

**"Archivez: A Multiplatform Research Paper Repository
Management System with Real-Time Review and Evaluation for
Baco Catholic, Inc."**

A non-thesis Project
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College of Computer Studies
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In Partial Fulfillment
of the Requirements for the Course of
APPLICATION DEVELOPMENT AND EMERGING TECHNOLOGY

by

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CHAPTER I INTRODUCTION

In this chapter, researchers will thoroughly examine the fundamental aspects of the project, thereby establishing a solid basis for the system that lies ahead.

Project Context

In the ever-evolving landscape of digital content, the need for a comprehensive and accessible repository system is increasingly vital. A digital repository is a mechanism for managing and storing digital content. Repositories can be subject or institutional in their focus. Putting content into an institutional repository enables staff and institutions to manage and preserve it, and therefore derive maximum value from it. A repository can support research, learning, and administrative processes. Repositories use open standards to ensure that the content they contain is accessible in that it can be searched and retrieved for later use. The use of these agreed international standards allows mechanisms to be set up which import, export, identify, store and retrieve the digital content within the repository. A repository system can be a shop window for stakeholders of the university. Its function is to store or catalog scholarly content such as research papers and journal articles. It can also be intended

to collect and preserve the research output of universities in digital form such as theses and special problems. Furthermore, Schopf et al. (2019) observed that in a research university, there is a need for access to scholarly works since scientific communities require access to scientific information for research and teaching activities. A thesis repository system provides several opportunities for advanced learning because it can aid students in widening their interests in research. When research outputs materials availability is limited due to inaccessibility, this can lead to wastage of knowledge in the academic research community. For instance, the quality research project output of students suddenly ends when not digitally archived and shared to future researchers in a certain institution. Additionally, the efforts and ideas poured into the research work stops when it is not adequately shared to the online community of researchers as an additional knowledge realm for future researchers to collaborate and innovate.

As the number of distinct repositories that are managed by individual HEIs increases, the complexity of finding relevant research materials/ideas from widely dispersed online repositories also increases. The chances to collaborate with a certain researcher become slimmer to

nothing at all. Using the vastness of the web to obtain potential research areas from varied online digital repositories, a novice researcher can hardly locate relevant research ideas and to directly connect to other researchers with the same interests. Conversely, a readily available, publicly accessible online community of digital repositories offers immense advantages to novice researchers. It provides them with a fertile ground to browse, explore, and extract resource materials and ideas to formulate and advance their research projects with ease. Such an ecosystem not only promotes the dissemination of knowledge but also fosters collaboration, innovation, and a sense of connectedness among researchers, including high school students and alumni. By implementing a digital repository within a high school context, the aim is to empower the school and its stakeholders to efficiently manage and utilize digital resources. Such a repository serves as an invaluable resource, supporting diverse aspects of the educational ecosystem, including research, learning, and administrative processes. The repository's adoption of open standards ensures that the content it houses remains accessible, searchable, and retrievable, thus enabling its sustained use. Its primary function is to efficiently store and catalog scholarly content, such as research papers and journal articles

produced by students and faculty. Moreover, it has the capacity to collect, curate, and preserve the school's research output in digital form, which includes theses, special projects, and other scholarly endeavors. In light of these considerations, the development of a multiplatform research paper repository management system for high schools is a project of immense importance, as it bridges the gap in the educational landscape by providing an inclusive, accessible, and collaborative platform for research and scholarly endeavors within high school communities.

Objectives

The study aims to design, develop, and implement a Multiplatform Research Repository Management System tailored to the needs of high school and senior high students. This system aims to address the challenges students face in conducting research, creating well-structured theses, and archiving research papers, while fostering a culture of academic integrity.

Specifically, this study aims to:

- Allow users, including researchers and students, to submit research papers and theses to the system.

- Provide tools for document management, including metadata entry (e.g., title, authors, keywords).
- Educate users on proper research methodologies, citation practices, and plagiarism awareness through a resource library.
- Offer guidance and resources that help students and researchers navigate the intricacies of scholarly work.
- Create an environment for collaboration and knowledge sharing among users such as students, alumni, and teachers.
- Facilitate interactions between users who share common research interests, thereby enhancing the spirit of community-based learning.
- Create a user-friendly interface to simplify the submission process of research papers, making it accessible and easy to both computer literate and non-literate users.
- Ensure that the Research Repository Management System is accessible across multiple platforms, including web browsers, mobile applications, and other devices.

Scope and Limitations

This study is limited to the aspects and factors of creating, designing, and implementing a Multiplatform Research Repository Management System. There are three users in the system: the students, the teachers and Research Instructor/Admin. The student can view and post their research, and the teacher can comment on the posted research. The system's design emphasizes multi-platform accessibility, ensuring that users can seamlessly engage with it through web browsers, mobile applications, and various devices. Furthermore, the study includes features related to efficient document management, encompassing metadata entry, and document tracking. The study does not delve deeply into the management of large volumes of data, which could present a limitation in scenarios with substantial document uploads and interactions. Understanding these scope and limitations is essential for defining the project's boundaries and focus areas.

Definition of terms

To enhance clarity and facilitate comprehension, the following terminology is conceptually and operationally elucidated:

Theses and Research - the documents that will be uploaded, stored, collected, viewed, searched, and evaluated in the researchers' system.

Repository - the model that is implemented or used into the researchers' system that can capture, store, index, preserve and disseminate the school's research documents.

Management System - serves as the backbone for efficiently handling and facilitating the control and administration of the digital repository.

Multiplatform - refers to the capability of the researchers' system to ensure that it is accessible and usable by the users who may have different types of devices and operating systems.

Digital Content - refers to the electronic information, documents and resources that are created, uploaded, collected, and managed within the research paper repository system.

Alumni - serve as mentors or collaborators in the system and provide guidance on current high school students research projects.

Students - are both contributors and beneficiaries of the research paper repository system. The system supports their learning, research, collaboration, and academic development.

Scholarly Content - refers to the academic and research materials that are created and contributed in the research paper repository system.

Metadata - is essential for the effective management, organization, retrieval, and understanding of the scholarly content within the research paper repository.

Novice Researchers - are individuals which are mainly the students, they are new to the field of research and are just beginning to explore and engage in research activities, in other words they are the primary users of the research repository management system.

CHAPTER II REQUIREMENTS SPECIFICATION

This chapter outlines the specific requirements, features, and functionalities significant to the researchers' system development.

Hardware Requirements

Hardware Requirements refer to the representation of the hardware used by the system. Table 1 below presents the hardware requirements to be used by the project.

Hardware	Functions	Specifications		Unit
		Minimum	Recommended	
Processor (CPU)	It is responsible for executing instructions, performing calculations, managing data, and coordinating the activities of other hardware components to ensure the proper functioning of our computer system.	Intel Core i3	Intel Core i5 or higher version	1
Memory (RAM)	A temporary memory storage for the system. It acts as a high-speed, volatile storage medium that supports the	4GB	8GB or higher	2

	immediate needs of the management system, contributing significantly to the systems overall performance and responsiveness.			
Storage	Acts as the persistent memory where the system's information is saved and contributed to the smooth operation of the system.	128GB SSD	256GB or higher	3
Modem	It enables remote access to the system. It is used by the developers because a stable and low-latency connection is essential to provide a fast and reliable network connection for the system.	20 Mbps	35 Mbps or higher	4
Android Smartphone	It used by the users to easily access the system and to test and try out the responsiveness and compatibility of the system enhancing its efficiency and flexibility.			5

Table 1: Hardware Requirements

Software Requirements

Software Specifications refer to the representation of the software used by the system. Table 2 below presents the software specifications to be used by the project.

Software used	Description
Windows 10 and Windows 11	Are versions of the Windows operating system that will be use for the researcher' system.
Laragon	A powerful development environment and server stack for building and managing the researchers' system. Version 7 to 8.2 is required.
phpMyAdmin	The latest version (currently 5.2.1) is required to be used for supporting a wide range of operations and managing the system's MySQL databases.
MySQL	Version 8.0.30 or higher is required for storing and managing the system's structured data.
Visual Studio Code	A free and powerful lightweight code editor providing support to the researchers' system by conducting development operations like debugging, task running, and version control. The required version is 1.83.1 or higher.
CodeIgniter 4	An open-source PHP framework. Version 4 is the required version to develop the researchers' system.
Bootstrap 5	Are ready-made web design composed of HTML and CSS along with other optional

	JavaScript plugins for easy customization of the system's UI.
Web browsers	Samples are Google chrome, Firefox, and Microsoft edge, etc. These are used to enable the system's access to necessary web-based contents and manage interactions with online services and resources.

Table 2: Software Requirements

Functional Requirements

This part enumerates the operations and features that the system must perform. Table 3 represents the descriptions of data requirements, process requirements, and output requirements.

ID NO	Requirement Description
FR1	Data Requirements
Admin/Research Coordinator Account	
1.1	The admin/research coordinator should be able to register with their name, email, and password.
1.2	The admin/research coordinator should be able to authenticate and validate their account using the email address they provided before logging into their account securely.
1.3	The admin/research coordinator should be able to reset their password if forgotten using the registered email id that they provided during their first registration.

1.4	The admin must be able to view, add, and edit their user profiles and information.
1.5	The admin must be able to evaluate the research paper and give comments and suggestions about the research papers of the students.
1.6	The admin should be able to manage the user accounts, roles, and access control, ensuring a secure and orderly environment.
Research Instructor/Teacher Account	
1.7	The research instructor should be able to register with their name, email, and password.
1.8	The research instructor should be able to authenticate and validate their account using the email address they provided before logging into their account securely.
1.9	The research instructor should be able to reset their password if forgotten using the registered email id that they provided during their first registration.
2.0	The research instructor must be able to view, add, and edit their user profiles and information.
2.1	The research instructor must be able to write comments and give feedback about research materials submitted by the students for approval and evaluation.
2.2	The research instructor must be able to evaluate the students' research paper by giving comments and suggestions.
2.3	The research instructor must be able to update the status of the students' research paper, if it already had been approved and submitted to the admin for further evaluation before it is published into the system.
Student Account	

2.4	The student should be able to register with their name, email, and password.
2.5	The student should be able to authenticate and validate their account using the email address they provided before logging into their account securely.
2.6	The student should be able to reset their password if forgotten using the registered email id that they provided during their first registration.
2.7	The student must be able to view, add, and edit their user profiles and information.
2.8	The student should be able to upload their research papers and add or write the metadata after completion of upload for research items including the title, author, keywords, and publication date.
2.9	The student must be able to specify to which research instructor is in charge of the evaluation of their uploaded research paper.
3.0	The student should be able to assess the quality and relevance of research papers allowing other students to have the option to upvote recommended research papers to provide other users with personalized recommendations and influence recommendations.
3.1	The student should be able to easily add citations in various citation styles (e.g., APA, MLA, IEEE) for the papers they cite or references.
3.2	The student should be able to use a bookmark function to save, efficiently manage, and revisit the specific research papers of interest.
FR2	Process Requirements
Admin Account	

3.3	The system must be able to receive research papers that were approved by the research instructors.
3.4	The system must be able to post the students research paper into the system if it already has been approved.
3.5	The system should have advanced research browsing and search function should enable all the users to efficiently browse, and search documents based on the search algorithm that considers various criteria including keywords, topics, authors, and dates.
3.6	The system should be able to allow admin/research coordinator to view metadata for research items such as its title, author, keywords, and publication date.
Research Instructor/Teacher Account	
3.7	The system must be able to receive and have access to review the research papers submitted by the students.
3.8	The system can view and track the status of the students' research paper, if it already had been approved and submitted to the admin for further evaluation before it is published into the system.
3.9	The system should have advanced research browsing and search function should enable all the users to efficiently browse, and search documents based on the search algorithm that considers various criteria including keywords, topics, authors, and dates.
4.0	The system should be able to allow research instructors to view metadata for research items such as its title, author, keywords, and publication date.
Student Account	
4.1	The system should be able to store the students research papers along with its metadata.

4.2	The system should be able to view research papers uploaded or published in the system.
4.3	The system should be able to show the status of their uploaded documents, if they already had been evaluated, approved, and submitted by the research instructor to the admin or research coordinator for further evaluation before it is published into the system.
4.4	The system should have advanced research browsing and search function should enable all the users to efficiently browse, and search documents based on the search algorithm that considers various criteria including keywords, topics, authors, and dates.
4.5	The system should be able to allow students to view metadata for research items such as its title, author, keywords, and publication date.
FR3	Output Requirements
Admin Account	
4.6	The system must provide the system's analytics and visual representation.
4.7	The system must track students log document uploads, and engagement in the system.
Research Instructor/Teacher Account	
4.8	The system must provide the system's analytics and visual representation.
4.9	The system must track students log document uploads, and engagement in the system.
Student Account	
5.0	The system must access and view relevant data analytics related to their activities and contributions.

Table 3: Functional Requirements

Non-Functional Requirements

These are requirements that pertain to behavior properties that a system must have. It defines how a system is supposed to be or its system properties. It contains the following:

Operational Requirement

Table 4 represents the requirement description that will specify the operating environment(s) in which the system must perform and how these might change over time.

ID No.	Requirement Description
1.1	The system should be able to operate seamlessly on various web browsers and devices, including desktops, tablets, and smartphones.
1.2	The system should be able to provide clear and user-friendly documentation or guidance to help users navigate and utilize its features effectively.
1.3	The system must log user activities, including document uploads and checks for auditing and monitoring purposes.
1.4	The system must adhere to data privacy regulations and maintain user data confidentiality.
1.5	The system must be able to enhance the user-friendliness of the system's interface, making it more accessible and appealing to a broad range of users.
1.6	The system's code and interface should comply with the web development standards and best

	practices to ensure consistent operation across various platforms.
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Table 4: Operational Requirement

Performance Requirement

Table 5 represents the requirement description that will emphasize the response time, capacity, and reliability of the system.

ID No.	Requirement Description
1.7	The system's web pages should be able to load within 2 seconds to provide rapid response times for previews, and when teachers review and comment on student research papers.
1.8	The system must be able to support at least 1000 concurrent users without significant performance degradation.
1.9	Search queries should be executed within 3 seconds, even when dealing with a large dataset of documents.
2.0	The system must maintain a 99.9% uptime percentage.
2.1	Users should be able to upload/download documents based on the internet speed and size of the file. Example is a 1MB file will be uploaded/downloaded per second if the internet speed is 5Mbps.

Table 5: Performance Requirement

Security Requirement

Table 6 represents the requirement description that will address issues with security, such as who has access to the system's data and must have the ability to protect data from disruption or data loss.

ID No.	Requirement Description
2.2	User accounts must be secured with strong password requirements by using regular expression and data validation.
2.3	Encryption used is Hash type which involves message authentication. Data in transit and at rest should be encrypted to protect against unauthorized access.
2.4	Role-based access control must be implemented to ensure that users have appropriate permissions and access to system features.
2.5	Data must be protected from unauthorized modifications or tampering, only the intended users may access the protected data.
2.6	The system must comply with relevant data privacy laws and regulations.

Table 6: Security Requirement

Chapter III

DESIGN AND DEVELOPMENT METHODOLOGIES

System Design

The developers of the system crafted a thorough plan in order to develop the Archivez Research Repository System. The students can use this system for easy access to the centralized database of resources and will serve as a guide for other students who are just starting to make their own research papers. On the other hand, Research Instructors benefit from monitoring and feedback processes guiding students while also ensuring consistency in resource sharing and training materials while Research coordinators gain centralized control over data management, quality assurance, and reporting, leading to better compliance and decision-making.

Database Design

The design of the database for the Archivez: Research Repository Management System, is a critical aspect of application development. This extensive database covers a wide range of entities in the research environment, giving users crucial knowledge about current research groups and assisting them in making the most out of the application. Tables are defined by the

database design, which includes fields that have similar data types and descriptions. This process carefully arranges, verifies, and extracts the most important information from designated data phrases. Additionally, it deftly illustrates the connections between different entities, guaranteeing a unified framework that makes it easier to store, retrieve, and organize research materials and related data.

The developers used MySQL RDBMS for the database design. With MySQL, it organizes information and facilitates the creation and management of relationships between different tables, for handling complex data structures and ensuring data coherence across various parts of the Archivez: Research Repository Management System's database.

Field Name	Data Type	Size	Default	Description
id	int		Auto_Increment	User ID (PK)
fullname	varchar	500	Not Null	User Fullname
idnumber	varchar	255	Not Null	User Id Number
department	varchar	255	Not Null	User Department
gradelevel	varchar	255	Null	User Grade Level
section	varchar	255	Null	User Section

usertype	varchar	500	Not Null	User Usertype
email	varchar	500	Not Null	User Email
password	varchar	500	Not Null	User Password
created_at	datetime		Current_Time stamp	Time Created
status	varchar	255	Not Null	User Status
uniid	varchar	255	Not Null	User Unique Identifier
activation_date	datetime		Not Null	Activation Date

Table 7: Fields for users

Table 7 above contains the field name, data type, size, default, and description of the field in the Users table. Here, the id is the Primary Key (PK).

Field Name	Data Type	Size	Default	Description
id	int		Auto_Increment	Research ID (PK)
researchtitle	text		Not Null	Research Title
submittedto	varchar	255	Not Null	Research Instructor
subject	varchar	255	Not Null	Research Subject
author	varchar	255	Not Null	Research Author
idnumber	varchar	255	Not Null	Research Id Number
gradelevel	varchar	255	Not Null	Student Grade Level
section	varchar	255	Not Null	Student Section
uploaddate	datetime		Not Null	Research Upload date

abstract	text		Current_Time stamp	Research Abstract
keywords	text		Not Null	Research Keywords
citation	text		Not Null	Research Citation
status	varchar	255	Not Null	Research Status
file	varchar	255	Not Null	Research File
user_id	int		Not Null	Research User Id

Table 8: Fields for research

Table 8 above contains the field name, data type, size, default, and description of the field in the Research table. Here, the id is the Primary Key (PK).

Field Name	Data Type	Size	Default	Description
id	int		Auto_Increment	Comment ID (PK)
commentedby	text		Not Null	Commented by
comment	text	255	Not Null	Comment
research_id	int	255	Not Null	Research Id

Table 9: Fields for comments

Table 9 above contains the field name, data type, size, default, and description of the field in the Comments table. Here, the id is the Primary Key (PK).

Field Name	Data Type	Size	Default	Description
bookmark_id	int		Auto_Increment	Bookmark ID (PK)
researchtitle	text		Not Null	Research Title
submittedto	text		Not Null	Research Instructor
subject	text		Not Null	Research Subject
author	text		Not Null	Research Author
idnumber	text		Not Null	Research Id Number
gradelevel	text		Not Null	Student Grade Level
section	text		Not Null	Student Section
uploaddate	datetime		Not Null	Research Upload Date
abstract	text		Current_Time stamp	Research Abstract
keywords	text		Not Null	Research Keywords
citation	text		Not Null	Research Citation
status	text		Not Null	Research Status
file	varchar	255	Not Null	Research File
user_id	int		Not Null	User Id

Table 10: Fields for bookmark

Table 10 above contains the field name, data type, size, default, and description of the field in the Bookmark table. Here, the bookmark_id is the Primary Key (PK).

Field Name	Data Type	Size	Default	Description
archive_id	int		Auto_Increment	Research Id (PK)
researchtitle	text		Not Null	Research Title
submittedto	text		Not Null	Research Instructor
subject	text		Not Null	Research Subject
author	text		Not Null	Research Author
idnumber	text		Not Null	Research Id Number
gradelevel	text		Not Null	Student Grade Level
section	text		Not Null	Student Section
uploaddate	date		Not Null	Research Upload Date
abstract	text		Not Null	Research Abstract
keywords	text		Not Null	Research Keywords
file	varchar	255	Not Null	Research File
citation	text		Not Null	Research Citation
status	text		Not Null	Research Status
user_id	int		Not Null	User Id

Table 11: Fields for archives

Table 11 above contains the field name, data type, size, default, and description of the field in the Archives table. Here, the id is the Primary Key (PK).

Architectural Diagram/ Block Diagram

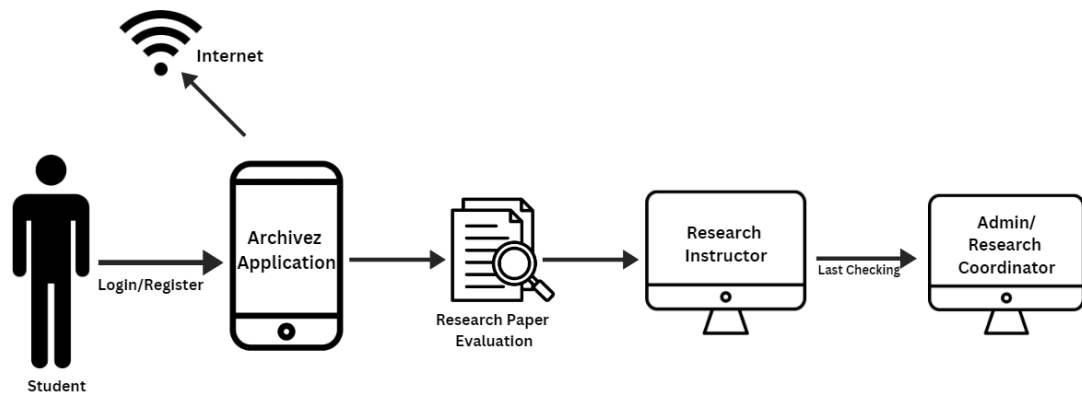


Figure 1. System Architecture of Archivez Website

Figure 1 shows the system architecture of the development of the Archivez Application. It illustrates the flow or process of how the system works. The diagram shows that the internet is necessary in order to access the website then the student can register and login into the system, afterwards the student can upload a research paper and submit it to the research instructor for evaluation and then proceed to the admin for the last checking of the research paper before it is published into the system.

Data Flow Diagram Level 0

This section shows the Data Flow Diagram Level 0 which is commonly known as an exploded view of the

context diagram that shows the detailed process of how the system works.

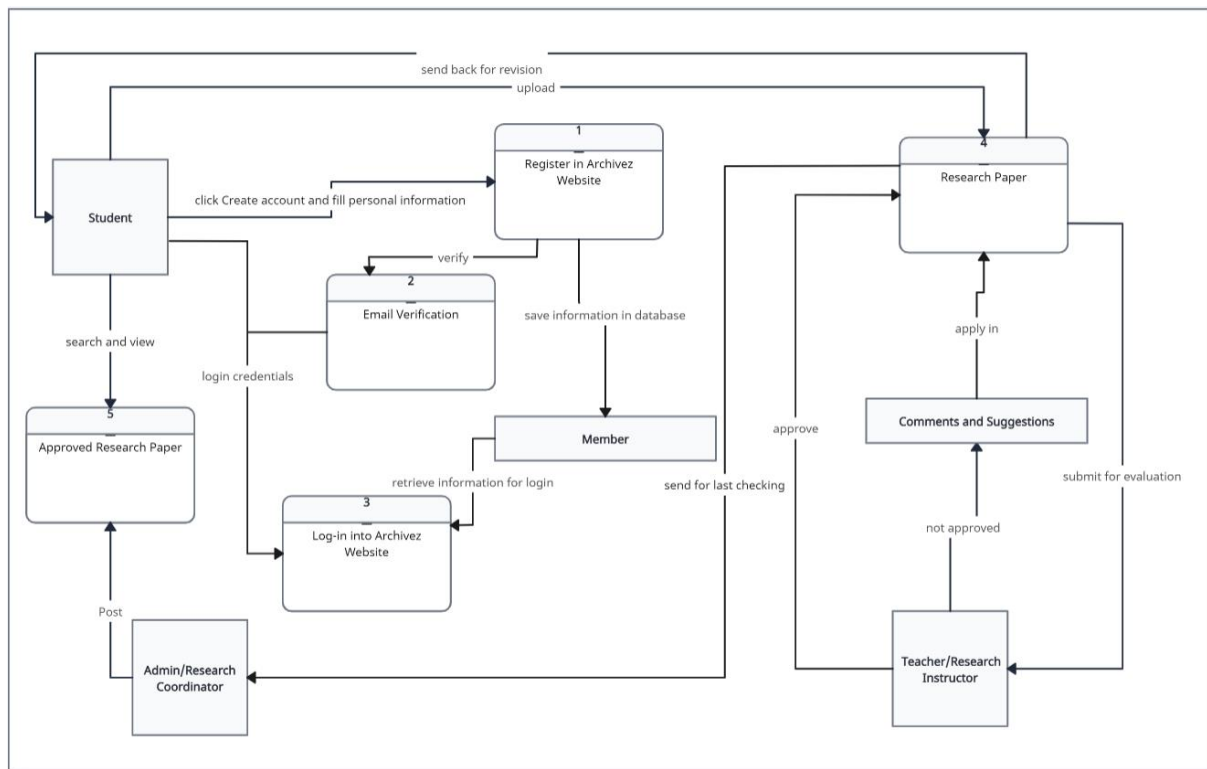


Figure 2. Data Flow Diagram Level 0

Figure 2 shows diagram 0 of the system. The student must register first and must verify their email before logging in securely. Then the student can now view and upload their research paper and submit it for evaluation. While the Admin and Instructor can evaluate the students research paper by giving comments and suggestions, but if approved the admin can directly post it in the system for other students to view and use as a guide.

UML Use-case Diagram

This section presents a use case diagram that provides a concise overview of the system's fundamental operations. The diagram visually illustrates the relationships among the system, admin/research coordinator, research instructors/teachers, and students. It serves as a graphical representation to elucidate how the system operates in the interactions among these actors. The diagram is a valuable tool for researchers, aiding in the identification and organization of the project's overall functionality.

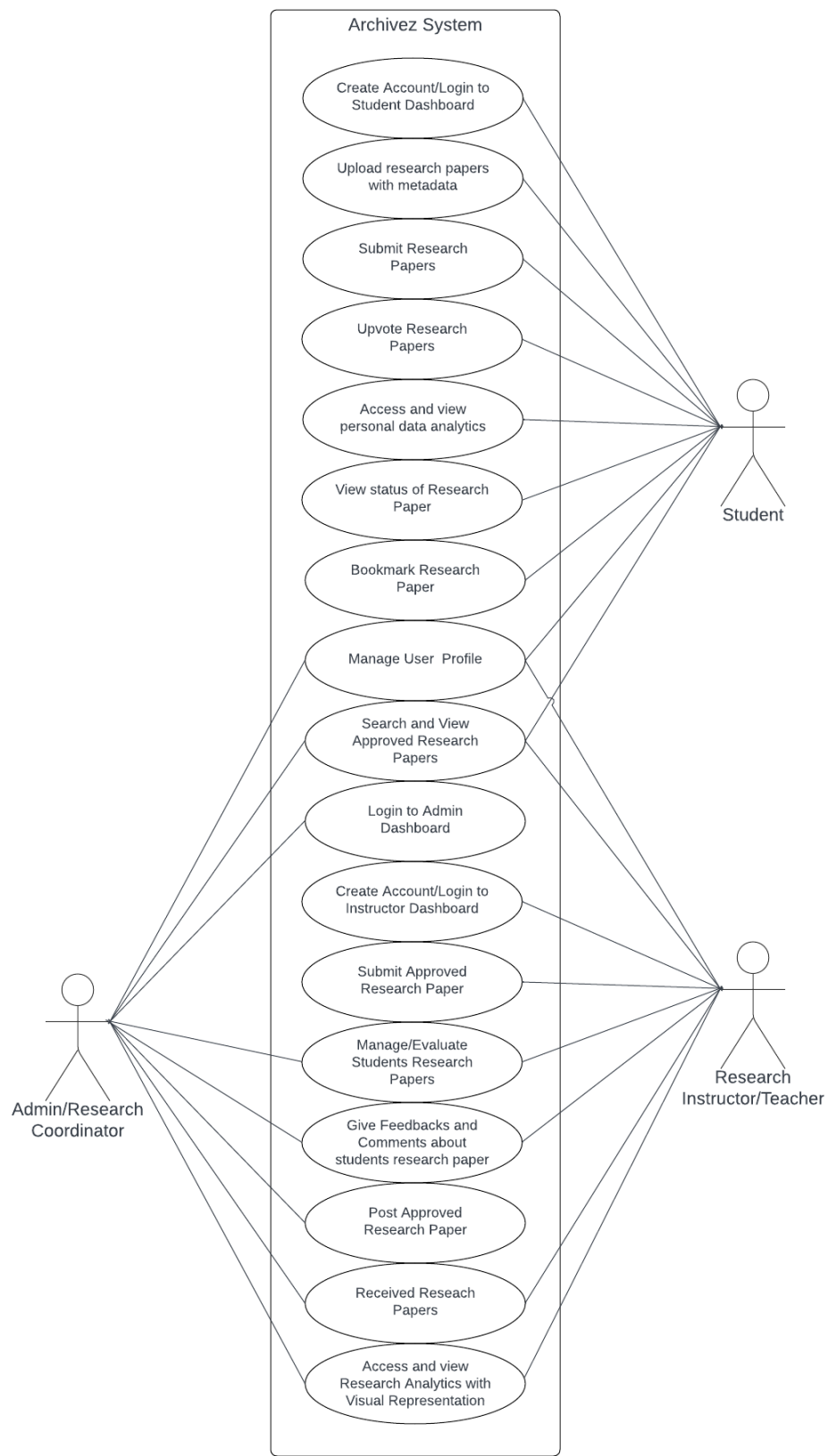


Figure 3. UML Use-case Diagram

Figure 3 illustrates the roles and functions of the Administrator, Research Instructor, and Student throughout the entire system process.

Sample Mock-up

A sample mock-up serves as a visual representation of a completed website, depicting its appearance and functionality. This tool is employed to further develop the design, pinpoint potential issues, and verify that the system aligns with the user's requirements and expectations. The interfaces for the system's students, research instructors/teachers, and admin/research coordinator are presented below.

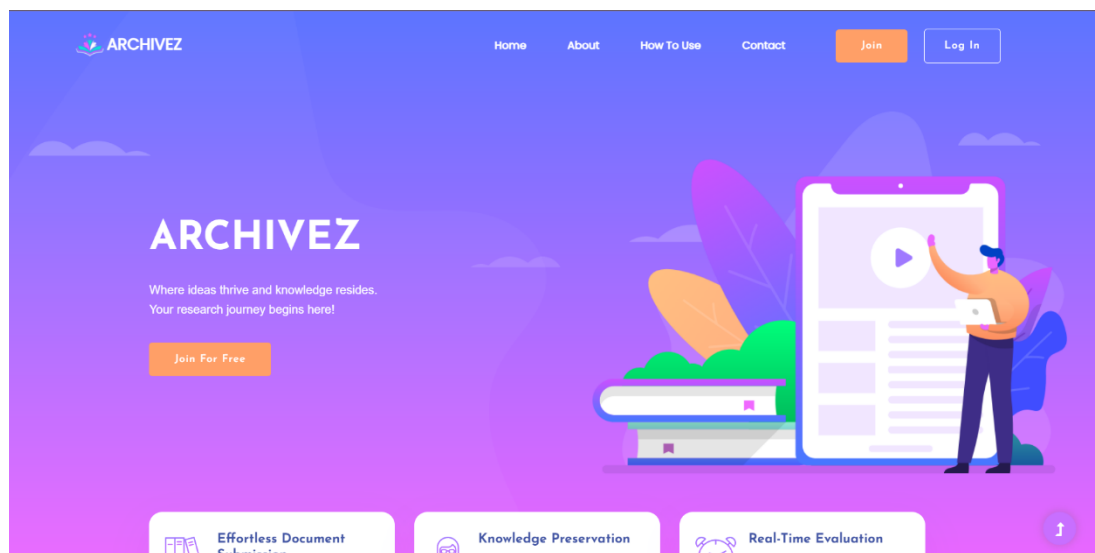


Figure 4. Student Interface

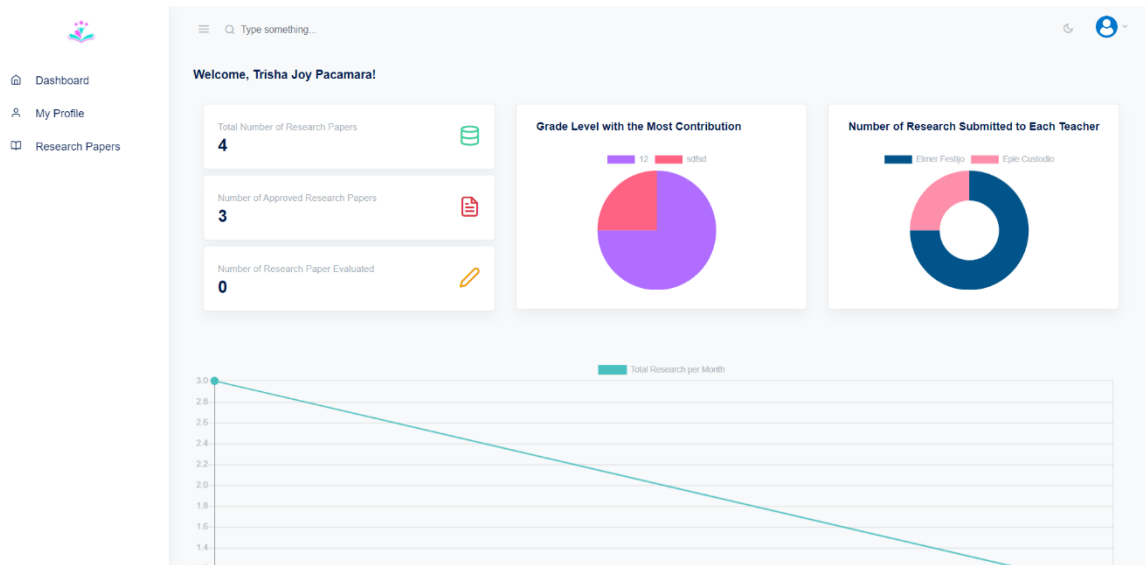


Figure 5. Instructor Interface

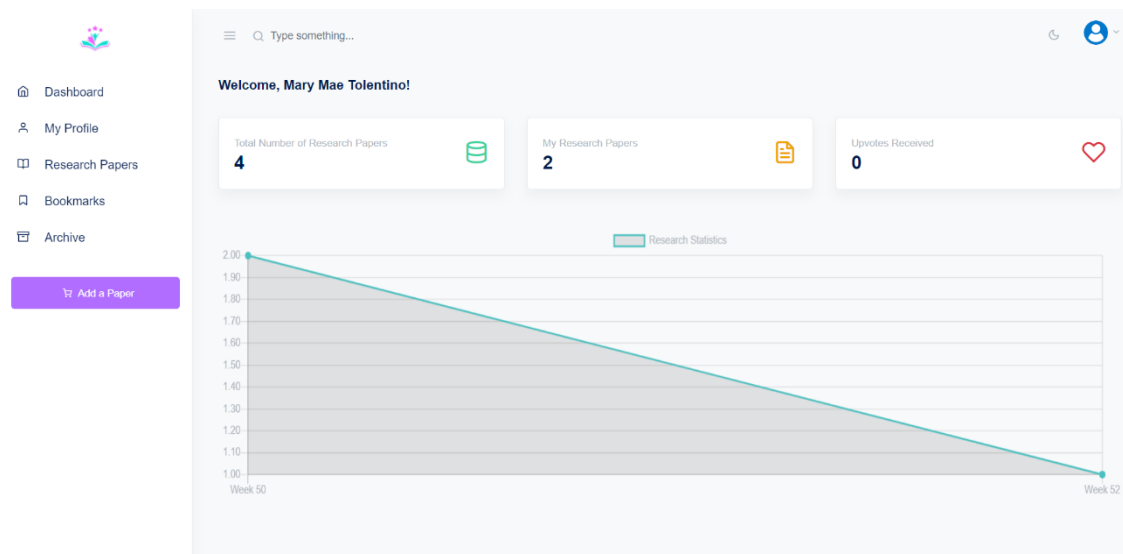


Figure 6. Admin Interface

Development Method

The development of the "Archivez: A Multiplatform Research Paper Repository Management System with Real-Time Review and Evaluation for Baco Catholic, Inc." will adhere to the System Development Life Cycle (SDLC) to ensure the development of an effective and functioning system. Through

the implementation of an Iterative and Incremental Model, this project allows continuous improvements throughout the development journey. The SDLC encompasses four phases: requirement collection, design and development, testing, and implementation. These sequential steps will be meticulously followed to ensure the successful creation of the system.

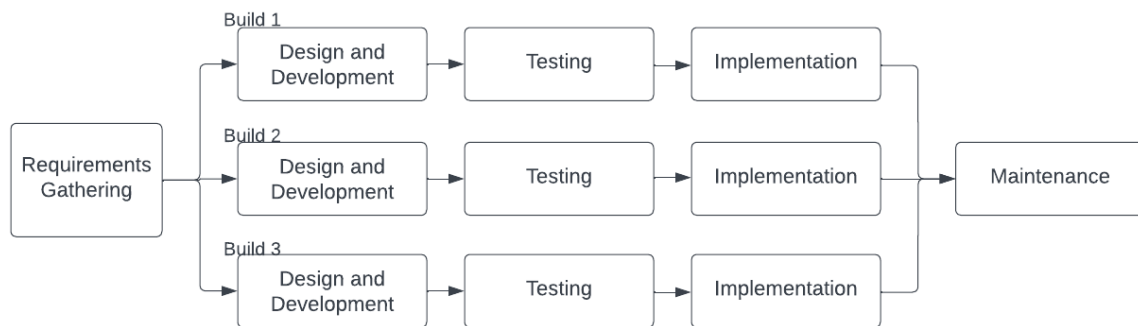


Figure 7. SDLC Iterative and Incremental Model

The research followed the following phase:

- 1. Planning.** During this phase, researchers conduct interviews and observations to address the identified problem. They establish the project's objectives and plans, forming the groundwork for generating the desired system output by the end of the study.
- 2. Requirements Gathering.** Researchers, in this phase, collect additional information and data requirements essential for system development. They define both the functional and non-functional requirements of the project.

- 3. Design.** This phase involves the initiation of hardware and software design based on user requirements. Researchers meticulously plan and implement a trial-and-error approach to ensure the user interface aligns with the desired output.
- 4. Development.** Researchers begin the coding process for the system's functionality in this phase, utilizing the Visual Studio Text Editor Application, PhpMyAdmin as the database administrator tool, with CodeIgniter 4 as the framework for the proposed system.
- 5. Testing.** During this phase, researchers execute pre-deployment testing to ensure the system functions correctly, employing trial and error to identify and address any issues.
- 6. Implementation.** Following the testing phase, researchers create an iteration of the project to analyze and enhance design and functionality, making significant improvements to achieve the project's objectives.
- 7. Maintenance.** During the maintenance phase, researchers uphold the system's functionality during deployment to sustain its performance. They also identify and rectify errors that may arise over time.

Gantt Chart

This section features a Gantt Chart illustrating the project's plans and schedules throughout its timeline, encompassing all development stages leading to project completion. The chart serves as a comprehensive documentation of deadlines for task completion, providing researchers with a visual representation of milestones and progress in various project tasks.

Table 12. Gantt Chart (Group)

Task Name	Task Date																			
	Oct				Nov				Dec				Jan				Feb			
	Week 1	Week 2	Week 3	Week 4	Week 1	Week 2	Week 3	Week 4	Week 1	Week 2	Week 3	Week 4	Week 1	Week 2	Week 3	Week 4	Week 1	Week 2	Week 3	Week 4
1.Planning																				
1.1 Conduct an interview																				
1.2 Define project objectives																				
1.3 Define project plan																				
1.4 Approval of project plan																				
2.Requirements Gathering																				
2.1 Data Collection																				
2.2 Functional																				
2.3 Non-Functional																				
3.Design																				
3.1 Frontend software design																				
4.Development																				
4.1 Back-end coding																				
5.Testing																				
5.1 Functionality testing																				
5.2 User interface testing																				

Legend:  - Completed/ Done

[illegible][illegible]

entering the production and deployment stages. The testing encompasses all the requirements outlined in the Requirements Phase, covering aspects like design, performance, and supportability. The results of these tests undergo evaluation to gauge the system's progress and confirm its alignment with the project requirements. The developers took into consideration the following factors:

1. Unit Testing- This is a form of software testing that focuses on evaluating individual units or components within a software system. Performed by the developers due to the necessity for in-depth knowledge of the system's internal structure, this testing method aims to verify the proper functioning of individual functions, modules, and features. The goal is to ensure that each component behaves exactly as intended.

2. Component Testing- Entails the examination of individual components within the system. It is essential to meticulously evaluate the individual components of the framework. This involves testing controllers for proper handling of actions, input validation, and routing configuration. Models should undergo thorough testing for accurate database interactions and data validation, while views need to

be assessed for correct template rendering and data binding. This approach aims to uncover defects or bugs specific to each component before their integration into the broader system. Additionally, it assists in identifying unforeseen interactions or dependencies between components that may lead to issues or errors in the overall system.

3. System testing- Is a type of software testing that evaluates the entire application or system as well as each of its component parts to verify that each module operates properly, and that data is transferred between them accurately. The purpose of this testing phase is to confirm that the system meets its requirements, performs as expected, and works flawlessly in the environment that it has been assigned. System testing, which comes after unit and integration testing, offers a thorough assessment of the complete system, making sure its overall performance and preciseness is working properly.

4. Performance testing- is a crucial software testing methodology employed to evaluate and validate the efficiency, responsiveness, and scalability of a system under different conditions. By conducting performance testing, organizations can identify and

address performance bottlenecks, ensure that the system meets specified performance criteria, and ultimately deliver a reliable and high-performing software application. This testing approach is essential for preventing performance-related issues, enhancing user experience, and optimizing the overall performance of software systems in real-world scenarios.

Chapter IV

DEVELOPMENT, TESTING, AND EVALUATION

Presentation of the System Output

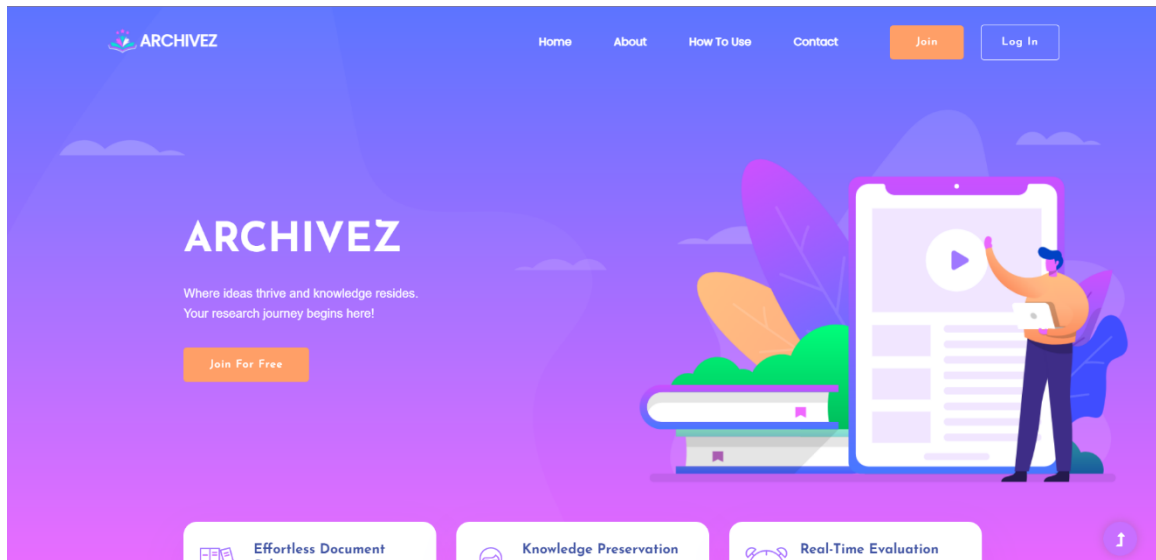


Figure 8. Landing Page of the System

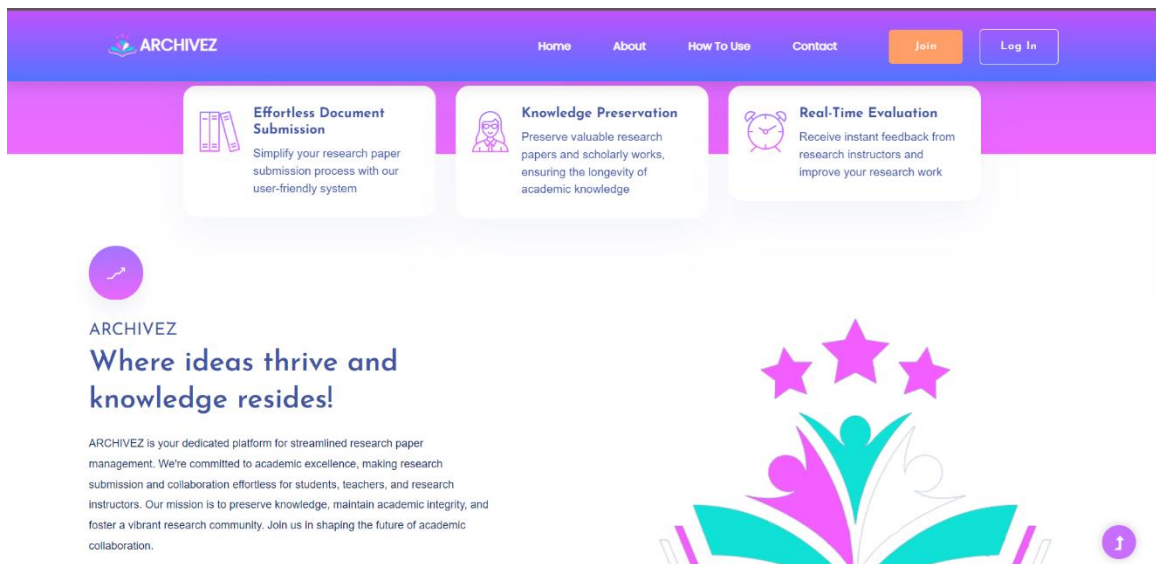
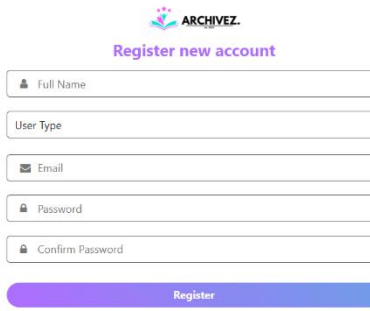



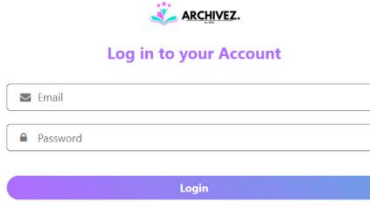

Figure 9. Landing Page of the System

Figure 8 and 9 shows the Landing Page of the Archivez Research Repository Management System.



The registration interface for ARCHIVEZ. It features a purple header with the logo and the text "Register new account". Below this are five input fields: "Full Name" (with a person icon), "User Type" (a dropdown menu), "Email" (with an envelope icon), "Password" (with a lock icon), and "Confirm Password" (with a lock icon). A prominent purple "Register" button is centered below the fields. At the bottom, there is a link "Already have an account? Log in" and a link "Back to Home".

Figure 10. User Registration Interface



The login interface for ARCHIVEZ. It features a purple header with the logo and the text "Log in to your Account". Below this are two input fields: "Email" (with an envelope icon) and "Password" (with a lock icon). A prominent purple "Login" button is centered below the fields. At the bottom, there is a link "Don't have an account? Register" and a link "Back to Home".

Figure 11. User Login Interface

Figures 10 and 11 display the User registration and Login Interface. User registration asks for the full name, user type, email, password and confirm password. Then in order to log in, the user needs to input their credentials which is email and password.

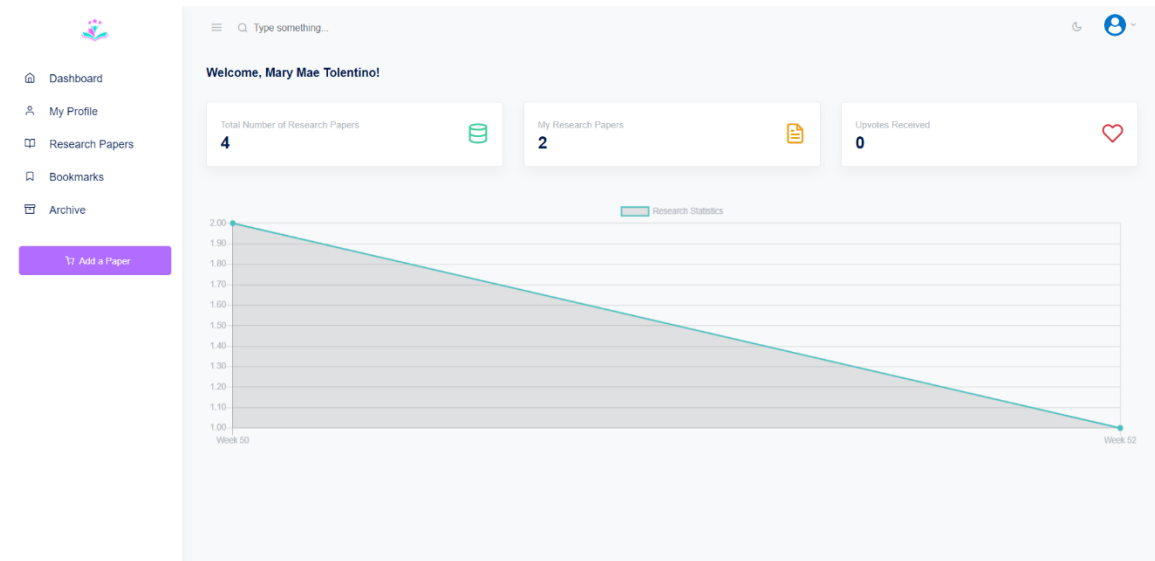


Figure 12. Student Dashboard Section

Figure 12 displays the student dashboard section which contains the total number of Research Papers, their own research papers and the upvotes received and a line chart visual representation of the number of research papers of the students.

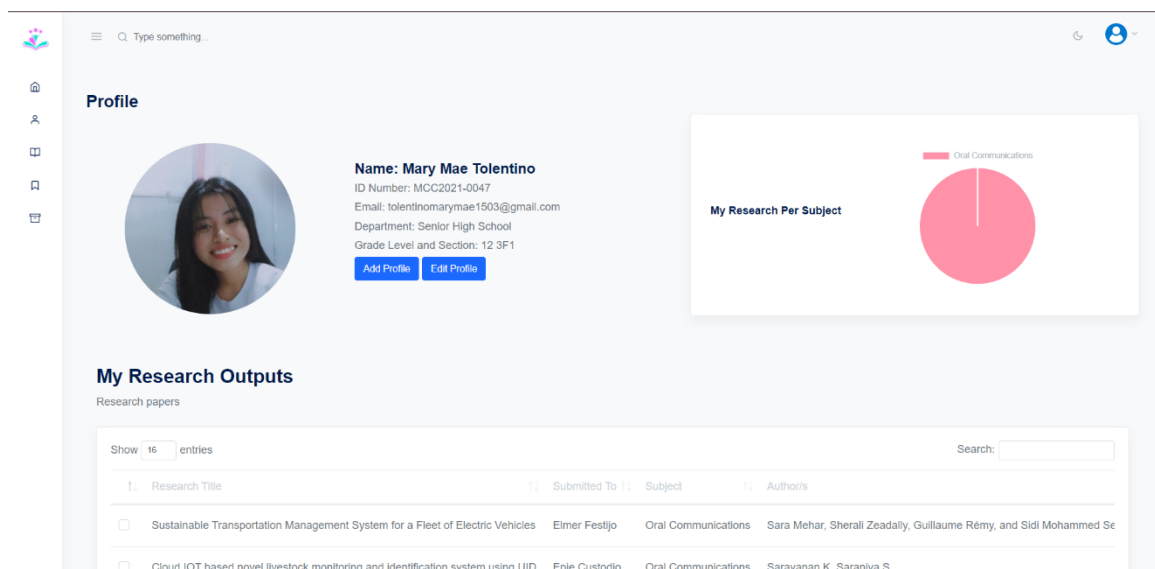


Figure 13. Student Profile Section

Figure 13 displays the student profile section which contains the students profile information and research papers uploaded in the system along with a small pie chart data visualization about the research per subject.

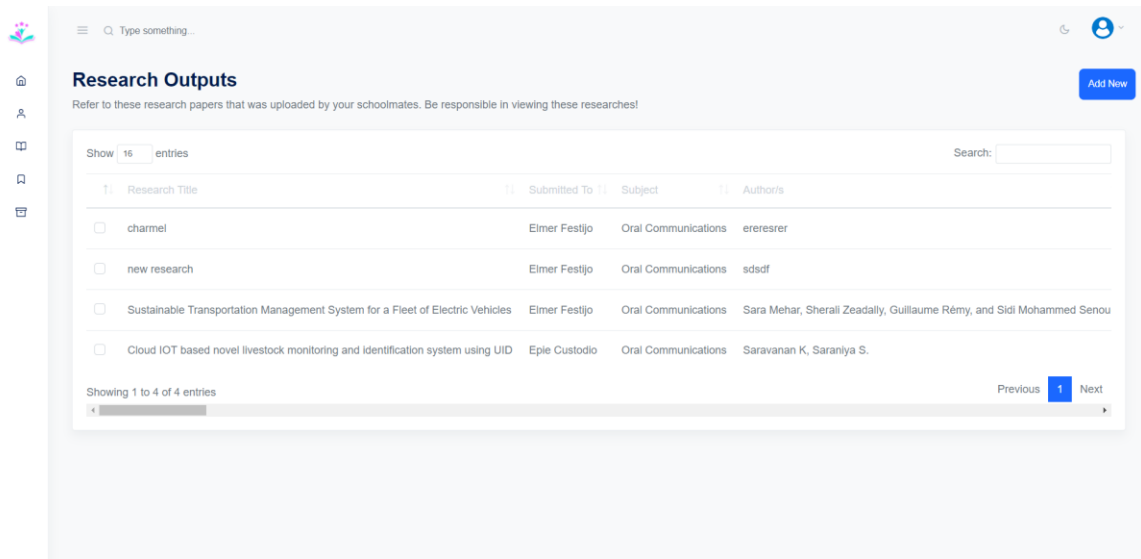


Figure 14. Student Research Papers Section

Figure 14 shows the student research papers section which contains the uploaded research papers of the students and an add new button for uploading new research papers.

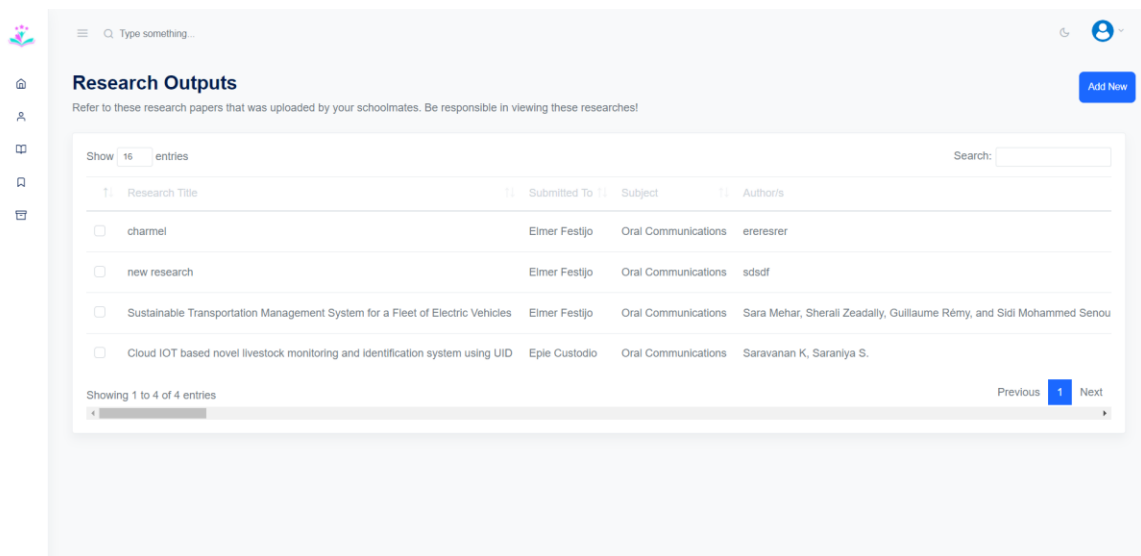


Figure 15. Student Bookmarks Section

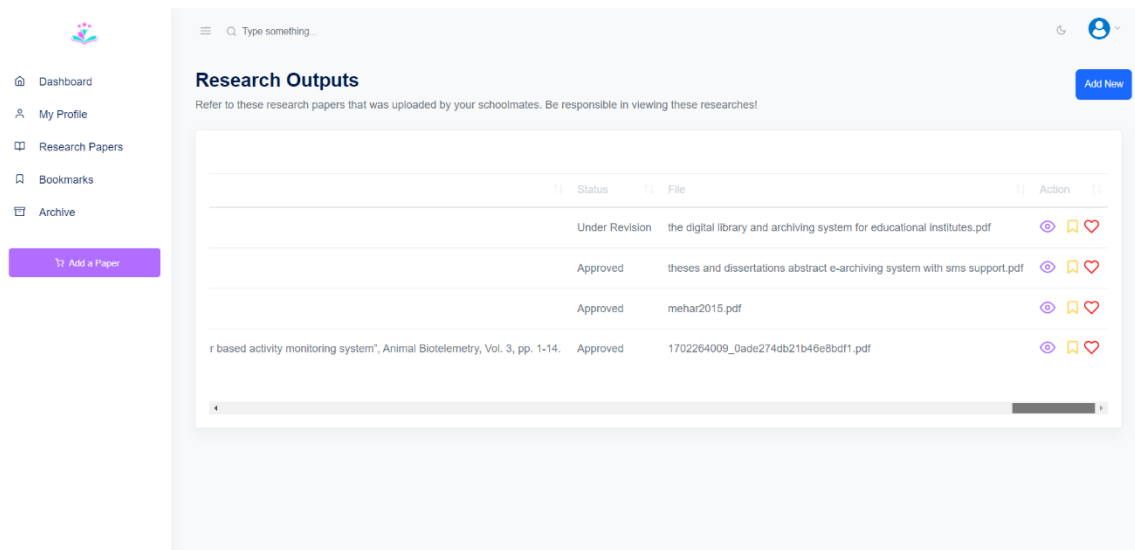


Figure 16. Student Bookmarks Section

Figures 15 and 16 show the student bookmarks section, which contains research papers that the student can view, bookmark and upvote.

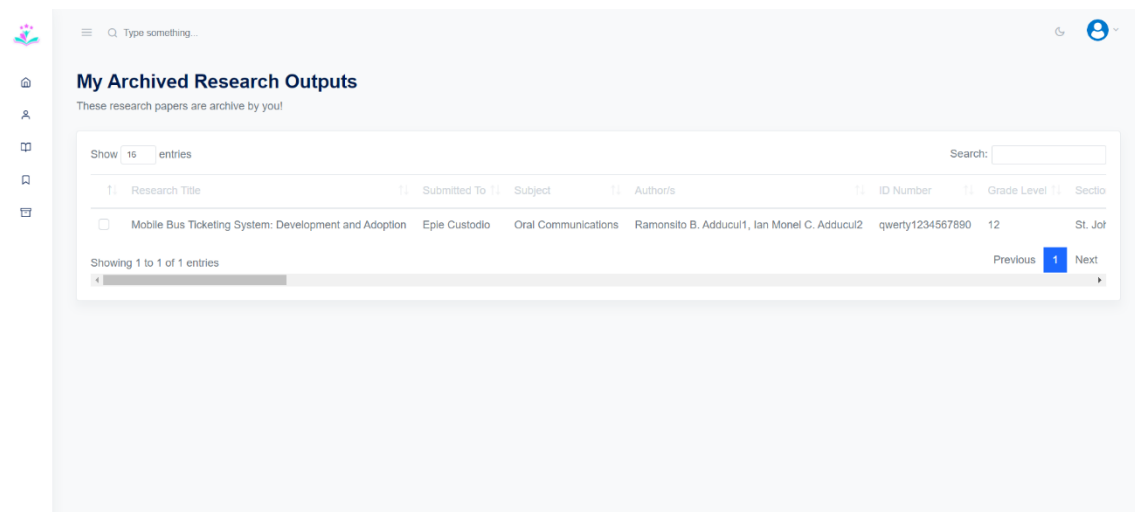
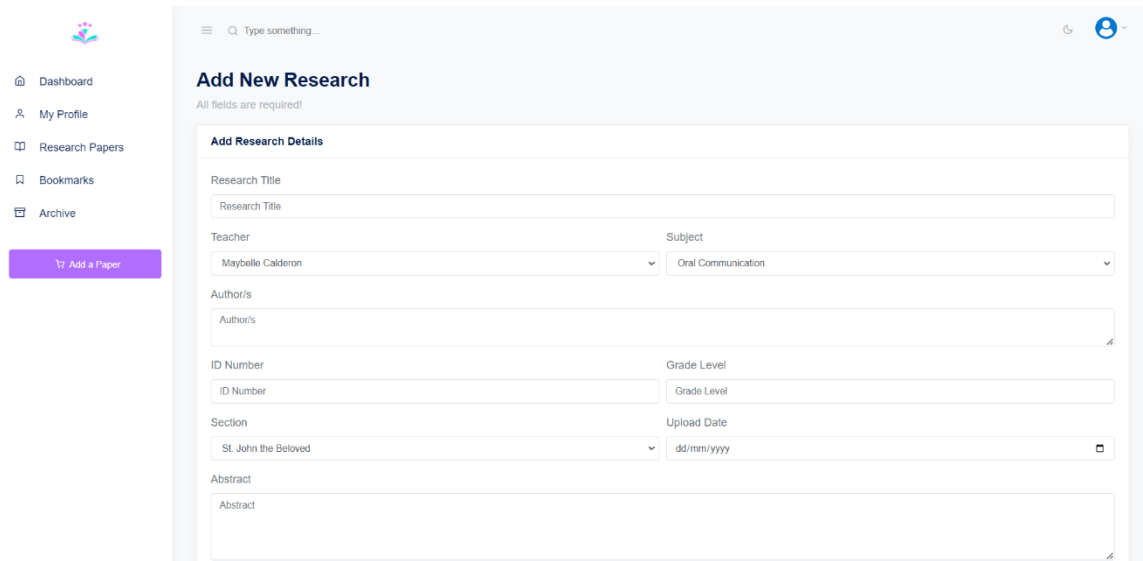


Figure 17. Student Archive Section

Figure 17 shows the student archive section. This contains the research papers that are archived by the students.



Add New Research
All fields are required!

Add Research Details

Research Title
Research Title

Teacher
Maybelle Calderon

Subject
Oral Communication

Author/s
Author/s

ID Number
ID Number

Grade Level
Grade Level

Section
St. John the Beloved

Upload Date
dd/mm/yyyy

Abstract
Abstract

Figure 18. Student Add New Research Section

Figure 18 shows the Add Research Section for the student for uploading of new research papers in the system.

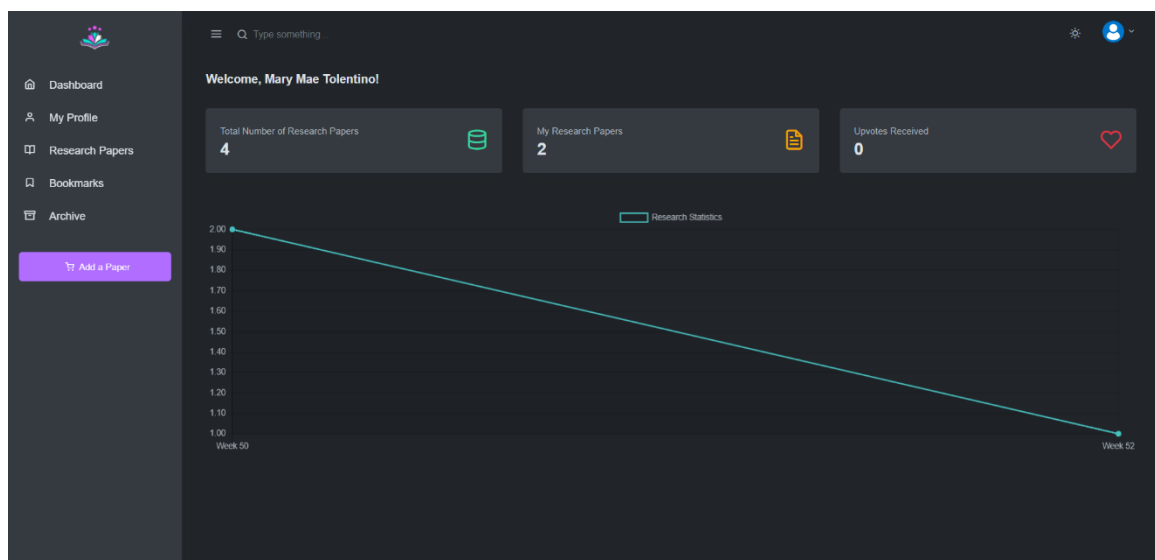


Figure 19. Student Dashboard Section in Dark mode

Figure 19 shows the student dashboard section in dark mode.



The screenshot shows a web interface for viewing research paper details. On the left is a sidebar with navigation links: Dashboard, My Profile, Research Papers, Bookmarks, and Archive. A purple button labeled 'Add a Paper' is at the bottom of the sidebar. The main content area displays the title 'CLOUD IOT BASED NOVEL LIVESTOCK MONITORING AND IDENTIFICATION SYSTEM USING UID'. Below the title, there are two columns of information: 'ABOUT THE AUTHOR/S' and 'ABOUT THE RESEARCH'. The author information includes the author's name, ID number, and year/section. The research information includes the upload date, status, subject, and submission details. Below this, there are sections for 'Keywords', 'Citation', and 'Abstract'. The abstract describes the proposed cloud IoT-based LMS (Livestock Management System) and its features.

ABOUT THE AUTHOR/S
 Author/s: **Saravanan K, Saraniya S.**
 ID Number: **MCC2021-0047**
 Year and Section: **12 St. John the Beloved**

ABOUT THE RESEARCH
 Upload Date: **2023-12-13 00:00:00**
 Status: **Approved**
 Subject: **Oral Communications**
 Submitted to: **Epie Custodio**

Keywords: *RFID, Sensor networks, Biometrics, Food Industry, Wireless sensor networks, Body sensors, Animal Husbandry, E-animal Health*

Citation: *Vazquez Diosdado, J.A., Barker, Z.E., Hodges, H.R., Amory, J. R., Croft, D.P., Bell, N.J. and Codling, E.A. (2015), "Classification of behaviour in housed dairy cows using an accelerometer based activity monitoring system", Animal Biotelemetry, Vol. 3, pp. 1-14.*

Abstract: – We propose cloud IoT based LMS (Livestock Management System) with three features. i) Animal healthcare monitoring and recording using IoT sensors via wearable collar, ii) Animal livestock identification using UID for animals (smart tag) and owners (smart card), iii) QR code reading, processing and display of the details in mobile via wireless technologies.

Figure 20. File Information Viewing Section



The screenshot shows the same web interface as Figure 20, but with the PDF file viewer open. The PDF title is 'Cloud IOT based novel livestock monitoring and identification system using UID'. The author information is 'Saravanan K. Department of Computer Science and Engineering, Anna University Regional Campus Tirunelveli, Tirunelveli, India, and Saraniya S. Department of Electrical and Electronics Engineering, Anna University Regional Campus Tirunelveli, Tirunelveli, India'. The abstract is displayed below the author information. The PDF viewer includes a toolbar at the top with navigation and zoom controls. The sidebar and navigation links are the same as in Figure 20.

Cloud IOT based novel livestock monitoring and identification system using UID

Saravanan K.
 Department of Computer Science and Engineering, Anna University Regional Campus Tirunelveli, Tirunelveli, India, and
Saraniya S.
 Department of Electrical and Electronics Engineering, Anna University Regional Campus Tirunelveli, Tirunelveli, India

Abstract
Purpose – We propose cloud IoT based LMS (Livestock Management System) with three features. i) Animal healthcare monitoring and recording using IoT sensors via wearable collar, ii) Animal livestock identification using UID for animals (smart tag) and owners (smart card), iii) QR code reading, processing and display of the details in mobile via wireless technologies.
Design/methodology/approach – The developed animal monitoring device is used to detect animal physiological parameters such as body temperature; physical gestures like sitting, standing, eating and heartbeat, environmental parameters such as air temperature and relative humidity. Also, e-animal husbandry information network management system is the comprehensive web-based animal husbandry software designed for better interaction between veterinary hospital, veterinary doctor, owner, farmer and animal husbandry management.
Findings – Animal monitoring device mounted on the neck sense the values and predict the health status of the animal by using cloud IoT analytics platform. The accuracy of the system is 90 per cent and it can be well placed in the livestock environment.

Figure 21. PDF File Viewing Section

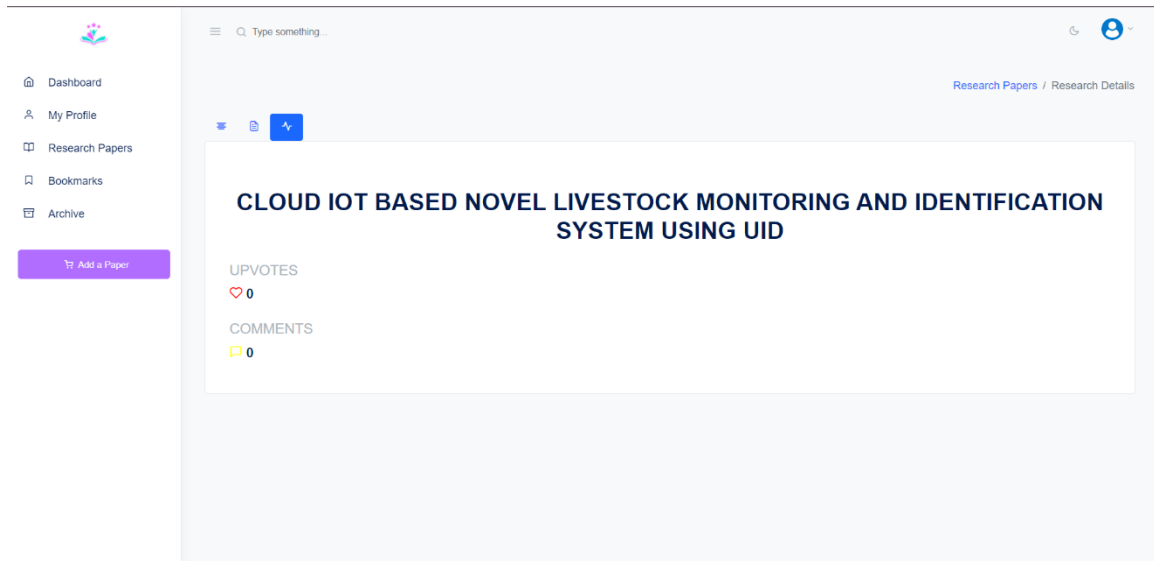


Figure 22. File Upvotes and Comment Section

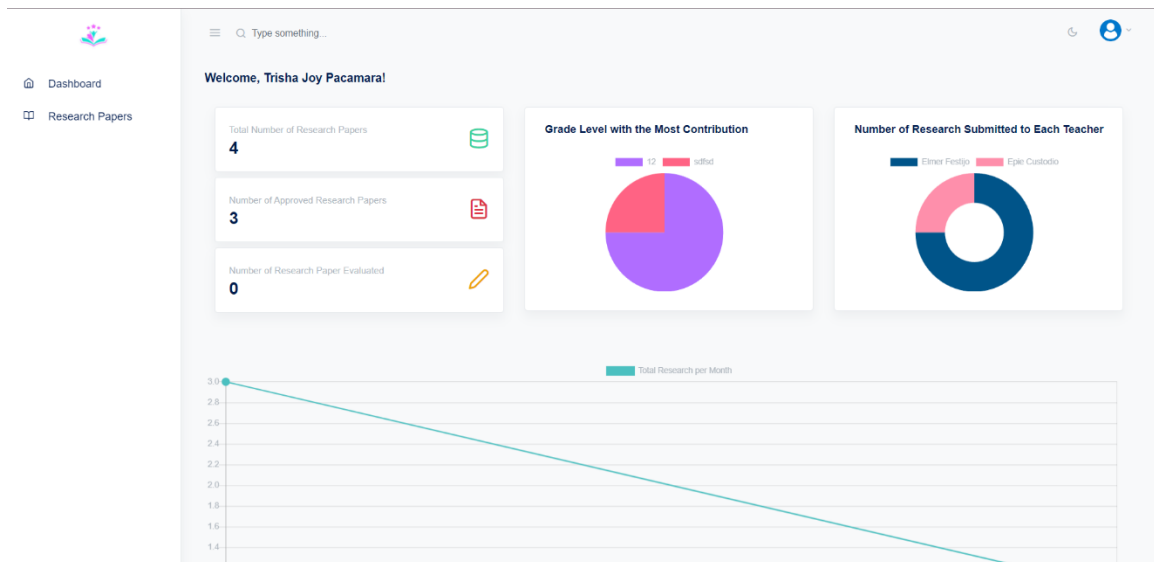


Figure 23. Instructor Dashboard Section

Figure 23 displays the instructor dashboard section which contains the total number of research papers, approved research papers and the number of research papers evaluated with a line, pie, and doughnut chart visual representation of the related data of the research paper.

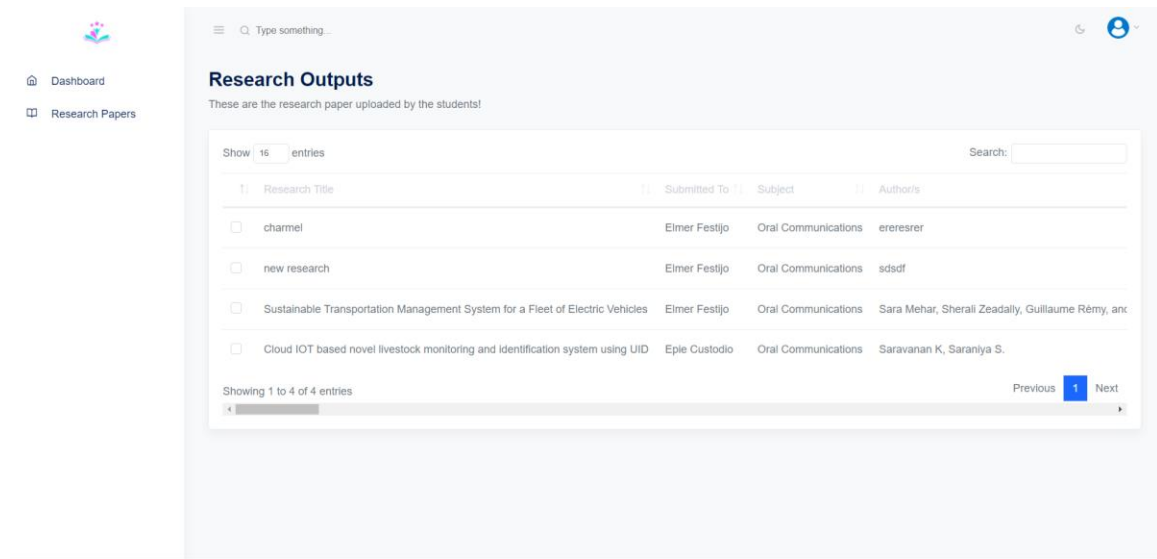


Figure 24. Instructor Research Papers Section

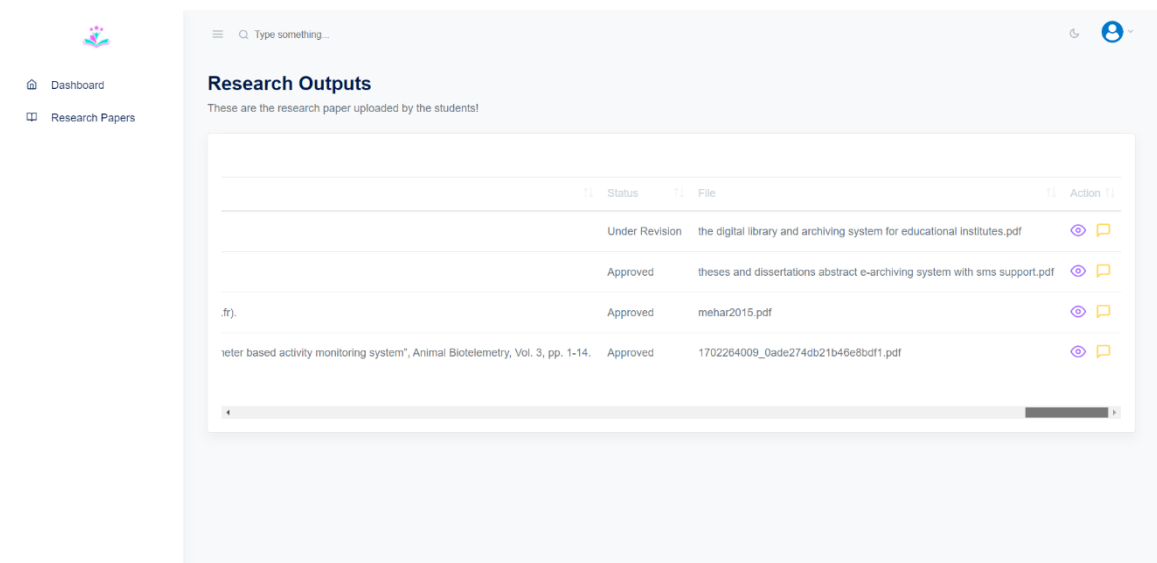


Figure 25. Instructor Research Papers Section

Figures 24 and 25 show the instructors Research papers section which contains research papers that the instructor can view, comment and upvote.

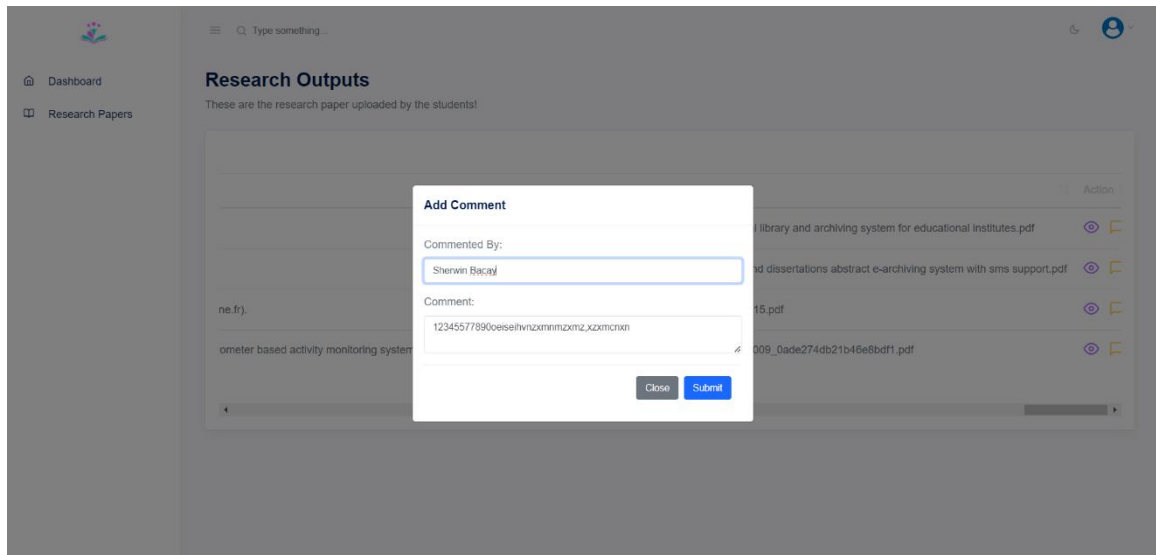


Figure 26. Instructor Add Comment Modal Section

Figure 26 shows the Instructor Add Comment Modal Section to specify the instructor who evaluated the paper and input the comments about the paper.

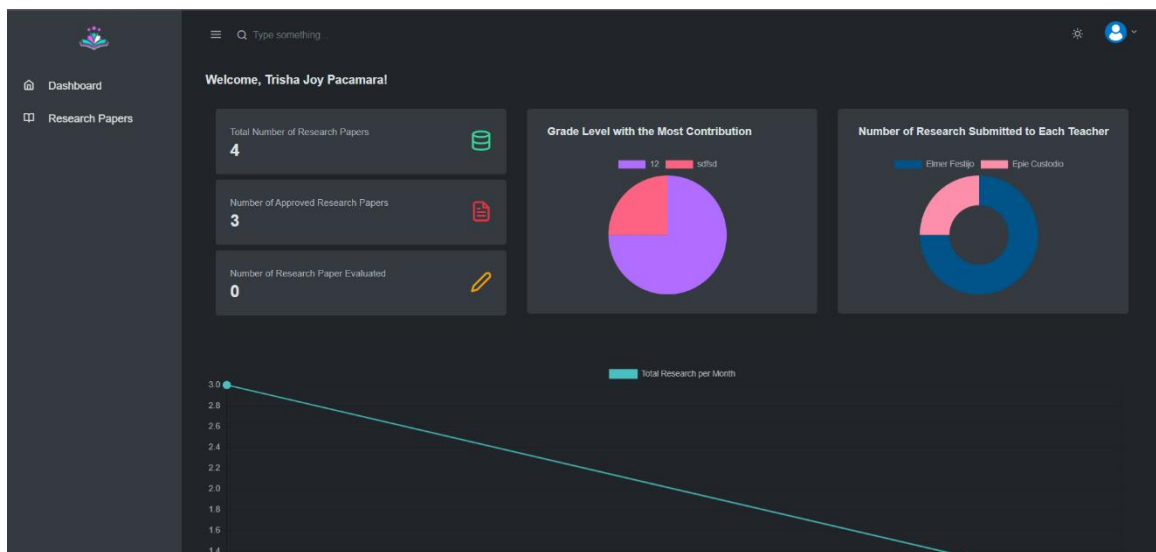


Figure 27. Instructor Dashboard Section in Dark mode

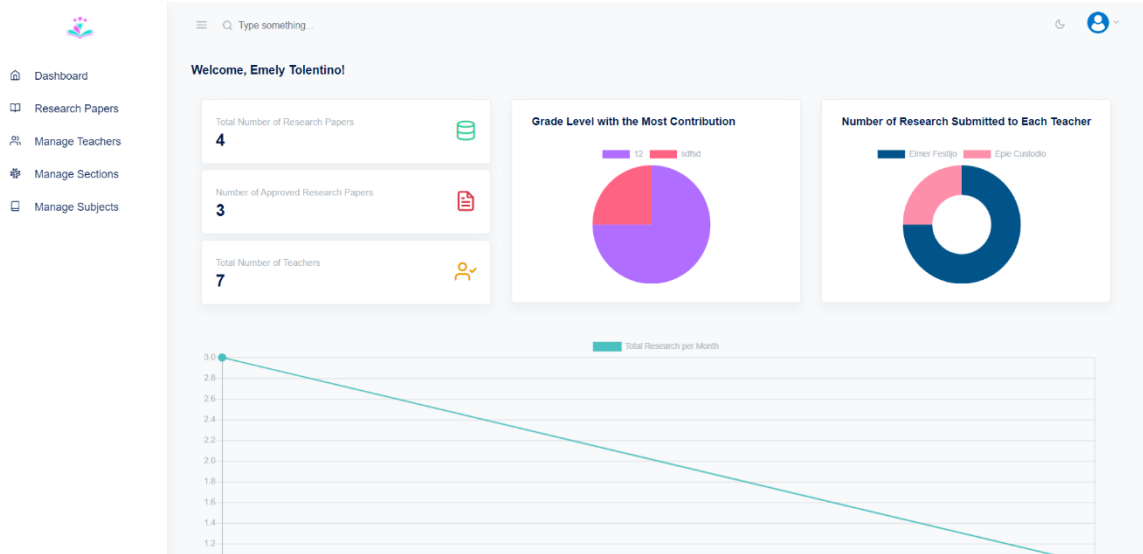


Figure 28. Admin Dashboard Section

Figure 28 displays the admin dashboard section which contains the total number of research papers, approved research papers and the number of research papers evaluated with a line, pie, and doughnut chart visual representation of the related data of the research paper.

The Admin Research Papers Section displays a sidebar with navigation links: Dashboard, Research Papers, Manage Teachers, Manage Sections, and Manage Subjects. The main content area is titled 'Research Outputs' and includes the following components:

- Search and Filter:** A search bar and a 'Show 15 entries' dropdown.
- Table of Research Outputs:**

	Research Title	Submitted To	Subject	Author/s
<input type="checkbox"/>	charmel	Elmer Festjo	Oral Communications	ereresrer
<input type="checkbox"/>	new research	Elmer Festjo	Oral Communications	sdsd
<input type="checkbox"/>	Sustainable Transportation Management System for a Fleet of Electric Vehicles	Elmer Festjo	Oral Communications	Sara Mehar, Sherali Zeadally, Guillaume Rémy, and
<input type="checkbox"/>	Cloud IOT based novel livestock monitoring and identification system using UID	Egle Custodio	Oral Communications	Saravanan K, Saraniya S.
- Pagination:** Showing 1 to 4 of 4 entries. Previous, 1 (selected), Next.

Figure 29. Admin Research Papers Section

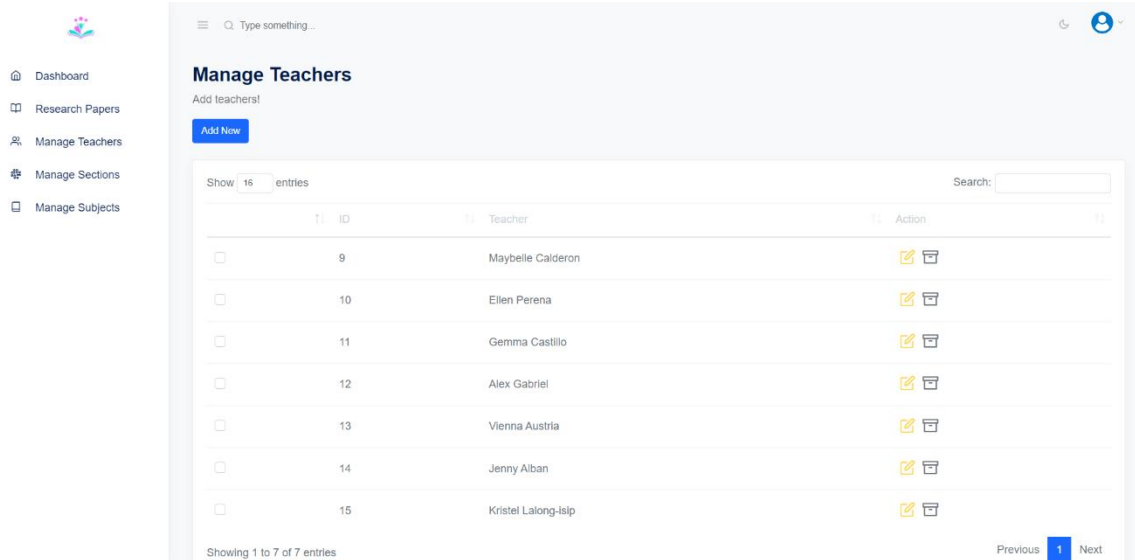


Figure 30. Admin Manage Teachers Section

Figure 30 displays the admin manage teachers section which stores and manages the teachers/instructors of the research paper.

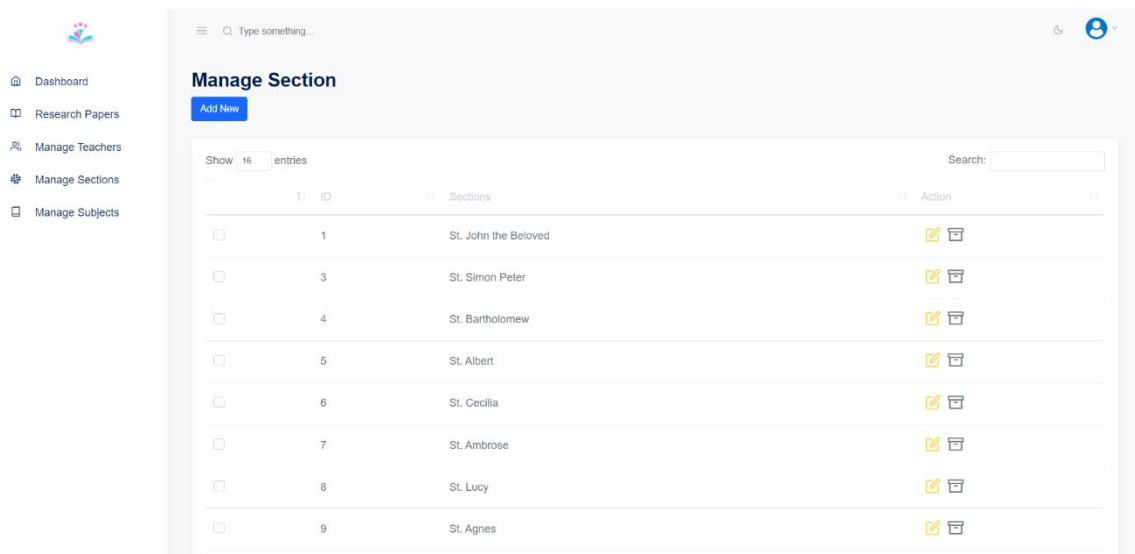


Figure 31. Admin Manage Sections Section

Figure 31 displays the admin manage sections section which stores and manages sections of the students.

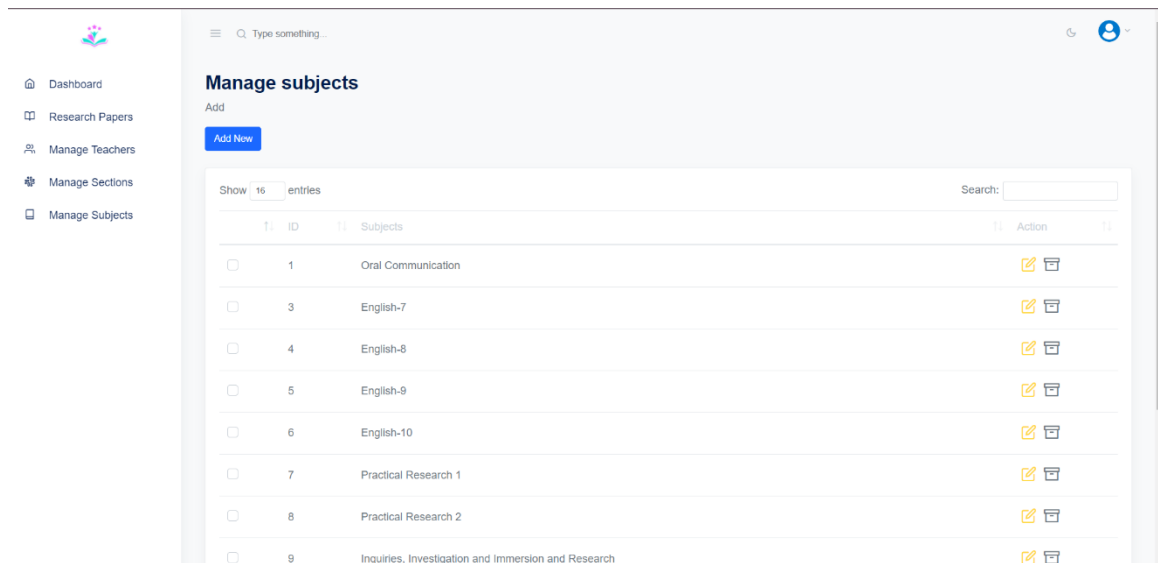


Figure 32. Admin Manage Subjects Section

Figure 32 displays the admin manage subjects section which stores and manages subjects of which the research paper belong to.

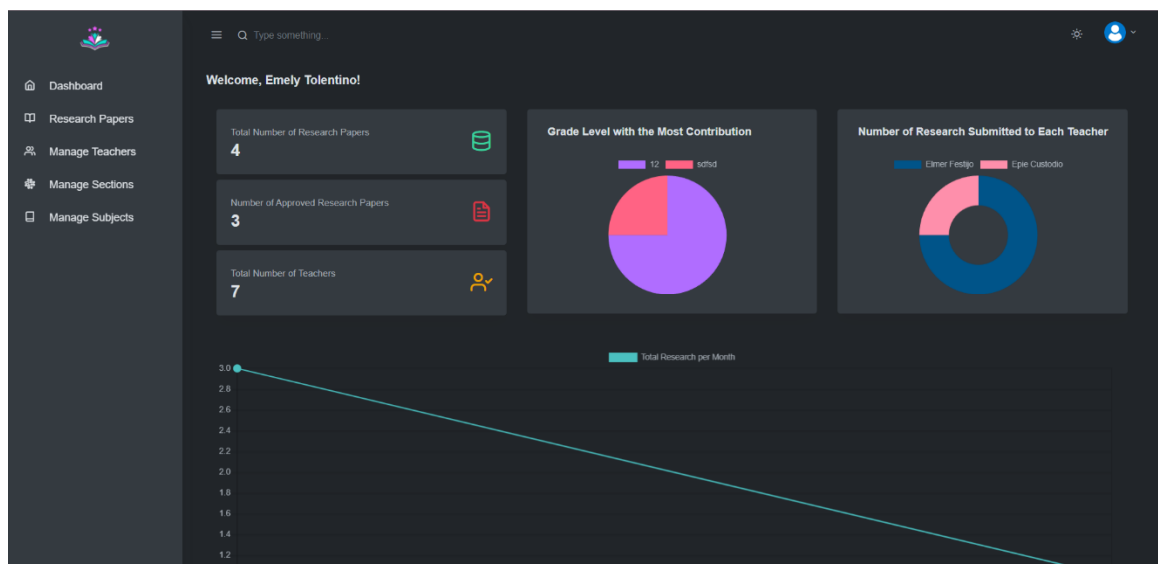


Figure 33. Admin Dashboard Section in Dark mode

Figure 33 displays the admin dashboard section in dark mode.

Chapter V

CONCLUSION AND RECOMMENDATION

Conclusion

The development and implementation of the Multiplatform Research Repository Management System represents a significant milestone in addressing the specific needs of high school and senior high students in their research endeavors. This transformative system, designed to facilitate the entire research lifecycle, has successfully met its objectives of simplifying submission processes, enhanced document management, and fostering a culture of academic integrity. As we reflect on the key achievements outlined in the study's objectives, it becomes evident that the system not only provides practical solutions for the challenges students face but also actively promotes collaboration, knowledge sharing, and community-based learning. Let us delve into the progress and outcomes that emphasize the success of this innovative platform.

1. The Research Repository Management System has effectively addressed the objective of enabling seamless

submission for both researchers and students. The platform's intuitive design ensures that users, irrespective of their computer literacy levels, can effortlessly submit research papers and theses, fostering inclusivity in the research process.

2. The study has successfully implemented tools for document management, allowing users to perform metadata entry. This addresses the crucial need for providing a structured approach to managing scholarly documents within the system.
3. A key achievement of this study is the incorporation of a resource library to educate users on proper research methodologies, citation practices, and plagiarism awareness. By offering a centralized repository of educational materials, the system actively contributes to fostering a culture of academic integrity among high school and senior high students.
4. The Research Repository Management System fulfills its objective of offering guidance and resources to assist students and researchers in navigating the complexities of scholarly work. This feature contributes significantly to enhancing the overall research capabilities of the user community.

5. The system effectively creates an environment for collaboration and knowledge sharing, bringing together students, alumni, and teachers. By facilitating interactions among users with common research interests, the platform enhances the spirit of community-based learning, fostering a collaborative research culture.
6. The creation of a user-friendly interface stands out as a notable achievement, simplifying the submission process of research papers. This ensures accessibility and ease of use for a diverse user base, accommodating both computer literate and non-literate users.
7. The objective of ensuring accessibility and responsiveness of the website has been successfully implemented. Whether accessed through web browsers, mobile devices, or other devices, the Research Repository Management System accommodates the varied preferences and technological environments of high school and senior high students, ensuring widespread usability.

In summary, the Archivez Research Repository Management System has achieved its defined objectives, providing a comprehensive solution that not only addresses the challenges of research and thesis creation but also promotes a culture of academic integrity while fostering a collaborative and

inclusive research community among high school and senior high students.

Recommendations

It is strongly recommended that educational institutions, particularly high schools and senior high schools, consider the adoption and implementation of the Multiplatform Research Repository Management System. This transformative system has proven its efficacy in addressing the specific needs of students engaged in research endeavors, offering practical solutions to challenges related to submission processes, document management, and the cultivation of academic integrity. The system's user-friendly interface ensures accessibility for users of varying computer literacy levels, promoting inclusivity in research participation. Moreover, the emphasis on collaboration, knowledge sharing, and community-based learning aligns with the contemporary educational paradigm that encourages holistic development. As educational institutions strive to provide a conducive environment for scholarly pursuits, integrating the Archivez Research Repository Management System emerges as a strategic move to enhance research capabilities, promote ethical academic practices, and foster

a collaborative and inclusive learning culture among students.

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