HIGHER EDUCATION DEPARTMENT

2.4   IT Audit of Student Academic Management System

The Student Academic Management System (SAMS) for e-admission process and e-administration in (+2) junior colleges under Higher Education Department was developed by M/s Cybertech Software & Multimedia Pvt. Ltd (CSM Technologies) out of budgetary provision of ` 16.75 crore made under the Twelfth Finance Commission award in the budget estimate for 2008-09 with a view to overcome the weakness of manual system of admission and provide a hassle-free economical admission process for students. A review of the system revealed the following deficiencies in Information Technology operations and controls.

x   **Purchase of hardware and software in excess of requirements for colleges resulted in idle investment.**

(*Paragraph 2.4.8.1*)

x   **Inability to provide for students from various examination boards resulted in entry of absurd maximum marks, discrepancies between the sum total of marks of individual subjects and aggregate total marks.**

(**Paragraph 2.4.9.2**)

x   **Deficient system design combined with deficient verification process to check the claims of applicants seeking reservation and weightage under various categories led to ineligible applicants being admitted.**

(**Paragraph 2.4.9.3**)

x   **System was not designed to take care of horizontal sliding of weightage category students to merit category and vertical lifting of waitlisted students in the weightage category in the 2nd selection process.**

(*Paragraph 2.4.9.6*)

x   **Gaps in vital fields like Money Receipt-cum-Index number, intimation ID, admission ID necessitated frequent backend corrections.**

(*Paragraph 2.4.10.2*)

x   **Acceptance of multiple Common Application Forms from applicants by the system jeopardised the admission prospect of other applicants by blocking seats through multiple applications.**

(*Paragraph 2.4.10.3*)

x   **Lack of validation controls allowed null subject codes, restricted subject combination codes and non-available subjects in a college in the system.**

(*Paragraph 2.4.11.1*)

2.4.1   Introduction

The increase in demand for education in Orissa is evident from the rising number of students passing class Tenth Board and further admission to Junior (+2) colleges. In Orissa, there are 1145 Junior Colleges with only 50 Government Colleges, located in 21 out of 30 districts. These Government colleges are always the first choice for these students. With the objective of providing a common application form, transparent selection process, economy, shorter period of selection process etc., Government of Orissa (GoO), Department of Higher Education awarded the work of Computerisation of admission process of Government colleges through Orissa Computer Application Centre (OCAC) on turn-key basis out of the budgetary provision of ` 16.75 crore made under the Twelfth Finance Commission award in the budget estimate for 2008-09. It was decided by the Steering Committee to award the execution and implementation of SAMS to M/s CSM Technologies. It was proposed to take up e-admission in 60 Junior colleges[101] for the year 2009 including nine Aided Junior Colleges selected from those districts which did not have a Government College.

The Higher Education Department, introduced e-admission for +2 students, as the first component of SAMS in selected +2 junior colleges which began in January 2009 and completed in June 2009. The project was monitored by the Project Steering Committee headed by Commissioner-cum-Secretary, Department of Higher Education. No separate User Requirement Specification (URS) was documented for SAMS but only broad details were discussed in the Steering Committee meetings held on different dates and Detailed Project Report (DPR) was prepared by CSM Technologies in which the gap analysis was defined.

The SAMS, a web based application was operated using Dot Net Framework 3.5 in Windows Server 2008 as Operating System and SQL Server 2008 as database. The web based application, SAMS, hosted in the Central Server at IT Centre, Secretariat, Bhubaneswar was approached by the colleges through VPN[102] of BSNL lease lines using 'e space' a utility hosted in the Server. The Colleges were equipped each with a Server, two Desktops, one/two Laptops, two printers and a DAT (72 GB) drive. The IT Centre at Secretariat, Bhubaneswar is equipped with a web server and a database server. The department maintains the Disaster Management Server at STPI[103], Bhubaneswar.

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[101] 50 Government Junior Colleges, College of Basic Science & Humanities under Orissa University of Agriculture and Technology, Bhubaneswar and nine aided Junior Colleges
[102] Virtual Private Network
[103] Software Technology Park of India

2.4.2   Organisational Structure

Department of Higher Education (DHE) is headed by the Commissioner-cum-Secretary who is the administrative head of Junior colleges. The Orissa Computer Application Centre (OCAC) is the designated Implementing Agency of SAMS programme. At the college level, the work is implemented through a validating team headed by a Lecturer and technical assistance is provided by Data Entry Operators (DEO) appointed on contract basis.

2.4.3   Financial outlay

Out of ` 16.75 crore provided to Orissa Computer Application Centre (OCAC) in 2008-09 by Twelfth Finance Commission, expenditure to the tune of ` 7.28 crore was made on different components including ` 3.03 crore for Hardware, ` 2.60 crore for Software and ` 1.05 crore for Site preparation, as of March, 2010 and the balance of ` 9.47 crore is left with OCAC. The accrued interest of ` 56.82 lakh[104] on balance amount is available with OCAC.

The Department on the advice of audit has directed OCAC (March 2010) to credit the amount of accrued interest to Programme Fund.

2.4.4   Objectives of computerisation

The system aimed at

  x reducing admission time and improve efficiency for the college functionaries who have been doing this manually,

  x maintaining transparency in the Admission process,

  x providing a citizen centric, hassle free, time saving and economical platform.

2.4.5   Audit objectives

The audit objectives were to assess whether:

  x adequate planning existed for purchase of hardware and software

  x the e-admission process was complete and conformed to the provisions in the common prospectus.

  x various application controls ensured integrity of the data.

  x reports generated were as per requirement and

  x the system was serving the intended objectives.

2.4.6   Audit Criteria

The following were used by Audit as criteria to conduct the review:

  x Rules and regulations of admission as per the common prospectus prepared by the Department

  x Rules and regulations of Board of Secondary Education, Orissa

  x Recommendations of the Steering Committee

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[104] As per RBI rate of six *per cent*

2.4.7   Audit methodology

The Audit objective, scope and methodology were discussed (March 2010) at an entry conference with the Joint Secretary, Department of Higher Education and the Officer on Special Duty, OCAC. Comprehensive assessment of SAMS was made between April-June 2010 through test check of records of Higher Education Department, OCAC and software vendor CSM Technologies through observation of actual data processing in 15[105] out of 60 Government Junior colleges of the State. Computer Assisted Audit Techniques (CAATs) package and Structured Query Language (SQL) was used in audit for analytical review of data. Audit findings were discussed at an exit conference held (7 September 2010) with the Commissioner-cum-Secretary, DHE and representatives from OCAC and CSM Technologies and the replies received from the Commissioner-cum-Secretary are duly incorporated at appropriate places.

Audit findings

2.4.8   General Controls

Admission Process

An applicant desiring admission under SAMS had to fill up a Common Application Form (CAF) and submit the same in any of the colleges under SAMS. CAF was instantly given one unique Index Number (Combination of eight digit college code and four digit index numbers starting from 0001) at the college. CAF details were then entered through MS Access software, offline, in a standalone system by the DEOs engaged by the CSM Technologies at respective colleges. A print out of the CAF details was to be given to the validating team in the college for verification of entries made with reference to photocopies of testimonials furnished. The final validated data after making due corrections then were uploaded in the central server through internet to facilitate selection process centrally.

A general assessment of SAMS revealed that the system was helpful to Higher Education Department in tracking the number and category of applicants and enabled the students to apply their choice of college in any of the 60 Junior colleges. Audit, however, noticed the following system deficiencies in general controls.

Project monitoring and implementation

2.4.8.1   Purchase of hardware/software for colleges - idle investment

The hardware comprising of one server, one/two laptop(s), two desktops, two dot matrix and one multifunction printer, one DAT drive with a storage capacity of 72 GB, networking equipments including one copy of SQL Server[106] along with the operating software of Servers were purchased centrally and supplied to each of the 60 colleges during the month of May 2009.

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[105] (1) BJB Jr. College, Bhubaneswar, (2) Rajdhani Jr. College, Bhubaneswar, (3) Ravenshaw Jr. College, Cuttack, (4) J.K.B.K Jr. College, Cuttack, (5) S.B Women's Jr. College, Cuttack, (6) Bhadrak Jr. College, Bhadrak, (7) F.M Jr. College, Balasore, (8) M.P.C Jr. College, Baripada, (9) G.M Jr. College, Sambalpur, (10) Govt. Women's Jr. College, Sundargarh, (11) Govt. Jr. College, Sundargarh, (12) S.C.S Jr. College, Puri, (13) Khallikhote Jr. College, Berhampur, (14) S.B.R Women's Jr. College, Berhampur and (15) S.V.M Jr. College, Jagatsinghpur.
[106] sql server 2008 version

However, it was noticed that Laptops and DAT drives supplied were lying idle in the test checked colleges and the Server connected to two desktops through LAN was only used for internet connection. It was observed that the work could have been managed from the desktops directly, thus obviating the need of a server. Further, since the data base is maintained in the Centralised SQL server and connected through the internet, the SQL Servers provided to the colleges also remained unused. The Principals of the test checked colleges accepted (May 2010) the facts.

Hence, the 60 Servers along with software, 60 DAT drives and 67 laptops for 60 colleges purchased at a cost of ` 1.37 crore have became idle. It was observed that the DAT drives (72 GB) may not be used in future as SAMS being web based application, the data is directly getting stored in the central server.

It was also observed that the hardware and software were purchased without assessing the actual requirements though it was decided in various Steering Committee meetings to assess the actual requirements comprehensively and to procure the hardware and software through the DGS&D rate contract holder.

The Commissioner-cum-Secretary while accepting the audit observation stated that for the academic year 2010-11, no laptops were supplied to the newly covered 109 Junior Colleges but was silent about the DAT drives and the Servers.

2.4.9 *System design*

System design aims at providing the correct output by mapping the existing rules and regulations electronically so as to provide assurance that all transactions are valid, complete and accurate. However, audit scrutiny revealed the following deficiencies due to system design failure as discussed in the succeeding paragraphs.

2.4.9.1 *Non-provision of stream weightage to women applicants*

Clause 7.4.1 of the common prospectus provides for stream weightage of five *per cent* over aggregate marks to be given to women applicants applying for the same in other colleges, if the concerned stream was not available in the local women's college(s). However, data analysis revealed that the same concession to give the weightage to women applicants was omitted to be mapped into the system in respect of 13 colleges.

In reply, the Commissioner-cum-Secretary (September 2010) accepted the facts and stated that these colleges were not considered for such weightage since they did not provide such information to the Department. He further assured that from the Academic year 2011-12, suitable action to include such weightage in all the eligible women applicants would be taken.

2.4.9.2 *Discrepancies in marks*

As per the information flow mechanism of SAMS, the applicant details were entered into MS-Access standalone software and it was uploaded daily in the Central data server through a utility '*e-space*' made available on Departments' web-site (http://dheorissa.in). The selection process was based

on the total secured and maximum marks. In the Common Application Form the data entry of subject marks columns were designed as per the pattern followed by Board of Secondary Education, Orissa i.e., maximum of 600 marks in six subjects. In respect of the applicants from boards other than Board of Secondary Education, Orissa, the total marks secured were converted proportionate to 600 marks. The following discrepancies in this regard were noticed.

(i)   The total marks secured and maximum marks

The system has not been designed with in-built control for total checks and automatic calculation of total marks secured. Instead, it allowed data entry of total marks secured also, based on which the selection of the candidates was to be made. Analysis of central database revealed that in 620 cases, the sum of marks secured in all the subjects were found not tallying with the total marks entered in the system and the differences ranged from '-1' to 344. On further analysis, it was noticed that in 11 cases, the maximum marks being 800/900, was entered as 600 and thus instead of being considered for proportionate conversion during selection process, the same were taken as it is. This proved to be advantageous to seven candidates in getting admission.

In another 11 cases, the total of individual subject marks as calculated by audit was even greater than the maximum mark viz. 600 indicating data entry errors.

(ii)   Entry of incorrect maximum marks

It was also noticed in five cases out of 620 cases as stated above, due to incorrect data entry of 'sum of marks secured' on the higher side, the applicants were considered meritorious and admitted in the respective colleges. These discrepancies could not be detected and rectified even during the time of admission.

The Commissioner-cum-Secretary during exit conference (September 2010) stated that from the academic year 2011-12, the system would be designed to accommodate the data entry of marks as per different Boards by designing suitable form design for data entry so as to ensure accuracy of the data entry.

2.4.9.3   Ineligible applicants given admission

It was observed that the admission system was not fully automatic. While the selection for admission was done through the system, the verification of the original documents in respect of weightage and reservation were done manually through the validating team in colleges. Further the System was not designed to cater for candidates seeking admission under different categories and suitable input controls were not built in to avoid erroneous inputs. Even such erroneous CAFs submitted by applicants skipped the scrutiny by the validating team and resulted in processing of such records for further admission as detailed below.

x   National Institute of Open School (NIOS)

An applicant passed through the Secondary Level Examination of NIOS, Delhi seeking e-admission shall be deemed to be equivalent to the HSC Examination of BSE, Orissa provided the examinee had passed with minimum of five subjects like English, one of the Modern Indian Languages (Oriya/Hindi/Bengali/Telugu/Urdu), Mathematics, Science and Social Science.

Analysis of central database revealed that 56 applicants from National Institute of Open Schooling (NIOS) Board not satisfying the above criteria had applied for admission and out of which 22 applicants were given admission. It indicated that the system was not designed to reject such applications.

The Commissioner-cum-Secretary in his reply during the review stated that the Implementing Agency has been instructed to devise the system to cater applicants from different Boards.

x   *Oriya Living in Neighbouring States (OLNS) category*

SAMS provided for reservation in respect of applicants of Oriya origin passing Secondary School examination with Oriya as a subject from the neighbouring states having common boundary with Orissa under OLNS category. However, another required condition of permanent residentship status in the aforesaid state(s) was not clearly indicated in the CP and was not incorporated in the system.

This resulted in incorrect acceptance and admission of 37 applicants residing in Orissa, who did not satisfy the criteria, out of 166 applicants applying under OLNS category. It was also observed that the system was not designed to indicate Oriya as a subject.

In reply the Commissioner-cum-Secretary agreed and stated that from the next academic year, i.e. 2011-12, such criteria would be specifically mentioned in the common prospectus.

x   *Children of Martyrs (CoM) category*

Two *per cent* of seats sanctioned were reserved for the Children of Martyrs (CoM). The certificate to this extent was to be given by the District Collector on the recommendation of Rajya Sainik Board. The reservation in CoM category was introduced for the first time in the State and the criteria for eligibility of applicants deriving benefits under this category have not been clearly mentioned in the CP. Audit observed that CAF and the System has not been designed for capturing necessary evidence and the verification was left to the validating teams in the colleges. This also confused many applicants and most of the applicants applying for Commerce stream had put tick mark in the specified column.

Test check of records and further confirmation from Rajya Sainik Board revealed that six ineligible applicants got admission under the category.

In reply the Commissioner-cum-Secretary ensured proper validation check in this regard henceforth from the year 2011-12.

x   *Physically challenged, Ex Servicemen, Defence personnel category*

The common prospectus provided for reservation of certain percentage of seats under physically challenged, Ex-Serviceman and Serving Defence Personnel reservation categories. The eligibility of applicants deriving benefits under the aforesaid category was clearly mentioned in the CP. Audit observed that CAF and the System has not been designed to cater for supporting evidence in this regard and the verification was left to the validating teams in

the colleges. Many applicants had put tick mark in the aforesaid category column in the CAF without having the required certificates for claiming such benefits. Even validating team could not filter such faulty claims.

Data analysis and test check of records revealed that supporting documents in respect of 13 such applicants those were selected under the aforesaid categories were not available with the colleges and out of which three had taken admission. In reply the Principals in test checked colleges replied that due to short span of time for validation and huge number of forms, the details could not be verified properly.

The Commissioner-cum-Secretary, however, ensured adequate check by the validating team in colleges in this regard in future.

x   *NCC and Scout/ Guide weightage category*

CP provided for weightage of five *per cent* for certificate holders of NCC-A/Scout-Rajya Puraskar/Sports-state level and 10 *per cent* for NCC-C/Scout-President Recognition/Sports-national level. Such weightage shall be given if the achievement was made within two years before the last date of CAF submission. Audit noted that there was no provision in the CAF and the System to indicate the year and month of achievement. As such the correctness of such claims was vested only with the validation team.

Test check of records revealed that out of 2059 applicants applied under the category, 89 applicants were found ineligible and six applicants not satisfying the two year condition got admission. Similarly, three applicants without valid certificates got admission.

The Commissioner-cum-Secretary stated that from the Academic year 2011-12 necessary provision would be provided to facilitate validation through system.

2.4.9.4   *Allocation of subject combination*

Students applying for different streams had to opt for four elective subjects in order of preference apart from the compulsory subjects one has to opt for the four elective subjects. Allocation of subjects, however, was very vital for science and arts stream applicants since they look forward to their future career through subjects with which they prosecute their higher secondary studies.

It was seen that intimations were sent to applicants intimating only the fourth elective subject. Based on the difficulties faced by the college authorities, Department later allowed the college authorities to admit the students and allot the fourth elective based on their merit subject to availability of seats irrespective of the one indicated in the intimations. Audit noticed 450 cases in 15 test checked colleges where students were not allotted fourth electives as was intimated to them. This process created strong resentment among students regarding allotment of subjects like Biology, Geology, IT and electronics etc. The objective of the e-admission has also not been fulfilled.

The Commissioner-cum-Secretary stated that necessary changes would be made in software and in the CP as well from 2011-12.

It is suggested that all the four elective subjects need to be indicated in the intimations so as to cater the option exercised by the applicants and avoid manual intervention in this regard.

2.4.9.5   Double rounding off marks

While converting the maximum marks secured to the base 600 in respect of the applicants belonging to the other Boards, the converted marks were rounded off to nearest whole number. Further, if any applicant was eligible for weightage[107] of five or 10 *per cent* over and above the aggregate marks then the marks were once again calculated and rounded off.

Audit observed that double rounding off marks proved to be advantageous to some applicants and disadvantageous to others.

The Commissioner-cum-Secretary during exit conference stated that as recommended by audit, the system of conversion of marks of other Board passed applicants at par with State BSE applicants has been dispensed with this year (2010-2011).

2.4.9.6   Second selection process

As per provision maximum of 10 *per cent* of seats in each stream had to be filled up on the basis of weightage for extracurricular activities and unavailability of stream in local women's college. During first selection process applicants under weightage for General Category were selected subject to restriction of cut-off marks against General Category. In the eventuality of seats falling vacant after admission in first selection process, second selection process was operated in many colleges when the cut-off marks against General Category reduced.

In that case the applicants under General weightage category whose base marks without taking into consideration of the weightage came between the cut-off marks of the first and second selection process should have been accommodated into (slided horizontally) General Merit Category and vacancies arising out of such sliding should have been awarded to even number of General weightage category students in the panel by upward lifting, subject to restriction of cut-off marks against General Merit Category and maximum of 10 *per cent* of General Seats available for them.

Audit observed that the system was not designed to take care of such horizontal sliding and vertical lifting of General Category Students in the second selection process and the eligible applicants in different colleges as such were not considered for admission. Incidentally, eight such applicants sought judiciary intervention and got admitted themselves in Ravenshaw College, Cuttack (August 2009). However, this was not extended to other eligible applicants who were not aware of such discrepancy and no action has been taken to correct the system during 2009-10.

The Commissioner-cum-Secretary stated that such horizontal sliding and corresponding vertical lifting of candidates, has since been adopted in the system this year, i.e, 2010-11.

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[107]   Weightage for NCC/Scout/Sports/Women

2.4.9.7   *Exhibition of abnormal fees in the database*

The CP contained varied prescribed fees of colleges payable for admission, depending upon the category of student, stream and subject ranging from ` 426 to ` 12534. The admission fees collected from students were entered in appropriate field column in the system.

Analysis of database revealed that in 49 cases fees ranging from ` 12568 to ` 218850 were entered in the said field towards admission fees collected from students. It indicated that the fee structure of the colleges was not mapped in the system. It accepted abnormal admission fees and made the database unreliable. Had the fee structure of colleges been mapped in the system, the database could have been used by the DHE to analyse the exact admission fees collected by the colleges.

The Commissioner-cum-Secretary stated that the Implementing Agency had been asked to map the fee structure of different colleges in the system so that collection of admission fees could be accounted for through the system.

Application controls

Application controls include input controls, process controls and output controls and are used to provide assurance that all transactions are valid, complete and accurate. The major spin-off from SAMS was that an applicant could view his status of application on-line by providing the MR-cum-Index Number. The MR-cum-Index numbers were issued by respective colleges manually in combination of eight digit college code followed by four digit code indicating application number starting from '0001' onwards. However, audit scrutiny revealed the following deficiencies in application controls as discussed in the succeeding paragraphs.

2.4.10   *Input Controls*

The input controls ensure that the data received for processing are genuine, complete, not previously processed, accurate and properly authorised and are entered accurately and without duplication. The following deficiencies in input controls employed were noticed.

2.4.10.1   *Data completeness and uniformity*

Data analysis showed that in one case the MR-cum-Index Number was blank and in 27 cases the MR-cum-Index Number contained alpha-numeric code. This indicated absence of input controls in this regard.

2.4.10.2   *Gaps in vital fields.*

x   *Gaps in MR-cum-Index Number*

The MR number being the primary identity of an applicant, there should not be any gap in allotting such numbers. Analysis of Central database revealed that the MR-cum-Index numbers contained 8502 gaps in 476 instances and such gaps were made by merging and deleting through backend mode which also resulted in deletion of applicant details.

x   *Gaps in intimation ID*

After the selection process, intimations were sent to the selected applicants and each intimation is identified in the system with a unique intimation *ID*.

Analysis of central database revealed that 508 such continuous *IDs* were skipped or deleted between first selection and second selection.

x   *Gaps in admission ID*

Soon after the applicants took admission the admission details were updated in the central server along with creation of a unique admission *ID* by the system. It was seen in audit that there were 3949 gaps in 63 instances in admission *ID* and it clearly indicated that the records were skipped during data entry.

The Commissioner-cum-Secretary accepted the facts and explained that backend deletion/corrections of records in the database were resorted to for correcting the mistakes in data entry based on the request from the Principals. However, it was agreed that a log of all such deletions and corrections would be maintained so that transparency could be maintained and accountability could be fixed.

2.4.10.3   Duplicate application forms

In e-admission process, an applicant was to submit only one Common Application Form (CAF) for admission into various streams[108] in any of the 60 junior colleges by exercising options of college/stream along with elective subjects in order of preference. Thus one could not jeopardise the admission prospects of other applicants by blocking seats in different colleges through multiple applications. However, it was seen that the system accepted duplicate/triplicate application forms in respect of 500 students. Out of these, multiple applications relating to 387 numbers of students could only be merged manually. This indicated that the system was not adequately designed to prevent the submission of duplicate/triplicate CAFs by the same student by using the Board's Roll number/Date of Birth/Father's name. Hence, all such multiple application forms other than the merged ones were processed for selection simultaneously through the system and separate intimation letters considering merit in different CAFs were issued to the 11 applicants.

Principals of the test checked colleges admitted (June 2010) that it was not possible to detect/prevent multiple application forms by the applicants at the college level. Hence, the SAMS system capturing CAF data should have been designed to track and reject the multiple applications.

2.4.11   Validation checks

2.4.11.1   Validation in subject field

As per CP, an applicant was required to enter in the CAF the college*,* stream and subjects in numeric codes as per choice in order of preference as detailed in the CP. In the CAF the applicant was required to fill seven subject codes, i.e, one compulsory subject, three elective subjects and for fourth elective

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[108] Arts/Science/Commerce stream

three subjects in order of preference. Analysis of Central Database revealed that the system accepted null subject codes, restricted subject combination codes, Commerce subject codes in Arts stream and male applicants applying for Home Science subject code etc. as discussed below.

x   *Coding of subjects and streams*

The system accepted data entry of illogical combination of subject codes relating to Science/Commerce subjects in respect of 39 applicants under Arts stream and combination of Arts, Science and Commerce subjects in respect of two applicants under Science stream. This indicated absence of validation checks in this regard.

x   *Null/incorrect codes in Compulsory subject field*

The system accepted the subject codes of elective subjects in place of compulsory language subjects and even null subject codes in 3717 cases and processed the said cases.

x   *Null/incorrect codes in compulsory electives*

The system permitted data entry in respect of compulsory elective subjects[109] in respect of both Science and Commerce streams. This resulted in incorrect choice of subjects and data entry of such subject codes in 303 cases in Science stream and 104 cases in Commerce stream.

x   *Male Applicants applied for Home Science*

Absence of validation checks regarding combination of gender of the applicants with the choice of subjects resulted in acceptance of data entry 'Home Science' as one of the elective subject in 112 cases of the male applicants. It was also noticed that one of them was also selected and allotted with 'Home Science' through the intimation; however, the same was rectified later through correction process.

x   *Restricted combination of subject codes*

In 427 cases the applicants had opted for combination of Logic and Geography subject codes, and in 139 cases the applicants had opted for combination of Home Science and Mathematics subject codes which were restricted as per the common prospectus.

x   *Non-available subjects in a college applied for*

Though details were available in the common prospectus, the applicants opted for subjects other than those available in applied colleges and the system also accepted such applications for further processing. Test checks in two colleges[110] revealed that the subjects Geography, Home Science, Language Urdu and *Parsi* not available in Khallikhote Junior college were given as choice and the subjects Anthropology, Geography, Education not available in

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[109]   Physics and Chemistry (Science stream); Accountancy, Business Studies & Management and Business Mathematics & Statistics (Commerce Stream)

[110]   Khallikhote Junior college and S.B.R Government Junior college, Berhampur

Shashi Bhusan Rath (SBR) Government Junior college, Berhampur were chosen.

These instances illustrate lack of validation in the system to restrict applications for mutually exclusive combinations and non-available subjects in a college. Creation of master tables catering combination of stream and related subjects using alphanumeric codes, spooling of compulsory subjects under the stream and creation of profiles of various colleges in the system would have avoided such mis-match.

In reply the Government stated (September 2010) that necessary corrective actions, as suggested by audit, by replacing the codes with alphabetical narration to the subjects and suitable validations regarding combination of subjects have been taken from the academic year 2010-11 so as to avoid such discrepancies in future.

2.4.11.2   *Validation in gender field*

The system provided for data entry of gender option 1 for Male and 2 for Female applicants. Due to absence of validation controls in the system, it was observed in audit that a female applicant with gender option 1, i.e. code for male applicant, submitted application for a women's college which was accepted and processed by the system for admission.

The Commissioner-cum-Secretary stated that validation in this regard has been provided from 2010-11.

2.4.11.3   *Dual weightage allowed in the system*

The criteria for selection of applicants under Oriya Living in Neighbouring States (OLNS) and Outside State Applicants (OSA) are different. OLNS is a reservation category whereas OSA is a weightage category for applicants from outside Orissa. It was seen in audit that central database exhibited the same applicant under both OLNS and OSA category in 66 instances. System was not designed to handle the criteria set for OLNS and OSA category separately and necessary validation check in this regard was not put in the system.

The Commissioner-cum-Secretary assured to provide necessary validation in the system in this regard.

2.4.11.4   *Processing of marks below the minimum pass marks by the system*

The minimum pass mark of any Secondary Education Board is 33 *per cent* of aggregate marks. Analysis of database revealed that in 13 cases, the system accepted erroneous data (marks less than 33 *per cent* of aggregate) thereby ignoring the genuine candidates from the selection process. However, four of them attended spot admission process and got admitted. It was also observed that in one case the aggregate marks were wrongly entered as '94' instead of 494, and incidentaly the candidate could not get admission despite the fact that the actual marks secured by him were more than the cut-off marks of first selection.

In reply (September 2010), the Commissioner-cum-Secretary stated that necessary validation in this regard has been given in the system during the admission process 2010.

2.4.11.5   *Inconsistent events in SAMS work flow mechanism*

When a CAF entered into the MS Access software, a record was created with date and time indicating date of receipt of CAF and when the created record was uploaded in the Central Server, the uploaded date and time was also recorded in the system. Analysis of central database revealed that in 11 instances, the dates of receipt of CAFs were later than the uploaded. Further, in seven cases the receipt dates of CAF were indicated Null. This indicated the lack of validation in the system to follow the sequential flow of records.

The Commissioner-cum-Secretary accepted the facts and stated that such validation has been provided in the system during admission for the academic year 2010-11.

2.4.12   *Information security*

2.4.12.1   *Access control*

The DEOs of the respective colleges were assigned the user *IDs* along with passwords to carry out different e-admission and e-administration activities in the SAMS. Since SAMS provided for web based access, management of users is an important issue. It was seen in audit that

x   The user id assigned to a DEO was not deactivated (June 2010) even after his resignation from service (April 2010).

x   The passwords were quite vulnerable as they were not following the password policy of keeping alpha-numeric passwords combined with special characters.

x   The system did not have the provision to restrict unsuccessful attempts and blocking such user ids after exhausting such number of attempts.

x   There was no provision for automatic log off when the system was left unattended for a long period.

In reply (September 2010), the Commissioner-cum-Secretary ensured strong password policy and suitable corrective action.

2.4.12.2   *Modification/Deletions through backend and audit trails*

As per the information flow mechanism of SAMS, soon after the details of CAF were uploaded in the Central Server, the maximum marks and total marks secured were separately taken out from the master table and stored in another table used for selection based on the choice opted by the applicant. It is required that the total marks secured and maximum marks of an applicant in the master table should not be different from those considered for selection process. In three cases there was difference in marks between two tables. It was observed that the marks of the applicants were edited through backend in only one table without effecting changes in the corresponding master table.

The Commissioner-cum-Secretary accepted the facts and further stated that a remarks column would be kept to keep log of any kind of corrections or modifications in future.

x   *Errors corrected after selection process***:**

After the selection process was over the intimations were generated mentioning the streams and destination college where the applicant was selected for admission. It was seen in audit that applicants with single stream option were issued intimations for streams for which they did not opt and similarly applicants were asked to take admission in colleges for which they had not applied at all. Audit also came across instances where applicants exercising single option and selected against that option in first selection process were again selected in the second selection process in the same or different college in different streams. Such flaws in the database raise doubts about the integrity of data. These discrepancies were due to incorrect data entry combined with inefficient validation process in colleges which resulted in rectification through backend on receiving complaints from students. Interview with stake holders revealed that some of them had taken admissions in private junior/residential colleges since they were not offered as per the choice opted by them in CAF.

While agreeing to the audit observations, the Commissioner-cum-Secretary accepted the facts and further stated that the software vendor has been instructed to devise a system so that a remark column may be kept to maintin a log of such corrections or modifications.

2.4.13   Output controls

2.4.13.1   *System deficiency in delivering the output*

The e-administration component of the system aimed at using the database of e-admission in various academic and administrative activities like issue of Identity cards, Library cards, College Leaving Certificate, Conduct Certificate, Return of Matriculates (RoM) & Long Roll, Attendance Register, Clearance Form etc. Audit observed the following deficiencies in delivering the services which were envisaged:

  x   Identity cards and Library cards generated from the system were abnormally large and without photograph.

  x   The RoM generated was not as per the requirement of Council of Higher Secondary Education (CHSE). Hence, many times the Council refused to accept such RoM as it did not contain the name of the student who had taken admission in the first selection but subsequently taken TC before the second selection process. The names of those students were entered manually as required by the CHSE.

In reply the Principals of test checked colleges stated that due to the aforesaid problem small and handy Indentity Cards and Library cards were issued to the students by following the previous practice. RoM was edited and sent to the CHSE because the system was deficient in delivering the output as desired by the CHSE. The Commissioner-cum-Secretary in regard to above observations assured that handy Indentity cards and Library cards would be issued to students henceforth. He also assured to take care of the deficiencies in generating the RoM & long roll.

2.4.14   Other points of interest

2.4.14.1   Reservation/weightage certificates not sent for verification

As per provisions, certificates submitted by the applicants, in support of reservation and weightage have to be sent to the appropriate vigilance authorities for scrutiny to eliminate possibility of fraud cases. However, it was noticed that no such action has been taken for verification.

The Commissioner-cum-Secretary agreed to initiate action in this regard.

2.4.14.2   Original School Leaving Certificate (SLC) of applicants not cancelled

As per para 5.10.8 of the CP, the original School Leaving Certificate (SLC) will have to be defaced manually by the college authorities soon after the applicant takes admission to avoid further misuse by the students. However, test check of records revealed that in 28 instances*,* SLCs were not defaced even after one year.

Principals of the test checked colleges admitted the facts.

2.4.15   Limitations to audit

CAFs along with the original documents in respect of admitted cases are vital records which need proper preservation. It was noticed that CAFs and the original documents in two of the test checked colleges[111] were lost due to theft (May 2010) and burnt in a fire mishap (November 2009). As such audit could not verify the audit findings through data analysis with these CAFs.

The Commissioner-cum-Secretary ensured that all the original records would be scanned and stored in the system as electronic documents for future reference.

2.4.16   Conclusion

The primary objective of module e-admission under SAMS to ensure admission into +2 Junior Colleges economically, efficiently with a hassle free, transparent selection process with zero errors was partially achieved. The other module e-administration was under partial implementation and its utility wherever implemented could not be derived. The system lacked validation controls at many stages. Its design was not catering to the provisions as mentioned in the common prospectus. Selection process was not fully automated, with the implementing agency depending on validating teams for check of accuracy of data given in the CAF with reference to documents enclosed therein which the teams did not exercise adequately. Thus the system suffered from wrong data inputs which aided by weak process controls led to incorrect selection of applicants for admission. Moreover, deficient system design and backend modification or deletion of data for correction of errors made the system prone to manipulations. The corrective measures as agreed to by the Commissioner-cum-Secretary during exit conference proposed to be made from the academic year 2011-12 would thus enhance the integrity and reliability of the System.

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[111] BJB college, Bhubaneswar and Rajdhani College, Bhubaneswar

2.4.17 Recommendations

- x System should be modified with drop down facility to accommodate data entry of marks relating to different Exam Boards.

- x System should be inbuilt with suitable input controls and validation checks to avoid and disallow erroneous data entry. Verification by the validation teams should be strengthened to achieve zero error status.

- x Provisions for data entry of eligibility criteria relating to various weightages and reservations being given to the students should be inbuilt both in CAF and in the System.

- x Suitable changes in the intimation process and design of intimation letters may be done so as to bring transparency and to avoid further manual process in admission.

- x The way forward should lead to complete implementation of e–administration module to derive its utility.

- x The corrections and modification of data should be done using front end utilities thus avoiding backend transactions and all such modifications/deletions should be logged so as to act as audit trail and to ensure accountability and transparency in selection process.