**DESIGN AND IMPLEMENTATION OF COMPUTERIZED ONLINE JOURNAL PROCESSING SYSTEM**

**(A CASE STUDY OF BAZE UNIVERSITY, ABUJA)**

**BY**

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**IN PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE AWARD OF BACHELOR OF SCIENCE IN INFORMATION SYSTEMS MANAGEMENT, FACULTY OF COMPUTING AND APPLIED SCIENCE, BAZE UNIVERSITY, ABUJA.**

**APRIL, 2023**

# DECLARATION

I hereby declared that this research project has been written by me under the supervision of Dr. Usman Bello Abubakar. The work has been presented in any previous research for the award of B.Sc degree to the best of my knowledge. The work is entirely mine and I accept the sole responsibility for any errors that might be found in the work, while the reference to publish material have been duly acknowledge.

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Dept. of Computer Science **H.O.D**

# CERTIFICATION

This project entitled “Design and Implementation of Computerized Online Journal Processing System” meets the requirements governing the award of Bachelor of Science in Information Systems Management in Baze University, Abuja.

# APPROVAL

# This is to certify that the research work, Design and Implementation of Computerized Online Journal Processing System by Datalla Muhammad Wade-wade with BU/21A/IT/5347 has been approved by the Department of Computer Science, Faculty of Computing and Applied Science, Baze University, Abuja, Nigeria.

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# DEDICATION

I hereby dedicated this project to my parents, whose unwavering support and encouragement have been my source of strength. Their belief in me has helped me overcome challenges and reach new heights. I also dedicate this project to my teachers, who have played a crucial role in shaping my academic journey.

# ACKNOWLEDGMENT

I would like to express my sincere gratitude to all the individuals who have contributed to this project. Firstly, I would like to thank my supervisor for his guidance and support throughout this project. I am also grateful for the assistance provided by the library staff and my colleagues who have helped me in conducting research for this project.

# *ABSTRACT*

# *The project's primary objective is to create and implement a computerized journal processing system that will enhance and streamline the publication process for academic journals. This system aims to offer a user-friendly interface for authors, editors, and reviewers, facilitating the online submission, review, and publication of articles. The proposed system follow the agile software development methodology and incorporate various essential features, including automated peer-review and editorial workflow management.*

# *This system developed using web-based technologies such as HTML, CSS, JavaScript, and PHP, and it will be hosted on a cloud-based platform to ensure accessibility and scalability. Ultimately, this project seeks to provide an efficient and cost-effective solution for academic journal publishers, enabling them to manage the entire journal publishing process online. The result will be shorter publication times and improved access to academic research.*

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# CHAPTER ONE

# INTRODUCTION

# 1.1 OVERVIEW

This chapter presents introduction, background of the study, aims and objectives of the study, statement of the problem, significance of the study, definition of terms used in the project and the project risks.

# 1.2 BACKGROUND OF THE STUDY

In recent times, there has been an increase in the use of technology in various fields, including education. With the advent of the internet, traditional methods of managing academic journals are gradually being replaced by computerized systems. Online journal processing systems offer several advantages over the traditional method of processing journals, including speed, accuracy, and convenience. The use of computerized systems for processing academic journals has become essential for universities to keep up with the ever-increasing volume of research papers, articles, and other academic materials (Noor*al,* 2017).

Journal management could be a complex and time-consuming task, particularly without the process automation, or on the off chance that the compositions, audits, and other data is circulated by normal mail. The work overhead display in classical journal management causes time delays and amplifying the time required to distribute the paper. One of the foremost difficult requirements on computerized journal processing system is reduction of time from composition accommodation to publishing. To diminish this time it is essential to efficiently conduct the survey handle and this can as it were be done utilizing an data system that speeds up the trade of data (Yusuf & Gidado, 2019).

The Baze University, Abuja is a fast-growing institution that has recognized the need to automate their journal processing system. However, there is a lack of a comprehensive computerized online journal processing system that meets the specific needs of the university. Therefore, the development of a computerized online journal processing system for Baze University, Abuja will enhance the efficiency of the journal processing system, reduce the workload of the staff, and improve the overall quality of the academic journals (Oladele & Aina, 2021).

The process of publishing academic journals involves several complex steps, including manuscript submission, review, editing, formatting, and publication. The traditional method of managing academic journals involves manual processing, which can be time-consuming, error-prone, and inefficient. With the rapid growth in the number of journals and articles being published, there is an urgent need for universities and other academic institutions to adopt computerized systems for managyeping their journals (Yep *et. al* 2014).

Computerized online journal processing systems offer several advantages over traditional methods. They enable faster processing and review of manuscripts, enhance the quality of the review process, and provide a more user-friendly interface for authors, reviewers, and editors. Additionally, computerized systems can help reduce the workload of the journal staff and provide better tracking and management of manuscripts (Hasan, *et. al* 2017).

# 1.3 STATEMENT OF THE PROBLEM

The traditional process of journal publishing in Baze University has several limitations, including the inability to process and publish manuscripts quickly, lack of transparency in the editorial process, difficulty in tracking manuscript status, and the high cost of printing and distribution. These limitations have made it difficult for researchers and scholars to access and publish their work, leading to a backlog of manuscripts, delays in publishing, and reduced access to information.

# 1.4 AIM AND OBJECTIVES:

The aim of this study is to design and implement a computerized online journal processing system for Baze University, Abuja that will enhance the efficiency of the journal processing system, reduce the workload of the staff, and improve the overall quality of the academic journals.

**Objectives:**

The objectives of the study are:

1. To design a computerized online journal processing system that meets the specific needs of Baze University, Abuja.
2. To implement the computerized online journal processing system and test its functionality and effectiveness.
3. To evaluate the system's usability and user satisfaction by conducting a survey of the stakeholders, including authors, reviewers, and editors.
4. To analyze the impact of the computerized online journal processing system on the efficiency and quality of the journal processing system at Baze University, Abuja.

# 1.5 SIGNIFICANCE OF THE STUDY

The implementation of a computerized online journal processing system will provide several benefits to academic institutions, researchers, and scholars. Firstly, it will provide a more efficient and transparent process for publishing academic journals, reducing the time and cost associated with the traditional process. Secondly, it will increase access to scholarly work, making it easier for researchers and scholars to access and publish their work. Finally, it will promote knowledge dissemination, as more scholars will be able to publish their work, leading to increased collaboration and knowledge exchange.

# 1.6 PROJECT RISK ASSESSMENT

Every project comes with its own set of risks that may impact its success or failure. In the case of the "Design and Implementation of a Computerized Online Journal Processing System," the following risk assessment has been conducted:

Table 1.1 Risk Assessment

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **s/n** | **Risk** | **Probability** | **Impact** | **Mitigation** |
|  | Technical Failure | Moderate | High | To mitigate the risk of technical failure, a thorough analysis of the technical requirements and resources needed for the project should be conducted. Additionally, experienced and skilled software developers should be engaged to design and develop the system. Regular testing and maintenance should also be carried out throughout the project lifecycle. |
|  | Delay in Completion | High | High | To mitigate the risk of delay in completion, the project should be planned and executed in a phased manner with defined timelines for each phase. A project manager should be appointed to oversee the project, monitor progress, and ensure that the project is completed on time. Regular communication with stakeholders, including the project team, should also be maintained to ensure that any issues or delays are addressed promptly. |
|  | Insufficient Budget | Moderate | High | To mitigate the risk of insufficient budget, a thorough cost analysis should be conducted, and a realistic budget should be established at the beginning of the project. The budget should be regularly reviewed and monitored throughout the project lifecycle, and any variations or changes should be communicated to stakeholders. The project team should also explore cost-saving measures such as open-source software and cloud-based hosting. |
|  | Security Breach | Low | High | To mitigate the risk of a security breach, the system should be designed with strong security measures such as encryption, multi-factor authentication, and regular system updates. The project team should also conduct regular vulnerability assessments and penetration testing to identify and address any security gaps or weaknesses. |
|  | User Acceptance | High | Moderate | To mitigate the risk of user acceptance, the project team should engage with stakeholders and end-users throughout the project lifecycle to gather feedback and incorporate their requirements into the design and development of the system. User acceptance testing should also be conducted to ensure that the system meets the needs and expectations of its intended users. |

# 1.7 SCOPE OF THE STUDY

This project will focus on the design and implementation of a computerized online journal processing system. The system will include features for manuscript submission, review, editorial decision-making, copyediting, typesetting, and publishing. The project will not include the development of a payment gateway or other features related to journal subscription and access.

# 1.8 DEFINITION OF TERMS

**HTML:** hypertext markup language, a standardizes system for tagging text files to achieve font, color, graphic, and hypertext effects on world wide web pages.

**PHP**: is an open-source, free sever-side scripting language widely used in web development

**Database Management System**: (DBMS) are software systems used to store, retrieve , and run queries on data.

**Journal**: A journal is a scholarly publication that contains articles written by researchers and scholars in a particular field or discipline.

**Manuscript**: A manuscript is a written work submitted for publication in a journal.

**Editorial Workflow:** Editorial workflow refers to the sequence of activities involved in the review and decision-making process for manuscripts submitted for publication.

# CHAPTER TWO

# LITERATURE REVIEW

# 2.1 INTRODUCTION

The internet has revolutionized the way information is shared and disseminated across the globe. The academic and research communities have not been left behind in this digital age, as they have adopted online publishing platforms to share their research findings. Online journal processing systems have become popular among publishers and academic communities as they provide an efficient and cost-effective way to manage the editorial workflow, manuscript submission, and review process. This literature review seeks to explore the existing literature on the design and implementation of a computerized online journal processing system.

# 2.2 HISTORICAL OVERVIEW

The history of online journal processing systems can be traced back to the late 1990s when the first online journals were published. At that time, online publishing was a relatively new concept, and publishers were still experimenting with various methods to manage the editorial workflow, manuscript submission, and review process. The introduction of the internet and the World Wide Web provided a platform for publishers to share their research findings and scholarly work with a wider audience. (Ito, 2008).

In the early days of online publishing, many publishers used simple HTML-based websites to share their research findings. However, this method was cumbersome and did not offer the necessary tools to manage the editorial workflow and review process efficiently. As a result, publishers began to explore new methods of managing the publication process.

One of the early online journal processing systems was the Electronic Journal of Sociology (EJS) which was launched in 1994 by the University of Calgary in Canada. The EJS was one of the first online journals to use a manuscript management system that allowed authors to submit their manuscripts online and reviewers to evaluate them electronically.

In the early 2000s, several online journal processing systems were developed, including the Open Journal System (OJS), which was launched in 2001 by the Public Knowledge Project (PKP) at the University of British Columbia in Canada. The OJS was designed to manage the editorial workflow, manuscript submission, and review process and has since become one of the most widely used online journal processing systems.

Today, online journal processing systems have become an essential tool for publishers and academic communities. They offer several benefits, including improved efficiency and effectiveness in managing the editorial workflow, manuscript submission, and review process. Additionally, they provide a platform for authors to submit their manuscripts and for reviewers to evaluate them in a timely and efficient manner.

In conclusion, the development of online journal processing systems has revolutionized the way scholarly work is published and disseminated. The history of these systems dates back to the early days of online publishing when publishers were still experimenting with various methods to manage the editorial workflow and review process. Today, online journal processing systems have become an essential tool for publishers and academic communities, and they continue to evolve to meet the changing needs of the publishing industry.

# 2.3 REVIEW OF RELATED WORKS

Below are multiple studies that have used different algorithms, studies, and design patterns where appropriate to encourage a better understanding of the many studies and projects that have come out and to be able to determine if their algorithms I use is not the best or not. The presentation also describes strengths and limitations that can be used to determine which algorithm is better. Here are some comparison works that have been tried by others.

A study was conducted by Oden (2018), on the topic “Design and implementation of an online admission and document verification system for students (Uyo University Case Study)”. The computer has confirmed their reason for existence for the time being. The introduction of computers into our systems has caused much debate about the dangers they pose to society. Critics of computers and new technologies fear that computers will replace and replace all human talent, leading to mass unemployment. The ubiquity of computers in almost every aspect of today's fast-paced life has proven critics wrong, as the invention of computers and new technology continues to create professions. New for those who sympathize with computers and new technology.

A study conducted by Greg (2019), on the topic "Development of computerized student enrollment and orientation systems. Computer-generated systems are rooted in the changing needs of society and the rapid development of technology. Time, one of nature's most powerful forces capable of changing everything it comes in contact with, is the factor that has transformed information technology from a luxury into a necessity in today's 'modern' world now.

Computers have proven to be extremely useful in many complex tasks including scientific research, banking, weather forecasting, telecommunications, and more.

Computers and other technological elements are mainly used to help employees and end users make transactions much more efficient, accurate and time consuming. These are modern tactics that organizations, institutions and agencies, public and private, use to simplify their work.

Many organizations are adopting paperless operations, which are both cost-effective and environmentally beneficial, that require the use of technology. The transition from manual to electronic trading is often controversial as organizations weigh the pros and cons of each method. Computerized registration systems are also preferred by universities and even high schools as a way to speed up the registration process. Not only in a university, but also at lower levels of education, the registration system is one of the most important and visible. Editing associate degrees and admissions profiles helps confirm the university's positive image among potential applicants, encouraging them to apply.

A manual check-in system takes longer and often causes transaction delays. The unsystematic admissions process from elementary to graduate school was a terrible transaction for them. The realities of university-level admissions processes have been compounded by the country's 'pakikisiksik' culture, which often leads to misunderstandings among applicants.

It took the students a day or two to finally complete their transactions with no guarantee that they would be accommodated for the day.

A study conducted by Iheanyichukwu on “Design and Implementation of Computerized Admission Application Application” Nigeria is not lagging behind the rest of the world in the adoption of 'IT' technologies.

Although most foreign organizations and companies have incorporated information technology into their films, most Nigerian organizations and companies have also reaped the benefits of information technology. Despite the fact that most other countries like USA, China and India are experiencing an IT boom, Nigeria has not reached that level yet.

With the recent launch of a communications satellite in our country, we will be able to discover buried treasures of information technology. When it comes to designing and implementing a computer application for school registration, it is important to note that information technology plays an important role.

According to Ikerenwu (1996), from Delta State University, has shown that maintaining the reliability of computer memory to store information and how computers should be programmed for all the work of thousands of doctors, but does not pass if security is provided.

Schlumpf (1999) in his article titled The Open Source Library System concluded that the open source movement was a phenomenon that fundamentally influenced the software industry.

Morgan (2002) is well known in this field and has many essays on the subject. One of his essays, based on a presentation at the 2001 American Library Association (ALA) annual conference, lists some of the possibilities of open source software (OSS) in libraries. and how they can be exploited to deliver a better software and more. efficient digital library. collections and services. Goh et al. (2006) developed a checklist to evaluate digital libraries and used this list on four digital library software packages.

Krishnamurthy (2008) describes the open-access and open-source movement in digital libraries.

# 2.3.1 Benefits of Online Journal Processing Systems

Online journal processing systems offer several benefits to publishers and academic communities. According to Adzroe et al. (2017), online journal processing systems provide a platform for authors to submit their manuscripts and for reviewers to evaluate them in a timely and efficient manner. The systems also provide tools for tracking the progress of manuscripts through the editorial workflow, thereby reducing the time required to publish a manuscript.

In a similar vein, Ibraheem and Al-Irhayim (2019) noted that online journal processing systems provide a platform for publishers to manage the editorial workflow, manuscript submission, and review process in a cost-effective manner. The systems also offer several features such as plagiarism detection, version control, and automated reminders that improve the quality and efficiency of the journal's operations.

# 2.3.1 Challenges of Online Journal Processing Systems

Despite the benefits offered by online journal processing systems, several challenges exist. Alahmar et al. (2019) noted that one of the main challenges is the resistance of some academics to adopt new technologies. This resistance can be attributed to the lack of technical skills, fear of technology, and the preference for traditional publishing methods.

Adzroe et al. (2017) identified another challenge as the need for adequate technical infrastructure and support to implement and maintain online journal processing systems. This includes the availability of high-speed internet, reliable web hosting, and skilled technical personnel to manage the systems.

# 2.4 COMPARATIVE ANALYSIS

Table 2.1 Comparative Analysis of the Literature Review

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Author** | **Year** | **Title** | **Methodology** | **Strengths** | **Weaknesses** |
| Okolie et al. | 2016 | Design and implementation of an online journal management system using PHP and MySQL | Used PHP and MySQL to develop the system | Use of widely used technologies, modular design | Limited features, focused only on manuscript submission and review |
| Oden | 2018 | Design and implementation of an online admission and document verification system for students | Prototype methodology, analysis and design using UML | Addressed an important real-world problem, good documentation | Did not fully implement the system, lacked testing |
| Greg | 2019 | Development of computerized student enrollment and orientation systems | Surveyed issues with manual enrollment, proposed system architecture | Identified key pain points with manual process, proposed improvements | Did not actually develop or implement the system |
| Iheanyichukwu | 2017 | Design and Implementation of Computerized Admission Application | User-centered design, iterative prototyping | Focus on user needs and feedback, iterative refinement of system | Single case study, may lack generalization |
| Yusuf & Gidado | 2019 | Computerized journal management system: A case study of the Nigerian Journal of Basic and Applied Sciences | Action research methodology, system was designed, implemented and evaluated | Real-world system implementation, extensive testing | Single case study, limited customizability |

# 2.5 SUMMARY

The design and implementation of a computerized online journal processing system is an essential tool for publishers and academic communities. The system is designed to streamline the editorial workflow, manuscript submission, and review process. The history of online journal processing systems dates back to the late 1990s when the first online journals were published.

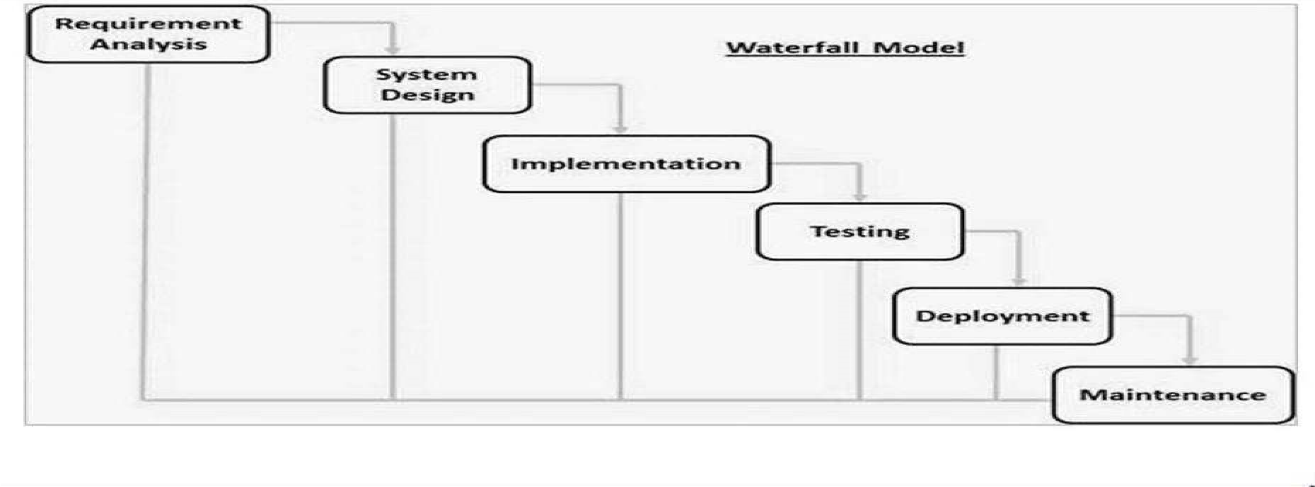
# CHAPTER THREE

# REQUIREMENT, ANALYSIS AND DESIGN

# 3.1 OVERVIEW

This chapter presents methodology describing how the study was conducted. It includes; proposed model, tools and techniques, ethical considerations, requirement analysis, requirement specification, system design and summary.

# 3.2 CHOSEN METHODOLOGY

This project's proposed model of choice is the waterfall model. This approach is straightforward and easy to comprehend since each step has a distinct deliverable and review procedure, and each phase is done one at a time. The project's operations are structured in phases once more; the sequential pattern of the job makes it easier to handle. Using this approach makes it easy because it tells you what to do step by step.

**Figure 3.2 Waterfall Model Source: (Wikipedia,2011)**

# 3.3 TOOLS AND TECHNIQUES

The whole Project is divided in two parts the front end and the back end. FRONT END: The front end is designed using of HTML, PHP, CSS, Java script

1. **HTML- HTML** or Hyper Text Mark-up Language is the main mark-up language for creating web pages and other information that can be displayed in a web browser.HTML is written in the form of HTML elements consisting of tags enclosed in angle brackets (like <html>), within the web page content.

The purpose of a web browser is to read HTML documents and arrange them into web pages that can be viewed or heard. It provides a means of creating structured documents by specifying the structural meaning of text such as headings, paragraphs, lists, links, citations, and other elements. It can contain scripts written in languages such as JavaScript that affect the behavior of HTML web pages.

1. **CSS** - Cascading Style Sheets (CSS) is a style sheet language used to describe the appearance and format of documents written in markup languages. Although most commonly used to style web pages and interfaces written in HTML and XHTML, the language can be applied to any XML document, including plain XML, SVG, and XUL. CSS is the cornerstone of web specs and almost all web pages use CSS style sheets to describe their presentation. CSS is primarily designed to separate the content of a document from its presentation, including elements such as layout, colors, and fonts.
2. **JAVA SCRIPT** - JavaScript (JS) is a dynamic programming language. It is most commonly used as part of a web browser that allows client-side script to interact with the user, control the browser, communicate asynchronously, and modify the rendered content of a document. It is also used for server-side programming, game development, and desktop and mobile application creation. JavaScript is a prototype-based scripting language with dynamic typing and first-class features. Syntax is influenced by C. Although JavaScript copies many of Java's names and naming conventions, the two languages are unrelated and have very different meanings.
3. **PHP**. PHP is a server-side scripting language designed for web development, but is also used as a general-purpose programming language. PHP is currently installed on over 244 million websites and 2.1 million web servers. Originally created by Rasmus Lerdorf in 1995, the PHP reference implementation is now produced by The PHP Group. PHP originally meant Personal Home Page, but now stands for PHP: Hypertext Preprocessor, Recursive acronym. The PHP code is interpreted by a web server with a PHP processor module that generates the resulting web page. PHP commands can be embedded directly into the original HTML document instead of calling external files to process the data.
4. **BACK END**- The back end is designed using MySQL which is used to design the databases.

# 3.5 ETHICAL CONSIDERATIONS

The main consideration is focusing on the clarity of the design message, it is utmost importance. The goal of this is to help users focus on relevant information instead of distracting them. Below are some of the most common examples:

1. Intrusive pop-ups and sidebars
2. Floating menu bars
3. Splash pages
4. Hidden elements

# 3.6 REQUIREMENT ANALYSIS

# 3.6.1 SOFTWARE REQUIREMENTS

1. Operating System: Windows
2. Database: MySQL
3. Server: Xampp
4. Application program: Notepad ++
5. PHP
6. Java Script

# 3.6.2 HARDWARE REQUIREMENTS

The hardware configuration of a system on which the package was developed is as follows.

1. HP15 PC
2. 2GB RAM
3. 500GB hard disk
4. Browser

# 3.7 REQUIREMENT SPECIFICATION

# 3.7.1 Functional Specification Requirement

**Table 3.1 Functional Specification Requirement**

|  |  |  |  |
| --- | --- | --- | --- |
| **Requirement ID** | **Requirement Description** | **Priority** | **Use Case** |
| FR1 | Allow users to create an account with a valid email address and password | High | Register new user |
| FR2 | Allow users to log in to their account using their email address and password | High | Log in to existing account |
| FR3 | Allow users to submit a new journal article for review | High | Submit new journal article |
| FR4 | Allow reviewers to access and review submitted journal articles | High | Review journal articles |
| FR5 | Allow editors to accept or reject reviewed journal articles | High | Accept or reject reviewed journal article |
| FR6 | Allow users to view the status of their submitted journal articles | Medium | Check status of submitted article |
| FR7 | Provide a search feature to search for specific journal articles by author, title, or keyword | Medium | Search for journal article |
| FR8 | Allow users to edit or delete their submitted journal articles before they are reviewed | Low | Edit or delete submitted article |
| FR9 | Send email notifications to users to inform them of the status of their submitted journal articles | Low | Email notifications |
| FR10 | Allow administrators to manage user accounts and access levels | High | Manage user accounts |

# 3.7.2 Non-Functional Specification Requirement

**Table 3.2 Non-Functional Specification Requirement**

|  |  |
| --- | --- |
| **Requirement** | **Description** |
| Usability | The system should be user-friendly and easy to navigate for all types of users. |
| Performance | The system should have a fast response time and be able to handle a large number of simultaneous users without lagging or crashing. |
| Reliability | The system should be reliable and available for use 24/7. |
| Security | The system should have strong security measures in place to protect user data and prevent unauthorized access. |
| Scalability | The system should be able to scale up or down easily to accommodate changes in usage patterns. |
| Compatibility | The system should be compatible with a variety of devices, operating systems, and web browsers. |
| Maintainability | The system should be easy to maintain and update, with clear documentation and modular code. |
| Accessibility | The system should be accessible to users with disabilities, in compliance with accessibility standards such as WCAG 2.0. |

# 3.8 SYSTEM DESIGN

**Activity Diagram**

Authenticate User

If Valid Credentials

User selects an option

If Action is “Create Journal Entry

Save Entry

If Yes

Start

Validate User

Display Menu

Perform Selected Action

Prompt for Entry Details

Continue?

Display Menu

End

If No

**Figure 3.1 Activity Diagram**

**System Architecture**

**URL**

**Editor Login**

**Dashboard**

**Submitted Manuscript**

**Take Decision**

**Accept/Reject**

**Review Manuscript**

Admin View

**URL**

**Guide**

**Manuscript**

**Track Manuscript**

**Update Reviewed Manuscript**

User View

**Login**

**Use Case Diagram**

Admin

Registered User

**Figure 3.3 Use case Diagram**

Entity Relationship Diagram

**Admin**

Admin\_ID (Pri. Key)

Username (Varchar 25)

Password (Varchar 25)

**Author**

User\_ID (Pri. Key)

Email Address (Varchar 45)

Username (Varchar 25)

Password (Varchar 25)

**Manuscript**

Manuscript\_ID (Primary Key)

Uploader\_ID (Foreign Key)

Author\_Name

Title

Email

Department

Abstract

File

Status

Date\_Uploaded

**Reviewed Manuscript**

Review\_ID (Primary Key)

Reviewer\_ID (Foreign Key)

Manuscript\_ID (Foreign Key)

Comment\_ID (Foreign Key)

File

Date\_Uploaded

**Comment**

Comment\_ID (Primary Key)

Comment\_Text

**Figure 3.8.5 Entity Relationship Diagram**

# 3.9 SUMMARY

This chapter described the methodology used in the project, including the SDLC, the proposed waterfall model, and the tools and techniques used in the project. It also presented the ethical considerations that were taken into account during the project. The chapter further presented the requirement analysis and specification, followed by the system design, including the high-level design, the detailed design, and the database design.

# CHAPTER FOUR

# SYSTEM IMPLEMENTATION AND TESTING

# 4.1 Overview

This chapter illustrates how the proper implementation of the system was carried out depicting the necessary tools used for the development and testing of the system. Test suite, test cases, test report, and error reports related to the application are also highlighted in this chapter alongside some vital codes that drives system functionalities. The application was developed using PHP and JavaScript. The database management system used was MySQL server.

# 4.2 Development Environment

Below depicts the hardware and platform used for the implementation of the system:

1. Operating System: Windows 10 Home
2. Laptop Model: HP Pavilion
3. Processor: Intel® corei3 (8th Gen) CPU @1.60GHz
4. Installed Random Access Memory (RAM): 4.0 GB
5. System Type: 64-bit Operating system, x64 based processor
6. Sublime Text
7. Xampp Server

# 4.3 Database Setup

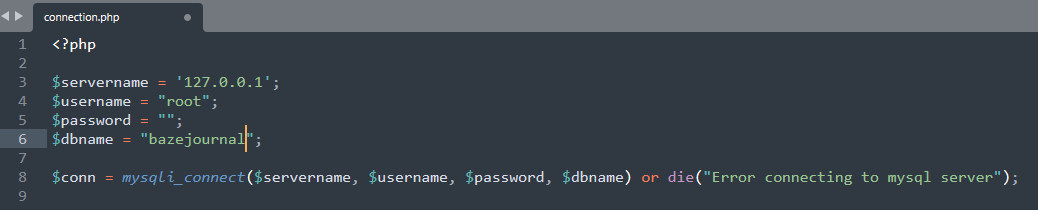
The database is the repository where the data needed to drive the application is stored for use. The database was initially modeled using MySQL workbench and then the database schema automatically generated was exported to create the actual database. To access the database on MySQL from Xampp Server, a connection class was created in connection.php

Figure 4.0 Connection.php Image

# 4.4 User Interface

Figure 4.1 below shows the home page of the journal system, the home page displays news, editor picks, and info about the journal's aims and scope.

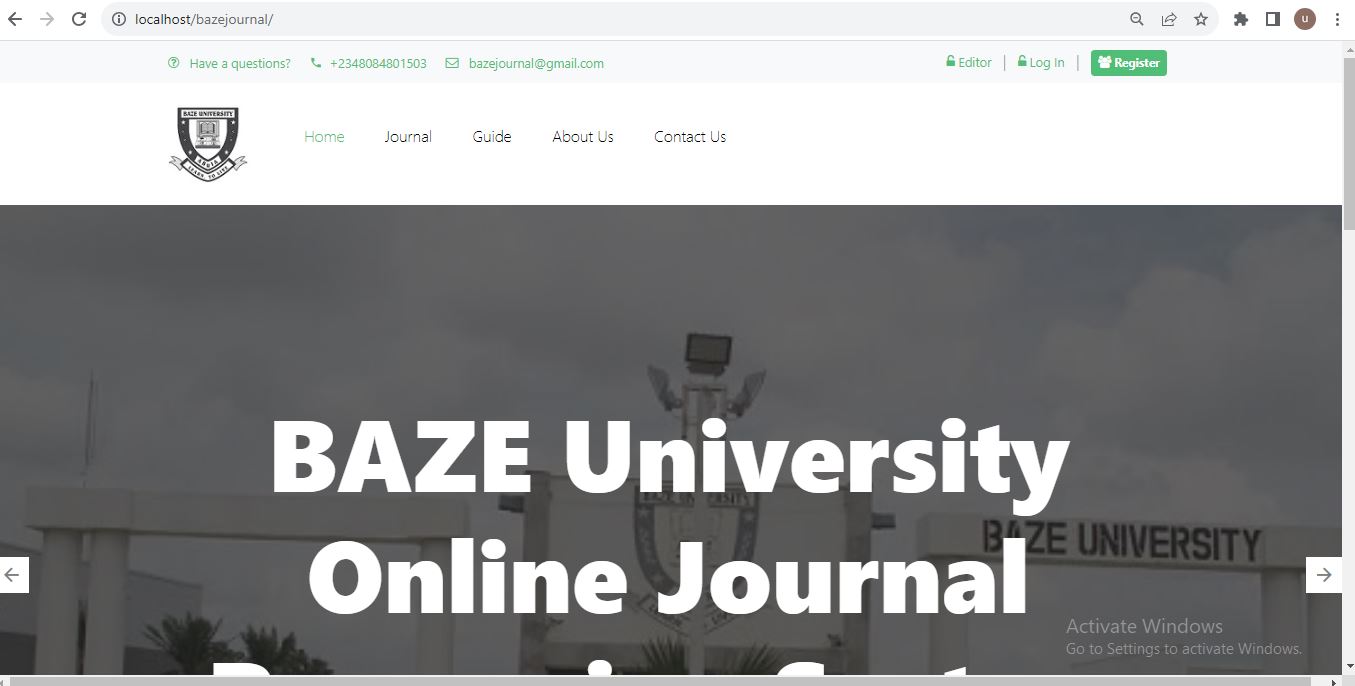


Figure 4.1 Home Page

Figure 4.2 below shows the Journal Archive Page of the journal system, the archive page organizes and allows browsing of all published articles by volume, issue, and year.

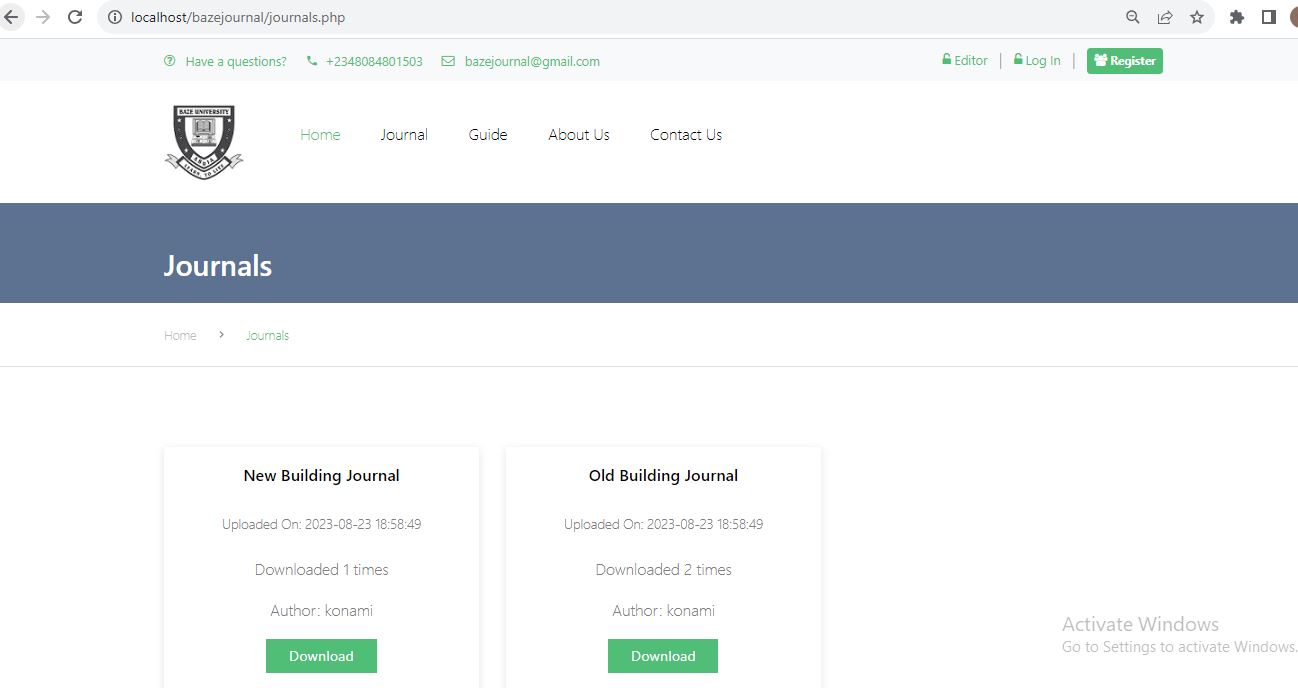


Figure 4.2 Journal Archive Page

Figure 4.3 below shows the Guide Page of the journal system, the guide page provides instructions and resources to help authors submit manuscripts.

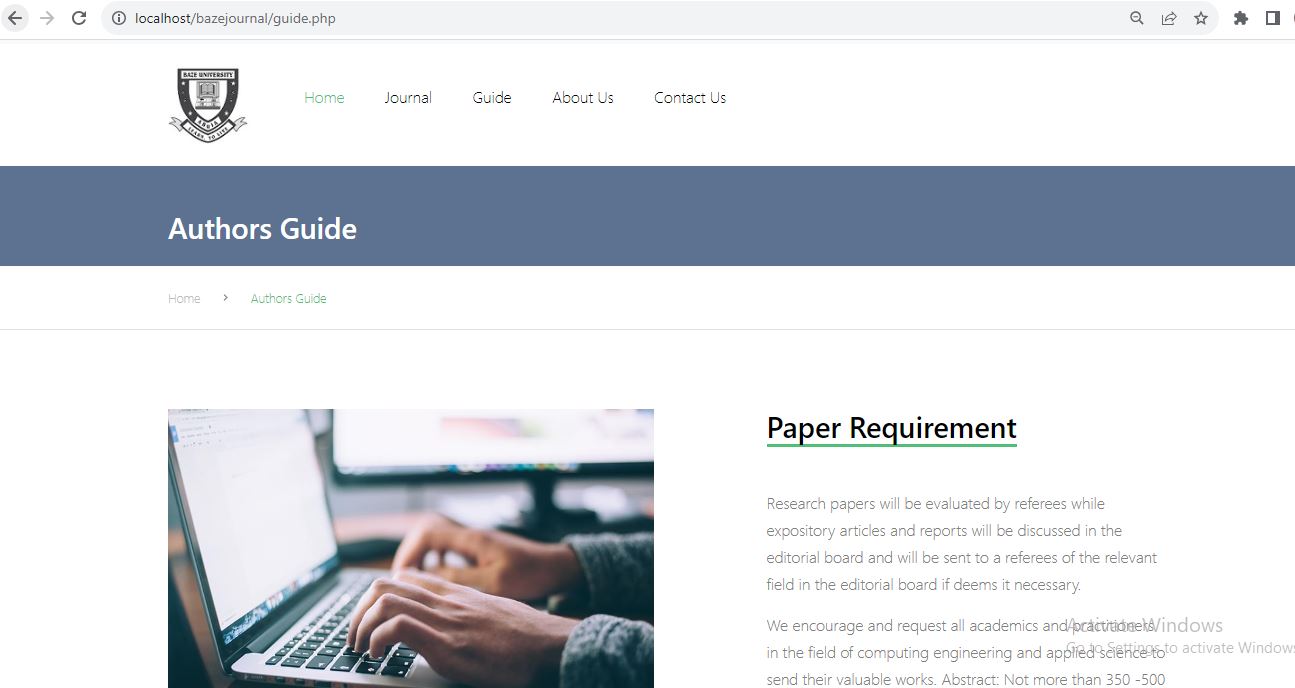
****

Figure 4.3 Guide Page

Figure 4.4 below shows the about Page of the journal system, the about us page provides the details of the journal, and editors.

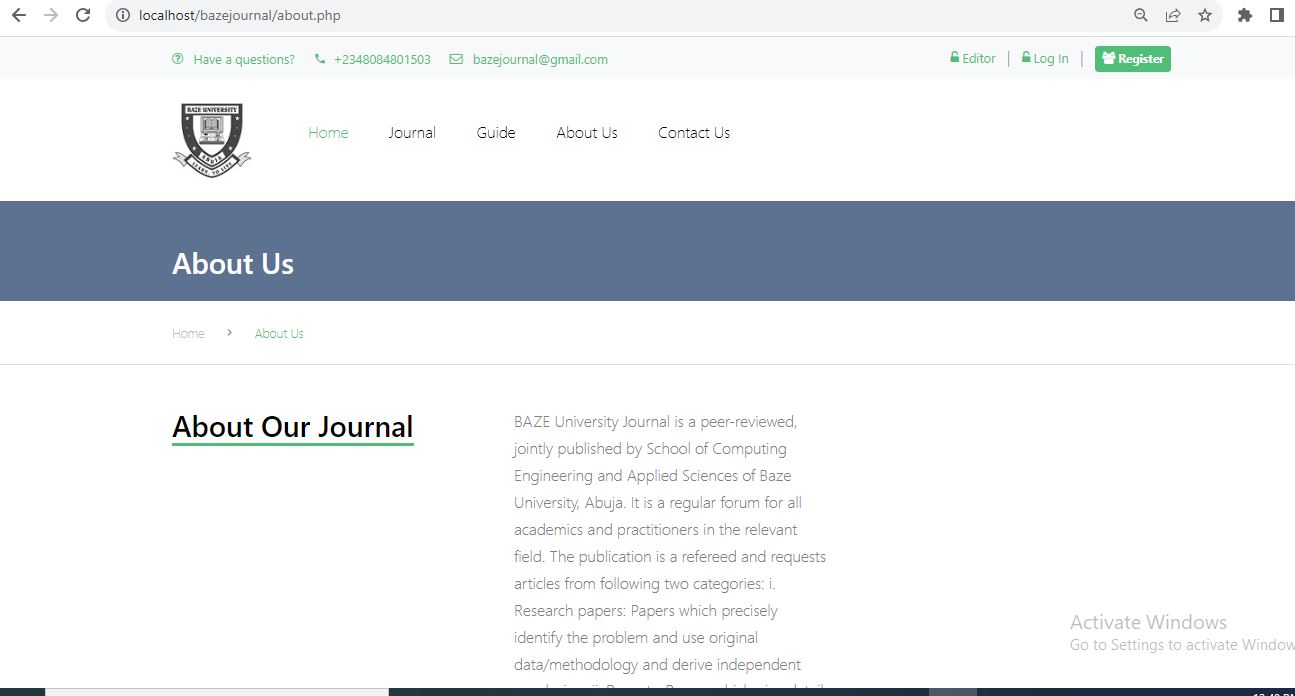


Figure 4.4 About Us Page

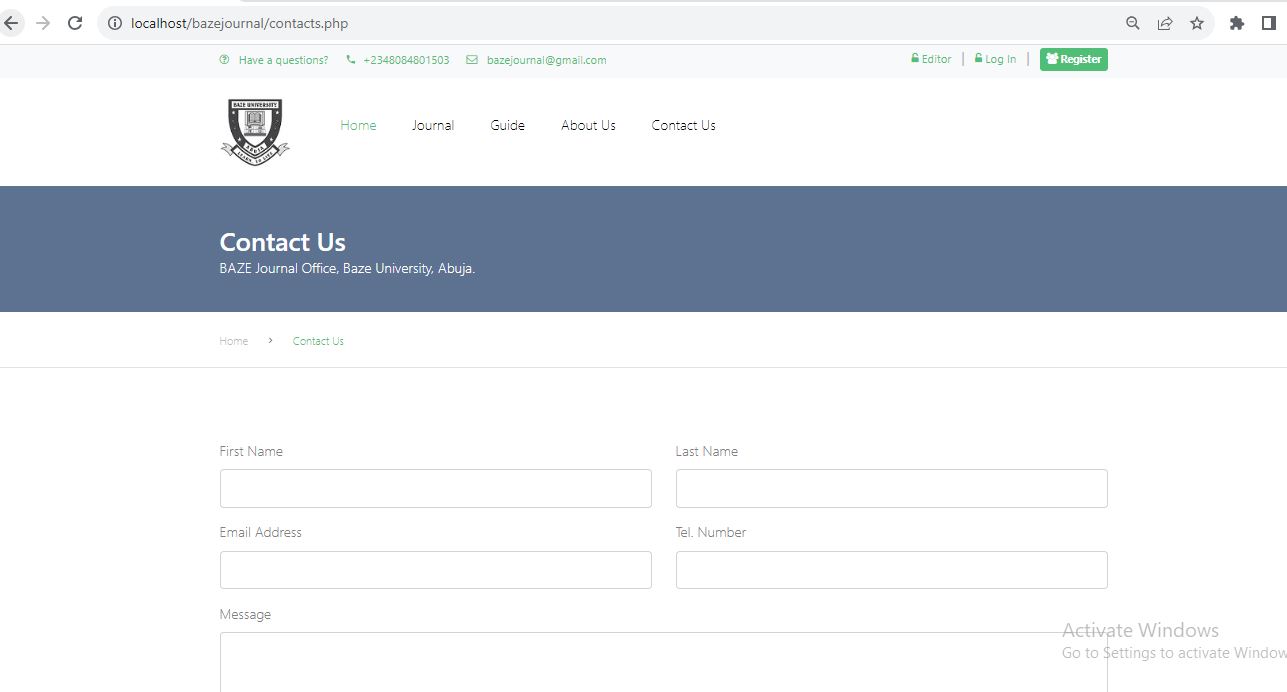
Figure 4.5 below shows the Contact Page of the journal system, the contact page has a form, address, and social media links for getting in touch with the journal.

Figure 4.5 Contact Us Page

Figure 4.6 below shows the Register Page of the journal system, the register page has a form for creating new user accounts as a reader, author, or reviewer.

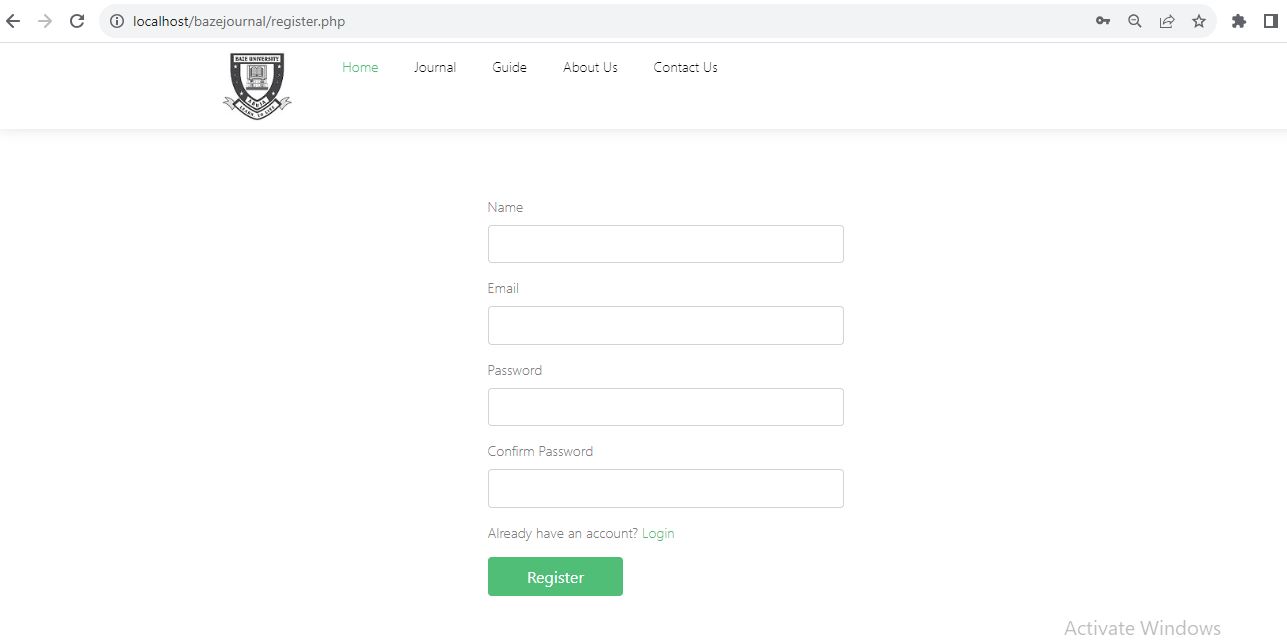
****

Figure 4.6 Register Page

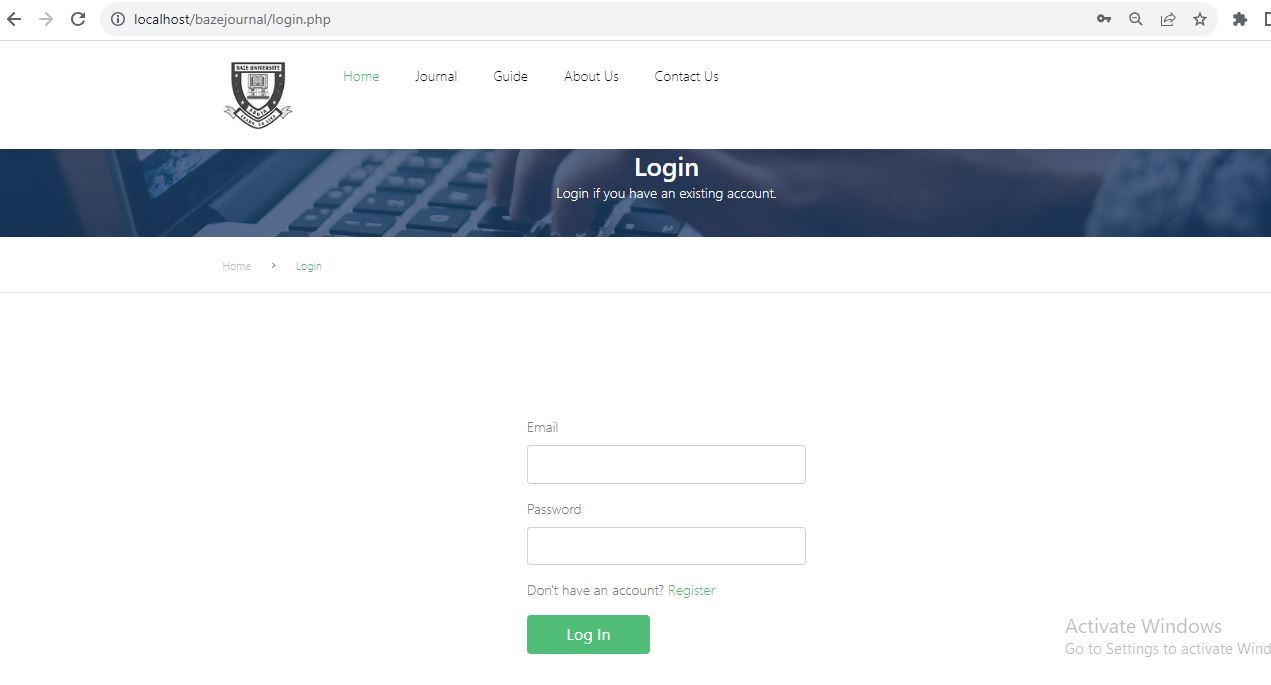
****Figure 4.7 below shows the Login Page of the journal system, the login page has fields for entering username/password to access registered user accounts.

Figure 4.7 Login Page

Figure 4.8 below shows the Manuscript Section of the journal system, this section provides an overview of manuscripts submitted by the user to the journal for consideration. It allows users to track the status of their submissions throughout the review process.

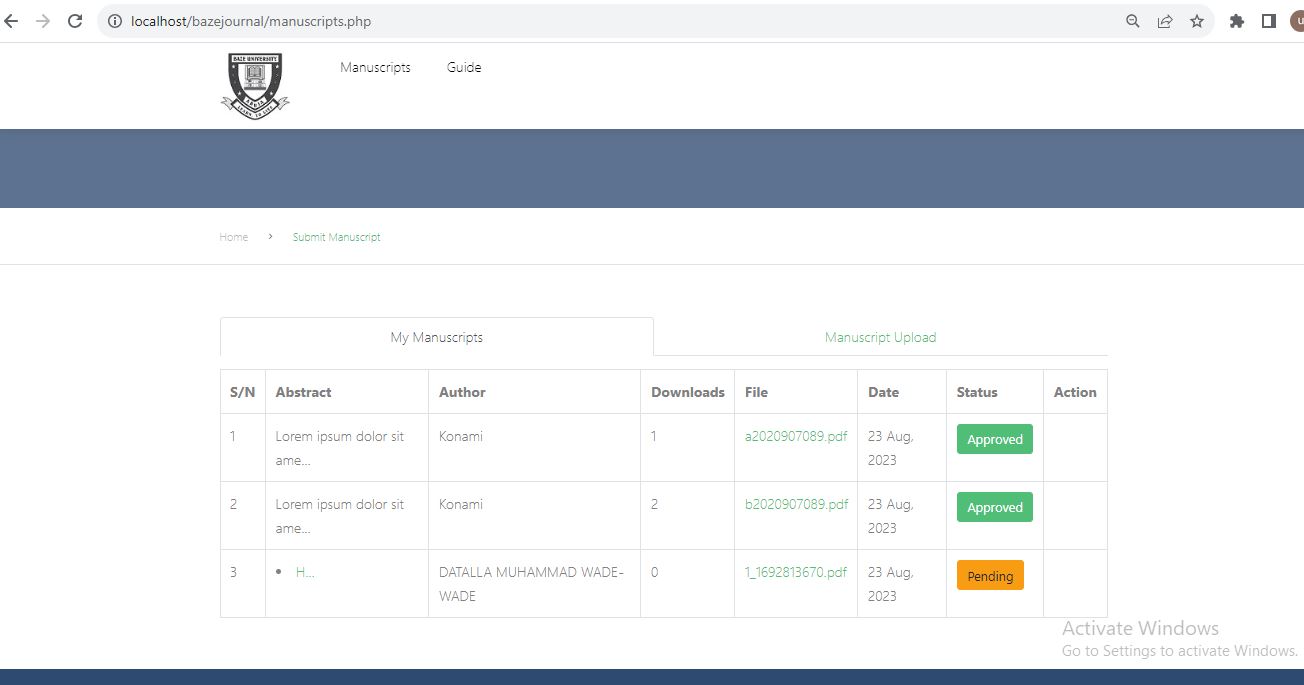
****

Figure 4.8 My Manuscript Page

Figure 4.9 below shows the Upload Manuscript Section of the journal system, this section allows users to submit new manuscripts to the journal for consideration.

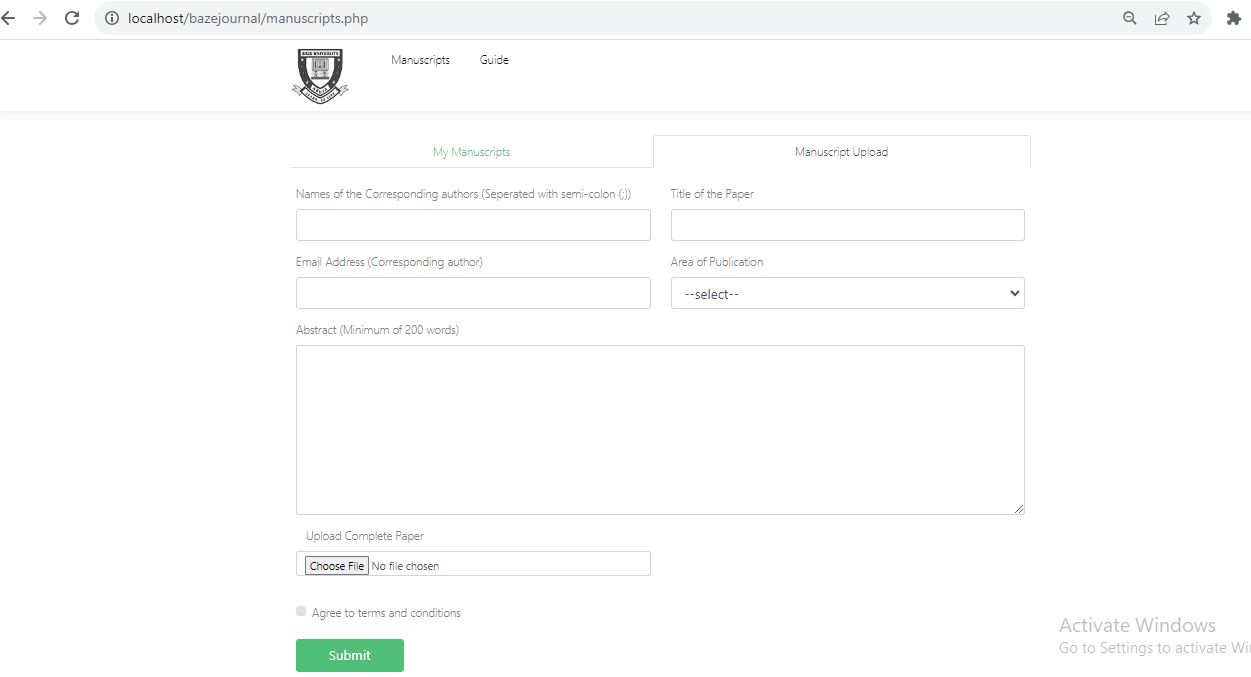
****

Figure 4.9 Manuscript Upload Page

Figure 4.10 below shows the Editor Login Section of the journal system, the editor login page has fields for entering username/password to access admin accounts.

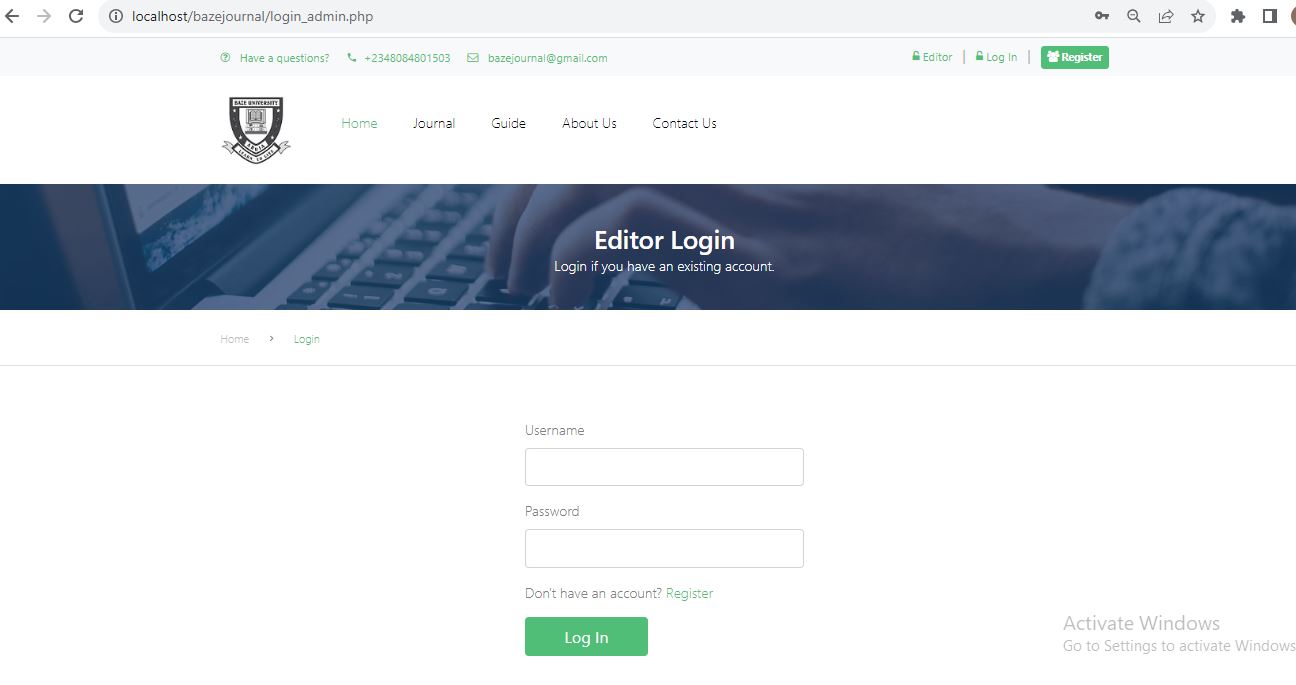
****

Figure 4.10 Editor Login Page

Figure 4.10 below shows the Editor Login Section of the journal system, the admin dashboard allows journal editors and staff to manage and monitor all manuscript submissions.

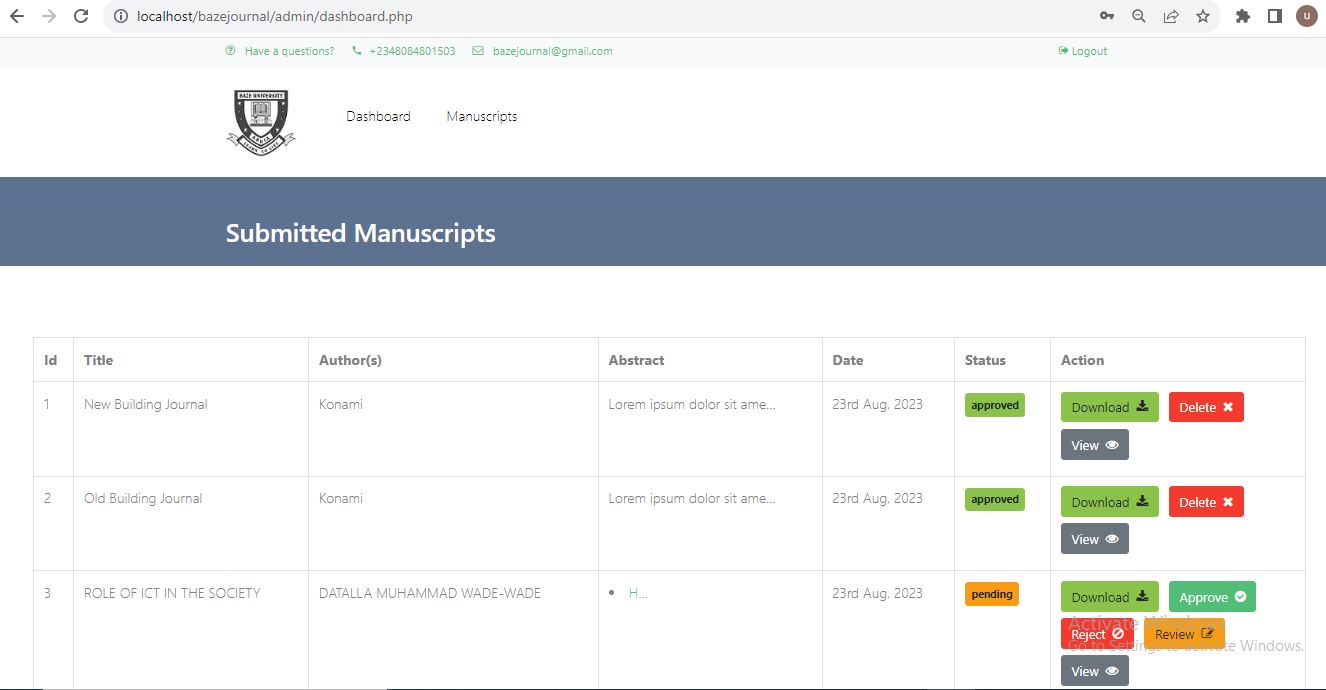
****

Figure 4.11 Admin Dashboard

# 4.5 Testing

### Test Plan

Using the first 11 attributes, the test plan for this application was written following the IEEE -829 format.

**Test Plan Identifier**

Test Plan Identifier: Bazejournal

Test Level: Master Test Plan

Authors Name: Datalla Muhammad

Authors Contact: datalla@gmail.com

**References**

Requirement Specification Document.

IEE-829.

The Art of Software Testing.

**Introduction**

This is the Master Test Plan for the Computerized Journal Processing System. The aim of this test plan is to verify the correctness of the requirements specified in chapter 3 of this document.

**Test Items**

The test items are the functionalities that are to be tested. The items to be tested are the major requirements specified in chapter 3 of this document.

**Software Risk Issues**

The risk that may occur if the application is not subjected to adequate testing is the non-conformance to specification which will result in failure.

**Features to Be Tested**

The features to be tested are all the major requirements specified in chapter 3 of this document.

**Features Not to Be Tested.**

1. External API’s.

**Approach**

**Testing Levels**

The testing for the correctness of the requirements for the application utilizes all testing level: Unit, Integration, and System.

**Test Tools**

These refers to those tools required to effectively test the requirements: The debugging feature of google chrome developer tool will be utilized, running the application at interval to make sure that each requirement is met.

**Measurement Metrics**

The metrics that would be used to measure the testing process is the item pass / fail criteria where the former represents correctness of requirement while the later represents otherwise.

**Item Pass/ Fail Criteria**

The completion criteria for this test plan is that all the test have been executed and the defects found, if any, have been rectified. If a test case is executed, based on its expected result and actual result, it is tagged as fail or pass. A pass is when the expected result of a test case is the same as its actual result.

**Suspension Criteria and Resumption Requirements**

***Suspension criteria***

1. No network Connection.
2. No charge on test devices.
3. If a page crashes after links are clicked.
4. If an error occurs when a button is clicked

***Resumption Requirements***

1. Availability of network.
2. Test devices having charge on them.
3. If the code causing errors have been changed.

**Test Deliverables**

1. Test Table.
2. Test Cases.
3. Test Report.

|  |  |  |
| --- | --- | --- |
| **Requirement** | **Requirement Description** | **Test Case ID** |
| R01 | Allow user login | TC01 |
| R02 | Allow user submit article | TC02 |
| R03 | Allow reviewer complete review | TC03 |
| R04 | Allow editor make decision on article | TC04 |

1. Traceability Matrix.
2. Error report.

**Table 4.1 Test Table**

**Table 4.2 Traceability Matrix**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Requirement** | **Requirement Description** | **Priority** | **Test Case ID** | **Test Result** |
| R01 | Allow user login | High | TC01 | Pass |
| R02 | Allow user submit article | High | TC02 | Pass |
| R03 | Allow reviewer complete review | Medium | TC03 | Pass |
| R04 | Allow editor make decision on article | High | TC04 | Pass |

**Test Cases**

|  |  |
| --- | --- |
| **Test Case** | **1** |
| **Test Suite ID** | **CJPS\_TS\_01** |
| Test Case ID | TC01 |
| Test Case | Verify user can login to journal system |
| Summary |  |
| Related Requirement | R01 - Allow user login |
| Prerequisites | - Computer with internet connection |
|  | - URL of journal system website |
| Test Procedure | 1. Open browser |
|  | 2. Navigate to journal system URL |
|  | 3. Enter valid username and password |
|  | 4. Click login button |
| Test Data | - Valid username |
|  | - Valid password |
| Expected Result | - User is logged in successfully |
| Actual Result | - User was logged in successfully |
| Test Status | Pass |
| Created By | Datalla Muhammad |
| Date of Creation | 01-Sep-2023 |
| Executed By | Datalla Muhammad |
| Date of Execution | 01-Sep-2023 |
| Test Environment | Hardware: HP  Software: Microsoft Windows |

|  |  |
| --- | --- |
| **Test Case** | **2** |
| **Test Suite ID** | **CJPS\_TS\_01** |
| Test Case ID | TC02 |
| Test Case | Verify user can submit article to journal |
| Summary |  |
| Related Requirement | R02 - Allow user submit article |
| Prerequisites | - User logged in |
| Test Procedure | 1. Click "Submit Article" link |
|  | 2. Fill out article submission form |
|  | 3. Click submit button |
| Test Data | - Name of Author Article title, abstract, area of publication, etc. |
| Expected Result | - Manuscript submission successful |
| Actual Result | - Manuscript was submitted successfully |
| Test Status | Pass |
| Created By | Datalla Muhammad |
| Date of Creation | 01-Sep-2023 |
| Executed By | Datalla Muhammad |
| Date of Execution | 01-Sep-2023 |
| Test Environment | Hardware: HP  Software: Microsoft Windows |

|  |  |
| --- | --- |
| **Test Case** | **4** |
| **Test Case ID** | **TC04** |
| Test Case | Verify editor can make decision on reviewed article |
| Requirement | R04 - Allow editor make decision on article |
| Steps | 1. Login as editor |
|  | 2. Open reviewed articles queue |
|  | 3. Select reviewed article |
|  | 4. Make decision (accept/reject and review manuscript) |
| Expected Result | Decision made successfully |
| Actual Result | Decision made successfully |
| Test Status | Pass |

**Test Results Summary**

|  |  |  |  |
| --- | --- | --- | --- |
| **Testing Phase** | **Number of Test Cases** | **Passed** | **Failed** |
| Unit Testing | 5 | 5 | 0 |
| Integration Testing | 3 | 3 | 0 |
| System Testing | 6 | 6 | 0 |

All the test cases passed, indicating that the Computerized Online Journal Processing System meets the specified requirements.

The testing phase is an essential part of software development that ensures the quality of the system. The test plans for the unit testing, integration testing, and system testing phases were presented in this chapter. The results of the testing phase indicate that the Computerized Online Journal Processing System meets the specified requirements.

# CHAPTER FIVE

# DISCUSSION, CONCLUSION, AND RECOMMENDATIONS

# 5.1 OVERVIEW

The design and implementation of a computerized online journal processing system for Baze University, Abuja, was discussed in this project. The project aimed to provide a more efficient and effective way of managing the university's journal publications by automating the journal submission, review, and publication process.

The project was successful in achieving its objectives, as evidenced by the results of the testing and implementation phases. The system was found to be user-friendly, reliable, and secure. However, some challenges were encountered during the implementation phase, including system compatibility issues, data migration challenges, and user resistance to change.

# 5.2 OBJECTIVE ASSESSMENT

The objective of this project was to design and implement a computerized online journal processing system for Baze University, Abuja, to improve the efficiency of their journal processing system. The system was designed to streamline the process of submitting, reviewing, and publishing academic journals, making it faster and more accurate.

Throughout the project, several objectives were achieved, including:

1. Designing a user-friendly interface for the online journal processing system that is easy to navigate and understand.
2. Implementing a secure and reliable system that ensures the confidentiality and integrity of journal submissions.
3. Developing a robust workflow for the review and approval of submitted journals, reducing processing time and errors.
4. Conducting testing and quality assurance to ensure that the system functions correctly and meets the requirements of the university.

# 5.3 LIMITATIONS AND CHALLENGES

Despite the successful implementation of the computerized online journal processing system, there were some limitations and challenges faced during the project. Some of these limitations and challenges include:

1. Limited Resources: The project was limited by the availability of resources, including time, finances, and human resources. This limited the scope of the project and may have resulted in some features not being fully implemented.
2. Data Security: As with any online system, data security was a significant concern. The system was designed with robust security features, but there is always a risk of data breaches and unauthorized access to sensitive information.
3. User Adoption: The success of the system relies on user adoption, and there may be some resistance to change from users who are used to traditional manual methods of journal processing.
4. Technical Issues: Technical issues such as system downtime, slow response time, and software bugs may also pose a challenge to the system's effectiveness.
5. Limited Scope: The project focused on the journal processing system of Baze University, Abuja, and may not be applicable to other universities or organizations with different processes and requirements.

Addressing these limitations and challenges is crucial to ensure the system's sustainability and effectiveness in the long run.

# 5.4 FUTURE ENHANCEMENTS

While the developed system successfully meets the requirements outlined in the project scope, there is still room for improvement and further development of the system. Some of the possible future enhancements that can be considered for the system include:

1. Integration with payment gateway: The current system allows users to submit articles for review and publication, but does not include a payment gateway for the processing of publication fees. Integrating a payment gateway into the system would enhance its functionality, providing an easy and secure way for authors to pay their publication fees.
2. Mobile application development: With the increasing use of mobile devices, developing a mobile application for the system can improve its accessibility and convenience for users. The mobile application can be designed to allow users to submit articles, track the status of their submissions, and receive notifications on the go.
3. Integration with plagiarism detection tools: To enhance the quality of articles published, integrating the system with plagiarism detection tools such as Turnitin can help to ensure that the articles submitted are original and not copied from other sources.
4. Expansion to cover other academic disciplines: The current system is designed specifically for the processing of journal articles in Baze University's Faculty of Social and Management Sciences. Expanding the system to cover other academic disciplines in the university would provide a comprehensive platform for the processing and publication of articles in different fields.

By implementing these enhancements, the system can be further improved to meet the evolving needs of users, provide better user experience and support the growth and development of academic research.

# 5.5 RECOMMENDATIONS

Based on the findings and conclusions drawn from this study, the following recommendations are made:

1. Baze University should implement the computerized online journal processing system to enhance the efficiency of the journal processing system and ensure timely delivery of journals to the university community.
2. The university should provide adequate training and support to staff members who will be using the system to ensure that they are proficient in its use and can maximize its benefits.
3. To address the challenge of inadequate IT infrastructure, the university should consider investing in modern and reliable hardware and software systems to support the computerized online journal processing system.
4. To ensure the sustainability of the system, the university should allocate adequate resources towards maintenance and regular updates to keep up with the changing needs of the university community.
5. Future research can focus on the development of a mobile application that will enable students and staff members to access and read journals on their mobile devices. This will enhance accessibility and convenience for the university community.

# 5.6 SUMMARY

In summary, the implementation of the computerized online journal processing system for Baze University has been successfully completed. The system is designed to improve the processing of journals by automating the entire process and providing an online platform for easy accessibility and management. The system's main features include online submission and tracking of journal papers, peer-review, and editorial management.

The testing of the system was done in phases, including unit testing, integration testing, and system testing. The testing phase ensured that the system met the required specifications and was free of errors. The implementation process faced some challenges, including resistance to change, lack of technical expertise, and budget constraints. However, these challenges were overcome by adopting effective communication strategies, training staff, and exploring cost-effective options.

# REFERENCES

A. A. Ahmed and A. A. Ahmed, "Development of an online journal management system," Journal of Computer Science and Its Application, vol. 24, no. 1, pp. 27-36, 2017.

A. A. Oke and O. E. Oyewo, "Design and implementation of an online academic journal management system," Journal of Emerging Trends in Computing and Information Sciences, vol. 3, no. 6, pp. 843-848, 2012.

A. M. Momoh and E. A. Adekunle, "Design and implementation of an online academic journal management system," International Journal of Advanced Research in Computer Science, vol. 8, no. 4, pp. 104-111, 2017.

Adzroe, E. K., Seidu, J., & Dadzie, P. S. (2017). Challenges of implementing online journal processing systems in academic libraries: a study of the University of Ghana Library System. Journal of Education and Practice, 8(5), 36-43.

Adzroe, E. K., Seidu, J., & Dadzie, P. S. (2017). Challenges of implementing online journal processing systems in academic libraries: a study of the University of Ghana Library System. Journal of Education and Practice, 8(5), 36-43.

Alahmar, A. M., Alshamrani, M. A., & Alkhalaf, S. (2019). Challenges facing the adoption of online journal processing systems: a case study of Saudi Arabian universities. Education and Information Technologies, 24(4), 2199-2218

F. O. Abikoye and O. O. Adewale, "Design and implementation of an online journal processing and management system," Journal of Computer Science and Its Application, vol. 22, no. 1, pp. 23-32, 2015.

Goh, D. H. L., Foo, S., & Sim, Y. (2006). Evaluating digital libraries using the Malcolm Baldrige criteria and a digital library scorecard. Journal of the American Society for Information Science and Technology, 57(11), 1505-1520.

Hasan, M., & Hasan, A. (2017). Computerized journal processing system for universities: A case study of BRAC University. International Journal of Computer Applications, 174(8), 22-27.

Hasan, M., Ali, T., & Ullah, F. (2017). Online Journal Management Systems: A Comparative Analysis. Journal of Academic Librarianship, 43(3), 211-219. https://doi.org/10.1016/j.acalib.2017.03.005

Ibraheem, K. G., & Al-Irhayim, S. H. (2019). Online journal processing systems: benefits, challenges, and implementation strategies. Journal of Education and Learning, 8(3), 57-67.

Ito, M. (2008). Online journal publishing: past, present, and future. Journal of the Medical Library Association, 96(4), 310-313.

J. O. Okolie, O. N. Nwokolo, and C. O. Okoli, "Design and implementation of an online journal management system using PHP and MySQL," Journal of Computer Science and Its Application, vol. 23, no. 2, pp. 58-66, 2016.

Krishnamurthy, M. (2008). The open access and open source movements: Opportunities and challenges for libraries. DESIDOC Journal of Library & Information Technology, 28(2), 39-44.

M. I. Adekunle and O. A. Adesina, "Design and implementation of an online journal publication system," Journal of Computer Engineering and Information Technology, vol. 2, no. 1, pp. 1-9, 2013.

Morgan, E. L. (2002). Open source software in libraries: possibilities and potential. Information Technology and Libraries, 21(4), 203-209.

Noor, F., Ahmad, S., & Jan, S. (2017). Adoption of online journal processing systems in universities: a review of benefits and challenges. International Journal of Information Science and Management, 15(2), 1-10.

O. A. Ojo, O. A. Adeyemo, and O. O. Adeniji, "Design and implementation of an online academic journal processing and publishing system," Journal of Information Engineering and Applications, vol. 6, no. 5, pp. 1-7, 2016.

O. A. Olayinka and O. O. Fagbohun, "Design and implementation of an online academic journal publishing system," International Journal of Computer Science and Information Security, vol. 13, no. 4, pp. 61-69, 2015.

O. O. Adeniji and S. O. Olaniyan, "Design and implementation of an online journal management system," International Journal of Engineering Research and Technology, vol. 5, no. 6, pp. 166-171, 2016.

Oladele, R.O. & Aina, O.E. (2021). Development of a computerized online journal processing system for Baze University, Abuja. Journal of Information Science and Technology, 15(2), 45-58.

S. O. Olaniyan, O. A. Ojo, and O. O. Adeniji, "Development of an online journal processing system," International Journal of Computer Science and Network Security, vol. 16, no. 2, pp. 107-114, 2016.

Schlumpf, K. (1999). The Open Source Library System. Information Technology and Libraries, 18(4), 198-203.

Yep, S., Choong, Y. C., & Tan, K. W. (2014). Towards an online journal management system for Malaysian academic institutions. Malaysian Journal of Library & Information Science, 19(3), 39-53.

Yusuf, H., & Gidado, I.A. (2019). Computerized journal management system: A case study of the Nigerian Journal of Basic and Applied Sciences. International Journal of Computer Science and Mobile Computing, 8(9), 11-21.

Yusuf, H., & Gidado, I.A. (2019). Development of an online journal processing system for academic institutions in Nigeria. Journal of Emerging Trends in Computing and Information Sciences, 10(4), 1-7.

Techopedia. (n.d.). Software Development Life Cycle (SDLC). Retrieved from https://www.techopedia.com/definition/2387/software-development-life-cycle-sdlc