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Web Based Automated Admission Processing System for Tertiary Institution of Kebbi State

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Abstract:- This research paper created and used advanced software design to design an automated system to process admissions for tertiary institutions all over the state. Participants in the system will be applicants from various states and countries, as well as staff from the respective institutions. All admission requirements for the institutions are entered into the system and recognized as guidelines for admitting applicants. If the requirement is not met, the admission may be rejected automatically by the system. The turnaround time is twenty-four hours. The method used for this research is waterfall modeling, which is very popular and easy in the software development lifecycle. It is also a linear, sequential approach to the SDCL. The research's findings have been put to the test and are functioning and operating properly to support institutions in Kebbi State in the admissions process. The system covered all the necessary phases of advanced software design, such as requirement elicitation, requirement analysis, functional and non-functional requirements, verification and validation, and many more.

Keywords:- *Admission, Automated, Tertiary Institution, Processing, System.*

I. INTRODUCTION

Admission is a necessary step in every institution around the globe that allows the applicants to register and complete all the necessary procedures for the specific institution. In some institutions, admission is given manually, while in others, admission is given online, and it takes a long time before the applicant knows his or her status, which leads to late registration. A web-based application called the admission processing system was made using the MySQL database and the PHP Server Scripting Language. The system enables institutions to accept applications online and determine whether the applications meet the specified requirements for admission. Then, the system will process the admission by approving or rejecting it.

Indeed, the automated admission processing system has a communication model between itself and applicants directly to notify them of their admission status.

In this article, all the software design processes, including requirement analysis, design, implementation, testing, and evaluation, were carried out accordingly.

II. OVERVIEW OF THE EXISTING KEBBI STATE TERTIARY INSTITUTION ADMISSION SYSTEM

Almost all tertiary Institutions in Kebbi State have given admission to their applicants in two different ways. Applicants from universities were given admission through the Central Admission Processing System (CAPS), which is a national mandate given to the Joint Admission and Matriculation Board (JAMB). Others, like polytechnic colleges and mono-technics, are selling the scratch cards at banks and filling out the online application form through the institutional website. The entire process of admission, which determines who is qualified for admission and who is not, is carried out manually, which causes a lot of delays in processing. Only the application form can be filled out online.

The admissions officers of all institutions are responsible for downloading applicants from various fields of study, departments, faculties, etc. He or she has the ability to arrange the applicant lists and send them to the various departments for recommendation. After the recommendation from the head of department, the applicant list is returned to the admissions officers for observation. Then, the list is also sent to the head of the institution for final approval.

III. THEORY

- **Automated Admission System:** is a system that build to help the entire Institution in the admission process, this system is serves as solution to the Kebbi State Tertiary Institution to process all their admission easily. The system also contains all the admission requirement of the respective Institution around the State.
- **Management Information System:** A management information system (MIS) is a set of systems and procedures that gather data from a range of sources, compile it and present it in a readable format. Managers use an MIS to create reports that provide them with a comprehensive overview of all the information they need to make decisions ranging from daily minutiae to top-level strategy. Today's management information systems rely largely on technology to compile and present data, but the concept is older than modern computing technologies.
  (https://smallbusiness.chron.com/management-information-system-2104.html)

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- **Model View Controller:** is an architecture pattern in software development that is divided into three interconnected elements (Aniche et al., 2018; Guaman et al., 2021) MVC is very popular architectural pattern due it advantages that separate application focus for user interface and data management (Guaman et al., 2021). The present the data structure, the view is information that will be displayed to the end-user, while the controller is the link the model, View, and additional extension to process HTTP requests so that they can produce webpages.

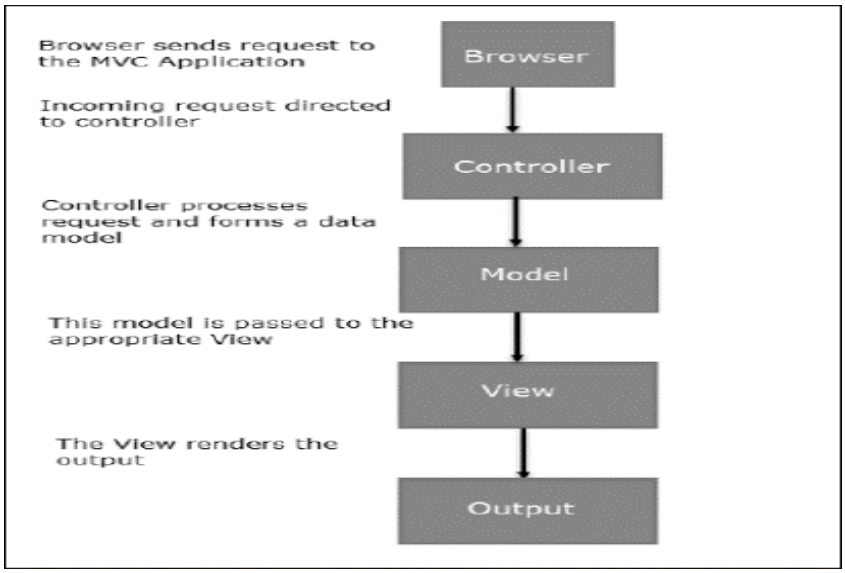

Fig. 1: MVC Flowchart
(Source: https://www.tutorialspoint.com/mvc_framework/mvc_framework_architecture.htm

- **CodeIgniter:** CodeIgniter is an application development framework, which can be used to develop websites, using PHP. It is an Open Source framework. It has a very rich set of functionality, which will increase the speed of website development work.

If you know PHP well, then CodeIgniter will make your task easier. It has a very rich set of libraries and helpers. By using CodeIgniter, you will save a lot of time, if you are developing a website from scratch. Not only that, a website built in CodeIgniter is secure too, as it has the ability to prevent various attacks that take place through websites.

(https://www.tutorialspoint.com/codeigniter/codeigniter_overview.htm)

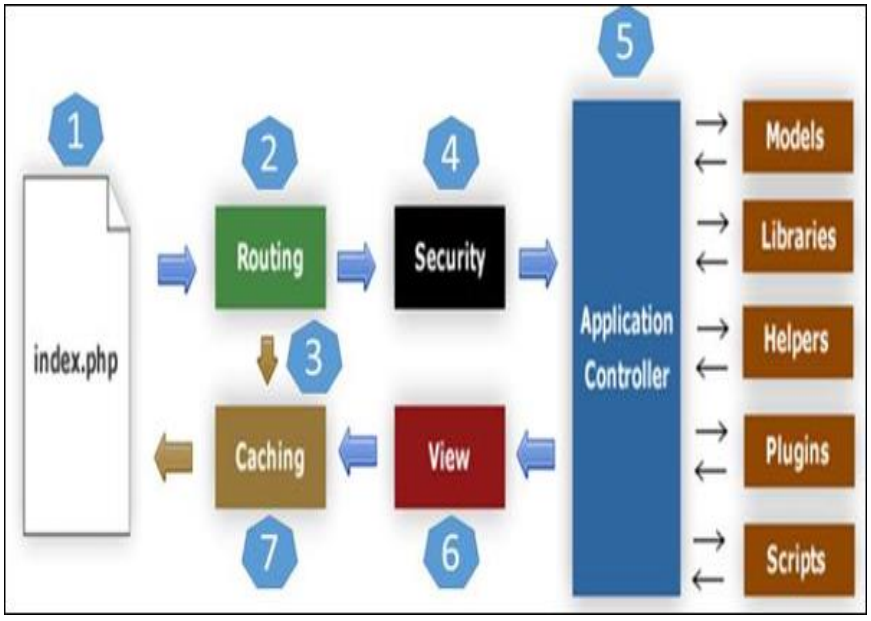

Fig. 2: CodeIgniter Flowchart
Source: https://www.tutorialspoint.com/codeigniter/codeigniter_application_architecture.htm

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IV. METHODOLOGY

This stage of the research was carries out using waterfall model method. The Waterfall Model was the first Process Model to be introduced. It is also referred to as a **linear-sequential life cycle model**. It is very simple to understand and use. In a waterfall model, each phase must be completed before the next phase can begin and there is no overlapping in the phases.The Waterfall model is the earliest SDLC approach that was used for software development.

The waterfall Model illustrates the software development process in a linear sequential flow. This means that any phase in the development process begins only if the previous phase is complete. In this waterfall model, the phases do not overlap.

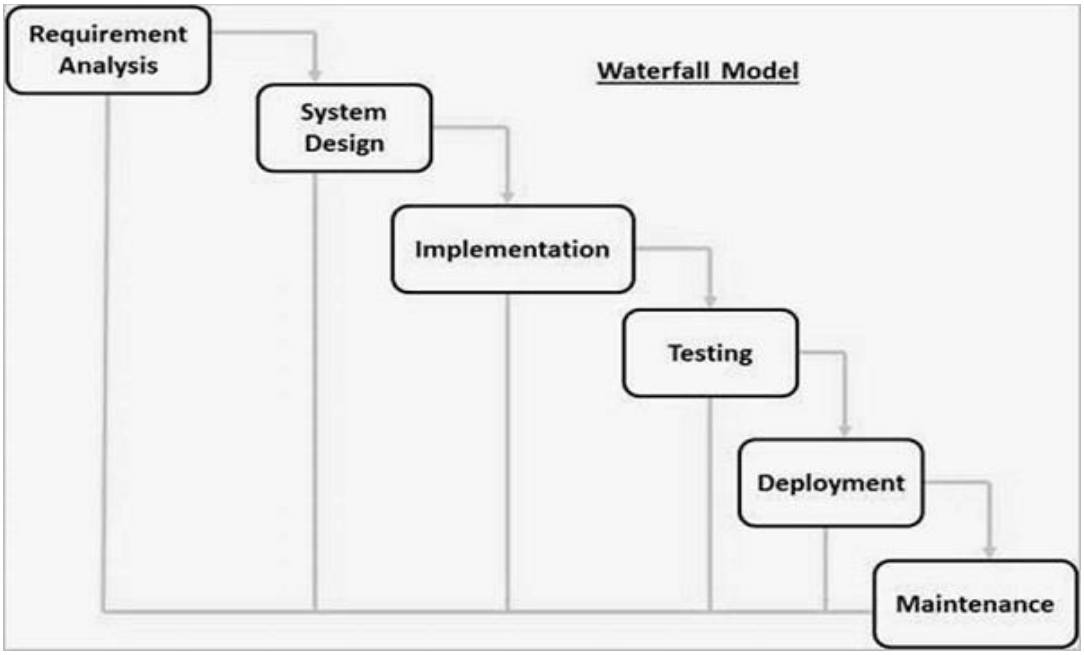

Fig. 3: Waterfall Model
(Source: https://www.tutorialspoint.com/sdlc/sdlc_waterfall_model.htm)

V. SYSTEM DESIGN

A. Requirement Elicitation

Table 1: Requirement Elicitation

Requirement	Behavioral Measure	Technical Measure
Visiting the automated admission processing system	The applicant, administrator, or admissions officer can visit the system via the internet.	system can give access to the applicant, admin, and admission officer via the internet.
Login	Types of users using the system (public, applicants, admission officer, admin)	The system allows the existing login credentials to access the integrated models.
Sign up	Applicants.	The system allows the new applicant to enroll in the system.
User discrimination	Unfair or prejudicial treatment of users	
User verification	Regularly checking that the user is still with the system	The system uses login credentials to verify that the attempted user exists.
User type	Applicants, Admission officer, Admin	The system allows each type to access their role.
Ability to view the applicants	Admissions officers can view all the applicants.	The system allows the admissions officer to view the applicant and schedule.
Access the database always	Admission officer can access the database	The system allows to access the database
Ability to recommend and approve the admission automatically	The system has the ability to determine whether the applicant meets the requirement or not.	The system can determine the approval of admissions automatically based on admission requirements.

B. Requirement Analysis

Table 2: Requirement Analysis

Public	**Applicant**	**Admission Officer**	**Admin**
Visiting the system	Login	Added from Admin	Login
Apply for the suitable program to become an applicant.	Sign up	Login	Sign Up by official sign-up links
	Verification	Verification	Verification
Ability to download the admission requirements and guidelines.	Submission of the application form	Received application forms from applicants	Managing the users
	Ability to check the admission status	Ability to view the admitted students or rejected applicants	Ability to add, edit and remove users
	Ability to download the offer of admission	Ability to change the program after admission by the system	

C. Requirement Definition

Table 3: Requirement Definition

Functional	**Non-Functional**
Login: system will allow the users to log in	Systems are loaded into every web browser**.**
Sign Up: system will allow the user to create account.	Authorize the user credentials according to the Sign Up requirement
Filling of the application form	System are performing the admission process according to the need.
Admission requirements model	Ability to check all the requirement one by one
Admission processing model	Ability to process the admission according to the need
Approval and rejection messages	System are handling the error, rejection message
Authentication and Authorization	
Check admission status	
Printing of admission letter	
Printing of rejection letter	
History of the applicants, admitted, rejected	

D. Authentication workflow

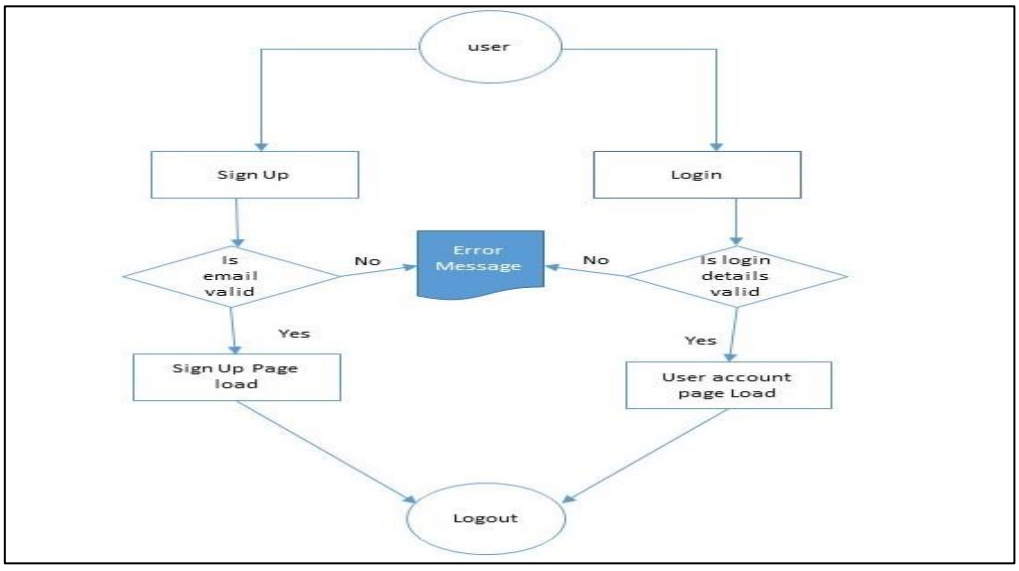

Fig. 4: Use Case Diagram of Authentication workflow

This use case diagram, as shown in Figure 4, has two users, namely, the signup user and the login user. This authentication model will verify the credentials of both users before allowing them to use the system. For signup, the user is required to supply a valid email address; if it is valid, the system will allow them to create an account; otherwise, the system will deny it and display an error message.

In login, the attempt user is required to supply the login credential register with us, then the system will check the database and compare if it exists or not. Once the condition is true, the system will allow the user to access the account; otherwise, the system will display an error message to the attempt user.

VI. SYSTEM MODELLING

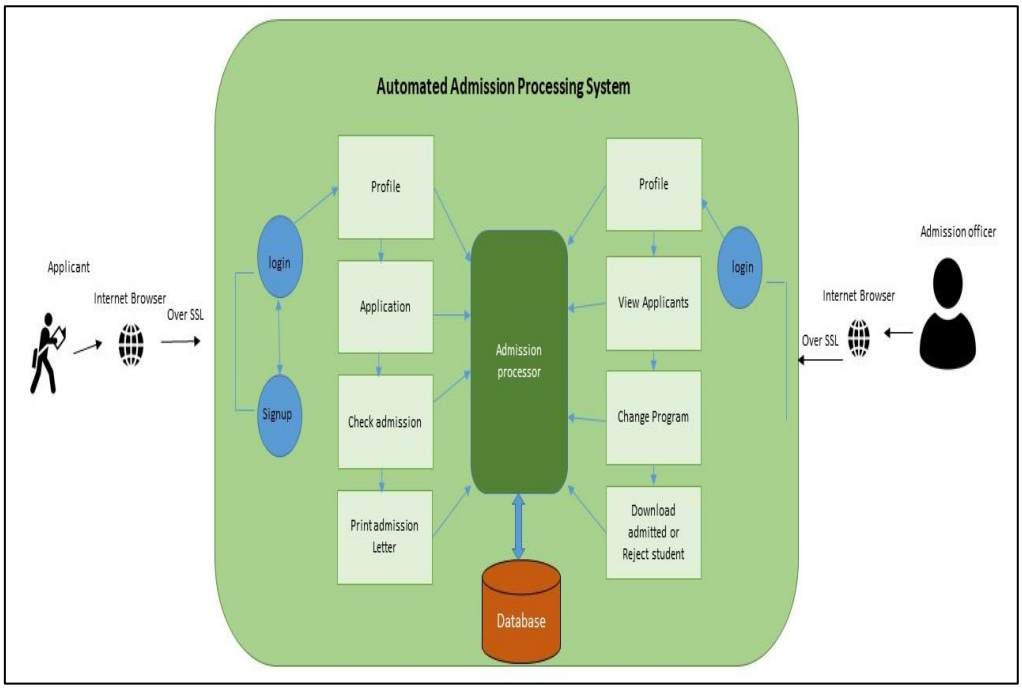

Fig. 5: Use Case Diagram of General Dataflow

The activity diagram, as shown in Figure 5, shows how automated admission processing system activities flow. This flow starts with the applicant accessing the web browser and then the system, i.e., the automated admission processing system. After that, the applicants can login to their account or create a new account, respectively, and then they can start application, check their admission status, or print an admission letter.

In the admission section, the admission officer can access the system through a web browser and have the ability to view the applicants, change the program if the applicant requires it, and download the admitted or rejected students. In this diagram, the admissions processor shows how all the admissions processes take place, such as the determination of admission through the admission requirement, rejection of admission, and so on.

VII. IMPLEMENTATION/CODING

In this stage, the designation and modeling of the system are converted into a computer programming language for implementation. PHP Scripting Language, CSS, Bootstrap, and JavaScript are recommended as development languages. then MYSQL Database is used as the backend.The images below show some pages of the system.

A. Home Page

Fig. 6: Home Page of the system

This page serve as home page and briefly indicated on how to apply for admission. It appears to be an index file in the system which will automatically display when user lunch the system.

B. Login Page

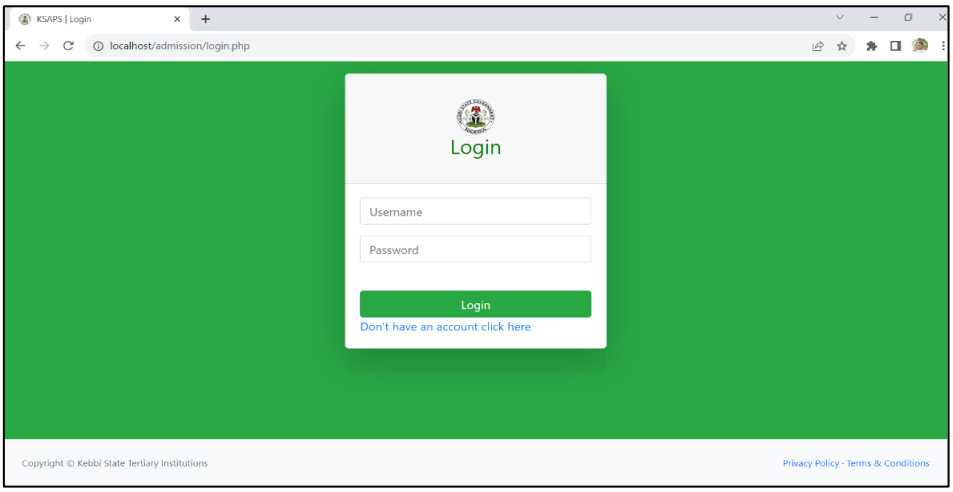

Fig. 7: Login Page

This is the authentication page of the system, where user can log in with their login credentials for authentication. It also provided a link for those who does not have an account or register with system. The link will redirect to the sign up page to enable the new user to create their account.

C. Sign-Up Page

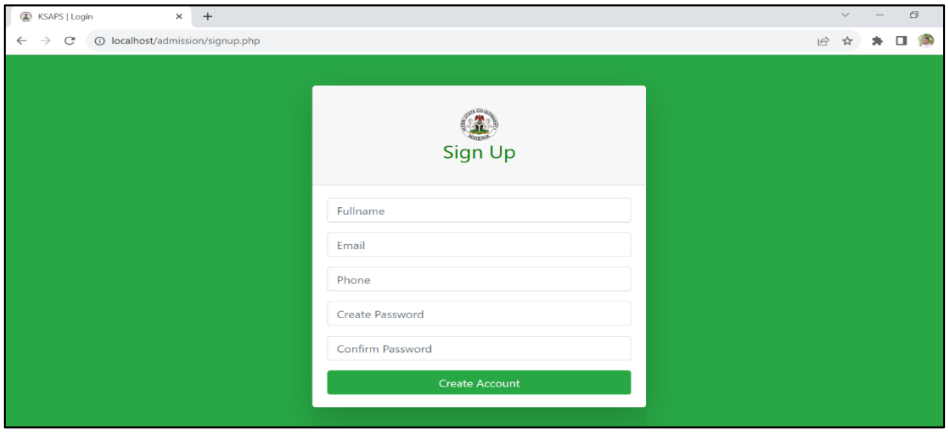

Fig. 8: Sign-Up page

In this page, new user has ability to create account with system using valid email address. It also allows the user to provide a user-define password which will serve as a secret code or pass code to ensure the security of the system.

D. Applicant Profile Page

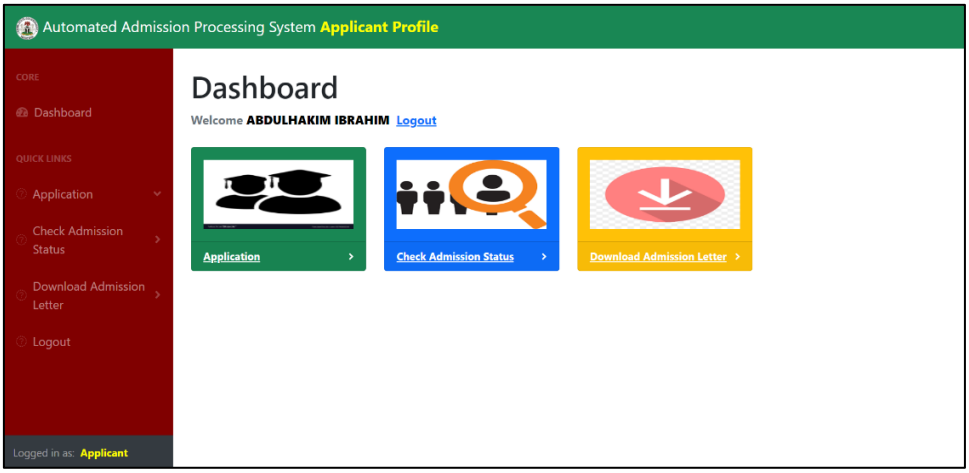

Fig. 9: Profile Page

Profile page carry the session of each user and allow them to access the entire resources. On the above figure 9, the page has three function: Application, Check Admission Status, Download Admission Letter. It also integrated with the admission processor which determine whether the applicant is due for admission or not. In this page all the entire process for admission is took place and feedback the process will be access through the page.

E. Application

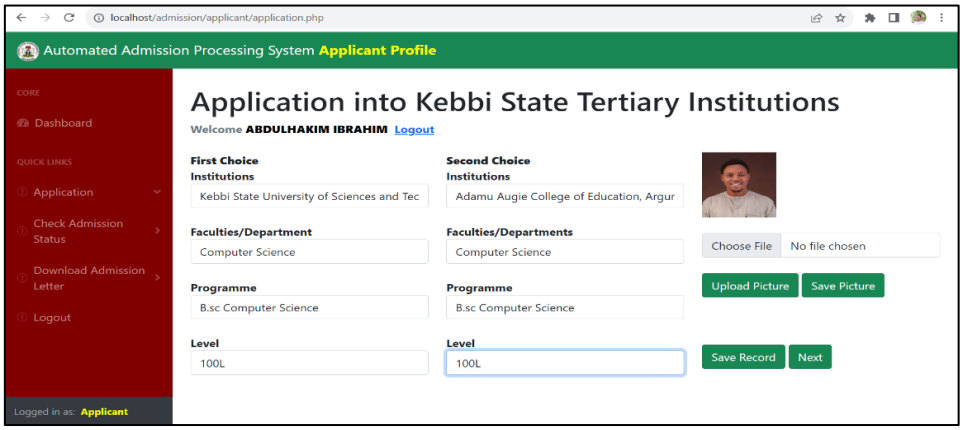

Fig. 10: Application into Kebbi State Tertiary Institution

This page contains application requirement such as Institutions to apply, Faculties/Department, Programme, Level and Photograph of the applicant. It required the O'level result and other admission requirement which adopted by the State Government.

F. Check Admission Status-waiting stage

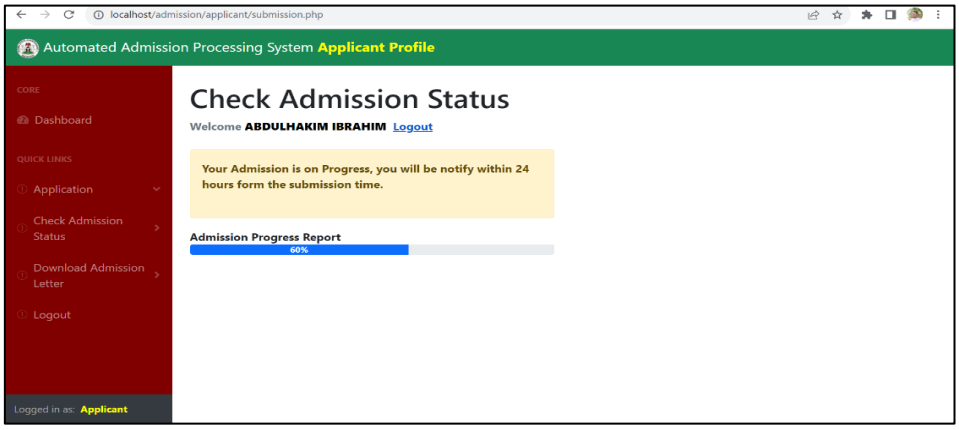

Fig. 11: Check Admission Status-awaiting stage

G. Check Admission Status-Approved Page

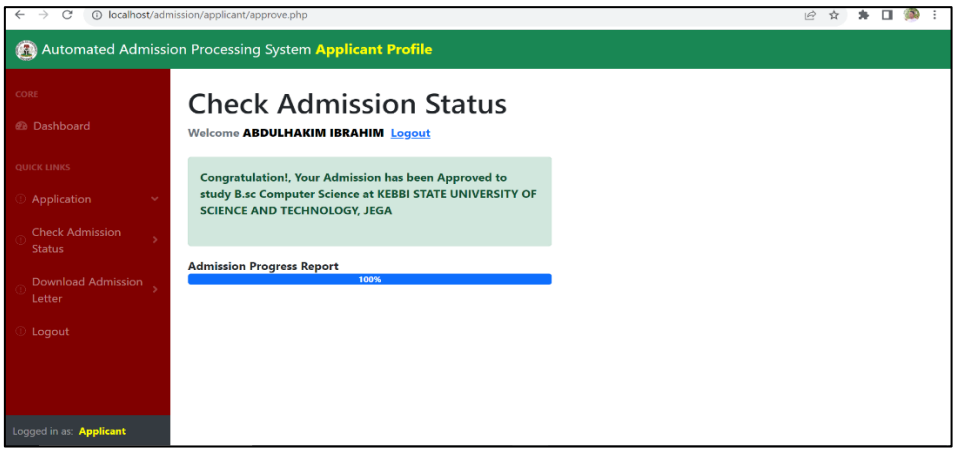

Fig. 12: Check Admission Status-Approved Page

H. Download Admission Letter

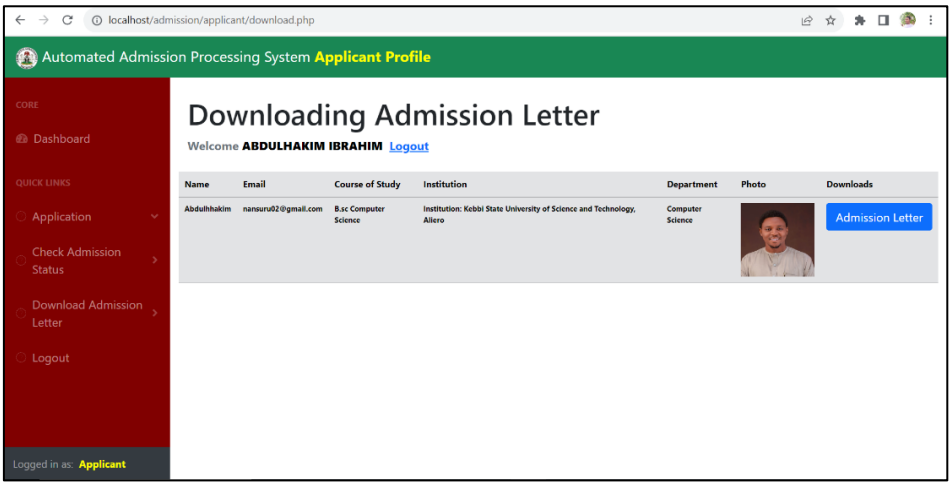

Fig. 13: Download Admission Letter

I. Admin Panel

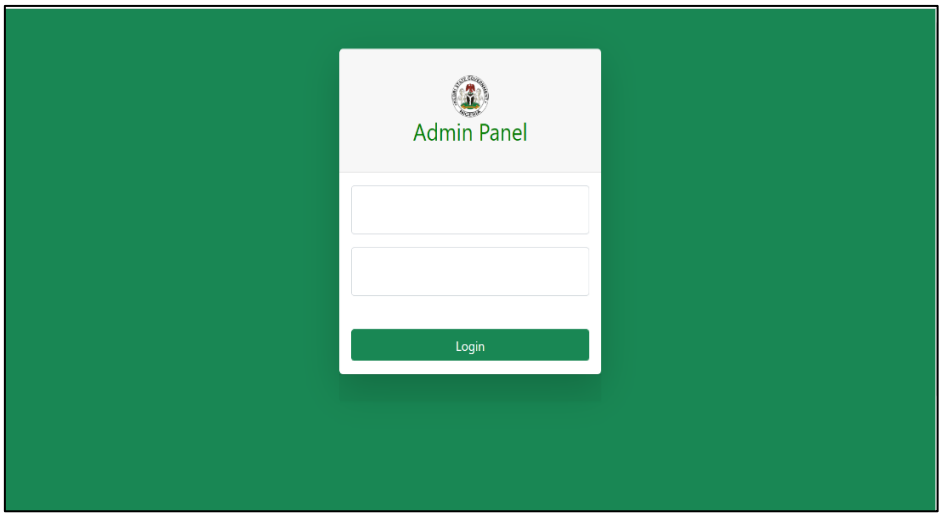

Fig. 14: Admin Panel

J. Admin-Dashboard

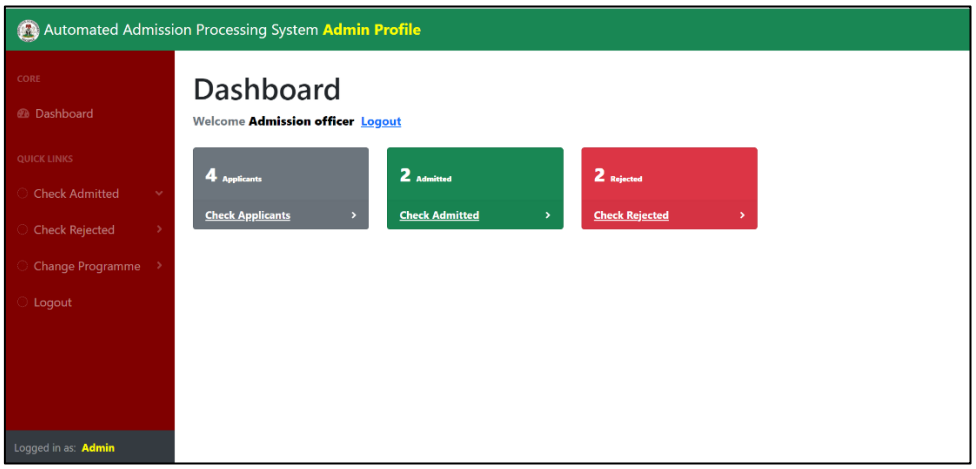

Fig. 15: Admin –Dashboard

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VIII. SYSTEM TESTING

In this section, testing is carried out to test every component of the system that has gone through the implementation stage. The table below shows the testing black box results.

Table 4: Testing Black box

Test ID	Description	Expected result	System-Provided Result
1	The Users Sign-up and Logs into the System	The account created and login successfully	As Expected
2	Users fill in personal data and edit	Data can be filled in and modify	As Expected
3	Users choose the institutions, Departments, and Programme	The list of institutions and their respective programme were selected successfully	As Expected
4	The users fill in the previous qualification as admission requirement	Data can be filled in successfully	As Expected
5	Users check the admission status	The current admission status display on the users Dashboard	As Expected
6	Users download the admission letter	The admission letter is downloading to the users through their account	As Expected
7	Admin perform change programme	The programme has been change to particular applicant	As Expected

IX. CONCLUSION

This research paper will help the Kebbi State Tertiary Institution admit their students as well as manage their information. All the necessary steps involved in the advanced software design are carried out accordingly, such as analysis, design, implementation, and testing. The method used in conducting this research is the waterfall model.

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