

Development and Validation of Web-Based Computerized Transcript Management System for Tertiary Institutions in South-Western Nigeria

Gbenga Olaniyi EFUNWOLE, Ph.D.
Department of Educational Technology
University of Ilesa, Ilesa, Osun State
gefunwole276@gmail.com

Abstract

The project was about a web-based computerized transcript management system, which was designed and developed to help proffer solution to challenges such as misplacement of student records / grades, inaccurate record keeping and poor information management, inaccessibility of students to their report and academic records in tertiary institutions in the South-western Nigeria. Five (5) final year students were randomly sampled from each of the five (5) purposively selected universities for administration of the instrument – Web-based Computerized Transcript Management System (WBCTMS). The system received, processed and retrieved data with increased data security, and ascertained the existence of data-base record of students' result, which fast-tracked students' transcript processing via active information stored in the database. It also prevented staff in the transcript office from strenuous work, because of reduced bulkiness of file and paperwork. The developed program was hosted on a university website, which ensured easy process of transcript and accurate information management. Based on the outcome, the package is recommended for adoption by all tertiary institutions in the country.

Keywords: Development, Validation, Web-Based Transcript Management System, Tertiary institution, Information Communication Technology (ICT).

Introduction

The evolution of internet commenced in the mid-1990s in Nigeria, and is adopted as a vital technology for fast and effective information communication technology, especially among digital natives in this era. Extensive research has been conducted on the implementation, development processes, policies, standardization versus creativity and so forth, still the potentials of internet and intranet technologies has not been fully exploited in the academia (Odachi, 2009). One of such areas is the process of applying for academic transcript from Nigerian university. Few of the tertiary institutions were established before the Nation's independence (first- generation), while others are post-independence institutions (second and third generations). Most of the universities

operates faculty system: Education and Arts, Engineering, Agricultural Sciences, Basic Medical Laboratory, Environmental Sciences, Management, Social Sciences and Natural Sciences, etc. ; (Iwuagwu, 2013).

Nigerian Universities does record significant increase in student enrolment on yearly basis because of passion for higher education and increasing demand for graduate's internet technology experience in the labour market. This lead to universities decision to include academic programme / course like Management Information System (MIS), to accommodate the need for it in this era where everybody is expected to be computer literate. MIS strategy is to leverage and automate information systems for improved operations, and to strengthen management controls that bring significant growth. The use of MIS encourages decentralization, thereby strengthening management controls. This means that it is cost effective, time-saving and data can easily be accessed and analyzed without time consuming manipulation and processing (Sumardi et al, 2022). Therefore, this project aimed at validating the operational impact of a web-based transcript management system (WBTMS), as well as its attendant benefits in transcript processing in tertiary institutions in South-Western States of Nigeria.

The federal government of Nigeria has contributed its quota tagged "booster plan" as mapped out in the ICT policy for Education, to computerized information in the schools at all levels (Sabah et al, 2019). Despite the significant contribution, the information resource still presents a major issue on educational management in the tertiary institutions. Studies have revealed that many of the tertiary institutions (federal or state or private) use both manual and computer based system. In fact, both are used to complement each other in information handling procedures. In his study, Iwuagwu (2013) stressed the need for management information systems in making effective decisions in educational institutions. Realizing the important role of information communication technology (ICT) to the survival of the university system, the National Universities Commission (NUC) introduced the computerized management information system to the Nigerian universities. The MIS was launched during a conference jointly organized by NUC and the British Council in 1987 at Kaduna. In 1989, the British Council in conjunction Overseas Development Administration (ODA) carried out a project with four pilot universities, namely: Federal University of Technology, Minna, University of Ilorin, University of Lagos; and University of Nigeria, Nsukka.

The aim of MIS is to develop a viable system that maximizes effective use of modern data approach to management practices. It also assists managers and operating personnel to produce timely and accurate information not only to decide present and future operations, but also to pinpoint potential problems that need to be rectified. NUC standard specify the objectives of MIS project in the universities as:

- a) To standardize the system of obtaining reports and statistical information from the various universities on students, stall, financial matters and library.
- b) To record such information on diskettes or tapes (now on modern storage devices such CDs, flash drives, etc.) at the universities and send to NUC for budgeting, information storage, analysis and retrieval purposes.
- c) To ensure that such information are accurate and timely.
- d) To organize information for planning, budgeting and decision making.
- e) To help the universities put in place effective management system and improve utilization of resources.

Based on the above objectives, it is expected that MIS will assist universities in decision making on various issues in their operations. This led universities to efforts set at the acquisition and use of computers in information processing, computer literacy, establishment of computer services units among others (Iwuagwu, 2013).

Transcript is an official documentation of a student's permanent academic record, which usually includes all courses taken, all grades scored, all awarded honours received, and degrees conferred.

It serve as a proof of student academic achievements (Kolawole, 2017). They are often required when applying for jobs, grants or further education opportunities. Employers and admission officers use transcript to evaluate a candidate's academic performance and potential for a job or admission (Benly & Brussel, 2009). It. Transcripts help universities monitor and maintain academic standards, by keeping track of student's grade and progress. Universities or employer can identify areas where students / graduate or applicant need additional support or resources via transcript. It also provide valuable data for program evaluation and improvement. Furthermore, students need to meet certain academic requirements to earn a degree, and transcript are used to confirm that these requirements have been met. Transcripts are used to verify students' eligibility for graduation. Transcript also provide a record of any honors or awards received during a student's

time at the university. Transcript management system emerged from the requirement of tertiary institution to get performance of a student seeking admission into higher degree program in their school. These documents are transferred from school to school or even from school to an organization that needs to know area of strength and weakness of the staff to be recruited (Transcript System – Wikipedia, 2011).

Transcripts are typically maintained by the registrar's office. Students do make request for copies of their transcripts for a fee. Transcript may be sent directly through posts to employers or other institutions upon request by its graduate. Result processing is a continuous process of converting data (scores, grade points, credit units etc.) into a definite and meaningful information such as statement of result, transcripts, etc. Student's performance is judged based on the outcome of his / her results. Thus, there is need for schools to have adequate online result management and processing system in place for graduates' use (Kolawole, 2017). As students go through different educational processes to earn a degree, the need for the sending, processing and grading students using paper records become cumbersome and unmanageable. Currently, the sending and receiving paper transcripts remains the most common form of record transfer, even though it is labour- intensive, manual keying of data does occur on both ends of the transaction process (Abidde, 2008; Ogu, 2008; Adekiigbe and Amosa, 2009). The developed web-based electronic transcript management and processing system is expected to help reduce problems that emanate from the manual means of transcript processing. In this system, only authorized user(s) would have access to the system.

Researches done in various countries confirm that management information systems increase organizational and managerial effectiveness. Other studies done with American school managers, revealed that efficiency has increased in decision making at schools where management information systems are used (Umoren, 2017). In a study that examined the effects of school management information systems on working of primary school managers in Australia, managers stated that the use of school management information systems has introduced them to information technologies and the facilities, lessened their workload and made management process more efficient, helped them use time more efficiently, made teachers themselves feel more important, made them and the teachers wish to improve themselves more, made important changes in education and teaching, and increased the quality of in-school communication. It was

also discovered that school managers believed that management information systems lead to important changes at school. According to the school managers, this application has increased school standards, helped decisions on the level of control and strategy, increased the quality of teaching programs, facilitated student-teacher interaction, increased the coordination between teachers, facilitated systematic and continuous information transfer to parents, and increased communication with other institutions and the central organization (Bill, 2009). The system utilize computer hardware and software, manual procedures, models or analysis, planning, control and decision making and database. MIS also assist workers in the field of education at all levels in contributing to the development of educational structures via information dissemination schools for the completion of tasks, activities and for providing means or a basis for formulating decisions. MIS's are utilized by universities in numerous processes such as student registration, grading of results, printing facilities, as well as administrative functions such as internal material procurement or checking in of staff members and students at points of entry (Sumardi et al, 2022). Nirmala (2015), in his study believed that information technology could be used to change universities administrative system in terms of result, transcript processing and issuance for the better. Hence the project.

Statement of the Problem

The annual increase in students' enrolment in Nigerian universities has pose challenges to university administration. Among the challenges are the delay in computation and issuance of results, certificates, transcripts and absence of real time services / information dissemination, etc. Nigerian University education needs to be reformed in order to meet up with the rapidly changing societal needs in the current digital world. Transcript request from Nigerian universities and other tertiary institutions is difficult to process and frustrating to collect. Although securing documents and transcripts may be easier if you live in Nigeria, attempting to do so from abroad can be annoying, traumatic and time consuming. There are administrative problems in the issuance of transcripts in many institutions of higher learning. One of the major challenges facing institutions of higher learning in Nigeria today is the issuance and collection of student's academic transcripts. Most times, students apply for transcripts from their respective institutions and it takes several months before such transcripts could be issued to the applicants, and for it to reach the expected destination. These scenarios do cost the applicant a number of failures. Admission process is not complete without attaching the transcript to the admission forms, especially for students applying

for higher degrees in other institutions. So, in some cases students lose admission due to late arrival of transcripts. The researcher was able to identify problems such as misplacement of student records, student's grades, slow and strenuous accessibility to students report and record, inaccurate record keeping and poor information management; which lead to poor transcript management in most Nigeria tertiary institutions.

Transcript Management System in South-Western Nigerian Universities

The common practice to collect transcript in Nigeria tertiary institutions require that graduate travel to his alma mater in order to apply for, and / or to collect it. Steps to collect transcript are:

- The applicant goes to the university to confirm the payment procedure
- The applicant goes to the bursary unit to make payment.
- The applicant takes the receipt to the exams and records department of the university in order to obtain the application form after submitting an application letter
- The applicant completes the form and takes it to his former department in order for the transcript to be officially processed and make take time.
- The transcript are then sent by post and through this some of the transcript get lost or may applicant get it late and this might be rendered useless.
- In the sampled tertiary institutions, transcripts are typically maintained by the university's registrar's office. Students can request copies of their transcripts for a fee, in person as we currently have it now. Transcript may also be sent directly to employers or other institutions upon request.
- Result management is the duty of the Exams and Records of the Registry unit of the university. Each department have copies of every student's results. In processing a student's transcript, the following steps are taken as presented in the block diagram below.

Firstly, payment is made to a designated bank account. This amount is dependent on the transcript delivery destination. After the payment has been made, the student then goes to the Exams and Records sub-unit of the registry with a formal letter requesting for his/her academic transcript. The letter is forwarded to the department where the student graduated from, requesting for copies of his results. The copies of the applicant's result are

then sent to the Exams and Records office for compilation and back to the office of the Registrar, where it is to be cross-checked, typed and endorsed for the Exams and Records office to dispatch. The transcript is then sealed and sent to the stipulated address through a courier service or the students come back to the university to collect it. (**Source:** *Transcript Officers - Researcher's field work*)

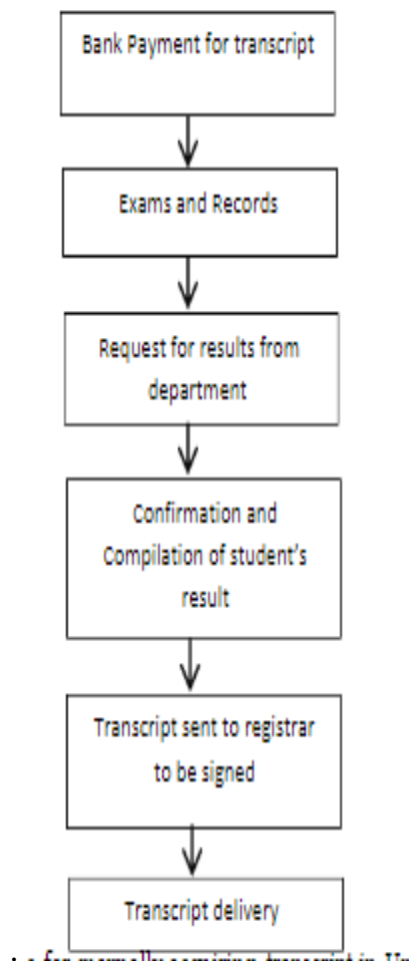


FIG.1: *Existing Procedure for Collection of Transcript*

This method is slow, error-prone, stressful and obsolete. These problems was assumed can be diminished by making use of a web-based computerized processing system or an electronic transcript management system.

Objectives of the Study

The purpose of this project is to develop and validate a web-based computerized transcript management system, while its specific objectives are:-

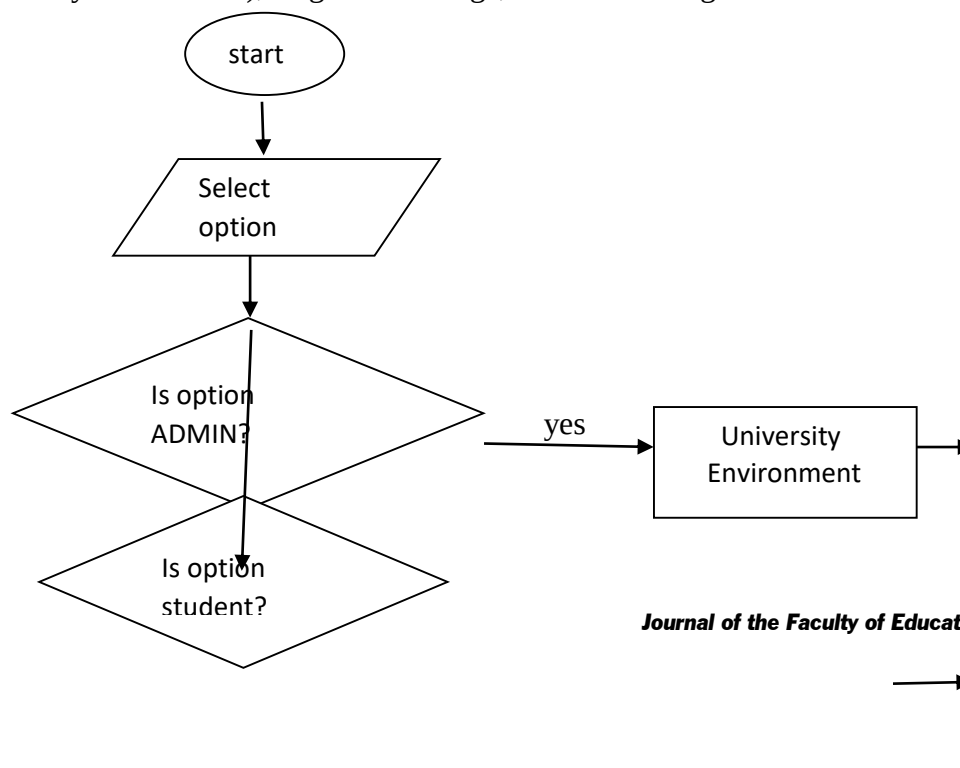
- To ascertain the existence of Data-base record of students' result.
- To retrieve students data with increased security.
- To design a computerized transcript management system for the tertiary institutions.
- To develop information system that will serve as interface between graduates and Universities' transcript management office; for online tracking of application for transcripts.
- To validate the computerized transcript management system.

Scope of the Study

The research project was limited to development and validation of a web-based computerized transcript management system (WBCTMS) that enables electronic access, processing and issuance of student's academic transcript in South-Western States Universities.

Design of the System

The WBCTMS was developed in modules with each modules working together to perform the goal of transcript management system, to enhance the performance of the existing system. The design and operation procedure of the system is explained in the following formats: Homepage of the Developed System, System Flowchat, Operation Procedure of the System, Login pages (University and Student), Registration Page, Database Design.



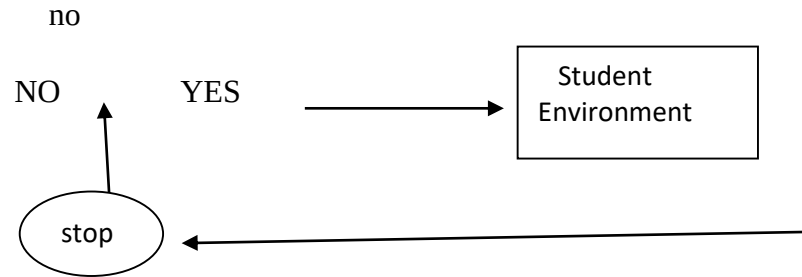


FIG. 2: System Flowchart

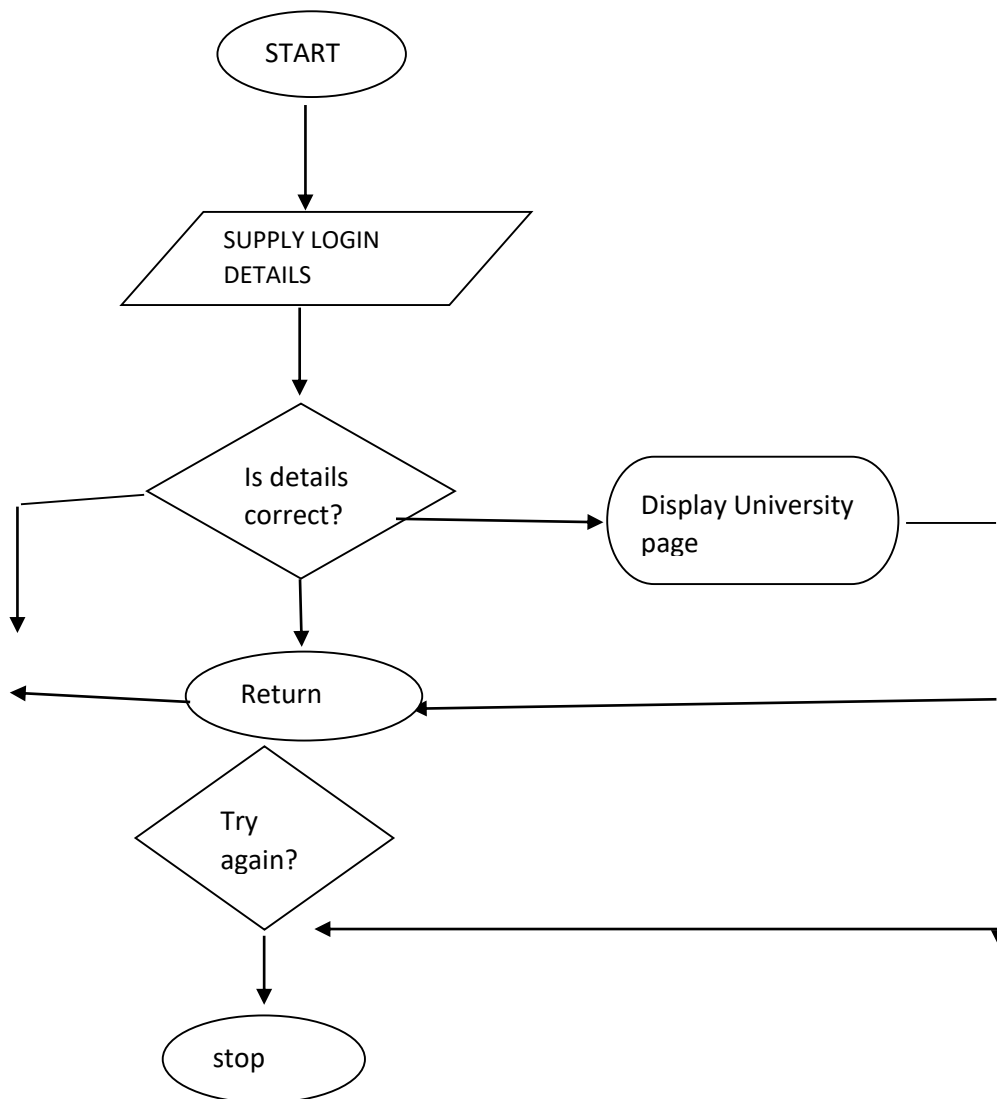


FIG 3.1 University Login Page

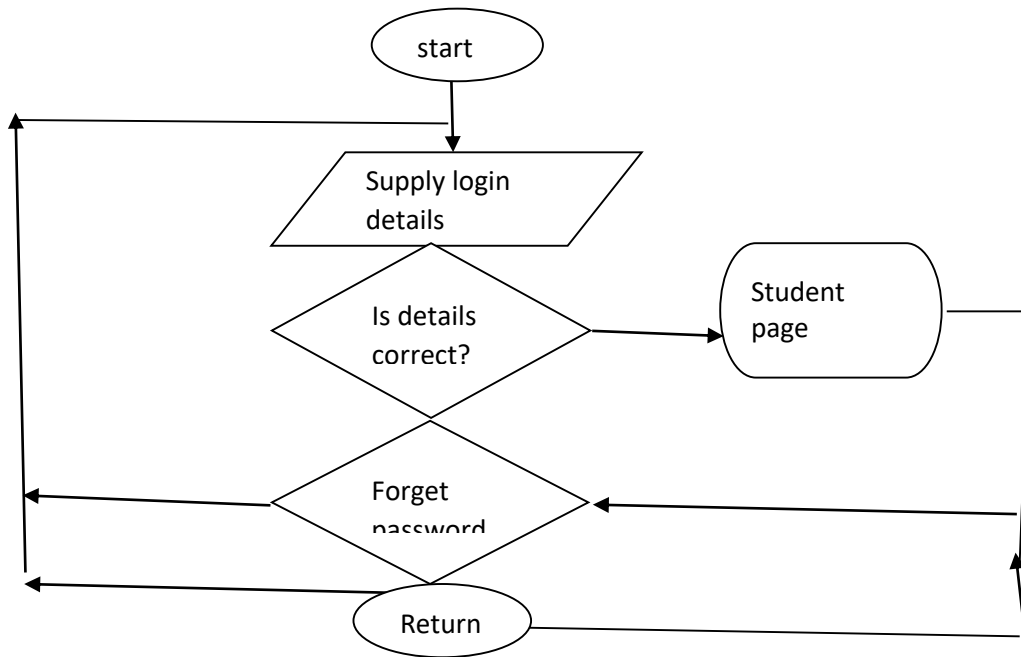


FIG 3.2: Student Login Page

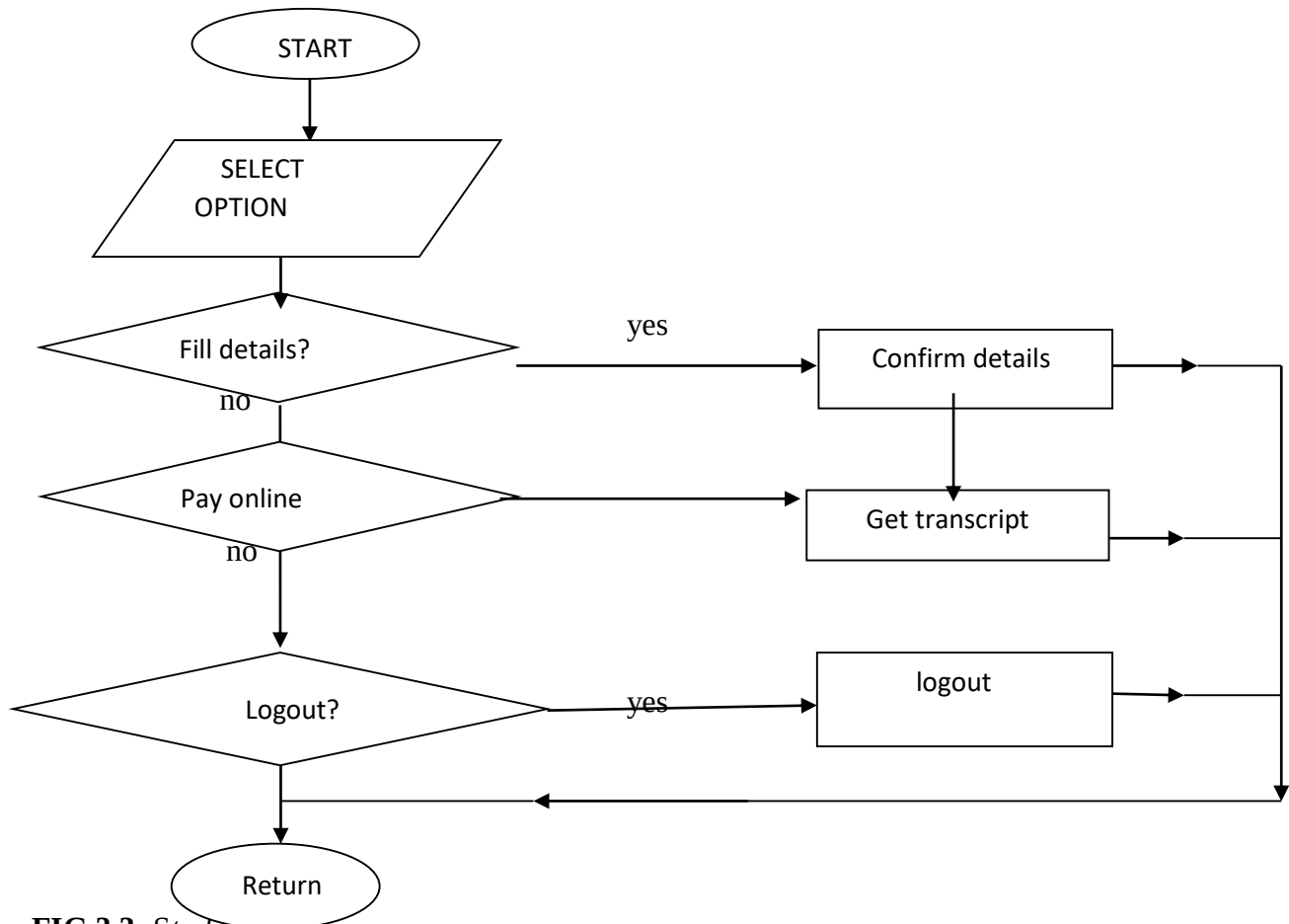


FIG 3.3: Student Page

Database Design

This refers to the tables used in the developed transcript management system (WBCTMS) – designed database, as shown below:

University Database

Email address	Password

Student table

id	fir	last	email	univer	inst	progra	fla	buildin	street	street_	city	po	state	pas	joinir	co	gr
15	ve	jost					a	a	a	a	a	39	guj	asd	0000	99	00
15	v	r					a	a	a	a	a	a	a	as	0000	99	00
19	Ab	Em					a	a	1	ama	anand	38	Gujarat	dev	2016	88	20

WBCTM System Requirement

This refers to the basic requirements by the developed system, which must be met by the users for optimal functionality.

Software Requirement

The table below is a list of the software requirements for the WBCTM system to function optimally.

Component	Requirement
Operating System	Windows 7, 10, Mac Os
Php version	PHP 4.2.1 or later

Database Engine	MYSQL 7
Web server	Laravel server
Browsers	Firefox, Chrome Opera

Table 1: Software requirement for the developed system (Babaoghi et al, 2012; Sumardi, et al, 2022).

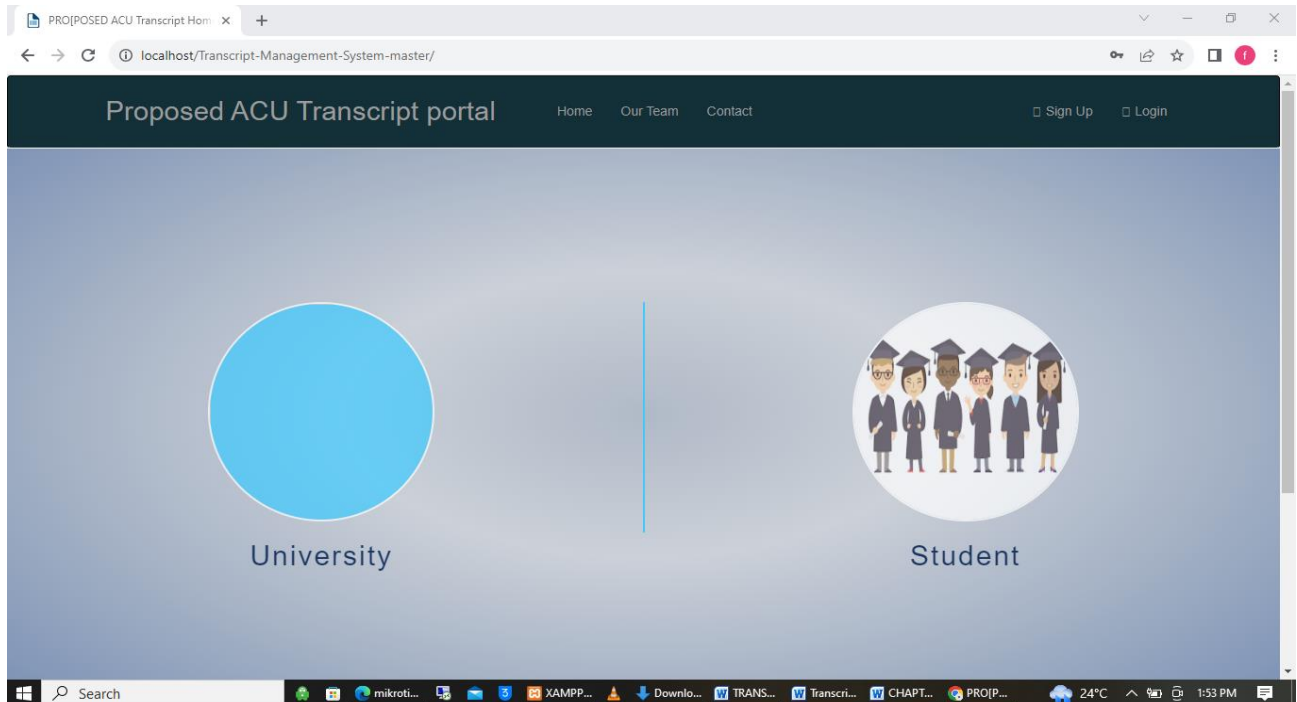
Hardware Requirement

Component	Requirement
RAM	1GB or higher
Harddisk	80GB or higher
Processor	Pentium IV or higher

***Table 2** Hardware requirements for the developed system (Babaoghi et al, 2012; Sumardi, et al, 2022).*

The need for web-based computerized transcript management system (WBCTMS) cannot underestimated because of its numerous advantages, which help reduce or remove the earlier identified challenges and problems that applicants encountered with the existing system. The newly developed system will counter some of the problems. The system was built in php and mysql programming languages that best solve most of the problems that accompany the existing system, since it's an online generation. The WBCTMS was developed considering the evaluation of already existing transcript processing system, the new system was not meant to add or remove from the already existing process, but it was meant to improve the way transcripts are processed.

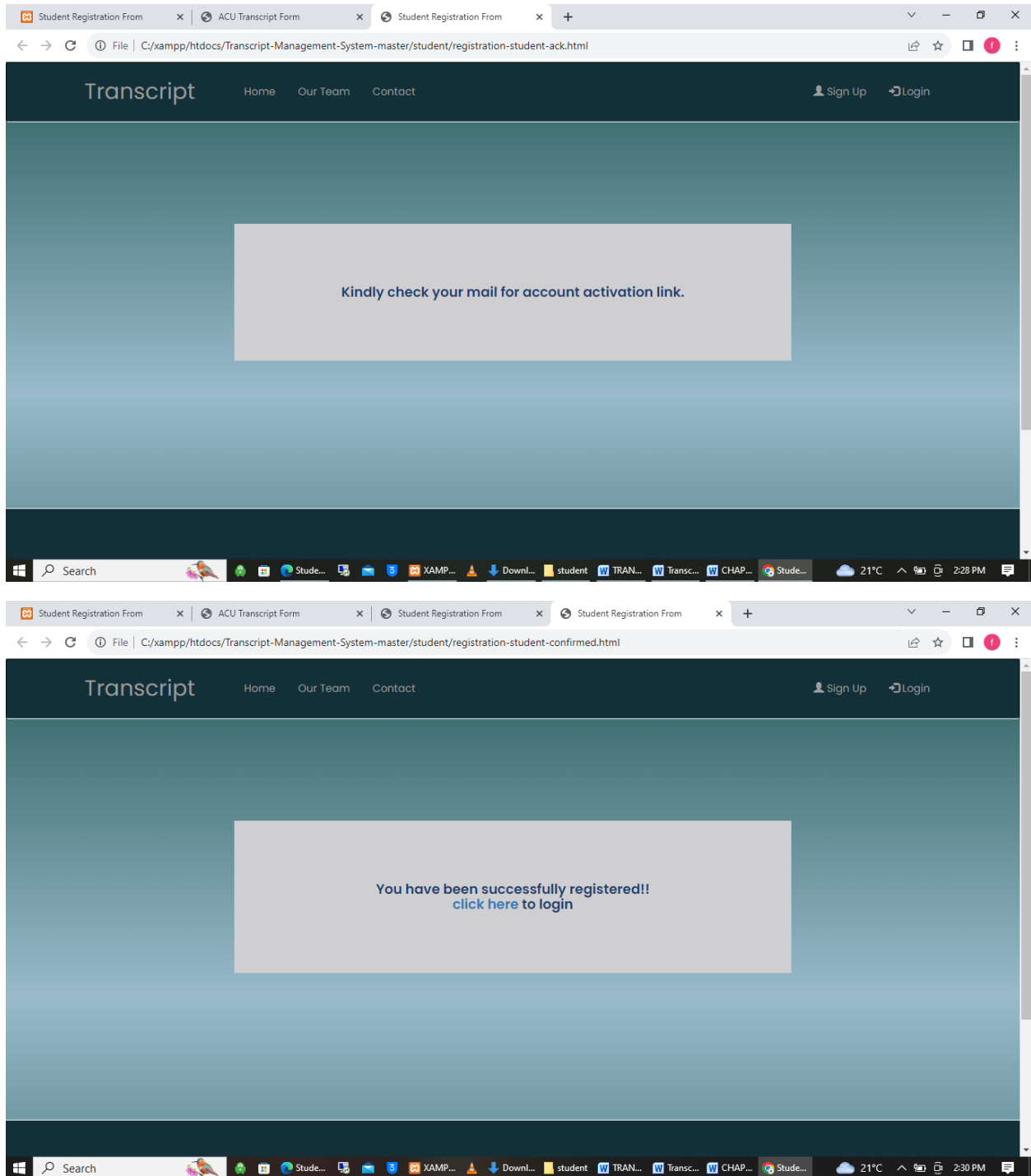
Homepage of the Design



This provides space for entity (university or student) to login.

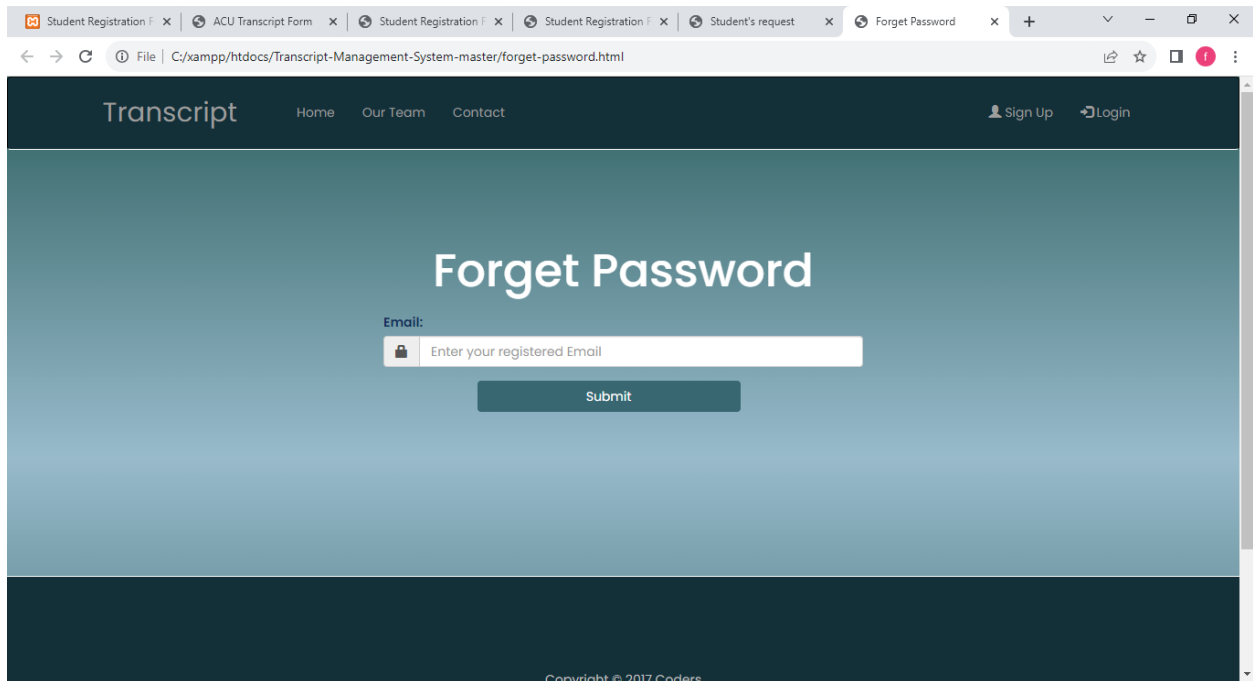
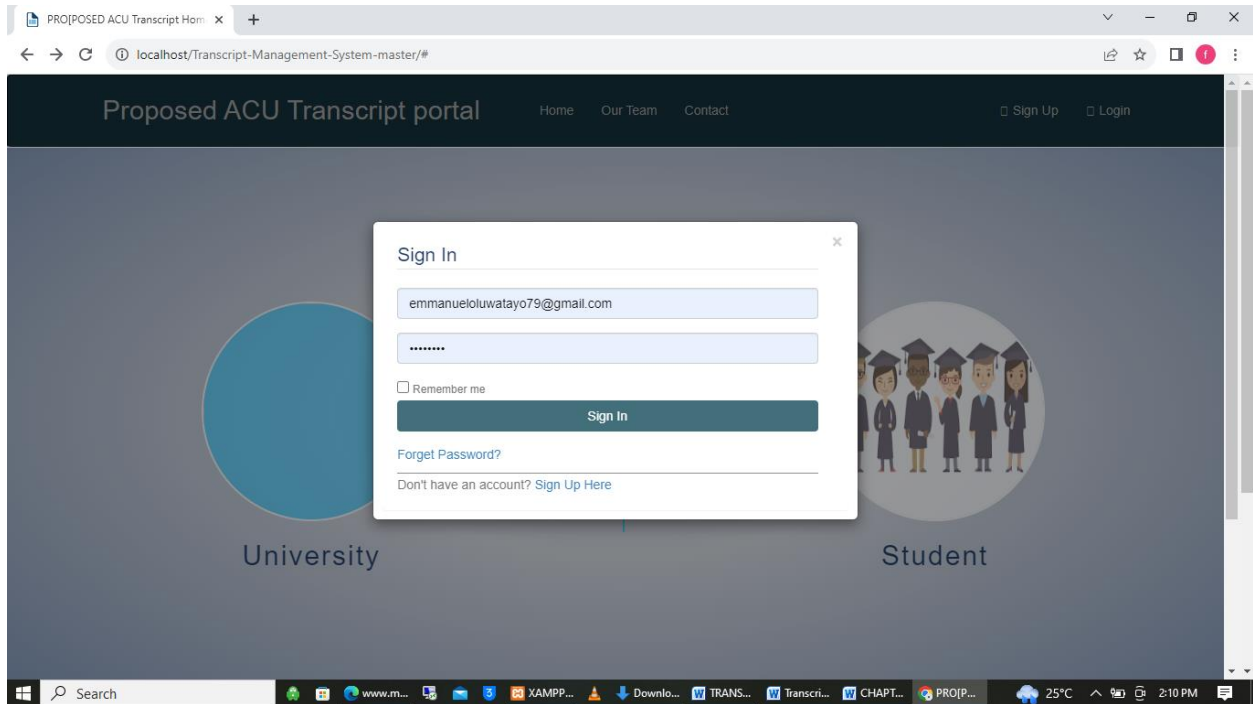
REGISTRATION PAGE

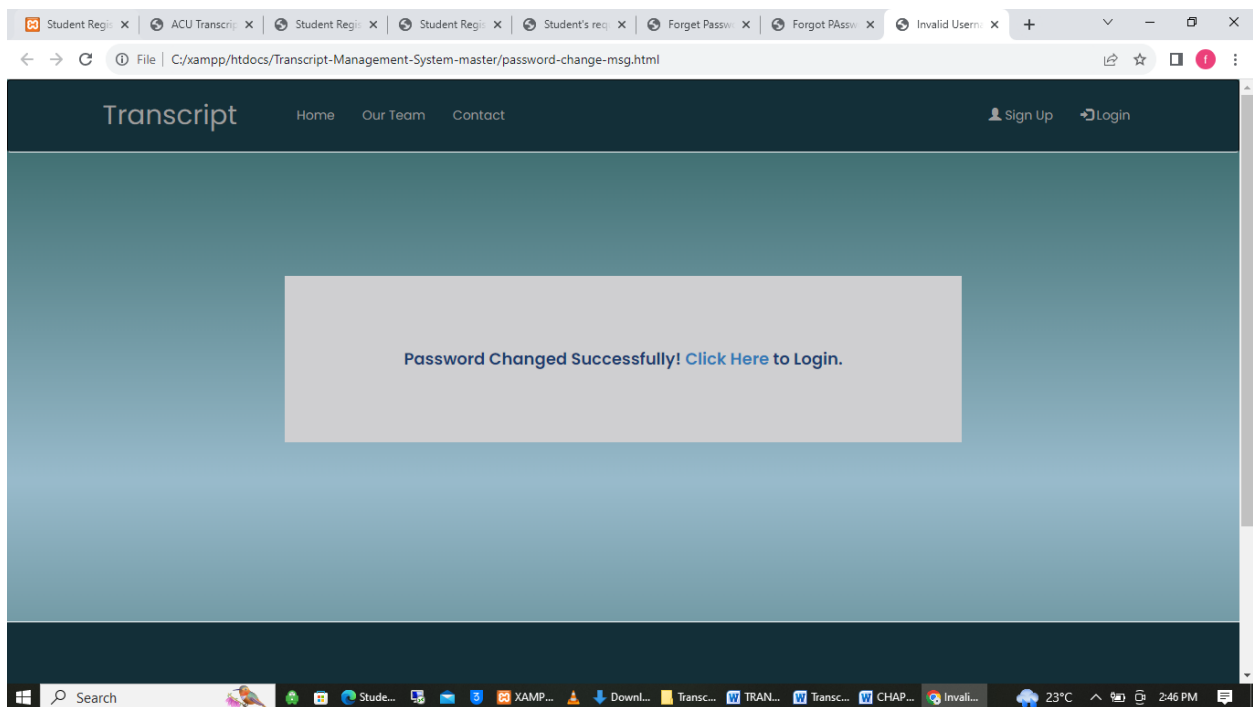
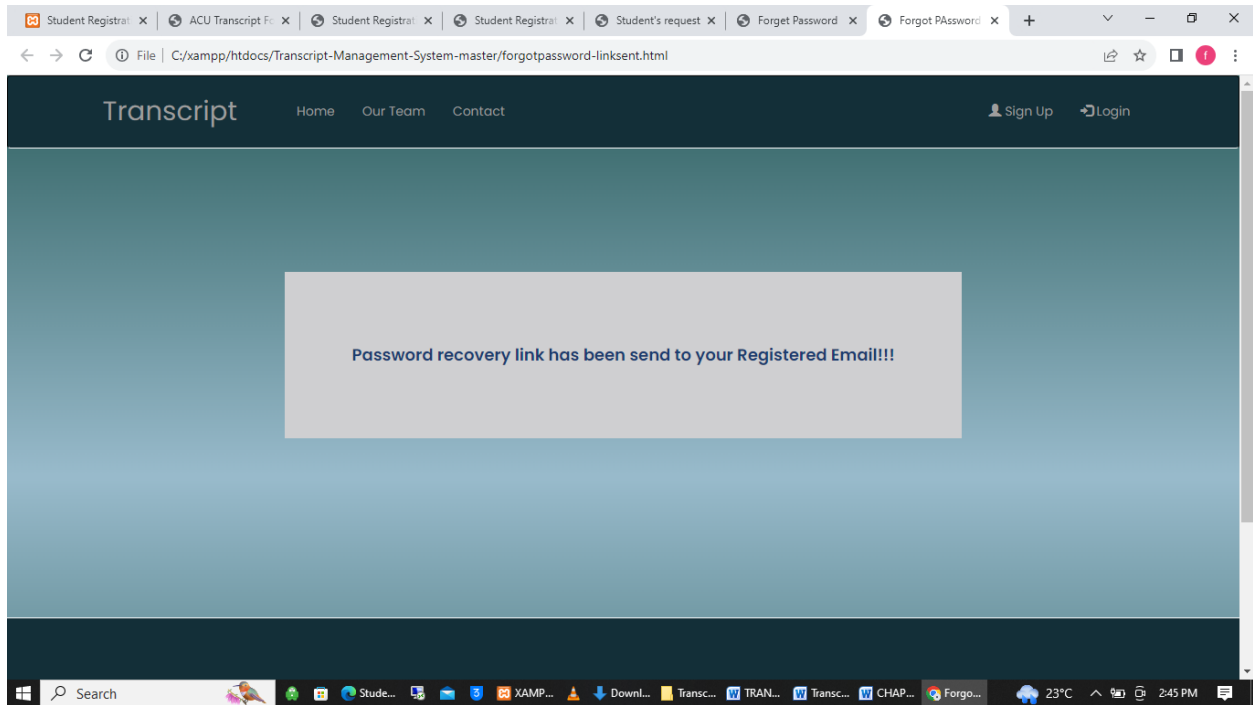
A screenshot of a web browser displaying the 'Student Registration Form' page. The browser's address bar shows 'localhost/Transcript-Management-System-master/student/registration-student-form.php'. The page has a dark blue header with the title 'ACU Transcript' and navigation links for 'HOME', 'Our Team', 'Contact', 'Sign Up', and 'Login'. The main content area has a teal background and features a white registration form. The form is titled 'Student Registration Form' and is divided into three sections: 'University Details', 'Joining and Graduation Year', and 'Student's Details'. The 'University Details' section includes fields for 'Institute*' (with 'AJAYI CROWTHER UNIVERSITY' entered) and 'Programme*'. The 'Joining and Graduation Year' section includes fields for 'Joining Year*' and 'Graduation Year*'. The 'Student's Details' section includes a field for 'Student's Enrollment ID*'. The Windows taskbar at the bottom shows various open applications and the system clock at 2:02 PM.



This design allows student to register via data input into the system's interface.

LOGIN PAGE



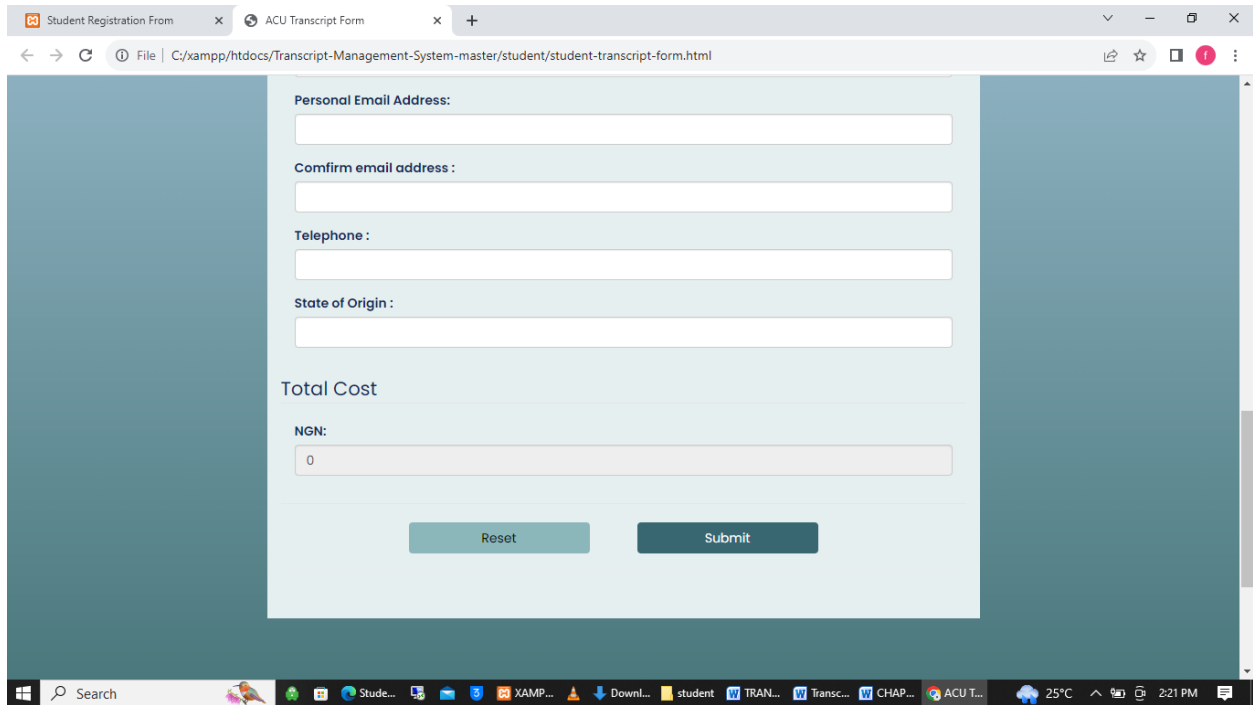


This allows student to sign in to the system and recover their forgotten password.

Transcript Form Pages

The screenshot shows a web browser window with two tabs: 'Student Registration From' and 'ACU Transcript Form'. The address bar shows the file path 'C:/xampp/htdocs/Transcript-Management-System-master/student/student-transcript-form.html'. The page has a dark blue header with the title 'Transcript' and navigation links 'Home', 'Our Team', and 'Contact'. On the right side of the header are links for 'Sign Up' and 'Login'. The main content area has a dark blue background with the title 'Transcript Form' in white. Below this is a light blue box titled 'Student's Details:'. Inside this box are several input fields: 'Student's MATRIC NO:' with a pencil icon, 'Student's Firstname:' with a person icon, 'Student's Lastname:' with a person icon, 'Middlename:', 'Date of birth:', 'Gender:', and 'Mode of Entry:'. Each field is represented by a white input box with a light blue border.

This screenshot shows the lower portion of the 'Transcript Form' page. It continues with the same light blue box containing the following input fields: 'Faculty:', 'Department:', 'Course of study:', 'Programe mode:', 'Session Admitted:', 'Session graduated:', 'Personal Residential Address:', and 'Personal Email Address:'. The browser window and header are consistent with the previous screenshot. The Windows taskbar at the bottom shows various open applications including 'Stude...', 'XAMP...', 'Downl...', 'student', 'TRAN...', 'Transc...', 'CHAP...', and 'ACU T...'. The system clock indicates 2:19 PM on a day with 25°C weather.

The image is a screenshot of a web browser window displaying a student transcript form. The browser's address bar shows the file path: C:/xampp/htdocs/Transcript-Management-System-master/student/student-transcript-form.html. The form itself is a light blue box with a white background, containing several input fields. The first section is labeled 'Personal Email Address:' and has a single-line text input. Below it is a 'Confirm email address:' section with another single-line text input. The next field is 'Telephone:' with a single-line text input. This is followed by 'State of Origin:' with a single-line text input. The final section is 'Total Cost' with a sub-label 'NGN:' and a single-line text input containing the number '0'. At the bottom of the form are two buttons: 'Reset' and 'Submit'. The browser window also shows a Windows taskbar at the bottom with various application icons and a system tray showing the date and time as 2:21 PM.

The transcript form allows graduate of the university to input required information, in order to request for their transcript online.

System Operation Procedure Design

This refers to the step by step method of using the developed WBCTM system. The system comprises of the home page, registration page, login page, etc.

The steps to use the proposed system are as follows:

1. On the address bar of any browser type <http://localhost/transcriptsystm/index.php>
2. You are prompted to supply the email and password this verifies that you are an administrator or as student.
3. If the email and password supplied are correct as that of an administrator or a student you are prompted with the home page for the administrator.
4. As a student you supply your details such as name and matric no you will be prompted with a page where you request for your transcript.

Summary, Conclusion and Recommendation

The system was developed using php as server, a dreamweaver platform which is compatible with windows. The proposed system will enable students and graduates of tertiary institutions gain access to their results easily and get transcripts online without delay, and thus helps to reduce paper work.

In this project, a computerized transcript management system was developed that facilitates the various activities taking place at the transcript unit of the university for the process of transcript , reduce stress of applying for transcript and also to secure some data. It is flexible as changes can easily be accommodated and take effect immediately.

The project has actually provided a platform for further studies in this area of transcript system. It is recommended that all other aspect of result be computerized so as to have a flow of automated system. The management of every university should ensure that all the staff of the transcript unit are adequately trained to ensure smooth implementation of the WBCTMS. Also, automation of the entire transcript unit should be done to ensure that all the systems are linked to one central local and internet network that is protected with high security measures.

References

- Abidde, S.O. (2008). Requesting Transcripts from Nigerian Universities. Lagos: Longman Publishers.
- Adekiigbe, A. and Amosa B.M.G (2009). *Journal of Computer Science and its Application*, Vol. 16, No. 2, pp. 45.
- Babaoghi, O., Marzolla, M., & Tamburini, M. (2012). Development and Implementation of p2p cloud system. Proceedings of the 27th Annual ACM Symposium on Applied Computing, pp. 412-417.
- Benly, H. C., & Brusell, G. C. (2009). School Computerization, 6th Edition. U.S.A: Kleen University Press.
- Bill, T. (2009). Echrome Transcript Management System. London: Princeton University Press.
- Iwuagwu, C.S. (2013). Computerized Transcript Management System. A case study of Caritas University. Unpublished Project Thesis submitted to the Department of Computer Science and Information Technology, Enugu, Nigeria.

- Kolawole, E. (2017). Design and implementation of employee information and payroll system, using Caleb University as a case study. Unpublished Project Report submitted to the Department of Computer Science, Mathematics and Physics; College of Pure and Applied Science; Caleb University Nigeria.
- Nirmala, R. (2015). Work stress coping and expectation of nurses. *IOSR Journal of Nursing and Health Sciences (IOSR-JNHS)*. 4 (5), . 49-56.
- Odachi, G.N. (2009) “Introduction to Information and Communication Technology”. Lagos: Longman Publishers.
- Ogu, O.P. (2008) Challenges Facing Nigerian Universities. Nigeria World (Baltimore)
- Sabah, A.A. & Yousif, N.H. (2019). Design and implementation of student’s transcript system. *Diyala Diyala Journal of Engineering Sciences*. 12(2), 65-70.
- Sumardi; Sofwan, A., & Adhipratama B. (2022). Design of website interface for smart greenhouse monitoring and controlling system using NoSQL database. *International Journal of Engineering and Information System (IJEAIS)*. 6 (6), 7-14.
- Transcript System – Wikipedia (2011). <http://en.wikipedia.org/wiki/transcriptsystm>
- Umoren, P. (2017). Automated students results management information system (SRMIS). *Journal of Engineering and Information System (IJEAIS)*. 6(6), 18-24.