Web Based Students' Record Management System for Tertiary Institutions

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ABSTRACT: This paper discusses the Web Based Students' Record Management System for Tertiary Institutions. This paper was borne out due to the problems associated with student academic record management which include improper course registration, late release of students' result, reconciliation of students' result, malpractices at various students clearing units, inaccuracy due to manual and tedious calculation and record retrieval difficulties in the institution. The objective of this paper is to develop a portal that would incorporate online registration, profile creation, students' final clearance and payment, transcript processing, checking of admission status, verification of both O'level /A'level and degree certificates and checking of results, thus it is expected to reduce paperwork and automate the record generation process in the tertiary institution. The methodology deployed in packaging this paper is the Object Oriented Analysis and Design Methodology (OOADM) while the programming languages used was Hypertext Markup Language (HTML), Hypertext Preprocessor (PHP), Cascading Style sheet (CSS), Java Script (JS), and My Structural Query Language (MySQL). The result aims to provide solution to inefficiency and at the same time maintain information accuracy and ease of access to students, lecturers, parents and management in the tertiary institution.

KEY WORDS: Portal, Record Management, Database, Result Management, Reconciliation, and Online Clearance.

I.INTRODUCTION

Students' academic and personal records form a vital part of the education system though progress throughout life continues to be hinged on availability of accurate data on graduates of various institutions.[1]And[2] noted that students' records in most institutions have been held in low esteem, especially in the third world where most archival records on students are held in physical systems, giving rise to complications in recovering vital information and reduced access time.

Therefore, since time is of essence in the digital age, there is need to develop systems that are flexible, reliable and accurate for the purpose of delivering accurate information anytime needed.

Meanwhile, availability of such information must not require physical presence except in exceptional cases when physical authentication is necessary.

Today's digital age and online registration, issuance of electronic notification of results and transcripts, and application into the university via the web have become the norm.

Therefore, it is awkward to keep students' records, certificate verification, final clearance and transcripts processing has been on paper form where they can only be accessed and processed manually and sent through postal service. An online (web based)students'record management system for tertiary institution has therefore been introduced to improve the efficiency, reliability, cost-effective exchange and management of students' academic transactions. The system provides a simple and interactive interface for the maintenance, and processing of student information via the web. It can be accessed by educational institutes or colleges to maintain the records of students' easily. Though, achieving these objectives is difficult using a manual system as the information is not organized which give room to students' data redundancy and poor data integrity. Therefore, the proposed system ensures to overcome these limitations witnessed in the existing method of managing student information.

Furthermore, management and protection of student records is one of the basic responsibilities of tertiary institutions. Investigation on school improvement and school efficiency has shown data use to be central to the school enhancement process. Investigation of student information can be used to inform solutions to a wide variety of educational challenges in tertiary institutions. General information about students' like name, matriculation number, date of birth, sex, nationality, state of origin, religion, local government area, permanent/residential addresses, etc., as well as examination results for each and all semesters are expected to be properly calculated and preserved.

Nevertheless, difficult processes are usually required to compute error-free students' examination outcome. Furthermore, these routines which are carried out every semester put the individuals responsible for the processes in a continuous and ever demanding cycle. Delays in the release of examination results and complaints from students about mistakes in their results are common. It is not unfair to say that some tertiary institutions still compute examination results manually; a process that is more time-consuming and error-prone. Comprehensive semester result format that can be accessed by students' and their parents when the results are ready, which shows the students' information, scores, grades, process of arriving at the calculated GPA (grade point average) and CGPA (cumulative grade point averages) are uncommon. Statistics over a period of time about students such as gender and age representation in a department or faculty are usually not readily available. Existing programs are therefore inadequate in addressing some of these complications.

In this paper, the researcher will present a design for web based students' record management system for tertiary institution. The design is deliberately focused on flexibility and accurate delivery of information to various users such as students, lecturers, parents, institution management and organizations. It is a role-based system as various users are approved to carry out different roles. For example, students can create profile, register authorized courses for a particular semester based on fulfillment of certain conditions like payment of necessary fees and possession of prerequisite conditions, verify admission status, verify matriculation number, do research in various computer areas using the e-library tools(Journals and articles),perform final clearance. Graduates on the other hand can apply for transcript, organizations/institutions can verify their potential employees/graduate students transcript. Administrator can grant access to students'to process their transcripts when the necessary fees are paid. Also, Organizations will have access to certificate verification of their employees using the tertiary institution portal without sending any special email to request for it.

II. SIGNIFICANCE OF THE SYSTEM

The paper mainly focuses on how web based students' record management portal would enhance the tertiary institutions in Nigeria to properly archive students' record especially in Imo State University, Owerri (IMSU), Nigeria. The implementation would enable students, parents, tertiary institutions and organizations with easy access to studentsrecords. The study of literature survey is presented in section III, Methodology is explained in section IV, section V covers the experimental results of the study, and section VI discusses the future study and Conclusion.

III. LITERATURE SURVEY

In the past eight years, various academics andresearchers have studied this area of web based students record management system. Through the recent progress surrounding process of students' record in the tertiary institution, new ideas have made up the literature reviews complex. However,[3]in his paper "design and implementation of a novel web-based student academic information system for higher institutions" talked about the functions of a student information system which outlined the following as: providing means to effectively maintain accurate, up-to-date student database that can be quickly and easily accessed; providing an efficient means to collect, collate, interpret, and administer students' information, results error-free,providing prompt processing and emancipating of relevant academic document (like transcripts, statement of results, etc.) in real-time fashion; providing effective means to secure and protect students' data against intrusion and unanticipated disaster; providing acomputerized means for institution to effective management and to be able to extract decision making information about students' academic performance; providing a unified communication interface between students and the institution. Hence, the objectives of his paper therefore include:

1. **Provides Students and Parents with Accurate Information:** This system provides students with updated information about their admission status, studentship, semester results and latest information.
2. **Provides Lecturers Easy Access of Communication with their HOD:** This system provides lecturers with easy access to send their various results with reference to date and time of submission. Also, they can view and courses allocated to them,
3. **Facilitates the work of Head of Departments in management of duties:** This system enables the HOD to upload results for students to view, allocate courses for lecturers, receive results from lecturers, reconcile results for graduating students, uploads Projects, Thesis and published article works in the departmental E – Library web page. This helps the Nigeria University Commission in their assessment upon accreditation visitation in various departments.

4. **Provides Institution Management, Graduates and Organizations with Accurate Information about the students past and present records:** This system provides genuine information to institution management, graduates and organizations as regards to students' Transcript, Statement of results/Certificates verification, O'Level/A'Level Verification using their unique certificate numbers.

[4]understood in his assessment that the management of student related information in an educational institute gets more tedious with every passing year and recommended for its computerization. There is need for an automated system for managing such information. In his publication "Student Information and Score Management System (SISMS)" he delivered a simple interface for maintenance of student information that can be used by educational institutions or schools to maintain the record of students' easily. The design and management of veracious, state of the art information regarding a students' academic career is critically important in the university as well as colleges. This was done by producing students' registration login form, registration form, examination form and the reevaluation form.

[5]noted that tertiary institutions (e.g., Universities, Polytechnics and Colleges of Education) are expected to manage and preserve data of both present and past students.

These data comprises of general information about students' as well as examination results at any or all stages of studentship. Investigation of students' data can be used to inform answers to a wide variety of educational challenges like discovering group differences, gender representation, ethnic representation, and growth over time. Though, data management and examination result calculation of large population of students' can be rigorous time-consuming and prone to errors. He is of the opinion that information management technology offers a comprehensive portfolio of students' academic record to be available in real-time to students' and professionals. That a comprehensive solution for use in many tertiary institutions is not yet common presents a unique opportunity for researchers to help shape the future of this technology.

[5]furtherintroduced a FORTRAN algorithm for Data Analysis and Result Computation (DARC). The algorithm analyzes student data as well as computes examination results of all students' in a department at once. DARC reads particular spreadsheet formats of students' information data, semester scores and previous academic records, after which it outputs, among others, investigation of students' information, all-inclusive result format for students' showing grade point averages(GPA) and updated cumulative grade point averages (CGPA), summary of academic records including log of carry over courses, log of carry over courses that have been cleared, log of outstanding courses and log of outstanding courses that have been cleared. Using synthetic record of some students, we validate the reliability of the algorithm by conducting accuracy tests. The algorithm is flexible and can be suitably modified to manage and preserve academic and general records of both present and past students in any tertiary institution.[5]stated that the algorithm also indicates a significant improvement in students' examination result computation and analysis. With proper file naming system, years of students' academic paper can be stored electronically and methodically archived. This can form a solid foundation of well archived students' record for future integrated systems and easy retrieval of any required information for data-informed decisions. The algorithm passed the accuracy and validity tests. Results obtained are as expected and supports all of the required objectives. This indicates that the algorithm is reliable. The algorithm is flexible and can be suitably modified to manage and preserve academic and general records of both present and past students in any tertiary institution.

[6]in their paper "Design and Implementation of Improved System for College Automation and Management"College Management system was discussed on android and web based application which is helpful for students as well as the colleges. In the existing system all the activities are done manually. It is very costly and time consuming. Neverthelesssystem allowed students'to view results, attendance percentage, internal marks, and download notes using Android phones. The data will be stored in the college server. Various faculties can login into their college account through the web based app itself and update the academic result as well as notes every day and perform a variety of tasks required by them for efficient college management. [6]also described that an Android and web based application for College Management System application offers reliability, time savings and easy control. It can be used as a base for creating and enhancing applications for viewing results, tracking attendance for colleges or any workplace. Students and their parents will also view results, attendance and curriculum details using this application. Also, students can view details, notifications anywhere and anytime. The application will greatly simplify and speed up the result preparation and management procedure. It provides high security and a system that reduces the work and resources required in traditional process.

IV. METHODOLOGY

The methodology adopted in this paper is Object-Oriented Analysis and Design Methodology (OOADM). It is a popular technical approach for analyzing and designing an application, system, or business by applying object-oriented programming, as well as using visual modeling throughout the development life cycles to foster better stakeholder communication and product quality. Web Based Student Record Management System for Tertiary Institution was designed following the OOADM stages /approach.

(a) Object-Oriented Analysis(b) Object-Oriented Design (c) Object-Oriented Implementation

(A) Advantages of the New System

The proposed system as stated earlier is an upgrade to the already IMSU portal (imsu.edu.ng). Its advantages or benefits can never be over emphasized as it will be compared with international standard. Some of the identified advantages include:

a. Easy and fast means of performing final school clearance from a remote location without visiting the various offices in the school.
b. Improve the rate of service delivery and production
c. Allow students to view their results online with ease
d. Automate the activities of various departments
e. Alerting parents on the academic performance of their ward will motivate students more to work and study hard.
f. Eradicate delay, bribery and corrupt practices in academics
g. Provide more revenue for the institution through the integration of an A'level, O' level and degree certificate verification.
h. Result reconciliation and transcript processing will be processed quickly.

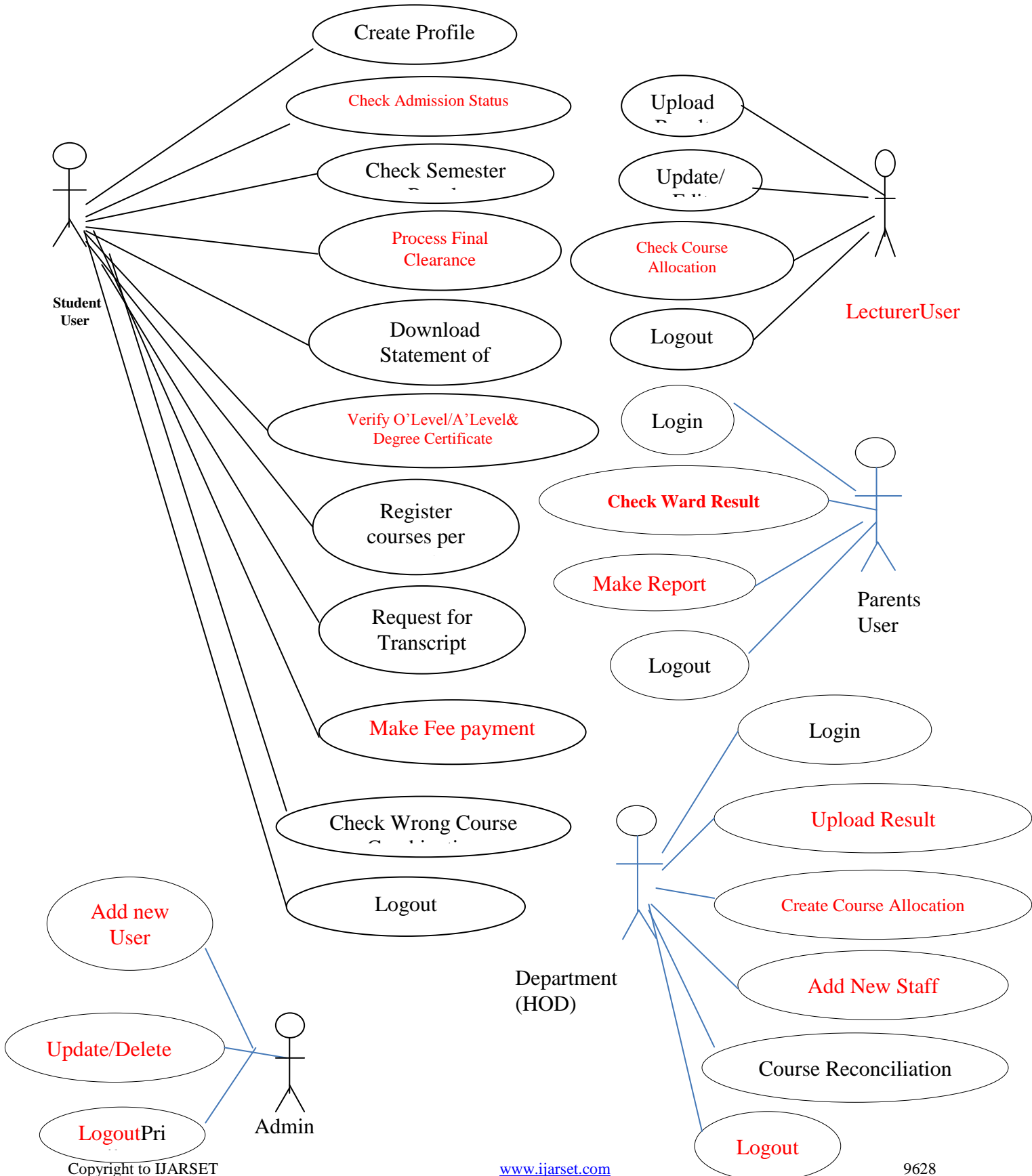**(B) The Proposed System UML Case diagram for Various Users**

The use case diagram of the various users of the proposed system is shown in figure 1. Indicating privileges and duties of various users of the Web Based Student Record Management System for Tertiary Institution.

a. Students User could login with their details to perform some task with the outlined functions below:
b. Create profile (Registration), Check Admission Status, Check Semester result, Process Final Clearance, Download Statement of Results, Verify O'Level/A'Level certificate, Register Course per semester, Request for transcript, Make payment for all stipulated fees
c. Lecturer User could also use the portal to upload results, check semester course allocation, or update profiles.
d. Admin User: this user is in charge of the entire portal as shown in figure 1.
e. Parents User: they have access and notification to academic performance of their wards.
f. Department (HOD) User: here the head of departments represent each department and hence the entire activities within the department. Therefore this module must be handled by the HOD to perform the outlined task as shown in figure 1.

(C) System Design and Implementations

System design deals with putting solutions to the problems with the available resources. It is the blue print of the system that is to be developed. Therefore, software life cycle requires some basic activities which include:

i. Decomposition of the entire system into components: Identification of the system architecture including various menu and screen displays, how the system can be installed, the hardware and software specifications/requirements for the installation of the system and how to start up the system.
ii. Component of the proposed system and their relationship as well as its dependencies are covered.
iii. Inter component communication mechanism are also achieved.

Figure 1 The User UML Case diagram for proposed System

(D)   System Description

The program was designed using Top – Down Approach. It makes use of the fundamental problem solving techniques. The software is structured in such a way that each subsystem is selected and executed independently. The task is divided into several modules, which come together to give the solution to the problem. The modules are as follows:

a)   **User's Module:** The user's module is designed to enable user sign up for the purpose of either check for result, make payment or clearance payments, download statement, check for admission status, create profile etc. On registration, the user obtains user name and password. Only valid pin can be used by the user in making payment for any school fees or other payments.

b)   **Admin Module:** The admin uses this module to create new users, maintain the entire database and as well view other information. This module can also enable administrator to view account reports as well as upload file on the portal.

c)   **Course Registration Module:** Students use this module to register their semester courses and obtain print-out.

d)   **Verify O' Level / A 'Level Certificate and Degree certificate Module:** This module is used by either admission officer or faculty officer to verify the authenticity of their O' Level certificates after payment is made.

e)   **Check Admission Status Module:** This module is used by prospective students' to check if admission has been offered to them on the portal.

f)   **Upload and Attach Semester Result:** This module is used by the departmental head to upload semester results after submission by various lecturers.

g)   **Check Semester Results:** This module is used by students from various departments to check for their results.

h)   **Parent Module:** This module allows the parents of the student to also check for academic performance of their ward and also make report.

i)   **Final Year Clearance and module:** all graduated student of the institution could make use of this platform to carry out their final clearance payment of various departments in the school after which a general Electronic Pin (E-PIN) will be sent to them before downloading statement of result.

j)   **Profile Creation Module:** This module is used by students to register and obtain a login details which will be used to login again to perform various task.

k)   **Verify Matriculation Number Module:** All students are allowed to make use of this module to confirm if their matriculation number is original or fake.

l)   **Transcript Request/Processing Module:** Students/Alumni could always use this module to request the school to process their transcript after making payment.

m)   **Payment Module:** All payment both school fees, clearance fees, statement and others are made in this module and all payments have an E-PIN.
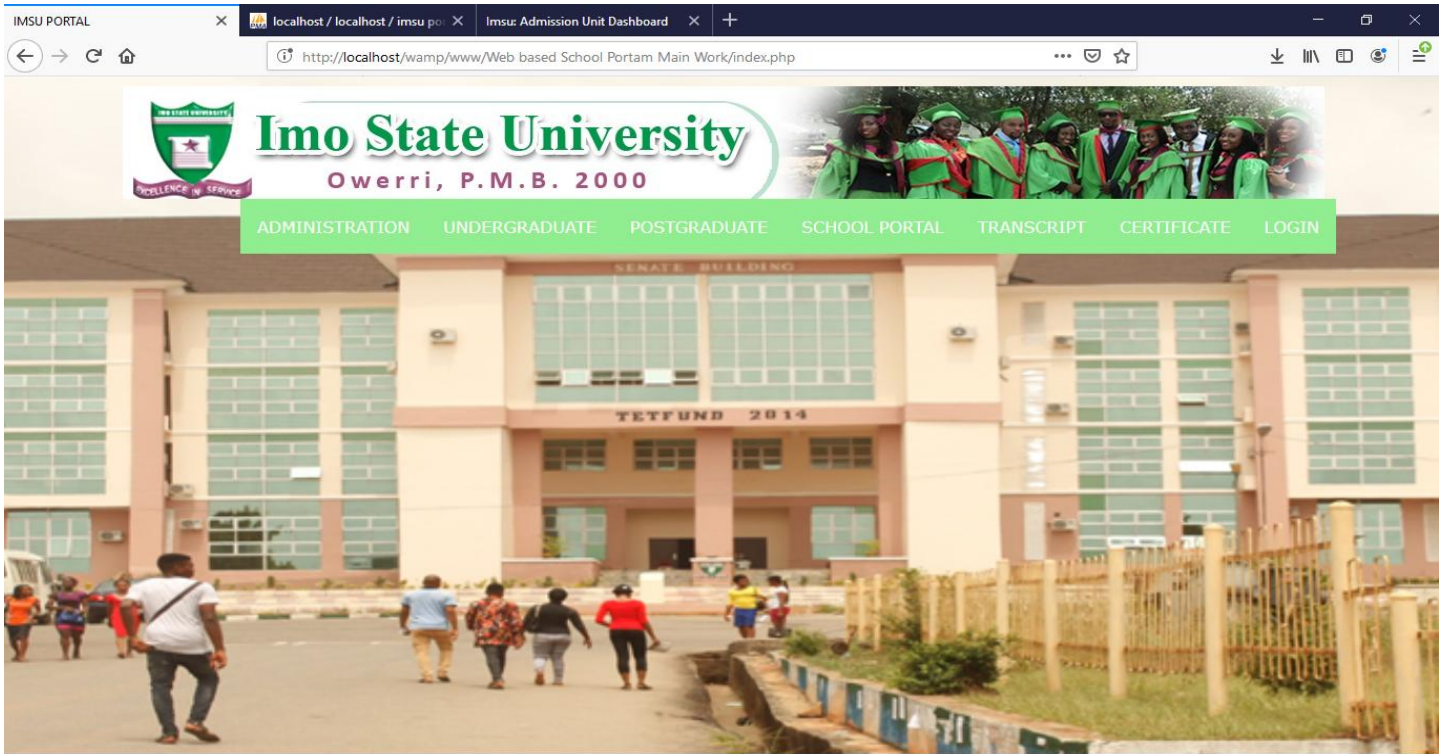
V. DESIGN OUTPUT RESULTS

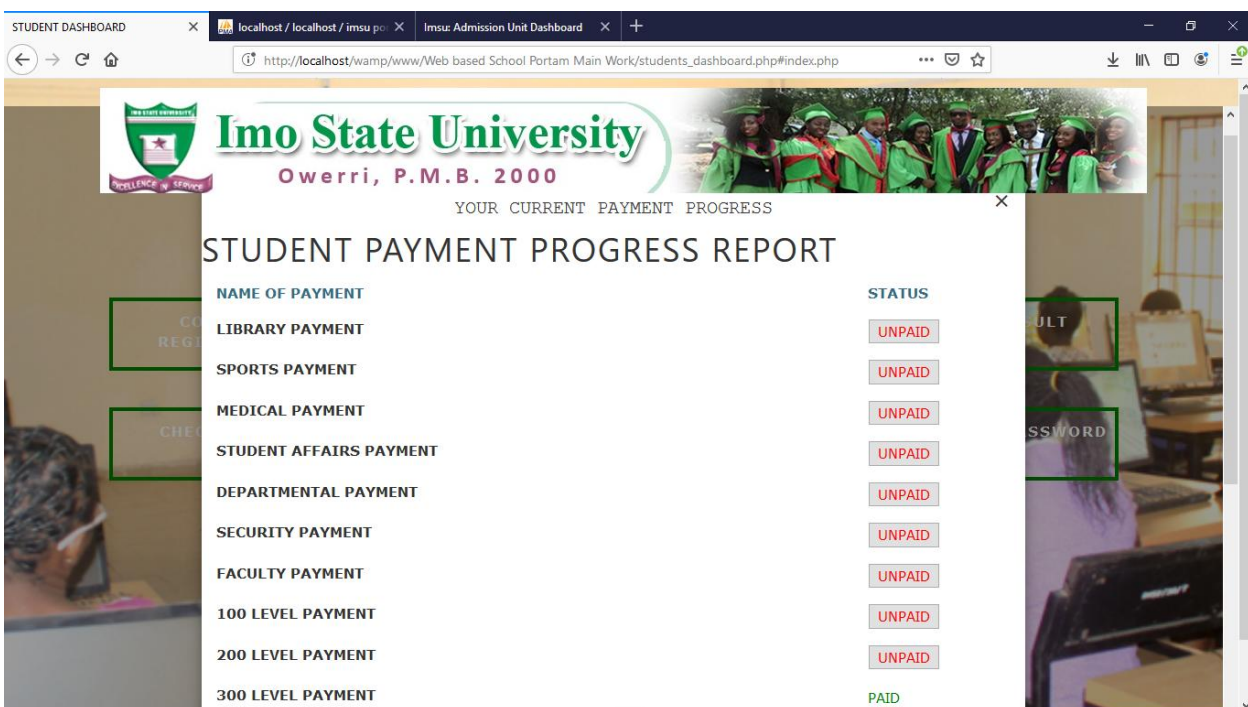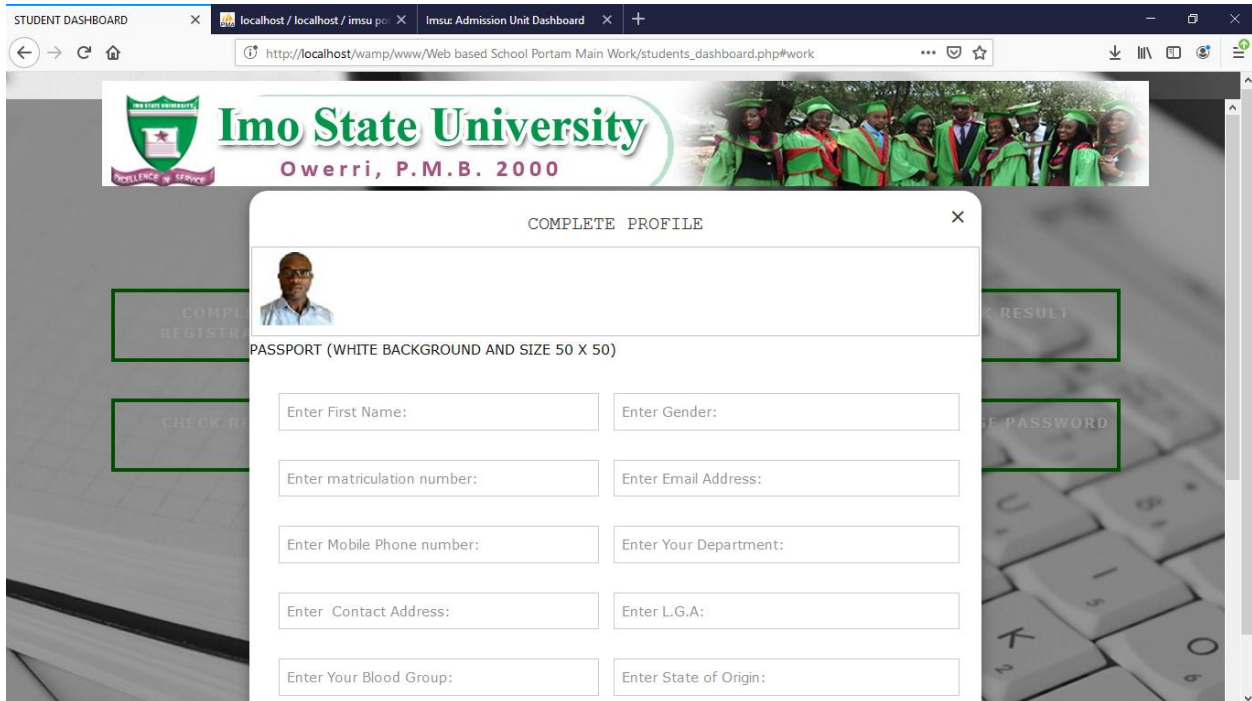**Figure 2:** Web base students record management system for Imo State University Owerri

Figure 3: Students Online Clearance Form and Payment

Figure 4: Users Registration Form

VI. CONCLUSION AND FUTURE WORK

The benefits of using a web based students' record management system for tertiary institutions cannot be over emphasized. This is because the system will increase the speed of processing students' results, increase accuracy in result computation, eliminate cases of misplacing files of students and will increase record generation process in various offices; allow students online clearance, quick processing of transcript, checking of admission status, verification of degree certificates, creation and allocation of course to lecturers, course registration, granting students and parentsaccess to results to parents and granting organizations access to records.

Therefore this study recommends the following:

Develop an open source android/web based students' record management system for tertiary institution.

Develop a school portal that could make use of face recognition as its security measures.

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