MZUMBE UNIVERISTY

FACULTY OF SCIENCE AND TECHNOLOGY (FST)

DEPARTMENT OF COMPUTING SCIENCE STUDIES (CSS)

A PROJECT REPORT

ON

PROJECT AND RESEARCH INVESTMENT HUB (PRIH)

BY

MAKONGO SELELE JOHNSON

REGISTRATION NUMBER: 14320033/T.22

PROGRAMME: BSc. ICTM 3

SUPERVISED

BY

DR TITUS TOSSY

This project report is hereby submitted in fulfillment of the requirements for the Bachelor of Science in Information Communication and Technology with Management at Mzumbe University

ACADEMIC YEAR: 2024/2025

CERTIFICATION

This certificate certifies for recognition of this project report submitted to the Department of Computer Science (CSS) under Faculty of Science and Technology (FST) for the development for Project entitled “Project and Research Investment Hub” (PRIH) as a part of accomplishment of the necessities for the award of the Bachelor of Science in Information Communication and Technology with Management (BSC ICTM).

Major Supervisor:

Name: Dr. TITUS TOSSY

Signature: _____

Date: ____/____/_____

Internal Supervisor:

Name: Dr. ALMAS MAGUYA

Signature: _____

Date: ____/____/_____

DECLARATION

I MAKONGO SELELE JOHNSON hereby declare that this final project report entitled "Project and research investment hub" represents my own work and that it has not been submitted for any academic or professional qualification, except where indicated.

I confirm that all sources used in the preparation of this report are appropriately cited and referenced. Any assistance received in the development of this project is acknowledged, and all direct quotations or paraphrased content from external sources are clearly identified.

I assert that the intellectual content of this project is the result of my independent research and analysis. Where contributions have been made by others, their roles have been duly acknowledged in the acknowledgments section.

I further declare that this project adheres to the ethical standards set by Mzumbe University (MU) and complies with all applicable academic and professional integrity guidelines.

By signing this declaration, I acknowledge the importance of academic honesty and affirm the authenticity and originality of the work presented in this report.

Signature: ……..

Date: ……

ACKNOWLEDGMENT

I would like to thank Almighty God for His tender Care, Love, and health that He has granted to Me since I started my journey for my education till this moment when I am about to wind up this journey.

I extend my heartfelt gratitude to all those who have contributed to the completion of this report.

Your support, guidance, and encouragement have been invaluable throughout the entire process.

I would like to express my deepest appreciation to my supervisor DR. TITUS TOSSY, for his unwavering support and mentorship. Their insights and expertise have been instrumental in shaping the direction of this project.

Special thanks to Dr. Patrick Kihoza for his collaborative efforts and constructive feedback. His contributions have enriched the content and strengthened the overall quality of this report.

I am indebted to Mzumbe University (MU) for providing the necessary resources and environment conducive to research and learning.

My sincere thanks go to my family and friends for their understanding, encouragement, and patience during the demanding phases of this project.

Last but not least, I want to acknowledge the participants and respondents who generously shared their time and insights, contributing significantly to the success of this endeavor.

Your collective support has made this journey not only academically rewarding but also personally enriching. Thank you all for being an integral part of this endeavor. May God bless you to all.

ABSTRACT

The Project and Research Investment Hub aims to bridge the gap between researchers in higher learning institutions and potential sponsors by providing a centralized platform for project submission and funding. Many students and researchers struggle to secure funding for their innovative ideas, while sponsors face challenges in discovering valuable research projects. This system offers a solution by allowing researchers to present their ideas, access funding opportunities, and interact directly with investors. The platform will simplify the funding process, provide real-time communication, and ensure transparency through progress tracking. By facilitating collaboration between researchers and sponsors, the hub will promote innovation, accelerate the development of research projects, and contribute to the advancement of knowledge and technology at Mzumbe University. This study explores the development of the hub, its features, and the benefits it offers to both the academic community and investors.

TABLE OF CONTENTS

LIST OF ABBREVIATIONS

MU – Mzumbe University

FYP – Final Year Project

PRIH – Project and Research Investment Hub

UI – User Interface

IP – Intellectual Property

NGOs – Non-Government Organizations

WBS – Work Breakdown Structure

XML - Extensible Markup Language

CSS - Cascading Style

HTML - Hypertext Markup Language

DRF - Django Rest Framework

DBMS - Database Management System

LIST OF FIGURES

TABLES AND ILLUSTRATION

CHAPTER ONE: INTRODUCTION AND PROBLEM DESCRIPTION

1.1 Background

Tanzania's higher learning institutions, including Mzumbe University, University of Dar es Salaam, and Sokoine University of Agriculture, play a crucial role in research and innovation. However, many of their research projects and ideas fail to receive the necessary funding and support to progress beyond academic discussions. A major challenge is the lack of a structured platform that connects researchers with potential investors, sponsors, and industry partners. Without proper funding and commercialization pathways, valuable research remains unused, limiting its contribution to Tanzania's socio-economic growth. Issues such as limited access to funding, weak industry-academia collaboration, and insufficient commercialization strategies prevent researchers from transforming their findings into practical solutions that address national challenges.

The Project and Research Investment Hub is designed to solve these challenges by providing a centralized digital platform where students, researchers, universities, and investors can connect. Researchers will be able to showcase their projects, while investors and industry stakeholders can discover, evaluate, and fund promising innovations. Universities and government bodies can use the platform to track research progress and support projects aligned with Tanzania's Development Vision, which emphasizes industrialization and knowledge-driven economic growth. By fostering innovation, research funding, and commercialization, this initiative will strengthen Tanzania's research ecosystem, promote university-industry collaboration, and enhance the country's competitiveness in scientific and technological advancements.

1.2 Problem statement

In Tanzania, universities and colleges are important places for education, research, and innovation. They play a key role in training skilled workers and creating new knowledge that can help solve problems in the country. However, many universities face challenges in promoting their research and connecting with the people who could help fund or support these ideas. Without a central platform to bring together researchers, students, and investors, the process of turning research into real-world solutions or businesses becomes difficult.

At the moment, there is no place where all the important stakeholders such as students, professors, researchers, businesses, and government bodies can easily meet, collaborate, and share their ideas. As a result, many great research projects and entrepreneurial ideas from Tanzanian universities are not well known or do not get the support they need to grow. This lack of a central hub for research and project development limits the impact these ideas can have on society.

Moreover, without a clear and organized way to connect researchers with funding and industry partners, many projects struggle to find the resources they need to succeed. This gap between research institutions and potential investors leads to missed opportunities for collaboration and funding. The result is that many innovative projects never leave the university and cannot contribute to the country's development, despite their potential to address local challenges.

This project aims to address these issues by creating a centralized "Project and Research Investment Hub" for Tanzanian universities. The hub will act as a platform where students, researchers, and investors can come together to share their ideas, find funding, and collaborate. By improving the connection between research, investment, and industry partners, the hub will help bring research ideas to life and support innovation in Tanzania, ultimately contributing to the country's development.

1.3 Project objectives

1.3.1 Specific objective

The primary goal of PRIH is to design, develop, and implement a centralized platform, the "Project and Research Investment Hub," which will serve as a bridge between students, researchers, investors, and industry partners in higher learning institutions. This platform will facilitate the collaboration, promotion, and funding of research projects, aiming to enhance innovation, foster entrepreneurial ventures, and contribute to national development.

1.3.2 General objective

To create a platform for research visibility, develop a user-friendly online hub where students and researchers can present their research projects, innovations, and ideas to a broader audience, including potential investors, businesses, and other academic institutions.

To establish a network for collaboration between researchers and industry stakeholders Facilitate connections between researchers, industry professionals, government agencies, and investors to promote partnerships and joint efforts in research and project development.

Provide a platform for investors and funding organizations to discover promising research projects and offer financial support to help bring these ideas to life. To connect research projects with funding opportunities,

To enhance communication and information exchange among stakeholders, develop tools for effective communication within the hub, ensuring researchers, students, and other stakeholders can easily share ideas, feedback, and resources.

To support the commercialization of research and innovation, provide guidance and resources to help turn research findings into marketable products or services, supporting entrepreneurship and business development within universities.

1.4 Significance and Scope

1.4.1 Significance

The Project and Research Investment Hub in Higher Institution is a platform designed to connect researchers with potential sponsors, helping to secure funding for innovative projects. The significance of this study lies in its ability to bridge the gap between researchers and investors, streamline funding processes, and enhance the impact of research. Below are the key aspects of its significance:

- Addressing the Funding Challenges for Researchers, Many students and researchers in institutions struggle to find financial support for their projects. This study provides a structured approach to solving this issue by developing a digital platform that simplifies the process of securing funding. Researchers can submit their projects, showcase their work, and attract potential sponsors who are interested in funding impactful research.
- Enhancing Collaboration between Researchers and Sponsors Currently, there is a lack of direct communication between researchers and sponsors. The study proposes an efficient system that facilitates real-time interaction, enabling sponsors to explore projects, ask questions, and make informed funding decisions. This will create a strong network between academia and industry, leading to more collaborative research efforts.

- Promoting Innovation and Research Development By ensuring that research projects receive adequate funding, this platform will encourage more students and researchers to develop innovative ideas. The study highlights how a structured funding system will enable projects with real-world applications to progress beyond the research phase, potentially leading to technological advancements, new business startups, and societal improvements.
- Increasing Transparency and Accountability in Research Funding a major concern in funding is the lack of transparency in how funds are allocated and utilized. This study introduces a system that tracks funding transactions, ensuring that funds are used appropriately. Sponsors can monitor project progress through regular updates, providing accountability and boosting trust between funders and researchers.
- Providing a Digital Solution for Efficient Project Management Traditional methods of securing funding, such as manual proposal submissions and paperwork, are often slow and ineffective. The study emphasizes the importance of a digital solution that allows for easy project submission, funding transactions, progress tracking, and reporting, all in one centralized platform. This will significantly reduce delays, improve efficiency, and enhance the user experience.
- Economic and Societal Benefits The success of this system will have far-reaching economic and societal benefits. By funding more research projects, the university can contribute to economic development through new discoveries, innovations, and startups. Additionally, research in areas such as health, agriculture, and technology can lead to solutions that improve people's lives.

1.4.2 Scope

Scope for Project and Research Investment Hub (PRIH) involves defining and managing all the work required to complete the project successfully (work breakdown structure) as well as defining or describing project boundary, project deliverables and product acceptance criteria.

1.4.2.1 Work Breakdown Structure (WBS)

This define specific work or activities that are to be done in order to complete the project. In the process of designing, developing and implementing Project and Research Investment Hub. The following are activities to be done within the project

- Designing a database to store system data.
- User Interface (UI) design.
- Implementing user management module which include features such as user creation, update and deletion.
- Implementing authentication and authorization mechanism for registered users based on their roles
- Implementing task management module with features such as task creation, update, deletion and task submission.
- Implementing document Management module with features such as Research description.
- Implementing Communication Module: In app messaging or notification system for seamless communication between students and Sponsors. Also real-time notifications for students and Investors regarding allocation status and updates.
- Implementing feedback mechanism.

1.4.2.2 Project boundaries

This section describe Limits to the project scope, what will not be included in developing and implementing Project And Research Investment Hub that is it define what is out of scope for the product or project. Also may include scope exclusions, or other limitations

- The scope is limited only to project researchers and students,
- No Integration with other systems

1.4.2.3 Project deliverables

A deliverable is a product or service, such as a technical report, a training session, a piece of hardware, or a segment of software code, produced or provided as part of a project. The following are deliverables for student project supervisor allocation and management system.

- Web-based application for Project and Research Investment Hub with a secure login system.
- Database for storing students and Researchers, project details, and sponsors.

- Project documentation.

1.4.2.4 Acceptance criteria

Criteria for evaluating whether the system meets user expectations. This is essential for ensuring that the final system aligns with the needs of its users or stakeholders which are administrators, Students and researchers, Investors and Sponsor in context of PRIH. The following are acceptance criteria for such system.

- Users can easily navigate the system and perform necessary tasks.
- Communication module between sponsors and researchers.
- The system meets predefined performance and security standards.
- Completed within time, cost and scope and quality.

CHAPTER TWO: LITERATURE REVIEW

2.1 Topic review

A Project and Research Investment Hub (PRIH) is a structured platform designed to facilitate the transition of research from academia to industry. It serves as a bridge between researchers, investors, and industry stakeholders by providing critical resources such as funding, infrastructure, mentorship, and commercialization support. The goal of a PRIH is to enhance innovation by ensuring that academic research is not confined to university settings but instead finds real-world applications in various industries. Globally, initiatives such as Lab2Market, MedTech Innovator, and University Lab Partners have demonstrated the effectiveness of research investment hubs in fostering economic growth, accelerating technological advancements, and enhancing the commercialization of academic research (Zavala, 2021; Larsen, 2022).

One of the fundamental roles of a PRIH is to bridge the gap between research and commercialization. Many researchers struggle to move their ideas beyond theoretical findings due to a lack of funding and business development expertise. Programs like Lab2Market in Canada have helped researchers transition their projects into market-ready innovations by providing financial support, training, and industry connections (Larsen, 2022). Similarly, MedTech Innovator has supported over 500 startups, helping them raise more than $6 billion in funding, particularly in the medical technology sector (Zavala, 2021). These examples highlight the importance of structured research hubs in fostering entrepreneurship and ensuring that research has tangible economic and social impacts.

However, research investment hubs face several challenges that can hinder their effectiveness. One significant issue is securing long-term financial support, as many hubs rely heavily on initial government funding, which may not always be sustainable. Another critical challenge is intellectual property (IP) management, where disputes between universities, researchers, and investors over ownership rights can slow down commercialization efforts (Technology Innovation International, 2020). Regulatory barriers, particularly in highly regulated industries such as healthcare and biotechnology, also pose a challenge, as startups must navigate complex approval processes before their innovations can reach the market. Overcoming these barriers requires a

combination of strategic partnerships, clear IP policies, and regulatory support mechanisms within the hub structure.

To enhance the success of a PRIH, adopting global best practices is crucial. Strong public-private partnerships have been identified as a key factor in sustaining research investment hubs, as seen in the collaborations between Lab2Market and the Canadian government, or MedTech Innovator and various healthcare investors. Additionally, structured incubation and mentorship programs that provide market validation, business training, and regulatory guidance significantly improve the chances of successful commercialization. Investment hubs should also establish sustainable revenue models, such as licensing and patenting research outcomes, to ensure long-term viability. Specialization in specific industries, such as medical devices, artificial intelligence, or renewable energy, can further enhance the effectiveness of these hubs by providing tailored support to researchers and startups (University Lab Partners, 2021).

For institutions like Mzumbe University, establishing a PRIH could significantly enhance research impact and drive national economic development. By aligning research projects with industry needs and integrating a structured incubation model, the university can position itself as a leader in innovation and entrepreneurship. Developing strategic partnerships with government agencies, local businesses, and international research networks will be crucial in securing funding and expertise. Additionally, creating policies that clearly define IP ownership and commercialization pathways will encourage researchers to actively engage with the hub. By leveraging these global best practices, Project and Research Investment Hub could become a catalyst for groundbreaking innovations that contribute to Tanzania's socioeconomic transformation.

2.2 Domain Review

The domain review for the Project and Research Investment Hub highlights the existing challenges in the research funding ecosystem in institutions, and the potential for a centralized platform to address these issues. Researchers often struggle with securing funding for their projects, as there is no direct platform connecting them with sponsors. At the same time, sponsors face difficulties identifying and assessing research projects worth investing in. This disconnect between researchers and potential investors limits opportunities for collaboration and innovation (Mugisha, 2022).

Existing funding systems, such as traditional grant applications and government-sponsored platforms, are fragmented and bureaucratic, often leading to lengthy approval processes and delays in disbursing funds. These systems also lack interactive features that would allow sponsors to engage directly with researchers. For instance, platforms like ResearchGate and Academia.edu allow researchers to share academic work but do not address the need for funding or sponsor engagement (Anderson & Williams, 2019). Additionally, Kickstarter and GoFundMe have been used for funding purposes but are not specifically designed to support academic or university-based projects, leaving a gap in the funding process for researchers in academia (Kane, 2021).

The Project and Research Investment Hub seeks to bridge these gaps by providing a centralized platform for researchers to submit projects and sponsors to browse and invest. This platform will offer integrated funding management, direct communication between sponsors and researchers, and progress tracking features to ensure transparency and accountability. Unlike the existing systems, this platform will cater specifically to academic research, streamlining funding processes and allowing for more efficient interactions (Smith, 2020).

Moreover, the proposed platform will incorporate tools for monitoring project progress, enabling sponsors to track the use of their funds over time. This will address the accountability issues often seen in existing funding systems such as government grants, where the lack of transparency in the allocation and use of funds is a significant concern (Jones & O'Neill, 2018). By offering these features, the Project and Research Investment Hub will improve communication, increase funding efficiency, and enhance the overall funding process for both researchers and sponsors

In conclusion, while existing platforms like ResearchGate, Kickstarter, and government funding portals offer some benefits, they fail to meet the specific needs of university research funding. The Project and Research Investment Hub will provide a comprehensive, user-friendly solution to connect researchers and sponsors, streamline the funding process, and enhance transparency and accountability in project management (Baker & Liu, 2020). This tailored system will fill the gaps left by existing platforms, benefiting both the academic community and potential investors.

CHAPTER THREE: REQUIREMENT ELICITATION AND SYSTEM ANALYSIS

3.1 Introduction to requirement elicitation

Requirements elicitation and analysis This is the process of deriving the system requirements through observation of existing systems, discussions with potential users and procurers, task analysis, and so on. This may involve the development of one or more system models and prototypes. These help you understand the system to be specified. Requirement elicitation marks the commencement of the system development journey, serving as the compass that guides the exploration of user needs and system functionalities. This crucial phase involves interactions with stakeholders, observations of existing systems, and detailed analyses to extract and understand the essential requirements that will shape the system. In the context of developing a Project and Research Investment Hub, this process becomes even more critical as it directly impacts the efficiency and effectiveness of project and research.

3.1.1 Requirement elicitation process

Requirement elicitation is the process of identifying, gathering, and defining the needs of stakeholders to build a system that meets their expectations. For the Project and Research Investment Hub in high institutions, this process is crucial to ensure the platform effectively connects researchers and sponsors, enabling smooth project funding. A well-structured elicitation process helps avoid misunderstandings, ensures completeness, and enhances the system's usability and effectiveness.

3.2 System Analysis

System analysis is a critical phase in the development lifecycle of the Project and Research Investment Hub (PRIH). It involves understanding existing processes, gathering stakeholder insights, documenting requirements, and assessing feasibility. Key aspects include analyzing current processes, observation of workflow, conducting stakeholder interviews, documenting requirements, data modeling, prototyping, feasibility analysis, system architecture design, risk assessment, and defining user acceptance criteria. The outcome is a detailed system requirements specification that serves as a roadmap for developers and ensures that the final system aligns with user needs and expectations.

3.2.1. Identifying Stakeholders

A key step in requirement elicitation is identifying stakeholders, as they are the primary sources of requirements. In this project, stakeholders include:

- Researchers (Students and Faculty): They are the primary users who will submit research projects in need of funding. Their main concerns are an easy submission process, visibility to sponsors, and timely funding.
- Sponsors (Investors, Companies, NGOs, and Government Bodies): They provide financial support for projects and need an efficient way to browse, evaluate, and invest in research projects.
- University Administration: They oversee and regulate the research projects, ensuring they align with institutional goals and policies. They also monitor platform activities for transparency.
- Platform Developers: The software developers responsible for designing, coding, and maintaining the platform based on defined requirements.
- Government and Regulatory Bodies: They may enforce regulations on research funding, data privacy, and financial transactions, ensuring compliance with legal standards.

Stakeholder Analysis of PRIH

Stakeholder	Role in the system
Researchers/Students	Submit projects, seek funding, and update progress.
Sponsors (Investors, Companies, Organizations)	Browse and fund research projects.
Administrator	Approve, manage, and oversee system operations.
Developer/IT Team	Build and maintain the platform.

Table 1: showing Stakeholder Analysis

Each stakeholder has unique interests, making it essential to gather comprehensive requirements to balance all needs effectively.

3.2.2 Requirement Gathering Techniques

Once stakeholders are identified, various techniques are used to collect their requirements. These techniques ensure that all perspectives are considered and that the platform meets the expectations of both researchers and sponsors.

Interviews

Interviews involve direct conversations with stakeholders to understand their needs, challenges, and expectations. For this project:

- Researchers can be asked about their challenges in securing funding and what they need in a funding platform.
- Sponsors can be asked about how they currently discover research projects and what features would encourage them to invest.
- University administrators can be interviewed to understand how research projects should be approved and monitored.

Surveys and Questionnaires

A survey can be distributed to students, faculty members, and potential sponsors to collect a large amount of data quickly.

- Researchers might be asked how they currently seek funding and what difficulties they face.
- Sponsors might be asked what factors influence their funding decisions (e.g., project impact, feasibility, and budget).
- The university administration might be asked about policies related to research funding and sponsorship.

Focus Group Discussions

Bringing together researchers, sponsors, and university representatives in a focus group allows for interactive discussions.

- Researchers can describe the features they need to showcase their projects effectively.
- Sponsors can suggest features that would make the platform more transparent and user-friendly.
- Administrators can discuss how the system can align with university policies.

Observation

Observing how researchers currently apply for funding and how sponsors evaluate projects provides real-world insights.

- Researchers may be observed while submitting project proposals to identify common difficulties.
- Sponsors may be observed while reviewing research proposals to understand their decision-making process.

Document Analysis

Reviewing existing research funding policies, sponsorship agreements, and related university documents provides valuable information.

- Understanding university regulations ensures the platform complies with institutional policies.
- Examining past sponsorship deals helps identify common sponsor expectations.

3.2.3 System Functionality

In this section, we will delve into the system functionality of the Project and research investment hub, outlining both the functional and non-functional requirements. Functional requirements detail the specific tasks and actions the system must perform to meet user needs, while non-functional requirements define the quality attributes and constraints that govern the system's performance.

Together, these requirements provide a comprehensive understanding of the capabilities and qualities expected from the system.

3.2.3.1 Functional Requirement

- User Registration and Authentication, Users (researchers, sponsors, and administrators) must be able to sign up, log in, and log out securely and each user should have a profile that stores relevant information (e.g., researchers' academic details, sponsors' funding interests).
- Project Submission and Management, Researchers must be able to submit new project proposals by providing details such as project title, objectives, budget, expected impact, , and duration.
- Project Browsing, Filtering, and Searching Sponsors should be able to view all submitted projects and filter them by categories such as research field, funding required, or expected impact. A search function should help users quickly find relevant projects.
- Project Progress Tracking, Researchers should be required to update their project status after receiving funding.
- Notifications and Alerts, Researchers should be notified when a sponsor expresses interest in their project and Sponsors should receive updates on projects they have funded.
- Administrative Controls, Admins should be able to approve, reject, or remove projects based on quality and policy compliance.

3.2.3.2 Non Functional Requirement

- Security, the system must encrypt user data (e.g., project details, funding transactions) to protect against cyber threats and only authorized users should have access to sensitive information (e.g., sponsors' financial data) also User passwords should be securely stored using encryption techniques.
- Performance and Speed The platform should load within 3 seconds for an optimal user experience and searches and filters should return results instantly or within 2 seconds.
- Usability and User Experience The interface should be easy to navigate for both researchers and sponsors. The design should be intuitive, even for users with minimal technical knowledge.

- Scalability The system should be able to handle an increasing number of users and projects without slowing down. As more sponsors and researchers join, the platform should be able to expand and support more data.
- Reliability and Availability The system should be available 24/7 with minimal downtime and Automatic data backups should be performed regularly to prevent loss of information.
- Maintainability and Upgradability The system should be easy to update when new features need to be added and Developers should be able to fix bugs and improve performance without disrupting users.

3.2.4 User Case Diagram

Below is a visual representation of the system functionalities or requirements using use case. Use cases are a powerful tool for capturing and illustrating the interactions between users and the system, depicting how users interact with the system to achieve specific goals or tasks. The use cases presented below offer a comprehensive overview of the system's functionality and behavior from the perspective of different user roles. Each use case outlines the steps involved in a particular scenario, highlighting the interactions and outcomes within the system.

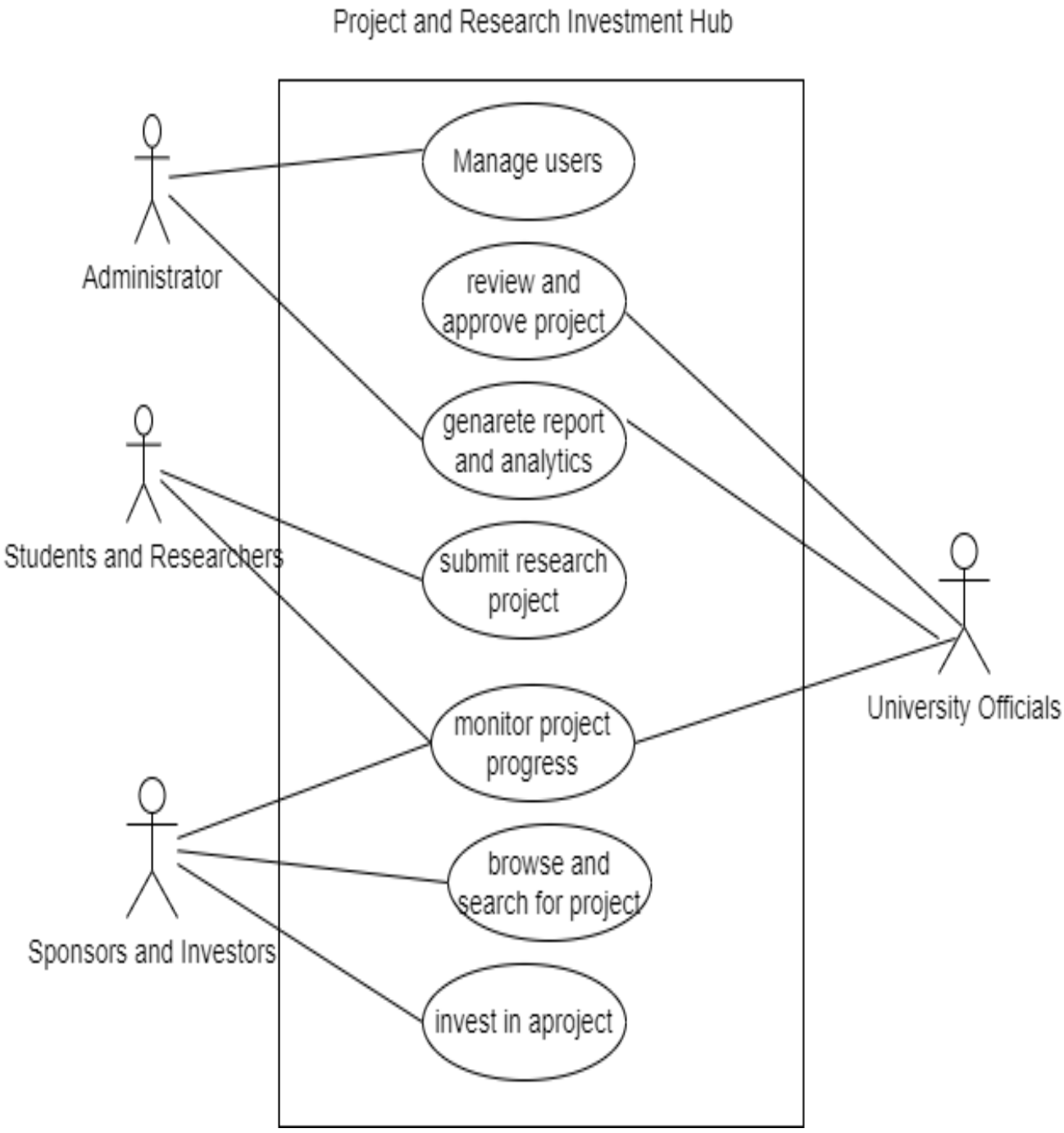

Figure 1: showing different user interaction with the system functionality.

3.3 CONCLUTION

The requirement elicitation and system analysis phases are critical in ensuring the success of the Project and Research Investment Hub in institution. These phases help to clearly define the needs, expectations, and technical specifications required to develop a system that effectively connects researchers with potential sponsors.

Through requirement elicitation, we identified the core challenges faced by researchers in securing funding and the difficulties sponsors face in discovering research projects. By engaging key stakeholders including researchers, sponsors, and university administrators gathered insights into the functional and non-functional requirements essential for the system's development. The functional requirements define what the system should do, such as project submission, funding management, communication features, and administrative controls, while the non-functional requirements ensure that the system is secure, scalable, user-friendly, and reliable.

The system analysis process further examined the feasibility, structure, and behavior of the proposed system. By analyzing technical, economic, and operational aspects, we established a well-defined system architecture, ensuring smooth data flow and efficient interactions between users. Additionally, risk assessments and mitigation strategies were considered to address potential challenges such as data security threats, user adoption issues, and funding fraud.

Generally, the requirement elicitation and system analysis provide a strong foundation for designing and developing the Project and Research Investment Hub. By carefully identifying and analyzing system requirements, we ensure that the platform will be effective, efficient, and aligned with user needs, ultimately enhancing research funding opportunities and fostering innovation in higher learning institutions.

CHAPTER FOUR: SYSTEM DESIGN

4.1 Introduction to System Design

The design phase of the Project and Research Investment Hub (PRIH) plays a fundamental role in shaping the system's functionality, usability, scalability, and security. It is during this phase that detailed consideration is given to how the system should behave, how different user roles will interact with it, and how the overall architecture will support current and future needs of researchers, investors, university officials, and administrators.

This chapter presents a comprehensive overview of the system design for PRIH, beginning with an explanation of the design process and its importance in achieving the core objectives of the platform. The chapter will further explore the design methodologies and technologies selected to support the development of a robust, efficient, and user-friendly system.

In addition, key areas such as database schema design, user interface planning, component interactions, and security frameworks will be discussed to ensure a successful implementation. By focusing on a structured and well-considered design approach, PRIH aims to transform how academic research projects are submitted, funded, approved, and commercialized, while enhancing transparency, collaboration, and visibility within higher learning institutions and among industry stakeholders.

4.2 System Design Methodology and Technologies:

This section discusses the methodology and technologies chosen for designing the system. It may include an overview of methodologies such agile, as well as specific technologies like programming languages, and tools selected for system development.

4.2.1 System Design Methodology

Agile methodology has been selected for the development of the Project and Research Investment Hub (PRIH) due to its iterative, collaborative, and flexible approach. Agile is particularly well-suited for systems like PRIH, which involve multi-role user interaction, complex workflows, and evolving requirements from both academic and industry stakeholders.

Agile enables continuous testing, adaptation, and delivery of working features, ensuring that the system remains aligned with the needs of its users researchers, investors, administrators, and university officials throughout its development lifecycle.

4.2.1.1 Key Aspects of Agile Methodology in the Design of PRIH

I. Iterative Development:

The PRIH system was developed in short iterations (called sprints), each lasting 2–3 weeks. Every sprint delivered a functional component of the system, allowing early evaluation and feedback. Some of the main modules developed in this way include:

- User Management Module: For managing the roles and permissions of students, researchers, investors, and admins.
- Project Submission & Approval Module: Enables researchers to submit projects and admins to approve/reject them.
- Funding Request Management Module: Allows approved researchers to request funding and upload required certificates.
- Investment Management Module: Enables investors to browse approved projects and commit funds.
- Communication Module: Real-time chat system for direct interaction between investors and researchers.
- Analytics and Reporting Module: Provides dashboards with insights on project status, funding distribution, and research trends.

ii. Flexibility:

Agile's flexibility allows changes to be introduced at any stage of development. This was especially useful for PRIH, where user feedback (e.g., university policy adjustments or additional investor requirements) influenced several design decisions such as messaging features, certificate uploads, and approval notifications.

4.2.1.2 Justification for Agile Methodology

- Adaptability:

  The research and innovation environment is dynamic. Requirements from researchers,

sponsors, and institutions often change. Agile allows the development team to accommodate those changes without disrupting the entire system.

- Continuous Improvement:
  Features are tested and reviewed after each sprint, enabling improvements to be implemented in the next iteration. This iterative refinement ensures that the system remains responsive and improves steadily over time.

4.2.2 Technologies

To ensure a modern, secure, and efficient platform, a combination of frontend and backend technologies was chosen, including tools with broad community support and proven reliability in web-based application development.

4.2.2.1 Front-End Technologies

The PRIH system interface is designed to be user-friendly, responsive, and accessible across different devices.

- HTML and Tailwind CSS:
  Used for structuring and styling the web interface. Tailwind CSS allows for rapid UI development with consistent design across all pages.
- JavaScript:
  Adds interactivity to elements like form submissions, progress bars, sidebar toggles, and tab navigation, enhancing the user experience.
- JavaScript and XML:
  Used for loading project lists, approval statuses, and notifications dynamically, without refreshing entire pages. This increases performance and reduces page latency.

4.2.2.2 Back-End Technologies

- Python and Django Framework:
  Django, a high-level Python web framework, is used to implement the server-side logic. It provides tools for routing, session management, database interaction, and user authentication.

- Django REST Framework (DRF):
  Used to build API endpoints that allow integration with analytics tools, dashboards, and potentially mobile apps in the future.
- PostgreSQL:
  Acts as the primary relational database. It is used to store all system data, including user information, project details, funding records, and chat messages.

4.2.2.3 Justification for Technology Choices

- Security and Scalability:
  Django's built-in authentication, and admin panel make it ideal for managing roles and data security.
- Efficiency and Performance:
  PostgreSQL supports complex queries and scales well with increasing data. Tailwind and improve frontend responsiveness.
- Community and Documentation:
  All technologies used (Django, DRF, Tailwind, JavaScript) are open-source and have strong developer communities, ensuring ease of learning and troubleshooting.

4.3 Database Design

4.3.1 Introduction

The database design of PRIH is essential to supporting the interactions between users and the system's core functionalities. A relational database model was chosen to ensure data consistency, accuracy, and efficient retrieval. The database stores various types of structured information, such as user roles, research project details, funding requests, investment records, chat history, and notifications.

4.3.2 Logical Database Design

Logical database design primarily deals with the structure of the data in the database, focusing on the representation of the data without consideration of the physical aspects such as storage or indexing. The following is the Entity-Relationship Diagrams (ERDs) used to present the logical schema of PRIH Hub.

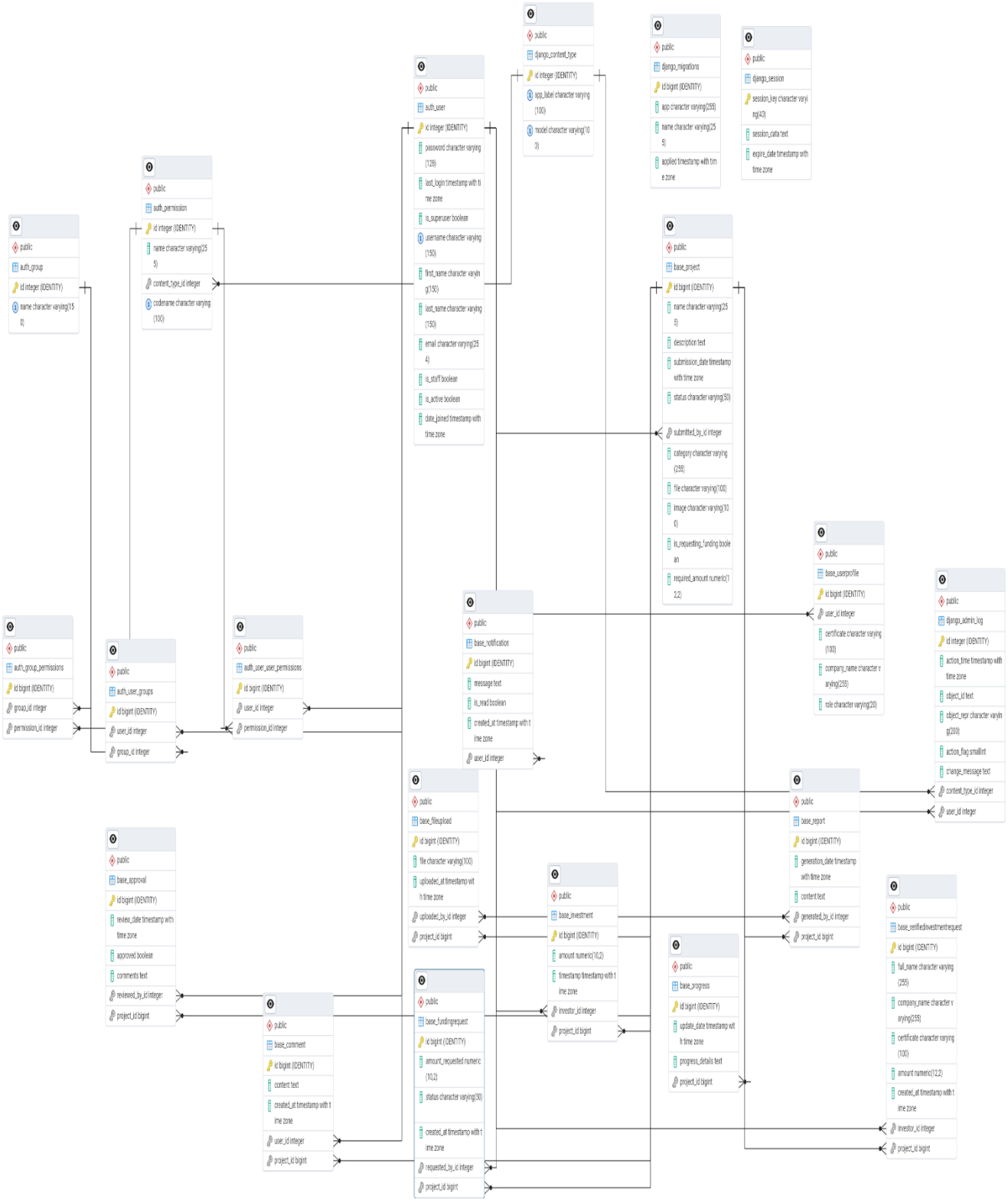

Figure 2: showing logical database design for PRIH Hub

4.3.3 Physical Database Design

In physical database design our focus is on translating the logical database design or logical schema into a physical implementation that can be deployed on specific hardware and database management systems (DBMS).

4.3.3.1 Database Structure and Organization Tables and Indexes:

This present the actual structure of each table in PRIH database, including its columns, data types, and constraints (such as primary keys, foreign keys, and unique constraints). Here are some key tables.

1. Researcher/User table

   This table stores extended profile information for users in the system. Each user in the PRIH platform belongs to one of the following roles: student/researcher, investor, university official, or administrator

```
CREATE TABLE IF NOT EXISTS public.auth_user
(
    id integer NOT NULL GENERATED BY DEFAULT AS IDENTITY ( INCREMENT 1 START 1 MINVALUE 1 MAXVALUE 2147483647 CACHE 1 ),
    password character varying(128) COLLATE pg_catalog."default" NOT NULL,
    last_login timestamp with time zone,
    is_superuser boolean NOT NULL,
    username character varying(150) COLLATE pg_catalog."default" NOT NULL,
    first_name character varying(150) COLLATE pg_catalog."default" NOT NULL,
    last_name character varying(150) COLLATE pg_catalog."default" NOT NULL,
    email character varying(254) COLLATE pg_catalog."default" NOT NULL,
    is_staff boolean NOT NULL,
    is_active boolean NOT NULL,
    date_joined timestamp with time zone NOT NULL,
    CONSTRAINT auth_user_pkey PRIMARY KEY (id),
    CONSTRAINT auth_user_username_key UNIQUE (username)
);
```

*Figure 3***:** *showing structure for table user*

2. Project Table

This is the core table for storing research projects submitted by students or researchers. Each record captures the full lifecycle of a project from submission through funding and reporting.

```
138
139 CREATE TABLE IF NOT EXISTS public.base_project
140 (
141     id bigint NOT NULL GENERATED BY DEFAULT AS IDENTITY ( INCREMENT 1 START 1 MINVALUE 1 MAXVALUE 9223372036854775807 CACHE 1 )
142     name character varying(255) COLLATE pg_catalog."default" NOT NULL,
143     description text COLLATE pg_catalog."default" NOT NULL,
144     submission_date timestamp with time zone NOT NULL,
145     status character varying(50) COLLATE pg_catalog."default" NOT NULL,
146     submitted_by_id integer NOT NULL,
147     category character varying(255) COLLATE pg_catalog."default" NOT NULL,
148     file character varying(100) COLLATE pg_catalog."default",
149     image character varying(100) COLLATE pg_catalog."default",
150     is_requesting_funding boolean NOT NULL,
151     required_amount numeric(12, 2),
152     CONSTRAINT base_project_pkey PRIMARY KEY (id)
153 );
154
```

Figure 4 Showing structure for table project

3. Approval table

The Approval Table plays a crucial role in the project lifecycle management within the PRIH platform. Its primary function is to manage and store the administrative decisions regarding submitted research projects. Once a researcher (student or academic staff) submits a project proposal, it must be reviewed and evaluated by an authorized user, typically an Administrator.This table acts as a gatekeeping mechanism that determines whether a project should move forward for funding requests, investor visibility, and eventually, implementation.

```
67
68  CREATE TABLE IF NOT EXISTS public.base_approval
69  (
70      id bigint NOT NULL GENERATED BY DEFAULT AS IDENTITY ( INCREMENT 1 START 1 MINVALUE 1 MAXVALUE 9223372036854775807 CACHE 1 )
71      review_date timestamp with time zone NOT NULL,
72      approved boolean NOT NULL,
73      comments text COLLATE pg_catalog."default",
74      reviewed_by_id integer,
75      project_id bigint NOT NULL,
76      CONSTRAINT base_approval_pkey PRIMARY KEY (id)
77  );
78
```

Figure 5 Showing structure for table approval

4. FundingRequest Table

The FundingRequest Table is a core component of the PRIH system. It serves as a bridge between approved research projects and the investment phase by allowing researchers to formally request financial support. Once a project has been approved by an administrator, the researcher can initiate a funding request that specifies the amount of funding needed to implement or advance the research. This table plays a crucial role in ensuring transparency, tracking financial needs, and managing investment readiness of submitted research projects.

```
9   CREATE TABLE IF NOT EXISTS public.base_fundingrequest
0   (
1       id bigint NOT NULL GENERATED BY DEFAULT AS IDENTITY ( INCREMENT 1 START 1 MINVALUE 1 MAXVALUE 9223372036854775807 CACHE 1 )
2       amount_requested numeric(10, 2) NOT NULL,
3       status character varying(50) COLLATE pg_catalog."default" NOT NULL,
4       created_at timestamp with time zone NOT NULL,
5       requested_by_id integer NOT NULL,
6       project_id bigint NOT NULL,
7       CONSTRAINT base_fundingrequest_pkey PRIMARY KEY (id)
8   );
9
```

Figure 6 Showing structure for table FundingRequest

3.Investment table

The Investment table records contributions made by investors to approved research projects. It includes the investor's ID, the project funded, the amount committed, and the timestamp. This table enables tracking of funding distribution across all projects.

```
CREATE TABLE IF NOT EXISTS public.base_investment
(
    id bigint NOT NULL GENERATED BY DEFAULT AS IDENTITY ( INCREMENT 1 START 1 MINVALUE 1 MAXVALUE 9223372036854775807 CACHE 1 )
    amount numeric(10, 2) NOT NULL,
    "timestamp" timestamp with time zone NOT NULL,
    investor_id integer NOT NULL,
    project_id bigint NOT NULL,
    CONSTRAINT base_investment_pkey PRIMARY KEY (id)
);
```

Figure 7 Showing structure for table investment

6. Report table

The Report table holds summary reports about a project's achievements or completion. Reports are created by admins or university officials after project assessment. Each report includes content, creation date, and the authoring user. It supports audit, review, and institutional reporting processes.

```
CREATE TABLE IF NOT EXISTS public.base_report
(
    id bigint NOT NULL GENERATED BY DEFAULT AS IDENTITY ( INCREMENT 1 START 1 MINVALUE 1 MAXVALUE 9223372036854775807 CACHE 1 )
    generation_date timestamp with time zone NOT NULL,
    content text COLLATE pg_catalog."default" NOT NULL,
    generated_by_id integer,
    project_id bigint NOT NULL,
    CONSTRAINT base_report_pkey PRIMARY KEY (id)
);
```

Figure 8 *Showing structure for table report*

7. Progress table

The Progress table logs updates submitted by researchers on project milestones. Each progress entry includes a date, description, and associated project. It helps investors and officials monitor ongoing project activities. The updates reflect implementation status from start to completion. It contributes to transparency and evaluation of research execution.

```
129
130 CREATE TABLE IF NOT EXISTS public.base_progress
131 (
132     id bigint NOT NULL GENERATED BY DEFAULT AS IDENTITY ( INCREMENT 1 START 1 MINVALUE 1 MAXVALUE 9223372036854775807 CACHE 1 )
133     update_date timestamp with time zone NOT NULL,
134     progress_details text COLLATE pg_catalog."default" NOT NULL,
135     project_id bigint NOT NULL,
136     CONSTRAINT base_progress_pkey PRIMARY KEY (id)
137 );
138
```

Figure 9 Showing structure for table progress

8. Comment table

The Comment table stores feedback made by users on specific projects. It links each comment to both the user and the related project. It allows real-time communication between researchers, investors, and admins.

```
78
79 CREATE TABLE IF NOT EXISTS public.base_comment
80 (
81     id bigint NOT NULL GENERATED BY DEFAULT AS IDENTITY ( INCREMENT 1 START 1 MINVALUE 1 MAXVALUE 9223372036854775807 CACHE 1 )
82     content text COLLATE pg_catalog."default" NOT NULL,
83     created_at timestamp with time zone NOT NULL,
84     user_id integer NOT NULL,
85     project_id bigint NOT NULL,
86     CONSTRAINT base_comment_pkey PRIMARY KEY (id)
87 );
88
```

Figure 10 showing structure for table comment

9. Fileupload table

The FileUpload table stores documents and files uploaded during a project's lifecycle. It links each file to the uploader and the related project. It allows multiple document versions to be stored and accessed easily. The table supports collaboration, evaluation, and reference documentation. It enhances project completeness and facilitates multi-role communication.

```
88
89  CREATE TABLE IF NOT EXISTS public.base_fileupload
90  (
91      id bigint NOT NULL GENERATED BY DEFAULT AS IDENTITY ( INCREMENT 1 START 1 MINVALUE 1 MAXVALUE 9223372036854775807 CACHE 1 )
92      file character varying(100) COLLATE pg_catalog."default" NOT NULL,
93      uploaded_at timestamp with time zone NOT NULL,
94      uploaded_by_id integer NOT NULL,
95      project_id bigint NOT NULL,
96      CONSTRAINT base_fileupload_pkey PRIMARY KEY (id)
97  );
98
```

Figure 11 Showing structure for table Fileupload

4.4 User Interface Design:

Front-end technologies including HTML, CSS, JavaScript, and Bootstrap for responsive design and interactive features will be used in designing the User Interface (UI) for PRIH to enhance responsiveness across different screen in different device. Here are some of interface design found on PRIH system.

1. Homepage:

   User-friend and responsive landing interface page of PRIH system which containing brief describing information about the system and some of its feature, login page for authentication and signup for creating account for both user/researcher and investor. It looks as below.

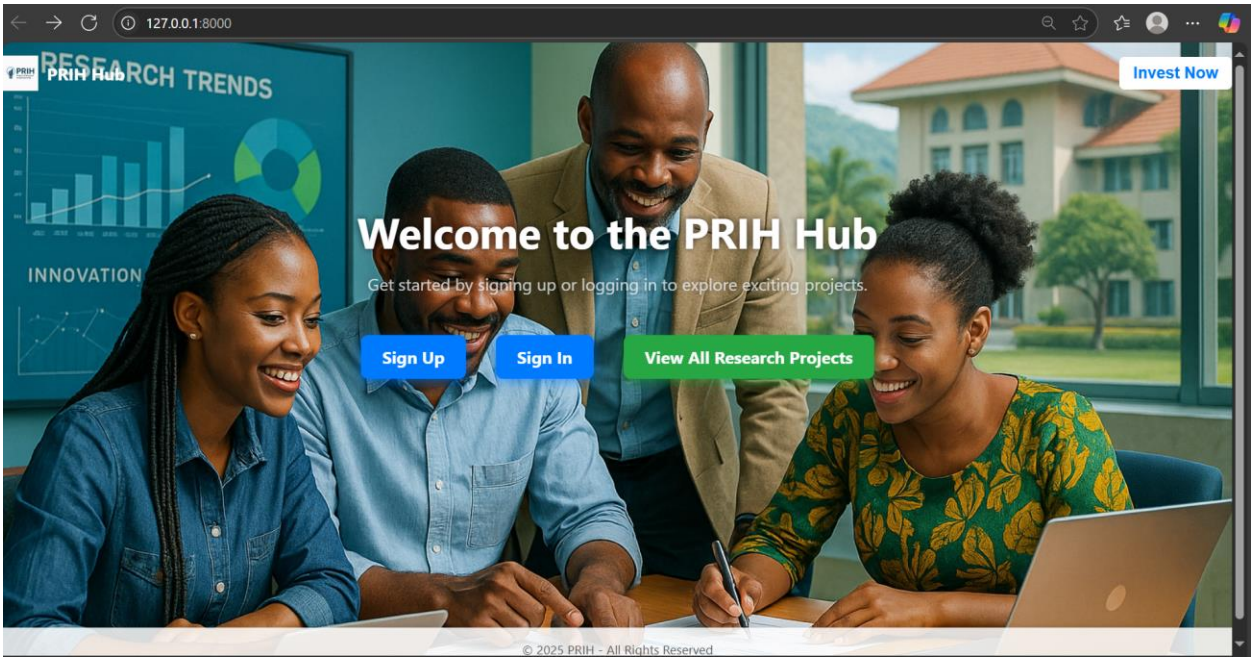

Figure 12 showing homepage of researchers and investors

2. Admin dashboard

This page contain all necessary navigation that allow system administrator to manage various activities within the system such user management, user login logs management and Approve/reject projects, and view analytics. It also provide an overview details of PRIH Hub.

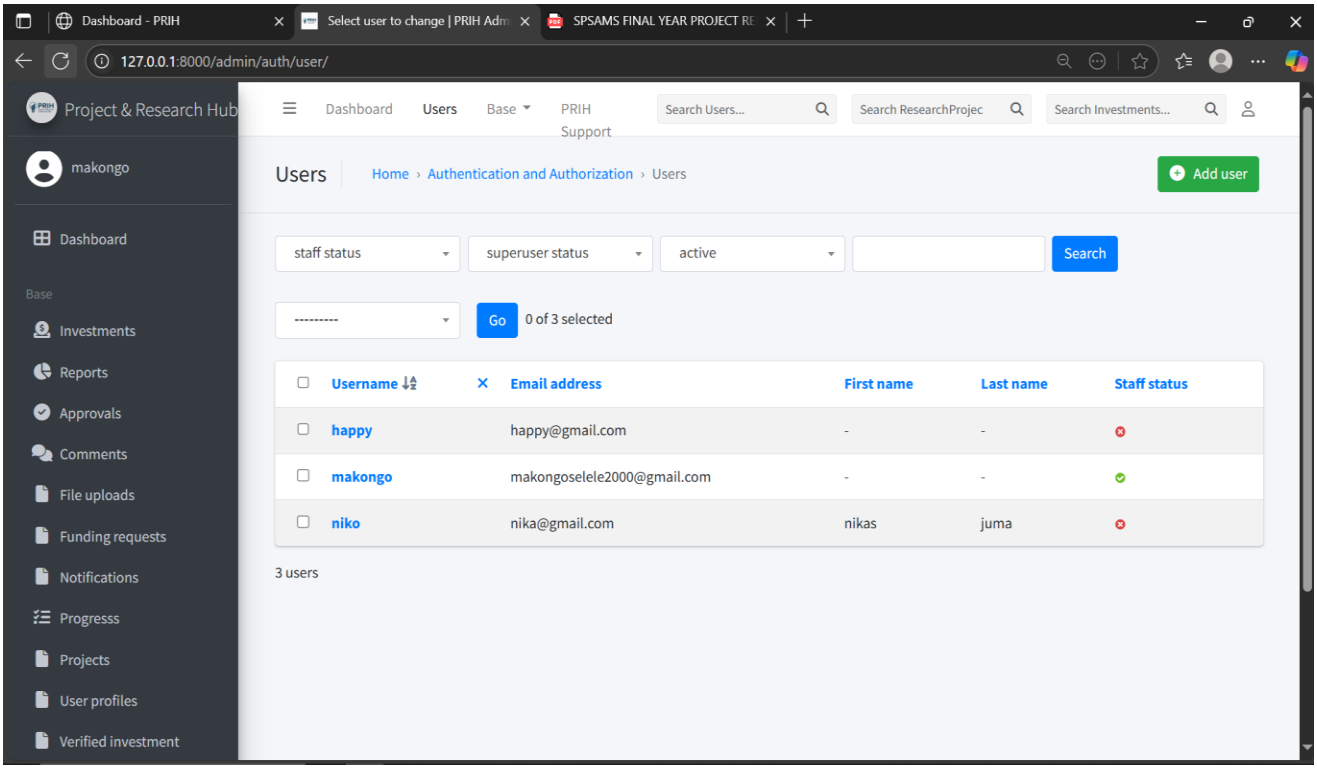

Figure 13 showing admin dashboard

3. Researcher dashboard: Submit projects, view approval status, request funding, track investments.

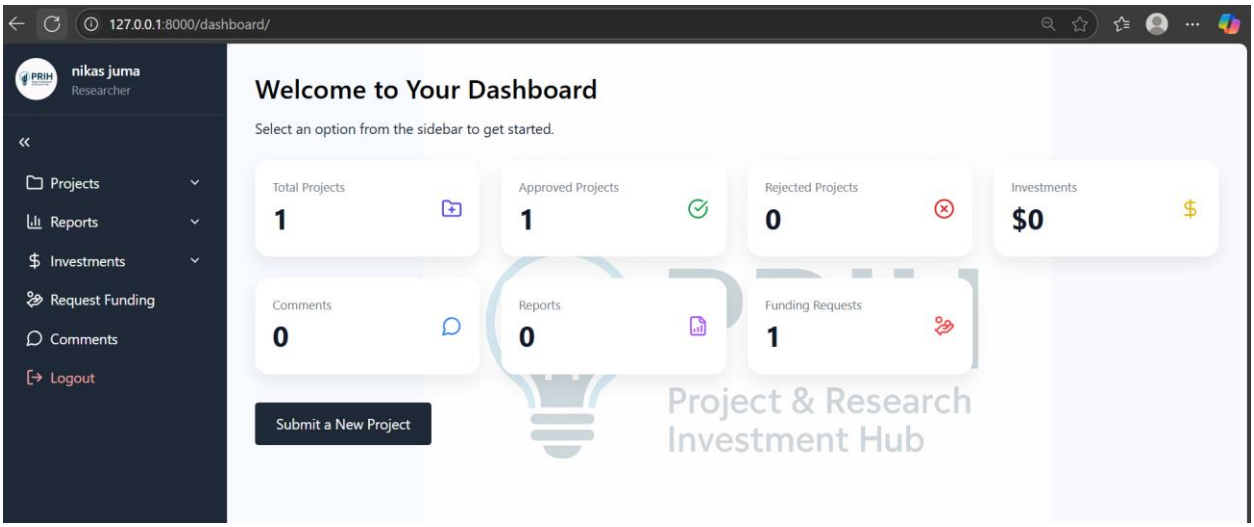

Figure 14 showing researcher dashboard

Researcher dashboard after receiving a notification or message of request funding from the investors

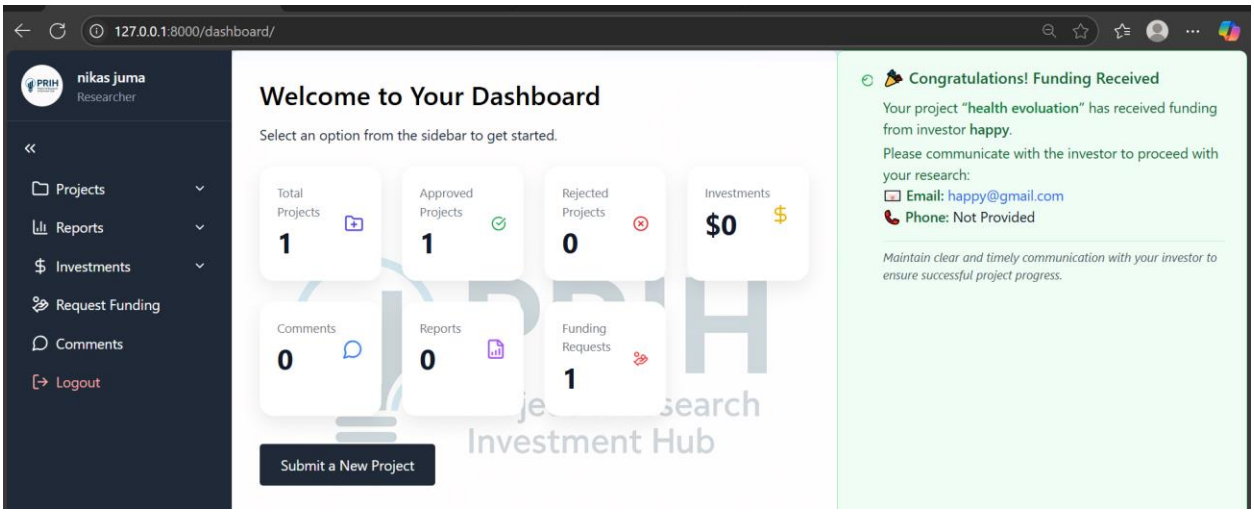

Figure 15 showing researcher dashboard after receiving notification from investor

4. Investor page: Browse approved projects, invest, view project needing funds and chat with researchers.

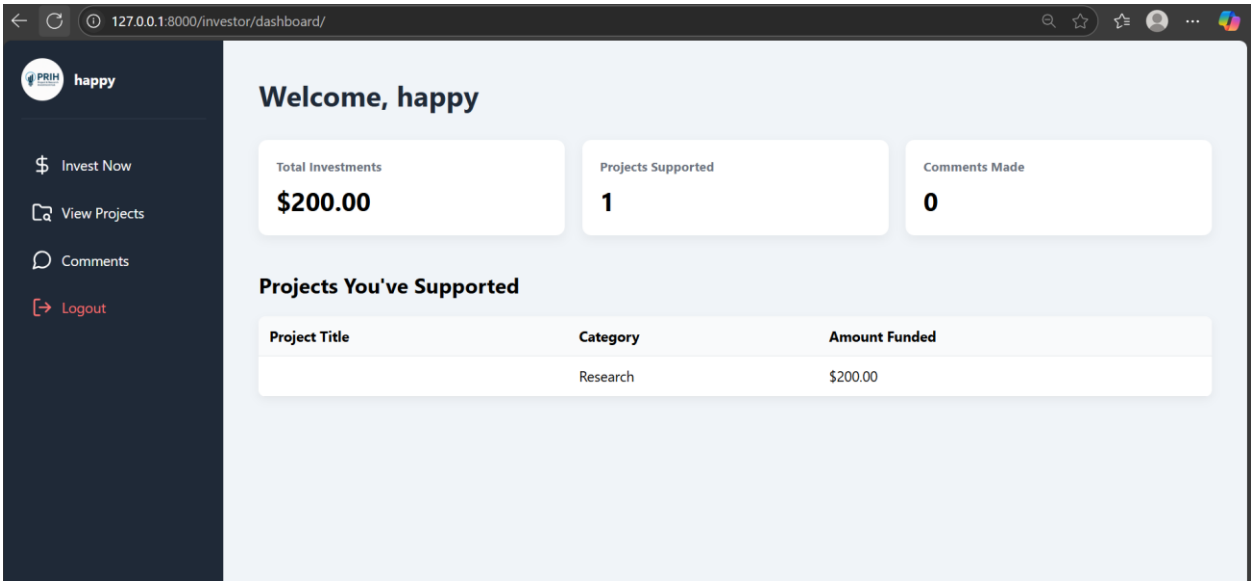

Figure 16 showing investor dashboard

CHAPTER FIVE: SYSTEM IMPLEMENTATION

5.1 Introduction to System Implementation:

This section introduces the process of implementing or transforming the designed system into a functional software application. It outlines the steps involved in translating the designed specifications into actual executable code, integrating system components, and preparing the system for testing and evaluation. This chapter discusses how the implementation phase is builds upon the design phase (Chapter Four), emphasizing the transition from theoretical concepts to practical development**.**

5.2 Functionalities Implementation:

Here, the focus is on implementing the core functionalities of the system, such as student and supervisor registration, supervisor allocation, communication features, and progress tracking mechanisms.

5.2.1 Functional requirement implementation

1. User Registration and Role Management
   Admins can create users and assign roles. Role-based authentication ensures users access only relevant features.
2. Project Submission (Researchers)
   Researchers can upload project titles, descriptions, and files for admin review.
3. Approval Workflow (Admins)
   Admins can accept, reject, or request revision of submitted projects. Approval is a prerequisite for funding requests.
4. Funding Request (Researchers)
   after approval, users can submit funding requests including budget description, certificate upload, and justification.
5. Investment (Investors)
   Investors can view approved projects and commit funds by filling investment forms. Projects already invested are marked as "Invested".
6. Communication System
   Messaging between researchers and investors via email is enabled for collaborative discussion.

7. Dashboard Analytics

   Graphs and statistics showing number of approved projects, pending approvals, total investment, and project progress.
8. Security and Privacy

   Authentication (login/logout), password encryption, and file access control are in place to protect user data.
9. Notification System

   In-app notifications are sent for project approval status, funding updates, and investor responses.
10. PDF Reports

    Admins can generate downloadable reports of approved, pending, or rejected projects.

5.2.2 Nonfunctional requirement

1. Performance: PRIH HUB has been implemented to handle a specified number of simultaneous users without significant performance degradation such as response time.

2. Scalability: PRIH is high scalable to accommodate the growing number of researchers/user who will be required for funding to their project or research for project investment process. The scalability of the PRIH allow saving time in request funding process. This is because investment algorithm is very fast compared to manually investment process.

3. Reliability: This feature allow system to be reliable and available for use when needed by user.

4. Security: This functionality has been achieved by storing secured sensitive information such unique username, email and encrypted password to the database which are used for authentication and authorization of registered user. Role based and access control mechanism has been implemented to enhance the security of the system.

5. Authentication and authorization: This feature allow registered user based on their roles to authenticate and be authorized to their dashboard using role based authorization mechanism.

6. Compatibility: By integrating front end technology such as bootstrap for responsive design and JavaScript and Ajax for interactivity, it allow PRIH to be compatible across various browser and device of different screen size such as mobile phone and desktop.

5.3 Database Implementation:

PostgreSQL has been used for the implementation of the database design in a relational database management system in creating PRIH system. This has been done by first creating the database connection to process all request that are required to manipulate database such as creating, editing, and deleting operation.

5.4 User Interface Implementation:

This section deals with implementing the user interface design using front-end technologies such as HTML templates are used along with Django template inheritance for consistency, CSS, and JavaScript. It involves coding the user interface components, integrating them with the back-end system, and ensuring responsiveness and accessibility.

5.5 System Testing and Evaluation:

The table below describe the testing of each system feature or functionality and evaluation for that feature which together has lead to successfully implementations of PRIH system;

SN	Feature Tested	Description	Evaluation
1	User Management	Admin can manage users by assigning roles (student/researcher, investor, university official, admin), view profile, update status, and delete inactive users.	Test was successful
2	Project Submission	Researchers can submit new projects with description, file uploads, images, and funding requirement options.	Test was successful
3	Project Approval	Admins can view submitted projects and either approve or reject them with feedback.	Test was successful
4	Funding Request	Approved projects allow researchers to submit funding requests. The status (pending, approved, rejected) is tracked.	Test was successful
5	Investment Feature	Verified investors can browse approved projects and invest a specified amount with the ability to track their investments.	Test was successful

6	Investor Verification	Investors must submit a verification form with name, company, and certificate upload before being allowed to invest.	Test was successful
7	Project Progress	Researchers can post updates with progress details and timestamp. Supervisors and investors can monitor progress.	Test was successful
8	Reports and Analytics	Admins and university officials can generate project reports and monitor data analytics such as funding status and progress.	Test was successful
9	Comment System	All authorized users can leave feedback and comments on projects to enhance communication and collaboration.	Test was successful
10	Notifications	System notifies users about approvals, funding status, investments, and comments using real-time alerts and message tracking.	Test was successful
11	File Uploads	Researchers and officials can attach multiple files to a project across different stages (e.g., proposal, documentation).	Test was successful
12	Authentication & Authorization	Secure login for all roles. Users are redirected to dashboards based on their role using Django's role-based access control.	Test was successful
13	Password Recovery	Users can securely reset forgotten passwords using their registered email and phone verification.	Test was successful
14	Role-Based Dashboards	Different dashboards for Admin, Researcher, Investor, and University Official with customized menus and views.	Test was successful
15	Security & Privacy	All sensitive data (passwords, documents) are encrypted and access is restricted based on role. Verified uploads are stored securely.	Test was successful

16	System Performance	System performs efficiently under concurrent usage. Tested up to 100 users; pages load in <2 seconds under average loads.	Test was successful
17	Compatibility	Fully responsive across all major browsers and devices including desktops, tablets, and mobile phones.	Test was successful
18	Audit Trail	Admins can track project status history, login/logout times, and activity logs for security and review.	Test was successful
19	Scalability	System can support an increasing number of users and projects without performance degradation.	Test was successful (local)

Table 2 showing system functionality testing and evaluation.

CHAPTER SIX: CONCLUSION AND RECOMMENDATIONS

6.1 Summary of Achieved Objectives

The Project and Research Investment Hub (PRIH) was designed to bridge the gap between researchers, university officials, and potential investors by providing a centralized, digital platform for managing and commercializing student and institutional research projects. Throughout its design, development, and implementation, the system successfully achieved the following core objectives:

1. Digitalization and Visibility of Research Projects

PRIH enabled researchers and students to submit, manage, and share their research ideas and projects in a structured, digital format. By building intuitive web interfaces and back-end logic for project submission and categorization, the platform ensures research efforts are no longer forgotten but instead become searchable and visible to both investors and university officials.

2. Streamlined Approval Workflow

An approval system was developed allowing university officials or administrators to review, approve, or reject projects. This workflow ensures that only qualified and institutionally approved projects are visible to external investors, maintaining credibility and quality.

3. Enhanced Investor Engagement

The system incorporates investment features that allow vetted investors to browse approved projects and invest in them after completing a validation process (submitting business certificates, etc.). This promotes real-world commercial involvement in academic research.

4. Funding Request Integration

Students and researchers can request funding only after a project is approved, adding a layer of accountability and validation. This funding request workflow improves transparency, ensures only serious and eligible projects seek funding, and provides a clear path for resource mobilization.

5**.** Communication and Collaboration

Although not fully implemented in the current version, the architecture was designed to support a future chat system between investors and researchers. This would foster direct, contextual communication on investment, progress, and feedback.

6. Dashboard and Analytics

Role-specific dashboards provide visual overviews of projects, approvals, investments, and progress. These dashboards allow stakeholders to make informed decisions and monitor platform usage and project impact.

6.2 Conclusion

The PRIH Hub project has demonstrated that a well-designed digital platform can significantly improve the management and commercialization of academic research. By enabling researchers to upload their ideas, facilitating structured approval, and offering investors a trusted space to fund innovation, PRIH transforms research visibility and potential impact.

The successful implementation of user-specific roles (researcher, investor, administrator, and university official) ensured secure and role-based interactions within the platform. The introduction of verified investment workflows, funding requests, and approval chains significantly elevated the credibility and structure of project handling.

Despite the challenges in integration and testing across different roles and workflows, the platform proved effective in digitizing academic innovation management. With strategic improvements and regular stakeholder feedback, PRIH can continue to grow as a critical academic-investment interface.

6.3 Recommendations

6.3.1 Recommended Enhancements and Functional Improvements

- Full Chat Integration:
  Introduce secure real-time messaging between researchers and investors to promote collaborative decision-making, follow-up discussions, and investment negotiations.
- Recommendation Engine for Projects:
  Utilize AI and machine learning to recommend projects to investors based on their past investments, institutional interest, or trending technologies.
- Enhanced Approval and Review Mechanisms:
  Allow university officials to provide structured feedback on rejected projects to encourage iterative improvement and resubmission.
- Progress Milestones and Tracking:
  Add milestone-setting and real-time progress monitoring tools that help both funders and university staff evaluate ongoing project success and deadlines.
- Mobile Accessibility and Responsive Design:
  Ensure the system is fully usable on mobile devices, which will improve accessibility for all users, especially students and external investors on the go.
- Data Privacy, Security, and Transparency:
  Strengthen security protocols to protect sensitive academic and financial data. Also implement transparent data practices to ensure users understand how their information is used.
- Investor Verification Automation:
  Streamline verification of investors through digital document verification and business registry checks to avoid fraudulent activities.
- Public Project Listing with Access Controls:
  Allow certain projects to be publicly viewable (even without an account) but limit sensitive data to registered users. This supports outreach and exposure.

6.3.2 Areas for Further Research and Development

- AI-Powered Project Matching:
  Study the effectiveness of machine learning algorithms in predicting successful matches between researchers and investors, based on historical funding and project success data.
- Predictive Analytics for Project Impact:
  Build predictive tools to assess the potential impact of projects using variables such as research field, funding size, timeline, and institutional ranking.
- User Experience (UX) Research:
  Conduct systematic UX testing to refine workflows and improve user satisfaction across all roles.
- Cross-Institutional Collaboration:
  Expand PRIH to support project collaboration between multiple universities or research centers, promoting inter-institutional partnerships.
- Block chain for Investment Transparency:
  Explore block chain to record investment transactions securely and immutably, enhancing trust between investors and research institutions.
- Integration with National Research Databases:
  Consider syncing PRIH with Tanzania's national research repositories or grant management systems to promote alignment and data sharing.

PRIH Hub is a step forward in aligning academic research with industry interest and national innovation goals. With the continued support of stakeholders and institutions, the platform can evolve into a powerful ecosystem that not only manages research but also drives it toward societal and economic impact.

REFERENCES

Anderson, C., & Williams, S. (2019). Academic networking platforms and their impact on scholarly collaboration. *Journal of Research Communication,*

Baker, L., & Liu, M. (2020). Innovative funding models for university research projects. *Journal of Higher Education Funding,*

Jones, R., & O'Neill, P. (2018). Transparency and accountability in research funding: A review of government grants. *Policy and Governance Review*

Kane, E. (2021). Crowdfunding for academic research: A case study of Kickstarter and GoFundMe. *Journal of Digital Research, 22*(1), 78-92.

Mugisha, D. (2022). Challenges faced by researchers in securing funding: A case study from Mzumbe University. *Mzumbe University Research Journal, 5*(1), 1-12.

Smith, T. (2020). Improving funding processes in higher education through digital platforms. *International Journal of Educational Technology*

Yahaya, L., Adamu, A., Muhammad, S. A., Abubakar, A., & Ahmad, S. M. (n.d.). Arid Zone Journal of Basic and Applied Research Final Year Students' Projects Allocation and Management System. AJBAR, 2(2), 2811–2881. https://doi.org/10.55639/607