opted respectively. The user does not have option to filter any NCO *viz*. 'Not including' option. Due to the above issue, the system does not filter the candidates who have undergone apprenticeship training and therefore, DEOs were forced to tag the candidates with 87311 NCO manually.

(iv)   Other issues:

➢   The system does not assign the relevant upper age limit for priority candidates like destitute widow (35 years), (Ex-servicemen – OC (48)/ Others (53)). Similarly, the system could not assign the appropriate age relaxation applicable to reserved candidates i.e. SC (Arunthathiyar)/ ST/SC (35 years) and MBC/BC/BC (Muslim) (32 years) when they were considered under "General Turn/Non Priority" category in State Government Departments. To overcome these issues, the input for the age limit was given as 57 years in 9,212 cases out of 35,030 vacancy IDs during the selection process.

➢   For selection of candidates based on educational as well as technical qualifications such as computer course etc., the system could not list out candidates with both the qualifications since the user can opt either

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[37]   Sequence in which type of priority to be considered for selection: (a) Destitute widow (b) Inter-caste marriage (c) Ex-servicemen, differently abled, etc., besides community based reservation i.e. SC (Arunthathiyar) /ST/SC/MBC/BC/General qualification, seniority, etc.

[38]   Seniority is date of registration of particular qualification of a candidate

[39]   National Apprenticeship Certificate

for "Consider all the Selected NCO" or "Consider Any one in Selected NCO" only.

➢ There was no provision in the selection module to filter "Second language" or "Percentage of Marks" of candidates though provision has been given to capture these data. This led to inability of the system to handle the specific requests from employers.

➢ An examination was conducted in audit to see the extent of the number of candidates generated from the computer system against the "input ratio" adopted and given as input before running the selection process. Examination revealed that out of 35,030 employer requests received and processed through the system, the system had generated an elongated list in 4,762 requests, in excess of the ratio given as input. Generation of excess list in the eight test-checked districts is given in **Table 2.18**.

Table 2.18 : Generation of excess list

Range of elongated list (In percentage)	No. of requests
0-50	2,230
51-100	862
101-200	697
201-300	289
301-500	254
More than 500	430
Total cases	**4,762**

To cite an example, for vacancy ID 'ARD2014SG00000077' against the five posts requested by the employer with vacancy ratio of 1:20, the system has generated a list of 180 candidates instead of 100 candidates.

Audit observed that the software was not tested fully before roll out of the application software, to ensure that it handles all the above business rules/situations as contemplated through various Government Orders for selection of candidates. Due to the above failure, the DEOs were forced to generate excess list from the module and manually tag from the list such of those candidates who were not eligible for selection based on the requirements and eligibility criteria received from the employer.

The Department replied (March 2015) that earnest efforts have been made to resolve all the objectives in a single cycle; however, testing the software under all combinations and inputs and preconditions (initial stage) is not feasible, even with a simple product. The Department further stated that only after number of trials and error corrections, the software would be refined and that there was dearth of experienced staff for the same. The Department assured that the observations of audit were being taken into consideration and necessary action would be taken to rectify the defects.

The reply is not acceptable since the defect exists even three years after the roll out in 2012.

(b)   **Errors in selection of candidates**

Every employer communicates his requirement for selection of eligible candidates to the respective DEO along with the eligibility criteria to be adopted for selection of candidates. The input parameters pertaining to the candidates such as qualifications which are identified by NCsO, community, age, whether Priority or Non-Priority candidate, crucial date for reckoning the age and profile status etc., are vital for generating the list. Therefore, it is the responsibility of the DEO concerned to ensure that all the required parameters, as sought for by the employer, were correctly entered in the computer system so that no eligible candidate would be left out due to omission of entering any vital information.

Audit examined 17 selection cases in the test-checked districts and found that the selection list generated by the system was incorrect due to errors in input/process such as order of priority not handled by system, no provision for selection by excluding NCO (Apprenticeship training), incorrect assignment of 'dead' profile status and absence of provision for selection based on percentage of marks and incomplete migration of legacy data. Out of the 17 cases, in eight cases the DEOs concerned accepted the observations of audit and in eight cases, the reply furnished by the DEOs was not acceptable for the reasons mentioned therein (**Appendix 2.12**). In one case, the reply is awaited from the department.

From the above, it is evident that the application software is yet to achieve its envisaged functionality due to (a) inability of the software to handle some important business rules leading to large-scale manual intervention in the selection process and (b) input process errors coupled with data migration issues in test-checked cases.

2.3.9.2   *Errors in the data impacting the selection process of eligible candidates*

The selection of candidates is done in the software through Vacancy Module. This Vacancy Module has been integrated with Registration Module in the system and both are inter-linked. Any error/omission/mismatch etc., present in the Registration database would have a direct impact on the selection process of the eligible candidates. In other words, the eligible candidates may be left out from the selection process or ineligible candidates would be selected due to absence of process control/referential integrity[40] in the system.

(a)   **Absence of NCO/Seniority date for 1.47 lakh registrations**

In the database, the profile of the candidate such as registration number, name of candidate, date of birth, date of registration, sex, caste, community, family card number, profile status etc., are stored in Candidate Profile table. In Candidate NCO table, the registration number of the candidate, NCO and Seniority date is available. Both these two tables are inter-linked and every registration number

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[40]   Referential integrity is a relational database concept in which multiple tables share a relationship based on the data stored in the tables, and that relationship must remain consistent.

available in the Candidate Profile table should have at least one NCO in Candidate NCO table.

Out of the 1,80,25,500 registrations in the Candidate Profile table, 2,81,653 registration numbers did not figure in Candidate NCO table, of which 1,46,397 registrations were made during 2011-14. Due to non-availability of NCO/Seniority date, these registrations were not considered in any of the selection processes as seen from selection details table.

The Department replied (March 2015) that a candidate while registering his/her highest qualification at the time of initial registration entering more than one qualification, only NCO for the highest qualification will be allotted. Eg. SSLC and HSC qualification, NCO is available only for HSC (X0115).

The reply of the department is not pertinent since the contention of audit is that without any information on qualification and date of seniority, the candidate cannot be considered in any of the selection process carried out by the DEO. Therefore, existence of these 1,46,397 registrations in the computer system without the vital information due to incomplete registrations/ incomplete data migration only proves that the application software lacks referential integrity, resulting in no scope for selection for these registrants in future as well.

(b)   Incorrect profile status of candidates

In the Candidate Profile table, the column "profile status" indicates whether a candidate is 'live'/'dead'/'placed'/'active'/'re-registered' in the database. Every candidate should renew his registration once in three years from the date of his/her registration to remain 'live' in the database for possible selection for employment. In the database, a candidate is considered as live, if his/her profile status is 'A' or 'L' or 'R'[41]. If the candidate fails to renew the registration within the grace period[42], he/she is moved to 'Dead' status from 'Live' and assigned with 'D' flag in the database.

Examination of the data relating to Registrations done upto 4 December 2014 disclosed the following -

➢   In 2,777 records with live profile status, though the expiry dates of these registrations were before 1 October 2014, the system failed to assign "Dead" status.

➢   17,341 records were assigned 'Dead' Status, though the difference between the expiry date and date of registration was less than 1,096 days (three years) during the registration period from 2011 to 2014.

➢   491 records have 'Dead' profile status though their expiry dates are later than 28 February 2015. These candidates should be "live" in the database.

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[41]   A-Active ; L –Live; R-Re-registered

[42]   Grace period of two months

Due to process error in the system, the system failed to assign the correct profile status in the above cases. In all these cases, ineligible candidates may be selected or eligible candidates may be left out during selection process of candidates. Reply of the Department is awaited (June 2015).

(c)   Differently abled candidates with profile status "dead"

Government, while implementing the integrated computerised system decided (September 2010) that all the differently abled (DA) candidates were exempted from renewing their registration. In the computer system, the details about all the "Priority"[43] candidates, including DA candidates were stored in the 'Priority_Details' data table.

Examination of "Priority_Details" table and "Candidate_Profile" table disclosed that out of 1,41,405 DA candidates, 20,199 candidates were assigned 'Dead' profile status by the system in Candidate_Profile table due to non-adoption of the above decision in the application software. Hence, these 20,199 candidates would not have been considered during selection process of DA candidates based on employers' request.

The Department replied (March 2015) that blind and deaf candidates were exempted from renewal as per Government Order (September 2010) and 'Ortho' candidates were exempted only from 2010. Hence, the ortho candidates who got registered before 2010 were with 'D' status in the data.

The reply of the Department is in contravention of the instructions of the Government contained in the Order mentioned above. Further, re- analysis in this regard revealed that in 176 cases, differently abled candidates were assigned 'Dead' status even after September 2010.

(d)   Incorrect registration of candidates with professional qualifications in DEOs instead of in Professional Employment Exchange Offices

The candidates possessing professional qualifications need to register the same at Chennai PEEO or Madurai PEEO only. Hence all the DEOs in the State were mapped with Chennai PEEO (CHP) or Madurai PEEO (MDP) for registration of professionally qualified candidates through online mode or through DEOs. The online system should not permit registration of professional qualification in exchanges other than CHP/MDP. In other words, each candidate with professional qualification should have registration numbers with exchange prefix "CHP/MDP".

A check of Candidate_Profile table, Candidate_NCO table and NCO_reference table[44] in conjunction with each other disclosed that there were 41,894 registrations of candidates with 'Professional qualifications' which were made with exchange code prefix other than CHP/MDP incorrectly due to process

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[43]   Inter-caste marriage; Ex-serviceman; Destitute widows; Land acquisition case; Differently abled, etc.

44   Contains the description of each NCO with Exchange type i.e. PEEO or General

failure in the system. All these registrations had taken place after 01-01-2011 i.e. after the introduction of new on-line system. It was also verified that these 41,894 registered candidates with professional qualifications were not considered in any selection process run by Chennai or Madurai PEEOs as observed from Selection Details table. Reply of the Department is awaited (June 2015).

(e)   Discrepancy in "Seniority date" of NCO

The NCO with Seniority date of a candidate is captured in Candidate NCO table and there may be multiple NCsO for a candidate depending upon his/her qualifications. Any updations or corrections to "Seniority date" are stored in NCO_Candidate_History table, wherein the old seniority date and new seniority date is available.

The Selection details table contains the selection details of candidates identified by a unique number (Vacancy ID) with other fields such as Candidate Id, NCO, Seniority, Qualification, Selection Status, Remarks, etc. The table also contains the NCO and seniority date of each selected candidate. On no account, the seniority date of a NCO existing in Selection details table should differ from that in Candidate_NCO table. In Vacancy details table, the inputs received from each employer for selection and the date of notification of the employer request for selection process are captured.

Audit examination of data disclosed that in the eight test-checked districts, there was discrepancy in "Seniority date" between "Candidate_NCO table" and "Selection details table" and no audit trail for these records is available in NCO_Candidate_history table. The details regarding number of instances where such discrepancy existed are given in **Table 2.19**.

Table 2.19 : Discrepancy in seniority date

Sl.No	District	No. of cases with different seniority date between Candidate_NCO table and Selection details table	Seniority Date greater in Candidate_NCO table	Seniority Date lesser in Candidate_NCO table
1	Coimbatore	356	200	156
2	PEEO, Chennai	40	21	19
3	Dindigul	718	421	297
4	Pudukottai	181	119	62
5	Salem	594	275	319
6	Trichy	346	214	132
7	Tiruvarur	391	305	86
8	Villupuram	806	422	384
	Total	**3,432**	**1,977**	**1,455**

➢   It is seen from **Table 2.19** that 1,977 candidates whose seniority dates are lesser in the selection details table stand to gain in getting employment, while the other 1,455 candidates stand to lose, as the selection of candidates is done based on the details available in the Candidate_NCO table.

> In the Candidate_NCO table, a candidate should not have any duplicate registration number/NCO/Seniority date. It has been observed that 1,17,021 instances have same Registration Number and NCO with number of records ranging from two to five. Out of this, 4,289 instances have same Registration Number, NCO and Seniority date with records ranging from two to four.

> It was noticed that 1,12,632 instances have same Registration Number and NCO but different Seniority date with number of records ranging from two to five.

> A candidate can be selected any number of times till his placement, based on his age, profile status, qualifications and employers' requests. On scrutiny of Selection_details table, it has been observed that 968 instances (1,939 records) have same Candidate Id, same NCO but with different seniority dates during selection for different Vacancy_Id.

The system has been designed to pick the NCO/Seniority date available in the Candidate_NCO table during selection process. Existence of more than one "Seniority date" for an NCO for a candidate in the database only proves that the integrity of the database is questionable, since every selection process run through the system is based on "Seniority of the Candidate" with reference to that NCO. However, the department replied (March 2015) that regarding duplication of records, the software developer has requested to furnish the duplicated records and it had been forwarded to field offices for data purification which would be set right in due course.

2.3.9.3 *Errors noticed in the profile of candidates*

Input controls and validation checks ensure the data entered is complete, accurate and reliable. Ineffectiveness of these critical control checks resulted in the following inaccuracies in the database.

In the database, the profile of the candidates such as registration number (16 digit number), name of candidate, date of birth, date of registration, father's name, gender, caste, community, family card number, profile status, etc., were stored in Candidate Profile table. Examination of the above table disclosed the following types of errors due to lack of input control in the system which are explained as below.

(a) Deficiencies in Registration number

The "Registration Number" allotted to candidates after registration process in the software is system-generated and of fixed length with 16[45] characters which is generated DEO-wise annually from January to December and gender-wise. In the 'Candidate Profile' table there are two separate mandatory columns *viz.*

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[45] Three characters – Exchange Code of registration, four characters - Year of registration, one character – Gender of the candidate and eight characters is the sequential number

'DEO Code' and 'District' to identify the registration. The discrepancies noticed are given in **Table 2.20**.

Table 2.20 : Details of types and number of discrepancies

Sl.No.	Type of discrepancy	No. of cases
1	Registration Number less than fixed length of 16 characters	7,117
2	Out of the above 7,117, without data in Exchange Code column	7,095
3	Out of the above 7,095, 'Live' registrations	1,230
4	Out of above 7,095, without data in Exchange Code and District columns	722
5	Out of the above 722, 'Live' registrations	708
6	Out of 7,095 – Registration Number in the format of "Gender + Year of Registration + 8 digits"	5,999
7	Out of 7,095 – Registration Number in the format of "Year of Registration + Gender+ 8 digits"	1,096

It has been provided in the User Manual that the system validates whether the mandatory fields were entered. If any of the mandatory fields were left blank, the system returns an alert message to enter the details in the mandatory field before saving the registration process. It was also observed that the columns 'Exchange code' and 'District' are mandatory fields. However, due to absence of input control in the system, the system allows to save the registration process, even without entering the mandatory fields.

(b)   Input entries

The Community ID, caste and the Community Certificate Number columns, gender, family card number and date of birth are 'mandatory' fields in the software and these are vital information required for selection process of candidates based on community reservation in employers' requests. Date of Registration is a system generated date shown in database. Audit noticed discrepancies in input of these fields during 2011-14 as given in **Table 2.21**.

Table 2.21 : Discrepancies in input of fields

	Name of the field details	No of records with deficiency	Records with live status
Community Certificate			
1	Without Community Details	13,561	1,830
2	No Community and Caste details	13,472	1,755
3	Without Community Certificate Number	36,41,572	25,09,000
4	Incorrect Community Certificate Number (i.e 3 or less number of characters)	7,24,916	6,22,009
Gender			
1	'Gender' left blank	288	125
2	'Gender' in Registration number differs from 'Gender' column (due to non-reflection of change made in the 'Gender' column in the Registration number)	680	314

Name of the field details	No of records with deficiency	Records with live status
Family card number		
1 No data in the 'family card number' field	4,05,383	43,871
Date of Registration		
1 No data in 'date of registration' but, date of expiry of registration available	8,104	1,774
2 'Date of registration' earlier to 'date of birth'	8,420	-
3 'Date of registration' earlier than1.1.1963 (or) later than 4.12.2014	4,789	-
Date of Birth		
1 Blank entry in 'date of birth' field	418	241
2 Invalid entries (year before 1901)	-	446
3 Registration of candidates aged 5 to 10 (born between 2004 and 2010)	1,819	206
4 'Date of birth' and Date of Registration are same	2,531	228
5 Age less than 14 years but completed SSLC	3,090	-
6 Age less than 16 years but completed HSC	4,505	-
7 Age less than 19 years but completed degree	1,256	-

Considering the fact that information in these columns were stated to be mandatory fields in the user manual, due to lack of input control these vital fields could be left blank, thus rendering the data unreliable. The Department replied (March 2015) that the defects noticed and identified by the audit team due to lack of input control in the system would be taken care of in consultation with the software developer in order to avoid such lapses in future.

(c)   Multiple Registrations

The software should not allow a candidate to do multiple registrations within a district or register his candidature in more than one district as per the policy of the Department. Hence, no duplicate registration of candidate should exist in the Candidate Profile table. However, a candidate could have two registration numbers if he is in possession of "General" as well as "Professional" qualifications, since "General" qualifications were registered in the concerned DEOs while "Professional" qualifications were registered either in Chennai or Madurai Professional Employment Exchange Office. Existence of multiple registration numbers within one district or in more than one district for a candidate would lead to incorrect selection of candidates during "Selection Process" apart from denial of opportunity to other eligible candidates.

Though the Vendor, M/s Onward e-Services had proposed the usage of de-duplication tool, it had not been implemented as approval had not been given by the user department.

Further analysis revealed that there were 78,528 duplicate/multiple registrations ranging from 2 to 102 and in one instance with 2,850 duplications in the table, after excluding all the registration numbers relating to PEEOs in Chennai and Madurai. Following discrepancies are noticed by audit.

➢ Multiple Registration of a candidate in different DEOs ranging from two to six districts involving 13,825 Registrations was noticed. Due to lack of validation control in the system, the system allows these multiple registrations. These multiple registrations entail undue advantage to these 13,825 Registrations since these candidates enjoy the possibility of getting selected in multiple selections carried out by different District Employment Offices.

➢ There were 64,741 records of multiple registrations within a district.

The application software should have been designed in such a way by adopting a combination of name of the candidate, date of birth, father's name and family card number as key field to arrest the capture/registration of multiple registration by a candidate. However, such critical input control is not available in the software. Even the Family Card Number (a unique identification number), though a mandatory field as per the User Manual, could be skipped without entering the data.

It was noticed during the test-check of DEOs that the system was unable to modify the category of a 'general' candidate wrongly registered as 'DA' instead of 'general', necessitating fresh registration. Similarly, there was no provision for recovery of password of candidates registered online, necessitating fresh registration. These were causes for multiple registrations.

The Department replied (March 2015) that the records identified by audit as duplicate/multiple registrations have been examined and necessary action will be taken to sort out the issues by adding de-duplication tool in future.

(d)   User identity not captured – absence of audit trail

Every single addition, deletion or modification to an existing data carried out in any table should be captured in the respective table in the form of audit trail. To ensure integrity of the data, the details about the user who carried out the changes, updation date with time should be stored in the relevant table. This provision helps in tracking the changes made in the database. The developer had stated in the User Manual of "Registration module" that audit trail had been enabled. However, examination of the following important tables disclosed that there is no audit trail in the system in the number of records indicated against each table as given in **Table 2.22**.

Table 2.22 : Absence of audit trail

Sl.No.	Name of the Table	No. of records with 'Updated by' information left blank
1	Candidate_Profile	4,23,296
2	Candidate_Address_History	15
3	Candidate_Caste_History	2
4	CandidateProfileStatusHistory	23,70,219
5	NCO_Candidate_History	328
6	Priority_Details	1,93,492
7	Qualifications	1,49,65,263
8	Qualifications_Change_History	1,01,714
9	RenewalStatus	1,784
10	Vacancyid_Process_History	125

The above status only proves that the integrity of the data is not ensured. The department replied (March 2015) that during data migration this has been omitted. When it is found necessary, input entries fed by the user have been taken care of and logs thereon have been fed into the system. The Internet Protocol address, user details and time has also been captured in the database now.

The reply of the Department is not acceptable because an audit trail is system generated and stored in the relevant tables automatically whenever there is any addition, modification, deletion to any record made by a user, provided such provision to capture the audit trail has been written in the coding itself. Further, all the above cases were found only after 2011. Hence, the reply of the Department that this has been omitted during data migration is not correct.

(e)   Inaccuracies in Qualifications table

The qualifications table have fields such as Qualification code, Qualification, Board, Year of Passing, Total Marks, Percentage, Certificate Number, Major subject and Ancillary subject. The field Qualification Code contain values like Below SSLC, SSLC, HSC, Degree and 'TECH' and the field 'Qualification' specifies the courses for various qualifications *viz*. 'GA'-Graduate Arts for Degree. Examination of the table disclosed that due to lack of input control in the system and also deficiency in the software, different types of errors were found in audit as detailed in **Appendix 2.13.**

The Department replied (March 2015) that the defects noticed and identified by audit with respect to input control in the system would be taken care of in consultation with the software developer so as to avoid such lapses in future.

(f)   Information on placement

On receipt of employers' requests, the selection process of eligible candidates is run in the software based on the requirements and rules prescribed. The list of selected candidates is sent to employer, who on completion of interview sends a list of placed candidates, rejected candidates and absentees. Based on the list, the user updates the candidate's profile status as "P" with additional information in Placed remarks column (details of placement - Vacancy_Id, date).

The above procedure involves manual intervention for updating the profile status of the candidate on his placement. In a computerised environment, the integrity of the database could be ensured by the following procedure. When candidates are shortlisted based on employers' requests in Selection Details table, profile status should be updated to 'P' in Candidate_Profile table on receipt of the placement information received from the employer, by linking the Vacancy ID from selection details table.

In the absence of the above procedure, examination of Candidate Profile table disclosed that

➢ Out of 88,622 records with profile status "P", only 49,685 records have information about the placement in the field 'Placed Remarks'. The remaining 38,937 records have no such information.

➢ Out of the 88,622 records, 62,166 records have no corresponding entries in 'Selection Details' table though they have been placed.

➢ These 88,622 records have no corresponding entries in 'Candidate Vacancy Final' Table also.

The above discrepancies only prove that the database lacks referential integrity. 'P' flag should be moved to the Candidate profile table, only after ascertaining existence of the candidates in the 'selection detail' and 'candidate vacancy final' data tables.

The Department replied (March 2015) that the placement details effected in the computer system is restricted to regular placement only. It was also stated that placement details of part time, daily wages, consolidated vacancies were not captured in the system. Moreover, for want of result of selection, some details had not been updated. Instructions had been given to capture the profile status ("Placed") along with relevant details, on receipt of selection result from the employers. Further, the software developer had also been asked to clarify the table details, which would be submitted in due course.

The Department's reply is not acceptable since placement details without 'vacancy id' information and date of placement, the authenticity of 'Placed' profile status moved by the DEOs cannot be ensured. No explanation is furnished by the Department with regard to contention of audit that these candidates had no corresponding records in Selection Details table or Candidate Vacancy Final Table.

2.3.10 Migration of Legacy data

2.3.10.1   *Fresh registration / 'Seniority From' correction*

The process of data migration from legacy system to new system is very critical. It was the responsibility of the developer to whom the task of 'data migration' was entrusted to ensure that each and every record existing in the legacy system got migrated to the new system without any change in the number of records or data stored in them. Audit during field visit to test-checked districts observed that after going online in September 2010, many candidates faced two types of

issues *viz*. non-availability of their registration at all in the new system and incorrect seniority date in their registrations.

Hence, the candidates visit their respective DEOs to rectify the above issues. For this purpose, a Register ('Not Found'/'Seniority From' correction Register) is maintained in all DEOs. The details regarding number of candidates to whom either fresh registrations were made by giving old seniority for their NCO due to non-availability of registration numbers in the new system or the seniority date for NCOs which were found to be incorrect were rectified during the period from 2012 to 2014, are given in **Table 2.23**.

Table 2.23 : 'Not Found' and 'Seniority From' cases

District	No. of Candidates
Dindigul	8,389
Tiruvarur	36,076
Pudukottai	6,828
Tiruchirappalli	20,865
Salem	19,151
Villupuram	19,324
Coimbatore	16,058
Chennai	13,161
Total	**1,39,852**

The above situation only proves that the procedure adopted for data migration by the developer was not fool-proof, despite allocation of considerable funds and manpower. Even after six years from the initial start of the project in 2009, there were discrepancies in legacy data which are yet to be resolved by the developer. The Department also failed to monitor the situation till date.

DEO, Chennai in reply (March 2015), accepted the audit observations and stated that such cases were being rectified as and when the candidates approach the DEOs office.

2.3.11 Deficiencies in the application software

2.3.11.1   Updation of Priority details table

A candidate can register online or through Employment Exchanges and also update his personal details, educational qualifications and skill details in the same way. Candidates are classified as "Priority" and "Non-Priority" candidates. Priority candidates are given preference in the selection process by the computer system as per the rules in force and employers' requests.

However, for registering as priority candidate, the candidate's priority details need to be verified at the Employment Exchanges (medical certificates, marriage certificates, discharge certificates, etc.,) and updated by the designated staff working in the DEO, who have been given system access privileges to do so. Various details like priority type, type of disability, percentage of disability, date of discharge, date of registration of priority, updated by and updated date are captured at the time of registering a priority candidate. Since priority is a vital parameter during selection process of candidates based on employers' request, it is done only by the staff of employment exchange to prevent misuse and manipulation of data.

Examination of the Priority details table disclosed that the "user id" of many candidates were stored in the field "Updated by" apart from the user id of DEO staff. The reason being that whenever an updation of priority details of a candidate is carried out by the DEO staff concerned by using their user id, the user-id get stored in the field "Updated by" column. Subsequently, if the candidate views their updated profile through online mode, their user id get stored in the Priority details table in the field "Updated by" incorrectly. Deficiency in the design of the software and ineffective audit trail in the system leads to misconception that the updations were carried out by the candidates affecting the integrity of data.

2.3.12 Conclusion

Out of the nine modules, only two modules (Registration Module and Vacancy Module) have gone live, six years after the entrustment of the work to the developer. Large-scale manual interventions were made in the selection process due to inadequacies in the Vacancy Module. There were errors in selection lists generated by the Vacancy Module due to errors in input/process/data migration. National Code of Occupation and seniority date in respect of 1.47 lakh candidates registered during 2011-14 were not furnished in the relevant table hampering their selection against vacancies. There were discrepancies in seniority date between two of the tables, hampering the selection process. Discrepancies were noticed in input of fields due to absence of validation controls. Multiple registrations of candidates were noticed. Under these circumstances, Audit could not derive assurance that the candidates were recommended for jobs, in accordance with the rules and regulations in force, through the system.

2.3.13 Recommendations

The Department, in coordination with ELCOT, may initiate the following actions to make the project fully functional.

➢ Cleanse the data and ensure its integrity and validate it with an audit trail. Till such time data integrity is ensured, compensatory controls which would ensure that the job lists are in compliance with the rules, are to be put in place.

➢ Coordinate with the developer for completion of Unemployment Allowance and EMI module and ensure its early rollout along with the other pending modules.

➢ Address the lacunae in the Vacancy Module to avoid any manual intervention in selection process.

➢ Address the deficiencies in the Registration Module to avoid multiple registrations

The above points were referred to Government in August 2015; reply has not been received (December 2015).