TRANSCRIPT MANAGEMENT

Design and Implementation of an Online Transcript Management System for Abia State College of Education (Technical) Arochukwu

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Abstract

Presently, Abia State College of Education (Technical) Arochukwu maintains manual transcript processing system. The system is not only expensive, but also causes delay in processing and sending of graduate transcripts to the organizations that requires them. To address this issue, the authors designed and implemented an online transcript management system that will be cheaper and faster than the present system. The system contains seven modules, namely, the transcript payment module, the transcript application module, the HOD module, the transcript processing module, the registrar module, the bursar module and the admin module respectively. The transcript payment module enables graduates pay transcript fees. The transcript application module provides an interface for graduate to apply for transcript. The HOD module enables HOD to authorize the processing of graduates transcript after viewing applicant's clearance and academic records. The transcript processing module generates applicant's transcript. The registrar module enables the College registrar to append signature on the transcript, send the signed transcript to required organization (eg. university) and finally send message to the applicant that his/her transcript has been sent to the organization applied for. The module in addition enables the registrar to update student's academic records and keep all the records of transcripts sent to organizations. The bursar module enables the College bursar to view all payment made in respect to transcripts. The admin module is responsible for adding all users, usernames, passwords and updating records. The online transcript management system was implemented using HTML, PHP, CSS, Javascript and XAMPP web development technologies. The PHP, HTML and Javascript codes were written using Microsoft visual studio code editor. The developed online transcript management system was tested by 10 evaluators. Thereafter, a questionnaire designed to measure user's satisfaction with the use of the developed online transcript management system was administered to the evaluators. The data collected from the questionnaire was then analyzed. The result of the analysis shows that the evaluators are satisfied with the performance of the online transcript management system. Furthermore, the evaluators recommended that the developed system can be used in the College for processing of graduates transcripts

Keywords: online transcript; online transcript management system; transcript; web application

1 Introduction

Every tertiary educational institution is established to train students in different areas of human endeavour. Students on the other hand are expected to attain at least a minimum level of academic achievement at the end of their sojourn in such educational institutions. The record of their academic achievement can take the form of GPA (Grade Point Average) for a semester, CGPA (Cumulative Grade Point Average) or academic transcript. Of all these academic records, students' transcript appears to

be the most comprehensive students' academic record as it contains students' grades in all courses registered along side with their respective credit units, GPA, CGPA and other records. Academic transcript or simply transcript according to Cristian et al. (2013) is a certified document that shows the records of the academic work of a student at the institution of learning. It captures details of marks/grades that a student gets in the various courses taken in the institution. Omogbhemhe and Akpojaro (2018) defined academic transcript as an academic record that details all the academic performance of a particular student throughout the years spent in the higher institution of learning. In this sense, transcript becomes the final official document listing the courses with corresponding credit units and grades as well as final Cumulative Grade Point Average (CGPA). In this sense, transcript represents student's official overall academic performance while in school. In a nutshell transcript represents student's academic status. Academic transcript should contain, name of the institution, logo of the institution, address of the institution (eg PMB or web address), name of the student, student registration number (or ID), student home address, student phone number, student e-mail address, student gender, student date of birth, student state of origin and country, picture of the student (optional), student programme title(course of study), department, faculty, the date on which the transcript was issued, grade levels, semester, session, list of courses together with credits and grades, signature and/or stamp by the institution, bear the embossed seal of the institution, CGPA, class of degree or diploma and electronic verification code among others. Academic transcript serves several purposes which include serving as supporting document for graduates' admission into higher degree, fellowship, scholarship and employment among others (Western University, 2025).

Academic transcript can be classified in different ways. In one way, academic transcript can be classified as official and unofficial. An official transcript includes a seal and signature of the registrar as well as all of coursework and degree information. Schools charge graduates for processing and transfer of this type of transcript. Unofficial transcripts are given directly to students or graduate as they can print them directly from school online portal. Unofficial transcripts are printed on plain paper and do not have a school's seal or registrar's signature. Unofficial transcripts cannot be used to transfer to another College or university and are issued for use by the student only (School Software Pro, 2023).

In another way, academic transcript are classified as paper based (manual) and online (or web based). The paper based transcript system as the name implies is written on a paper and deliver to desired institution through postal service or face-to-face delivery. The paper based transcript system is bedevilled with some problems which include delay in issuance and collection of transcript, costly, labourious, cumbersome in nature, prone to human errors and often not secure (Konyeha and Isere, 2020). The online transcript management system on the other hand is the electronic version of the paper based one and is delivered online via internet. Online transcript management system has advantage of cheapness, less effort and high speed when compared to paper based (or manual) counterpart. It is against this backdrop that the researchers set out for the design and implementation of an online transcript management system for Abia State College of Education (Technical) Arochukwu, Nigeria.

2 Problem statement and justification

All tertiary educational institutions are involved in processing and sending of students' transcripts to other educational institutions. Certainly, Abia State College of Education (Technical) Arochukwu (ASCETA) as a tertiary educational institution is not an exception. In fact, ASCETA is processing and

sending students transcript on yearly basis. The present method of processing and sending of students' transcript is manual and paper based. The paper based system is not only labourious, but also costly. In addition, the paper based system of course, causes delay in processing the admission of students that graduated from Abia State College of Education (Technical) Arochukwu to other educational institutions. To address these problems, the researchers set out to develop an Online Transcript Management System for Abia State College of Education (Technical) Arochukwu. The proposed Online transcript management system is expected to mitigate the aforementioned problems.

3 Objectives of the study

The main objective of this study is to design and develop an Online Transcript Management System for Abia State College of Education (Technical) Arochukwu. Specifically, the study will:

1. Determine the Online transcript management system specification requirements
2. Design the Online transcript management system
3. Develop the Online transcript management system
4. Test the developed Online transcript management system
5. Determine users' satisfaction with the developed Online transcript management system

4 Literature review

This section first introduced the concept of transcript management system. It then presents the concept of online transcript management system. The section ended with the review of some online management systems developed in educational settings.

4.1 Transcript management system

Transcript management system is one of the most important administrative tasks of educational institutions. Transcript management system that makes it possible for the exam, records and statistics unit to put together and analyze in an accurate and comprehensive way all the information about the students' academic records. The system provides a complete students academic records and it is expected to be accurate, timely, consistent and reliable (Konyeha and Isere, 2020). Transcript management system falls into two major categories, namely manual and online. Figure 1 shows the steps involved in manual transcript system.

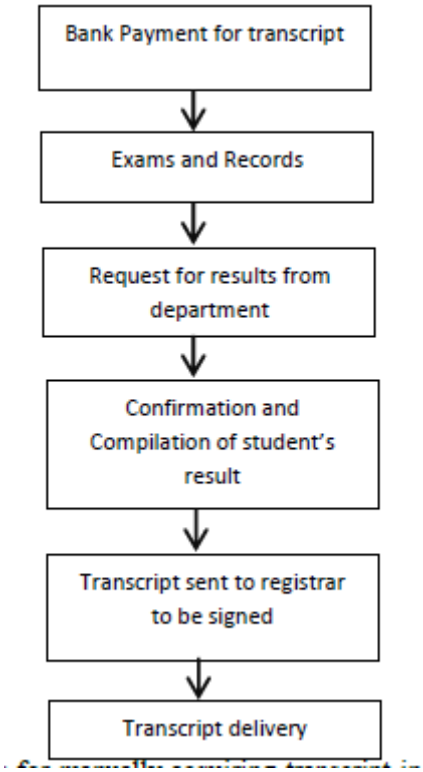


Figure 1. Steps in a manual transcript system (source: Tamarankuroemi, 2019).

The traditional manual or paper based management system is bedevilled with some problems such as high cost, delay in processing and submission of transcript. These problems greatly reduced with the introduction of online or web based transcript management system. A computerized or online transcript management system is usually a system, which is implemented with a computer to achieve the utmost efficiency and desired goals (Iwuagwu, 2013). Online transcript management system makes it possible for educational institutions to exchange students' academic data electronically cheaply, easier and faster in a secured environment.

4.2 Some developed online transcript management systems

Researchers developed a number of web based transcript management systems. This sub-section reviewed a handful of them. The knowledge gained from the review will be used in the design of the proposed online transcript management system.

Konyeha and Isere (2020) designed a Hybridized-Database Web-Based Transcript Processing System (HWBTP). The system generates transcript, verifies and approves electronically and also able to keep database at the departmental level for quick response to notification requests for verification from the transcript unit. The system architecture is shown in Figure 2.

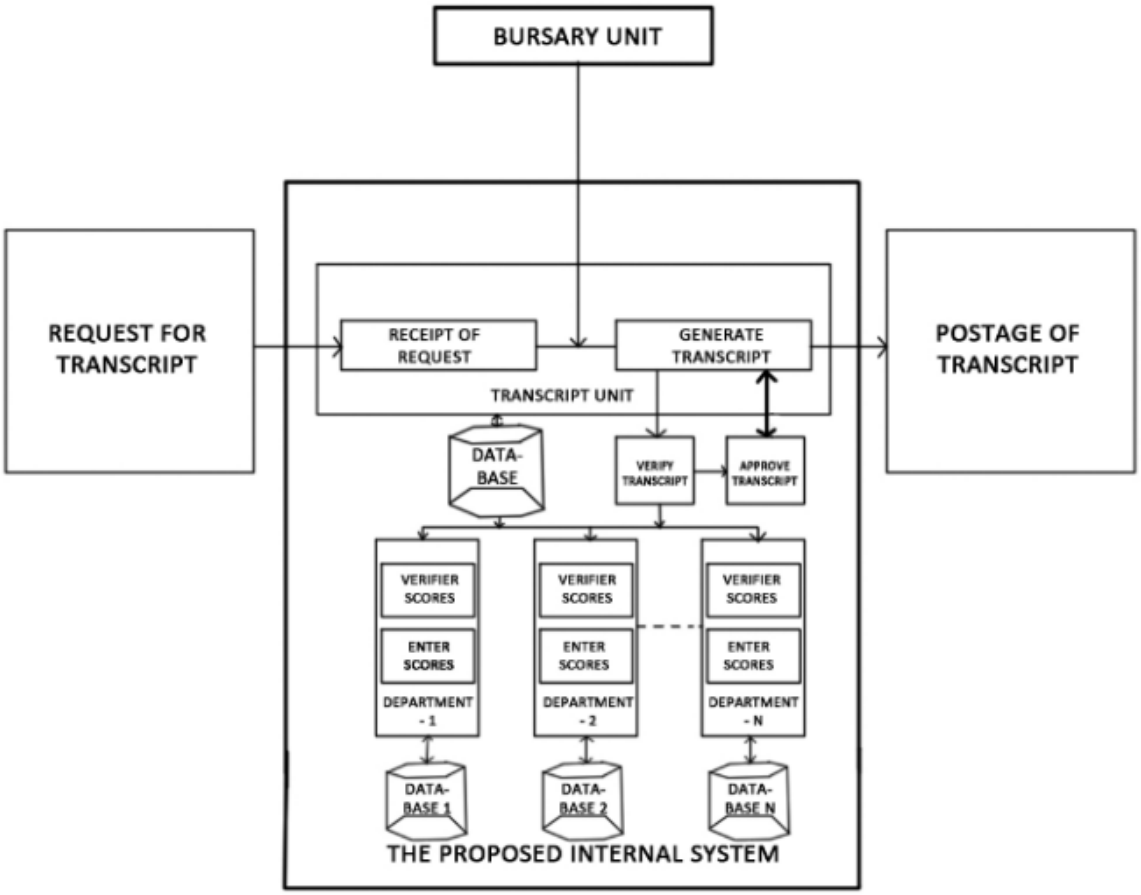


Figure 2. Architecture of the hybridized-database web-based transcript processing system (source: Konyeha and Isere, 2020).

Okpeki and Kehinde (2019) developed invigorated web-based results processing and transcript generating data handling system for universities in Nigeria; the system was developed using web based tools such as PHP, JavaScript and MySQL Server. Figure 3 shows the architectural diagram of the system.

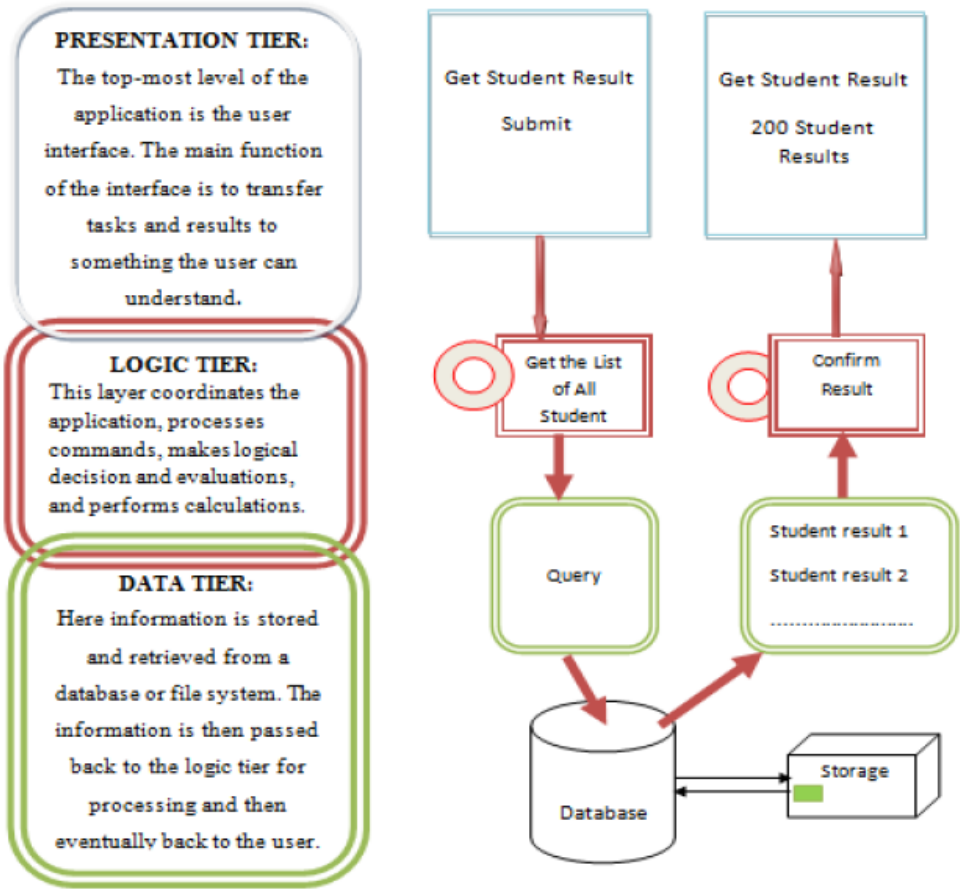


Figure 3. System architecture diagram (source: Okpeki and Kehinde, 2019).

Omogbhemhe and Akpojaro (2018) developed a centralized transcript processing system. The system allows students to process their transcripts at the comfort of their homes without considering the location, and the transcript will be generated and submitted to the designated address either electronically or by post. Figure 4 shows the systems architecture.

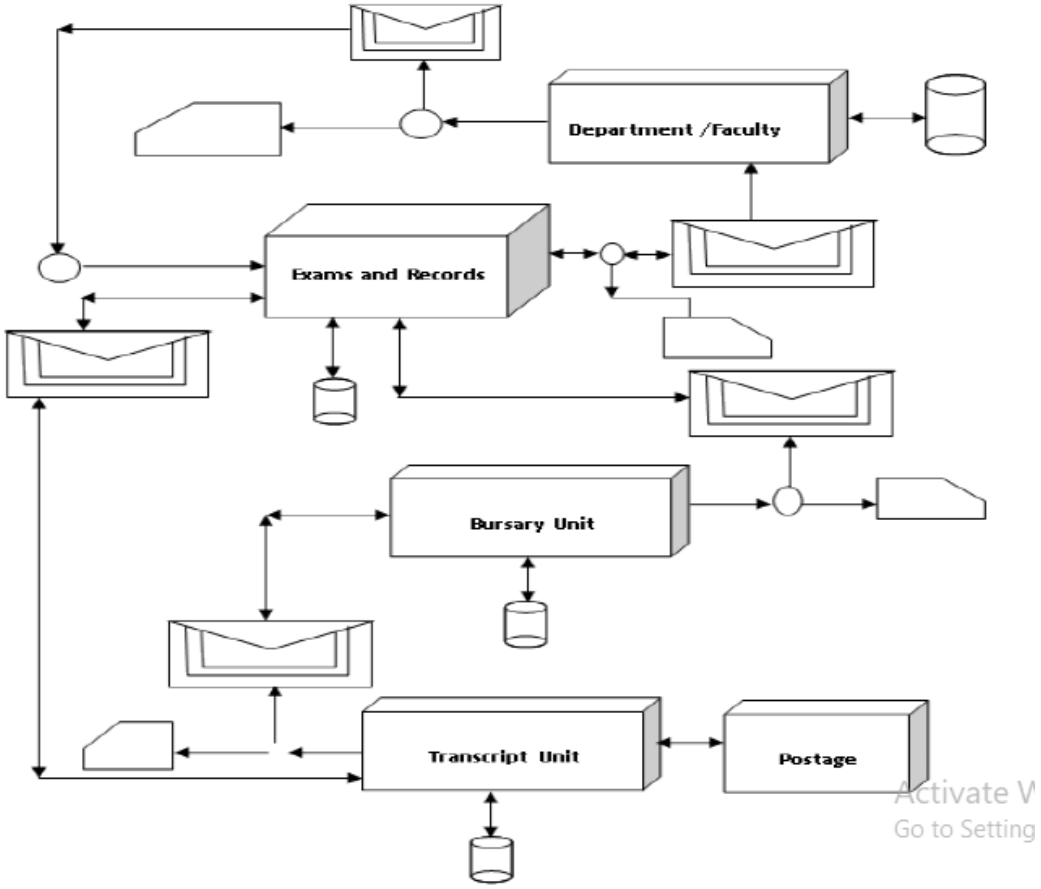


Figure 4. Architecture of the centralized transcript processing system (source: Omogbhemhe and Akpojaro, 2018).

5 Methodology

The study adopted Software Development Life Cycle (SDLC) model. SDLC is said to be a framework that shows a combination of stages involved in a software development process and what is done at each particular stage (Rani, 2017). SDLC consist of the following stages; planning, analysis, design, implementation, testing& integration and maintenance.

5.1 Planning stage

The researcher will itemize things to be achieved, how to achieve them, the material, financial and human resources required. The researcher will also determine the approximate time required to complete the project.

5.2 Analysis stage

The researcher will first examine the paper-based questionnaire and the procedure of its administration. The researcher will then interview the users of paper-based questionnaires. The information gathered will then be used to conceptualize the web-based questionnaire to be developed. The researcher will then formulate the main function of the web-based questionnaire. The main function will then be broken into sub-functions. These sub-functions then form the functional requirements for the new web-based questionnaire. Finally, the researcher will formulate the non-functional requirements for the web-based questionnaire.

5.3 Design stage

The researcher will then document the functional requirements using various UML diagrams such as use case and activity diagrams. The researcher then integrates various functional requirements to form a system (Web-based questionnaires).

5.4 Implementation stage

The UML diagrams drawn will serve as guides in building the new web-based questionnaire. The web-based questionnaire will be built using PHP and Javascript programming languages. Visual studio will serve as code editor. Web technologies such as HTML and XAMPP will also be used during the implementation stage.

5.5 Testing and integration stage

The web-based questionnaire to be developed will undergo two types of tests, namely, functionality and usability tests. The functionality test will aim at finding out whether the developed web-based questionnaire meets both functional and non-functional requirements. The usability test on the other hand will measure users' satisfaction concerning the use of the web-based questionnaires' interface. The developed web-based questionnaire is to be integrated into the College website.

5.6 Hardware requirements

- RAM: 1 GB or above
- Hard disk: 4 GB or above
- Processor: 2.4GHZ or above

5.7 Software requirements

The following specification are needed

- Window 10
- MySql
- Microsoft visual studio
- XAMPP
- phpMyAdmin

5.8 System users

1. Admin
2. Graduate
3. HOD
4. Bursar
5. Transcript Processing Officer
6. Registrar

5.9 Functional requirement specifications

Admin:

1. Login and logout

2. Add username and password
3. View, add, delete, update and print staff login credentials
4. View students records(payment, application, clearance and academic records)

Applicant/graduate:

1. Login and logout.
2. Pay transcript fees
3. Apply for transcript
4. Receive message of sending of the transcript to the institution applied for admission

HOD:

1. View students' records(payment, application, clearance and academic records)
2. Authorize processing of applicant's transcript

Bursar:

1. View students' records(payment, application, clearance and academic records)

Transcript processing officer:

1. View students' records(payment, application, clearance and academic records)
2. View HOD'S authorization records
3. Generate graduate/applicant transcript

Registrar:

1. View students' records(payment, application, clearance and academic records)
2. View HOD'S authorization records
3. Update Students academic records
4. Sign transcripts
5. Send transcript to required organizations
6. Send message to applicant that his/her transcript has been sent
7. Keep records of all transcript sent

5.10 Non-functional requirement specifications

1. Provide data security
2. Be efficient during operations
3. Be portable
4. Be reliable
5. Accommodates more than 10,000 records
6. Be Scalable
7. Be robust
8. Maintainable

6 Design

The information gathered during literature review as well as interviewing experts were used in the design of the system as follows.

6.1 System architecture

The project adopted client-server architecture with three tiers; the presentation, application and the database. The presentation tier consists of the browser. The application tier is the, Graphical User Interface (GUI) while the database tier serves as the database system (MySQL). The system architecture is shown in Figure 5.

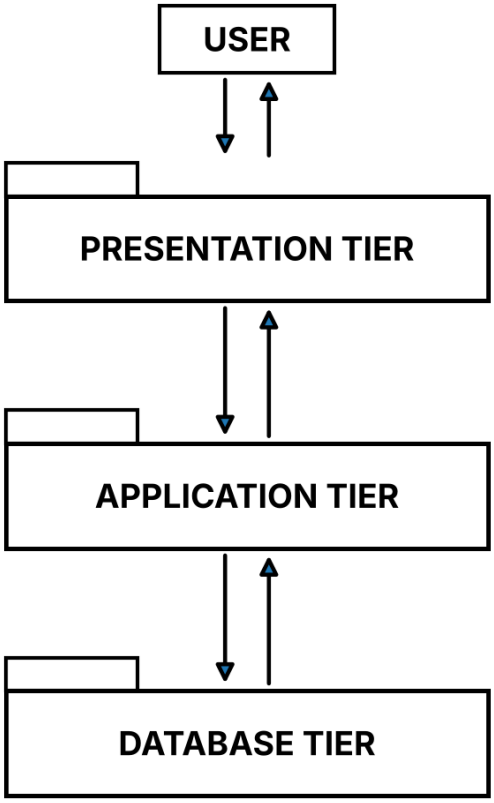


Figure 5. Three-tier architecture.

6.2 Use case

The use case diagram that shows the major functions of the users, using the Unified Modelling Language (UML), is shown in Figure 6.

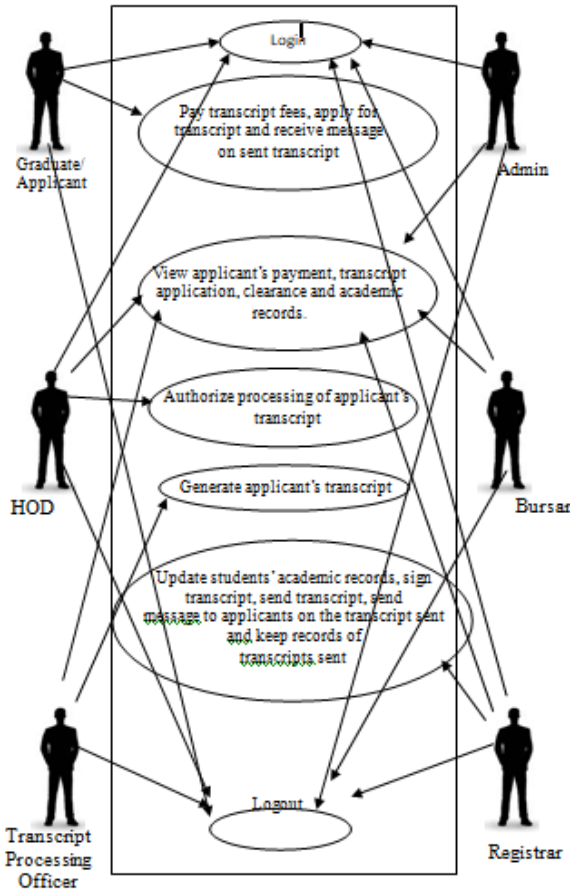


Figure 6. Use case diagram.

6.3 Database design

This project made use of MySQL database to store all the information required by the system to function. The database named transcript_db contains 22 tables. Figure 7 shows the 22 tables along side with fields in them. The database and its tables were created using phpMyAdmin.

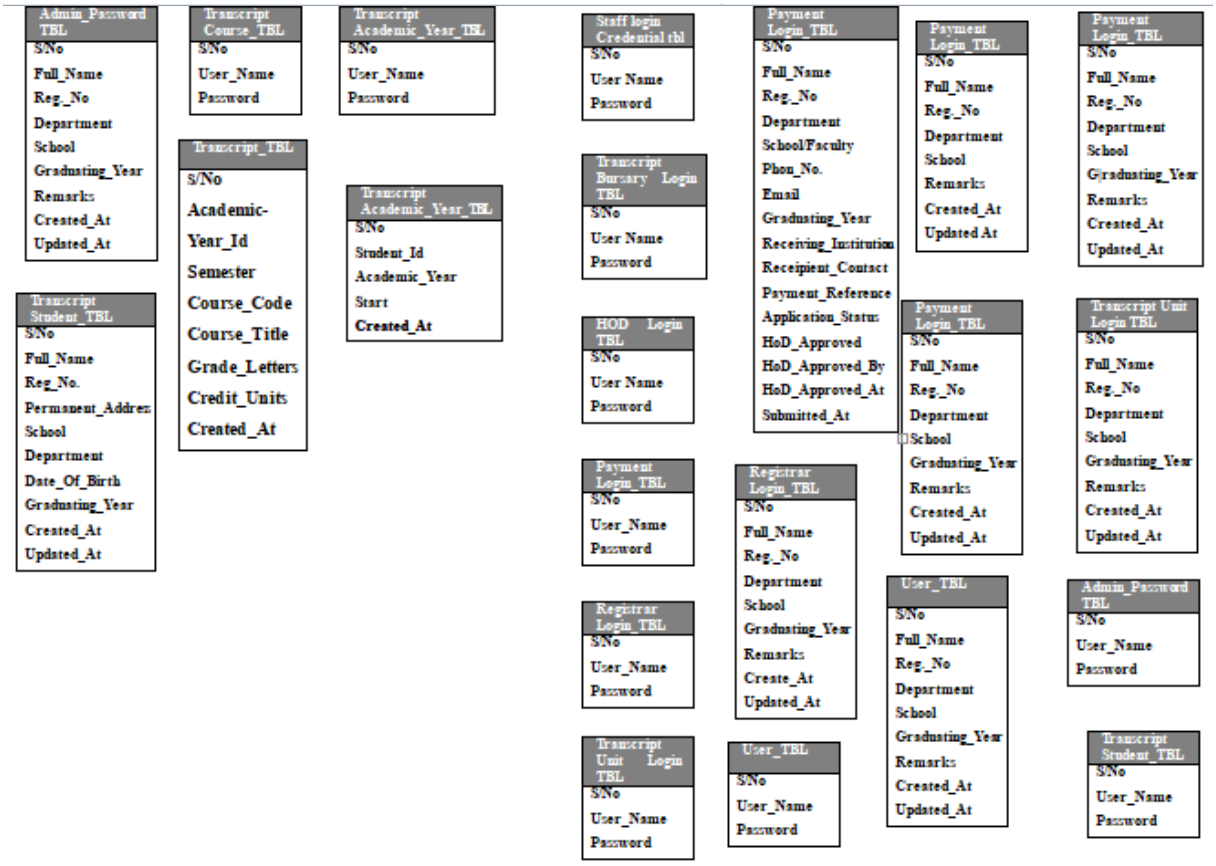


Figure 7. Tables in the transcript database.

7 Implementation

7.1 Writing program code

The project was implemented using PHP and javasript programming languages. The database and its tables were constructed using phpMyAdmin as stated earlier. The codes were written under Microsoft visual studio.

7.2 Sample outputs

Sample outputs of the transcript management system are shown in Figures 8–15.

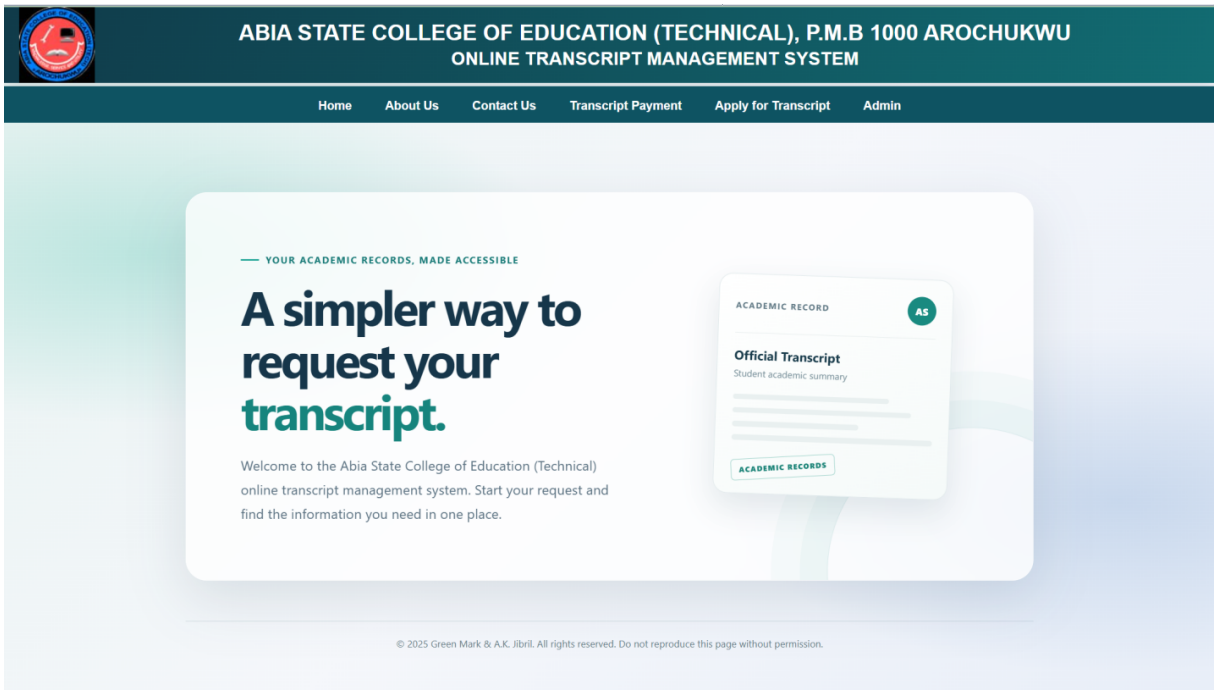


Figure 8. Home page.

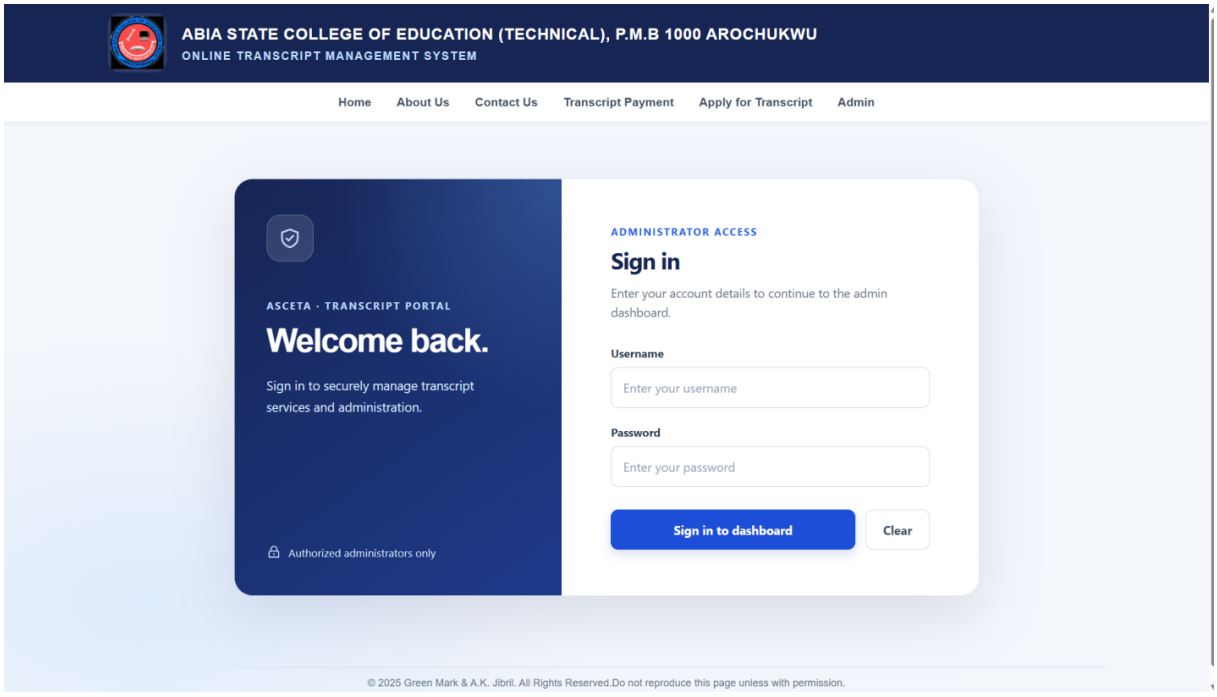


Figure 9. Staff login page.

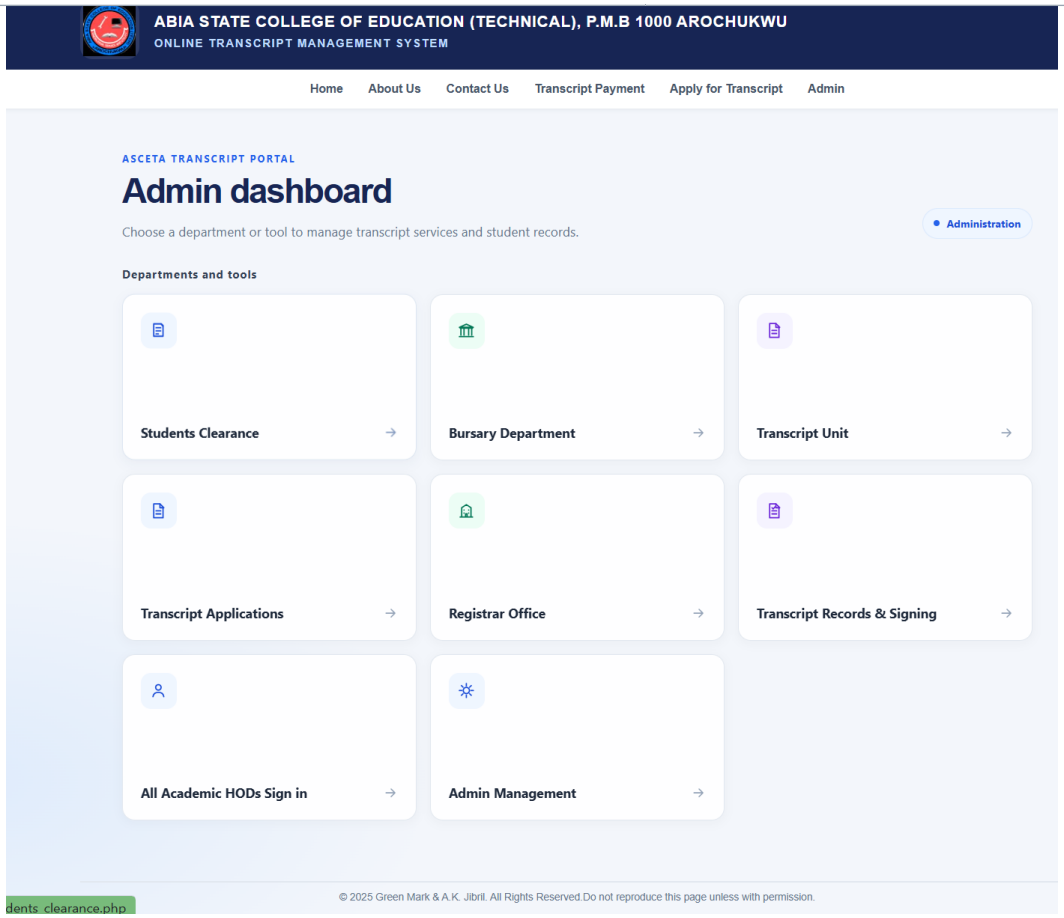


Figure 10. Dashboard.

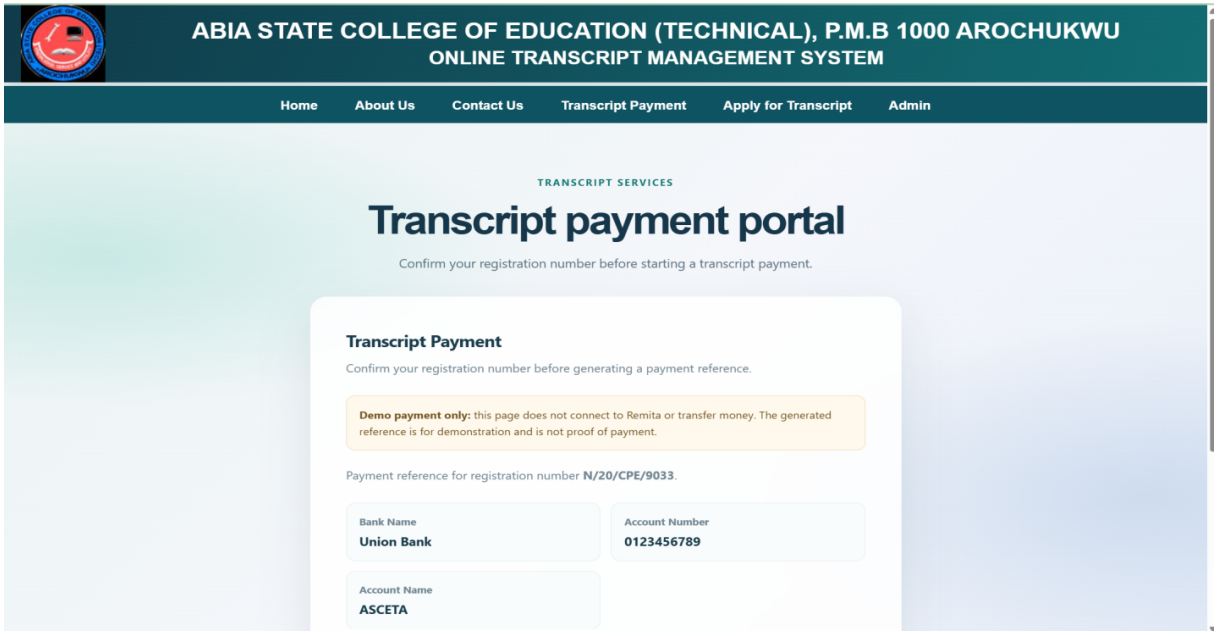


Figure 11. Applicant transcript payment interface.

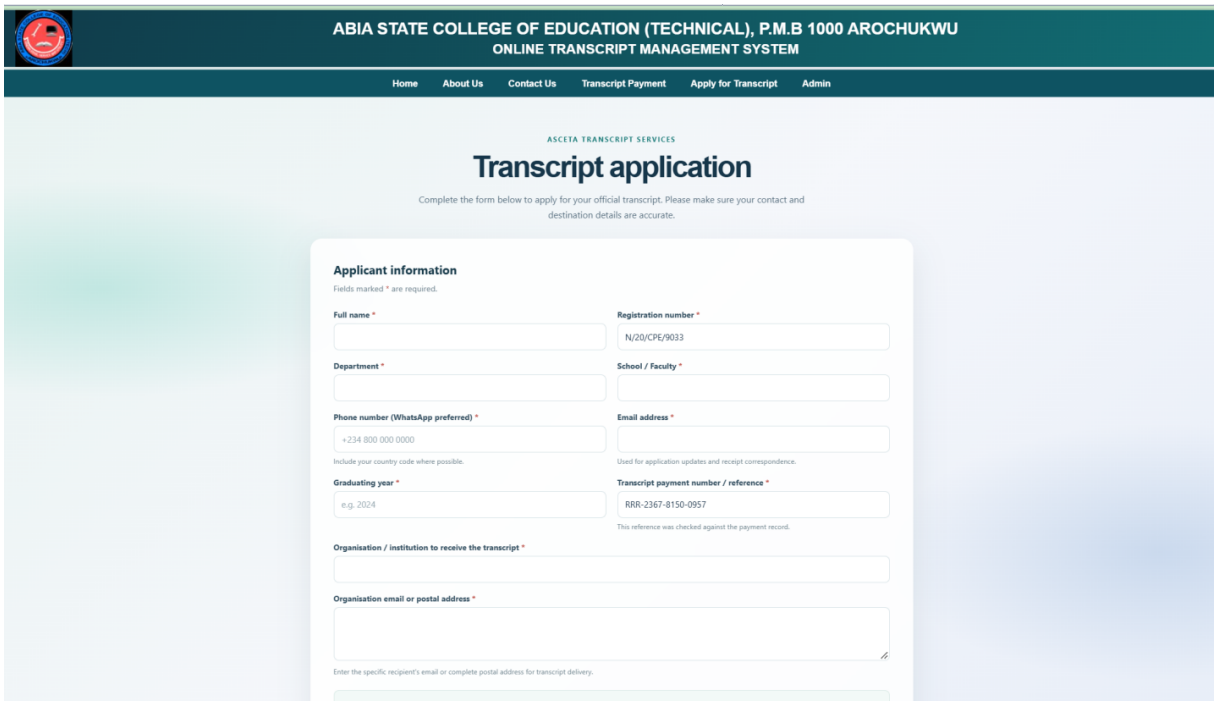


Figure 12. Applicant's application interface.

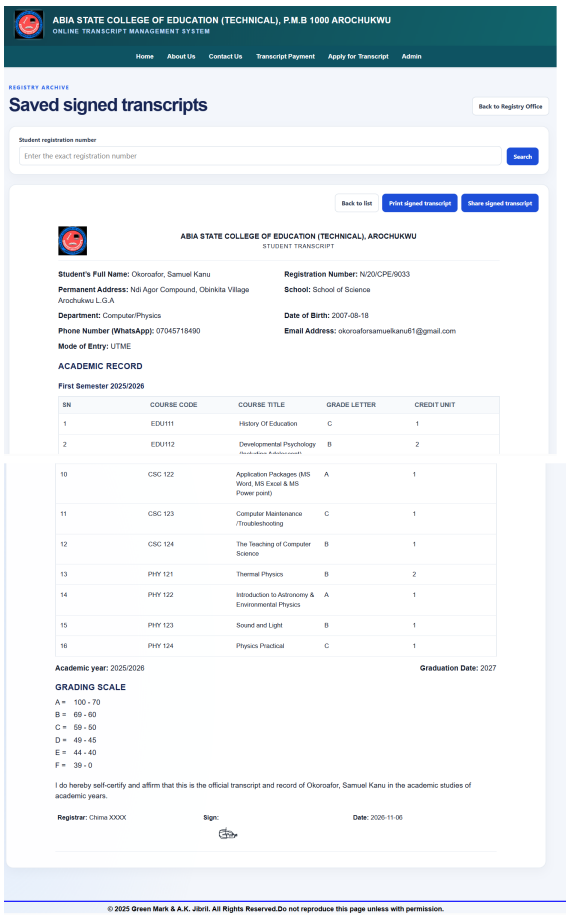


Figure 13. Signed transcript.

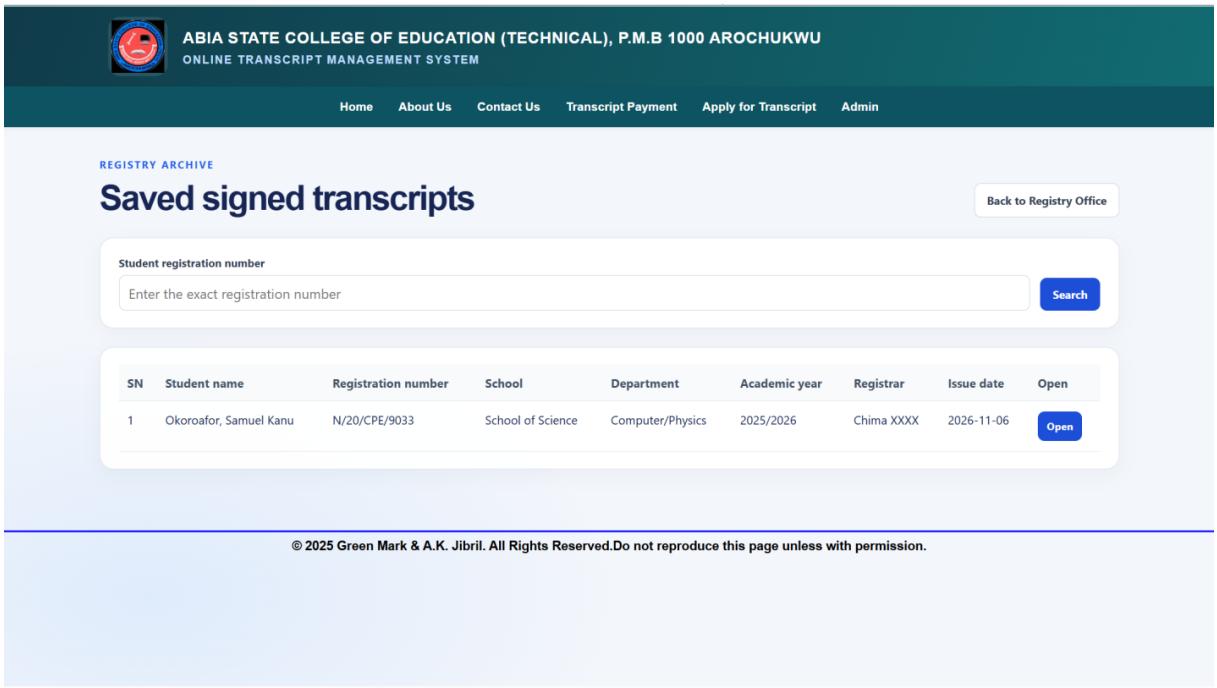


Figure 14. Stored sent transcripts.

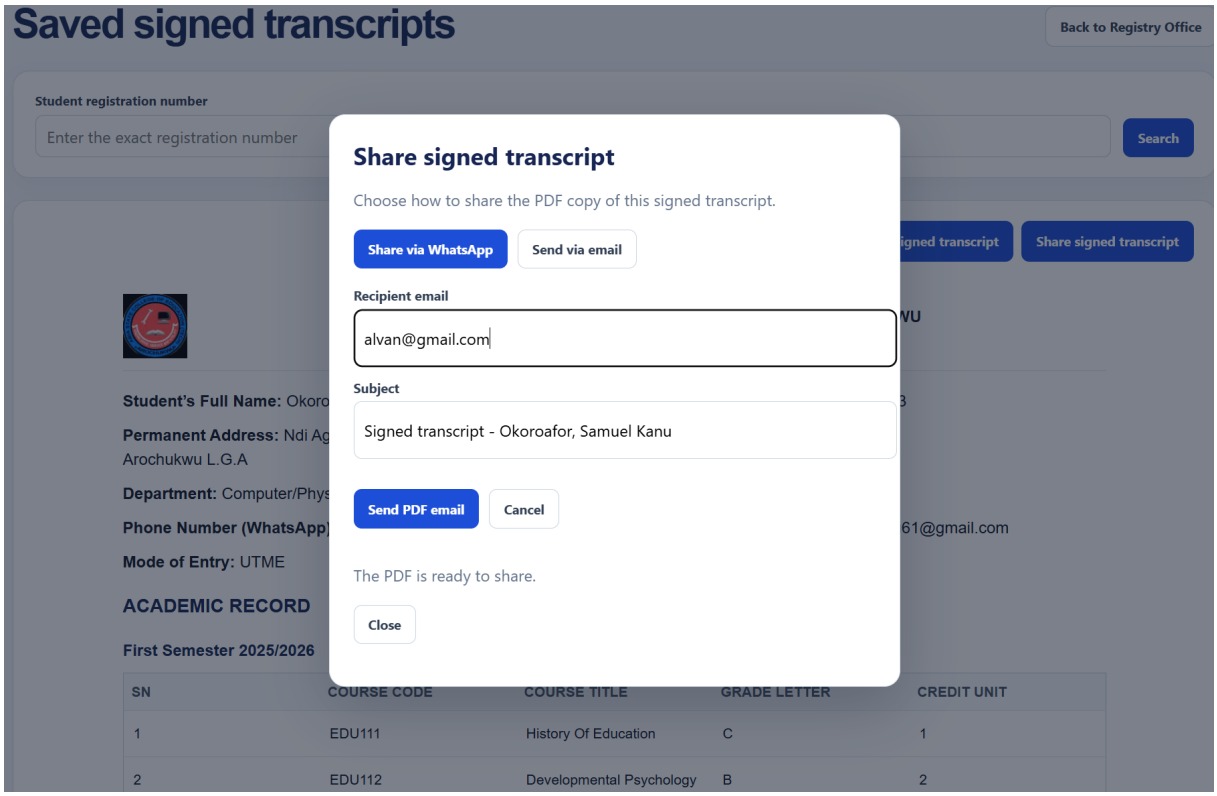


Figure 15. Record of transcripts sent to various organizations.

8 Testing and evaluation

The researchers tested each newly created file and make necessary correction(s) before creating another one. Thereafter, 10 evaluators were asked to test the new developed system. After testing the system, a survey questionnaire designed to measure users' satisfaction with the performance of the

system was issued to them. The data collected from the questionnaire were then analyzed, The result of the analysis is shown in Table 1.

Table 1. Mean and standard deviation of the evaluators' responses.

S/N	Item	Mean	SD	Remark
	Functional Software Requirements			
	Admin			
1	The online transcript system enables admin to add staff username and password	3.80	0.632	Agree
2	The enables online transcript system enables admin to login	3.20	0.919	Agree
3	The online transcript system enables admin to logout	3.50	0.850	Agree
4	The online transcript system enables admin to update and delete user login records	3.00	1.054	Agree
5	The online transcript system enables admin to view the students records	3.50	0.956	Agree
	Graduate/Applicant			
6	The online transcript system enables graduate/applicant to login	3.60	0.699	Agree
7	The online transcript system enables graduate/applicant to logout	3.50	0.950	Agree
8	The online transcript system enables graduate applicant to pay transcript fees	3.80	0.632	Agree
9	The online transcript system enables graduate/applicant to apply for transcript	3.70	0.675	Agree
10	The online transcript system enables graduate/applicant to receive information that his/her transcript has been sent to organization that requires it.	3.90	0.949	Agree
	HOD			
11	The online transcript system enables HOD to view graduate/applicant payment, application, clearance and academic records	3.80	0.427	Agree
12	The online transcript system enables HOD to authorize the processing of graduate/applicant transcript	4.10	1.735	Agree
	Transcript Processing Officer			
13	The online transcript system enables the transcript processing Officer to view graduate/applicant payment, application, clearance and academic records	3.40	0.843	Agree
14	The online transcript system enables transcript processing Officer to generate graduate/applicant transcript	3.70	0.567	Agree
	Registrar			
15	The online transcript system enables Registrar to view graduate/applicant payment, application, clearance and academic records	3.70	0.675	Agree
16	The online transcript system enables Registrar to add, delete and update students' academic records	3.50	0.707	Agree
17	The online transcript system enables Registrar to sign prepared transcript	3.50	0.527	Agree
18	The online transcript system enables Registrar to send the prepared transcript to organizations that required them	3.80	0.421	Agree
19	The online transcript system enables Registrar to keep records of all the transcript sent to organizations	3.30	0.483	Agree
	Bursar			

S/N	Item	Mean	SD	Remark
20	The online transcript system enables Bursar to view graduate/applicant payment, application, clearance and academic records	3.60	0.700	Agree
	Non-Functional Software Requirements			
21	The online transcript management system is well organized	3.20	0.632	Agree
22	The online transcript management system window environments are attractive	3.20	0.422	Agree
23	The online transcript management system buttons are responding to mouse click quickly	3.10	0.876	Agree
24	The feedback massages provided by the online transcript management system are self- explanatory	3.30	0.871	Agree
25	The online transcript management system has data security	3.20	0.876	Agree
26	I felt comfortable when using the online transcript management system	3.40	0.842	Agree
27	It is easy to navigate to different parts of the online transcript management system	3.50	0.707	Agree
	Recommendation			
28	The developed online transcript management system can be used for processing and sending of graduate/applicant transcript in Abia State College of Education (Technical) Arochukwu	3.50	0.707	Agree

N = 10 respondents; SD = standard deviation. Four-point scale; cut-off mean 2.50.

The data in Table 1 shows the means and standard deviations of the questionnaire items. The table shows that all the item mean values are greater than the cut-off point of 2.50. This implies that respondents are satisfied with the performance of the developed online transcript management system. Table 1 also shows lower values of standard deviations for the items. The lower values show that the respondents are very close concerning their opinion on their satisfaction with the developed online transcript management system. Finally, the mean value of item 28 (3.50) indicated that evaluators agreed that the developed online transcript management system can be used in Abia State College of Education (Technical) Arochukwu.

9 Conclusion and recommendation

Students' transcript represents students' academic achievement during their academic engagements in their schools. For graduates to be admitted for postgraduate diploma, masters and doctoral programmes, their transcripts must be sent to the educational institutions that will admit them. Since the establishment of Abia State College of Education (Technical) Arochukwu till date, students' transcripts are processed and sent manually. The manual system is not only costly, but also cause delay in sending students transcripts to the organization that requires them. To mitigate this problem, the authors developed an online transcript management system. The developed system was tested and evaluated. The result of the evaluation shows the developed online transcript management system is effective and efficient. The evaluators recommended the use of the developed online transcript management system in processing and sending of students transcript in the College.

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