

# Enhancing Web-based Students' Results and Transcripts Computation in a Hybrid System

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## Abstract

An automated computerized examination results management system for tertiary Institution use for end semester examination and generation of transcripts as student's records processing in a hybrid system is design to overwhelmed the manual or computerized method used for students' end of semester academic result processing for some institution which was found to be complex and tedium, especially when apply for a large number of students or hybrid system in term of different program. The processing of result in term of grade collection on different courses may involves the entire process time-consuming, error prone and inability to carry out real time control system. The system to be designed is meant to perform student result administration of all facet. The method to be employ to achieve this approach is top – down hierarchical approach. The expected result show that result and transcript generation was achieved on real time and the monitoring of students with outstanding subject are transfer to a particular partition in the database, where they are monitored on the duration of academic studies before transfer to the first, second and third probations and finally terminated. The system presents a single platform that will be used to manage the processing of all examination records both in part time and full time within the institution. The data used for testing was obtained from the Department of Academic Planning (DAP) Lagos State Polytechnic, Lagos State. In conclusion, the deployment of academic student processing result and transcripts has demonstrated high sense of efficiency, reliability, error free and real time actualization of student position and good standing.

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## Introduction

lot of data duplications and provision of unnecessary space/ storage in institution of higher learning in African is becoming alarming. The registration of student from the time of admission, payment of acceptance fee/completion of fee, registration and verification of student payment on line and assigning of matric number to the student is the rule of the game. But problems of duplications of student's record during result processing are the user practice by the departmental school official, the Information and Communication Technology (ICT) department as well as the result processing unit in Lagos State Polytechnic of Excellent. The departmental school official carried out clearance and registration of qualified student, the ICT take care of matric number and payment of school fee and the center for result processing take care of record and process student result and transcript. These three bodies have no link or interface on each other. The ideal is an institution to rely greatly on technology in other to harmonize the school official, ICT and directorate of academic planning in the form of Student Management information Systems (SMIS). The three unit early discussed should mainly focused on the current trend of information Technology, so that information or record of student should be portal led system that will have continuation or common handshake where transfer of control is permitted to proficiently handle advancement like registration, payment of school fee, assigning of matric number, inputting scores, storing results, automatically calculating grade points, and ability to monitor carry- over of courses by student, duration of years by student and interpretation of student's overall result as well as transcripts.

The processing of student grades has now reached a certain level where it is difficult for result to be processed and the documentation of student information in various units as a work room for other processing activities to be enable for common interface. With this approach, there will be a drastic reduction of man power to cope with the magnitude of result processing and result can be generated at a stipulated time. Many schools have their own system to manage students profile and assessments, but information is still obtained from the traditional method, which has some weaknesses such as: takes a longer time to search student's particular, the possibility of misplacing these record books and the vulnerability of student's record as the records could be accessed by unauthorized persons. Eludire (2011) stated that other problems associated with manual course system management include; improper registration, late release of students' results, inaccuracy due to manual and tedious calculation, retrieval difficulties/inefficiency. It is unfortunate that most educational institutions in the developing world still operate the manual methods of record keeping and computation. Although the manual methods still work, it is prone to errors and only used in less populated environment. Automation of school administration processes should be

encouraged by the use of computers which is a primary source for this automation process and processing student's results can be done quickly and efficiently to the satisfaction of the students, lecturers, parents and school authority.

This study intends to verify the manual process involved in generating students' examination result and to seek a way of automating the system for effective operations. The need to evolve a computerized process that will effectively and efficiently capture all the important data associated with the registration and examination result processing within the Polytechnic. This research will critically examine the design and implementation of an application where student results can be stored, users can access this software from anywhere as long as the computer as a tool are available on the application server (network).

### **Problem Statement**

Many schools have their own system to manage students' profile and assessments. Common practice is earlier stated by recording the student information in a record book(s). Students' information is attaining from the registration forms obtained and provided by student. This practice has some paleness such as longer time to search the student's profile, the possibility of misplacing these record books and the vulnerability of student's records as the records could be accessed by unauthorized persons. It also involves inappropriate registration, on timely display of student result, mistakeness and wrong calculation of transcripts and difficulties in the retrieval of records.

### **Objectives of the Study**

- i. To review all Related literature on Web-based Students' Results and Transcripts Computation .
- ii. To design a system for processing end semester examination and generation of transcripts
- iii. To utilize the spirit of .NETFRAME WORK in the realization of student Management system in a hybrid environment.
- iv. To demonstrated high sense of efficiency, reliability, error free and real time actualization of student position and good standing.

### **Review of Related Literature**

Different approach was employed in the past as a technique of information system management such as Student Information Systems (SIS), Student Management Information Systems (SMIS), Student data Systems (SDS), Student Data Warehouse (SDS), Student Academic Information Systems (SAIS), or Student Information Management Systems (SIMS). Barrett (2010) defines SMIS as "an unified software suite that keeps, cares, and runs examination in other to investigate, and communiqué student information to support the educational process". The necessity of this software was based on the implementation of Polytechnic's RMS, that will have the functionality of accepting present and historic data and able to establish the data as well as analyze this data as a requirement for the integration with other SIS packages. Emmanuel and Choji (2012) stated that the introduction of information system in computer studies has massively improved the information need of organizations in term of planning, organizing, control and implementation of students' activities. Anigbogu (2013) defined a computer as an electronic device that is unquantifiable machine even seen by human being. It is capable of accepting data and instructions, processing the data based on the instructions to generate results or output. It is more advantageous to utilized the efficiency of these machine to it maxima benefit.

The increase in student's population over the years has made the work of administrative officer in charge of processing students result a very tiresome exercise to deal with. The rise in the number of students in schools today has made it imperative that we continue to seek out the best and most efficient ways to handle schools and school administration. Mohini and Amar (2011) indicated that due to manual result processing in a high densely populated environment takes a very long time owing to which students remain idle for months together. Sometimes the delay in declaration of result cause heavy losses to the students especially student under probation that is yet to be defined because they cannot join further studies or appear in competitive exams because of the non-availability of examination result in time. Hence, it brings to the fore the need to properly address how these shortcomings could be resolved and improved. They further stated that the solution to these shortcomings lies in and efficient information management system, or simply, information system , but with the use of computers for information processing, the following are possible: instant access to students' personal and course information, instant student information updating, automatic computation of the Grade Point Average (GPA), generation of the graduating students list, monitoring of failed courses, keeping an up-to-date record of the entire student in the Polytechnic, storing course information such as course code, course description, course unit, and scores for the purpose of GPA computation, transcript generation and producing user friendly data entry screens for ease of use.

### **Research Methodology**

There exist several programming Languages, programming packages and database management systems that can be used to develop result processing software. .NET Frame work is a programming language used to build programs that can work on stand-alone computers and on the internet, its primary features are that it is object-

oriented and a cross platform language. By cross platform, it is necessary for us to know that the programs can run across several platforms language. By cross platforms such as Microsoft Windows, Apple Macintosh, and Linux etc. My MySQL as a database backend is the choice of programming language used in the development of this application, because it's Oracle Corporation's procedural extension language or SQL and the Oracle relational database.

This research employed a Structured Paradigm based on gathering students results by course lecturer by downloading result marksheet from a centralized location for users of the application to have access to, which is later uploaded by the same lecturer after cumulative average exams grade has been recorded. To achieve the purpose of this research work, interview with stakeholders at the Lagos State Polytechnic, document analyses on related academic documents in use in the school, as well as Students Information Management System (SIMS) was used to gain in-depth understanding of what the system should look like, comprehensive academic records from the Directorate of Academic Planning was also used for testing the system. This application allows users to have access from anywhere as far there is network. It is necessary to make use of what will classify as design models, such as the rational model and corporal model.

The rational model is about the database tables, and the relationship between those tables that make up the application. The model helps to identify entities (i.e. data), and the relationships between entities, within an information system. The entities identified in the design are; School, departments, students name, matric number, academic sessions, students' registration and academic courses registration. The second model "corporeal model" defines how the system is materially and theoretically implemented using **.NET Framework**. The .Netframework was built at the front end. The purpose of this software was based on the power, flexibility and simplicity. The application runs on a desktop and provides much more power and flexibility in the development of the system as well as to the user of the system.

As web applications, it is centrally deployed, by allowing the main program code to be stored on a central location and accessed from the executable file initially installed on the client computer as though the code was stored locally. Therefore, whenever there is an update, the centrally stored files simply need to be replaced, and all clients to automatically use the updated code. The initial deployment can also be done centrally via active directory. The software is built on high level security that allow system administrator to grant permission only to an authorized user. Security can be setup on:

- i. Tables
- ii. Forms
- iii. Reports
- iv. Processes

The software also allows log-in authentication procedure that identify the user who created each record as well as the date and time at which the record was created and stores the last user who updated the record. The database model contains the database table which holds the data as described in the Rational model; it also contains the Corporal data files in which the database tables together with their data will be stored. A local area network (LAN) or intranet for this research will be set up for connectivity between the application server, database server and client computers. Data will be stored in database tables, users will be able to key in data within the tables through a stipulated forms which was design for this purpose, these forms will interface between users and the database and will run in web browsers, preferably internet explorer, Mozilla Firefox or Google chrome.

Users will be authenticated at the Welcome and Login pages before they can interact with the application and database, therefore usernames and passwords will be required from users at the point of login, once successfully authenticated by the system at login, users are re-directed to the appropriate page, depending on their system defined privileges, where they can perform whatever actions their user privilege is entitle to perform.

## **Software Tests and Results Discuss**

### **Application forms**

#### Welcome screen

To log-in the application a web browser such as internet explorer, Mozilla or Google Chrome is necessary and be place on the desktop of all computers that will be accessing the software for easy access to the application. Upon double clicking this short cut the welcome page will be displayed.

The System Administrator has a password and user name to gain access to the software in order to be given the profile information of the application. The Administrator can perform additional tasks that other users cannot ordinarily perform. Every software of this nature has such users and this one is no exception. The table contains the following: Result Broadsheet, Submitted Result Broadsheets, Courses, Student Programmes, Result, Programmes and Result Transcripts. There are other additional Administrator task, such as creation of new students, lecturer and other administrator's profile with the student/lecturer/administrator profile forms also the administrator can edit these profiles with the student/lecturer/administrator profile edit forms. Also, Grades Edit form for editing erroneously entered grades is available.

### RESULT BROADSHEET

This table keeps the Department in the polytechnic, session, year, school semester, Version, Matric No list, meeting date, Approval Date and Broadsheet mode which consist of Generate, Generate and save, submit for Approval, Approve and Reject.

### REGISTRATION TABLE

The table columns are; Matric Number which is the primary key, Course Code, Session, School session, cumulative Average, Exam Score, Total Score.

### STUDENT PROGRAMMES TABLE

This table contains Detail application such as Course Registration, Results, Session Levels, Referral Application, Registration Locks, Leave/Change of Programme.

### COURSES TABLE:

It is divided into two form, that is Details and Setup. The detail contains Lecturers/ Teachers to operate on the sub menu as: Course Code, Course Tittle, Course Description, Course Unit and the Setup contain setting to specifies the limit for CA and EXAMS.

### RESULTS TABLE

The table columns consist of Matric Number which is the primary key, Session, School Semester, and Year.

### RESULT TRANSCRIPTS TABLE.

The parameters are Transcript Number, Matric Number, Programme, Student Programme ID, Transcript Mode, Print Destination, File Format Paper Size, Report Width, Report Height and Report Orientation.

### Conclusions

The application software intended is meant to ease the processing of students' results in tertiary institutions. The system is capable of storing and retrieving academic records of the past student with high speed and accuracy. Its qualities are the reduction in the cost of processing students results, reduction in the time spent in the computation of student's grades and the elimination of duplication of resources in terms of manpower and infrastructure. It also minimizes Redundancy in term of Relational Database Management System or storage of students' data.

### Contribution to knowledge

The system presents a single platform that will be used to manage the processing of all examination records within the institution. The system designed is meant to perform all such of student results in term of exam – wise reports, Generates subject – wise reports, Group examination for specific reports, Generates Grouped Examination reports for archived students, Generates report for subject –wise student ranks, Generates reports for batch –wise student ranks, Generates reports for class –wise student ranks, Generates reports for overall student ranks for the whole session, Generates reports for batch –wise student rank per class attendance, Generates reports based on different ranking levels, Generates students transcripts, Generates combined student reports, register students as soon as they paid their school fee and departmental/registration and only then will they be able to view their results.

### Future Research

The processing of Student result and Transcript can be more beneficiary, if the next of kin or the sponsor of of that particular student can receive all student information through their GSM.

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