

**KIGALI INDEPENDENT UNIVERSITY ULK
SCHOOL OF SCIENCE AND TECHNOLOGY
DEPARTMENT OF COMPUTER SCIENCE
P.O. Box: 2280 KIGALI**

**INTRANET MAILING SYSTEMS
CASE STUDY: KIGALI INDEPENDENT UNIVERSITY (ULK)**

BY

Abigail K. Nehwon

Roll No: 202111433

Supervisor: Mr. Eric BYIRINGIRO

A dissertation submitted to the School of Sciences and Technology in partial fulfillment of the academic requirements for the award of Bachelor's Degree in Computer Sciences

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DECLARATION

I, **Abigail K. Nehwon**, thus certify that the study I have done for my thesis, "**INTRANET MAILING SYSTEMS**" is original to me and was done on my own, with guidance from I **Mr. Eric BYIRINGIRO** certify that no other university or institution has accepted this research, in whole or in part, for the award of any other degree or diploma. Through cites and references, every information source and piece of literature used in the study has been appropriately acknowledged.

This study was carried out in compliance with the regulations and ethical standards established by **KIGALI INDEPENDENT UNIVERSITY (ULK)**.

Name: _____

Date: _____

Signed: _____

APPROVAL

This is to certify that the research work titled " **INTRANET MAILING SYSTEMS**" has been conducted and completed by **Abigail K. Nehwon** under the supervision of **Mr. Eric BYIRINGIRO**. This research has been examined and is hereby approved as meeting the requirements for the degree of **BSc Computer Science** at **Kigali Independent University (ULK)**.

Supervisor:

Name: _____

Signature: _____

Date: _____

DEDICATION

I dedicate this book to my ever potent mother, **Ruth M. Nehwon**, and my beloved sister, **Mercy Nehwon**, and other family members, I express my deepest gratitude for their unwavering support and guidance. I also extend my heartfelt thanks to the **Lempekeh's family** for their support throughout this study. Lastly, I am profoundly grateful to all of my professors and fellow students at **ULK** for their impeccable contributions to my academic journey.

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LIST OF ABBREVIATION AND ACRONYMS

CRMS	: Crime Record Management System
CSS	: Cascading Style Sheets
DFD	: Data Flow Diagram
ERD	: Entities Relationship Diagram
FTP	: File Transfer Protocol
HTML	: Hyper Text Markup Language)
IMS	: Intranet Mailing System
JS	: Java Script
MYSQL	: Structured Query Language.
PHP	: Hypertext Preprocessor
SSADM	: Structured System Analysis Design Methodology
ULK	: Université Libre de Kigali
URL	: Uniform Resource Locator

ABSTRACT

The Intranet Mailing System is an internal communication platform designed to facilitate seamless and secure communication within an organization. Unlike conventional email systems, this project focuses on creating a closed-loop messaging system accessible only to authorized personnel within the organization. It enhances internal communication by offering a fast, reliable, and secure medium for exchanging messages, documents, and other essential information.

Built using a robust architecture, the system ensures data security and confidentiality through user authentication, access control, and encrypted communication channels. The system allows users to send, receive, and archive messages, manage attachments, and organize communication threads, all while ensuring that sensitive information remains within the organization's intranet.

Designed for scalability and adaptability, the system can be customized to meet the specific needs of various departments or divisions, fostering efficient collaboration and reducing reliance on external communication platforms. By centralizing internal communications, the Intranet Mailing System improves operational efficiency, reduces delays in decision-making, and strengthens organizational coherence. This solution is ideal for businesses aiming to optimize internal workflows and ensure secure information exchange. Some key words are:

Intranet communication system, Internal email platform, Secure organizational messaging, Closed-loop messaging system, corporate intranet email, Internal communication software, Confidential messaging platform, Encrypted communication channels, User authentication in intranet, Access control in internal messaging.

CHAPTER ONE: GENERAL INTRODUCTION

1.1 Introduction to the Study

In today's digital era, effective internal communication is critical for the smooth operation of organizations, particularly academic institutions where timely and secure communication is essential for administrative efficiency, academic coordination, and student services. Intranet mailing systems provide a solution to the communication challenges faced by such institutions by offering a secure, centralized platform for internal communication. Unlike traditional email systems that rely on external providers, intranet mailing systems are hosted internally, giving institutions better control over data security and user management.

Kigali Independent University (ULK), one of Rwanda's leading universities, has experienced significant growth, leading to increased demand for efficient communication systems to meet the needs of its expanding student body and staff. Existing communication channels at ULK, while functional, have shown limitations in terms of speed, security, and accessibility. As a result, the need for a dedicated intranet mailing system has become evident. This study focuses on the design and implementation of such a system at ULK, aiming to enhance internal communication, improve information security, and support the university's broader goals of digital transformation and operational efficiency [1].

1.2. Background of the study

The importance of effective internal communication within educational institutions cannot be overstated, particularly in rapidly growing environments such as Kigali Independent University (ULK). With its increasing student population and diverse academic programs, ULK faces challenges in maintaining timely, secure, and efficient communication among administrators, faculty, staff, and students. Communication is essential not only for academic coordination but also for the smooth operation of administrative tasks, dissemination of information, and fostering a sense of community within the university. As ULK continues to expand, the limitations of traditional communication methods, such as reliance on external email services, physical memos, and noticeboards, have become more apparent [2].

The university's current methods for internal communication are limited in several ways. First, external email services, though commonly used, pose significant concerns regarding data security and information integrity. As these services are not controlled by the university, sensitive information exchanged between university members is potentially vulnerable to unauthorized access. This is particularly concerning for an institution that handles private student data, staff records, and confidential administrative information. Moreover, the reliance on physical memos and noticeboards presents logistical challenges; they are not only slow but also lack the interactivity and efficiency required to meet the demands of a modern academic institution.

The university's desire to adopt an intranet mailing system reflects a broader commitment to digital transformation and aligns with Rwanda's national ICT development goals. Rwanda has prioritized the advancement of information and communication technology (ICT) as a critical driver of economic growth and development. By embracing digital tools, including intranet systems, institutions can better position themselves to meet these national goals and contribute to the country's vision for a knowledge-based economy. For ULK, implementing an intranet mailing system represents an important step toward modernizing its infrastructure and improving the quality of services provided to its members.

An intranet mailing system can offer numerous advantages, such as enhanced security, greater control over data, and increased efficiency in information sharing. By using a centralized platform accessible only within the university's network, ULK can mitigate security risks associated with external email services. This system can also streamline communication processes by allowing users to access real-time updates, participate in group discussions, and quickly locate important information without the need to sift through multiple channels. For academic staff and administrators, the intranet mailing system will facilitate collaboration and ensure that critical updates reach intended recipients in a timely manner.

In addition, the system aligns with ULK's commitment to improving educational outcomes and operational efficiency. By reducing delays in communication and improving the accessibility of information, ULK can foster a more cohesive environment where students and staff are well-informed and actively engaged in university activities. As ULK continues to grow, having a scalable, secure, and efficient communication system in place will be crucial for supporting its

mission and goals. This study, therefore, aims to examine the design and implementation of an intranet mailing system tailored to ULK's specific communication needs. By addressing these needs, the university not only enhances its internal processes but also sets a precedent for other institutions seeking to implement similar solutions.

1.3. Problem Statement

Kigali Independent University (ULK) faces challenges with its current communication systems, which rely on traditional methods such as external email services and physical notices. These methods lead to delays, inefficiencies, and security vulnerabilities, particularly as the university expands. The lack of a centralized, secure platform complicates the exchange of sensitive information, impacting both academic and administrative operations. As ULK continues to modernize, there is a pressing need for a dedicated intranet mailing system that can streamline communication, enhance data security, and support the university's growth in line with Rwanda's ICT goals.

1.4.1 General Objective

The general objective of this project is to develop and implement a secure, efficient, and user-friendly intranet mailing system that enhances internal communication at Kigali Independent University (ULK), thereby supporting the university's operational efficiency and aligning with Rwanda's national ICT goals for educational institutions.

1.4.2 Specific Objectives

- i. To create a secure intranet mailing platform tailored to ULK's needs
- ii. To streamline communication processes within the university
- iii. To provide training and support for effective system adoption

1.5 Research Questions

- I. What are the current limitations and challenges of the existing communication methods at Kigali Independent University, and how can an intranet mailing system address these issues?

- II. How can the proposed intranet mailing system be designed to ensure secure, efficient, and user-friendly communication for students, faculty, and administrative staff at ULK?
- III. What are the anticipated benefits and potential obstacles in implementing the intranet mailing system, and how can the university effectively manage these challenges to ensure successful adoption?

1.6 Scope of the Project

The scope of this project includes the design, development, and implementation of an intranet mailing system specifically for Kigali Independent University (ULK). It encompasses creating a secure, user-friendly platform tailored to the university's communication needs, integrating features for efficient information exchange, and providing training for effective system adoption. The project will focus on internal communication within ULK, excluding external communication and interactions with external email systems. The scope also includes evaluating the system's impact on operational efficiency and addressing any challenges that arise during its implementation.

1.6.1 Content Scope

The content scope of this project involves developing a comprehensive intranet mailing system that includes features for secure internal messaging, document sharing, and notification management tailored to the needs of Kigali Independent University (ULK). It will cover user authentication, role-based access controls, and the ability to handle various types of internal communications, such as administrative notices and academic updates. The project will also encompass the creation of user guides and training materials to facilitate effective use of the system by students, faculty, and staff. The focus will remain on internal communications within ULK, excluding integration with external email platforms or services.

1.6.2 Geographical Scope

The geographical scope of this project is limited to Kigali Independent University (ULK) in Kigali, Rwanda. The intranet mailing system will be implemented and used exclusively within the university's campus and administrative offices.

1.6.3 Time Scope

The time scope of this project includes the development and implementation of the intranet mailing system over a period of six months. This timeframe encompasses initial research and design, system development, testing, deployment, and user training, with the goal of fully operationalizing the system by the end of the sixth month.

1.7 Project Methodology

The project will employ a systematic methodology involving several key phases: initial research and needs assessment to identify the specific requirements of Kigali Independent University, followed by the design and development of the intranet mailing system using agile development practices. This will include iterative design reviews and testing to ensure functionality and security. Upon completion of development, the system will undergo rigorous testing to address any issues before deployment. Training sessions and user support will be provided to ensure a smooth transition and effective utilization of the new system. Continuous monitoring and feedback collection will be implemented to make necessary adjustments and improvements.

1.8 Significance of the Project

The significance of this project lies in its potential to transform internal communication at Kigali Independent University (ULK) by introducing a secure and efficient intranet mailing system. By addressing current communication challenges such as delays and security vulnerabilities, the system will enhance administrative efficiency, support academic coordination, and improve overall operational effectiveness. Additionally, the project aligns with Rwanda's national ICT goals, contributing to the country's vision of fostering a technology-driven educational environment. This advancement not only benefits ULK's stakeholders but also serves as a model for other institutions seeking to modernize their communication infrastructure.

1.8.1 Personal Interest

My personal interest in this project stems from a strong belief in the transformative power of technology in enhancing communication and operational efficiency within educational institutions. The opportunity to contribute to Kigali Independent University's digital

transformation excites me, as it aligns with my passion for leveraging technology to solve real-world problems and improve organizational processes. This project offers a chance to apply my knowledge and skills in a meaningful way, positively impacting the university community and supporting Rwanda's broader ICT goals.

1.8.2 Institutional Interest

The institutional interest in this project is driven by Kigali Independent University's commitment to improving internal communication and administrative efficiency. By implementing a dedicated intranet mailing system, the university aims to streamline information exchange, enhance data security, and support its ongoing digital transformation initiatives. This project aligns with the university's strategic goals of modernizing its infrastructure and fostering a more connected and efficient academic environment, ultimately contributing to its mission of providing high-quality education and administrative support.

1.8.3 Public Interest

The public interest in this project is significant as it demonstrates a commitment to advancing technology and improving communication within educational institutions, which can serve as a model for other universities in Rwanda and beyond. By showcasing how effective internal communication systems can enhance operational efficiency and security, the project contributes to the broader discourse on digital transformation in education. It also aligns with national ICT development goals, potentially inspiring further investments in technology-driven solutions that benefit the public and support the country's knowledge-based economy.

1.9 Limitations of the Project

The project may face limitations such as budget constraints that could impact the scope and features of the intranet mailing system, potentially restricting its functionality or scalability. Additionally, the implementation process may encounter resistance from users accustomed to existing communication methods, necessitating extra efforts for training and change management. Technical challenges, such as integration with existing systems and ensuring robust data security, may also pose hurdles that could affect the overall success of the project.

1.10 Organization of the Project

This study is structured and articulated into five chapters sequentially:

CHAPTER 1: INTRODUCTION TO THE STUDY

This chapter gives an introduction and background of this research. It introduces the main research purpose including, the statement of the problem, Research objectives, research questions, scope and the limitations.

CHAPTER 2: LITERATURE REVIEW

The main purpose of this chapter is to describe the key terms or concepts used in our study, to review the existing related systems and how previous researchers addressed data exchange problems.

CHAPTER 3: SYSTEM ANALYSIS AND DESIGN

This chapter will present the analysis of the system Vs the new system to be implemented along with research methodologies used and the system design and overview.

Chapter 4: SYSTEM IMPLEMENTATION

In this chapter will describe the tools and technologies used for implementation and system implementation flow and Specifications.

Chapter 4: CONCLUSION AND RECOMMENDATIONS

This chapter offers the conclusion of the study and suggestions to call institutions to adhere on the importance and advantages of using machine learning algorithms in Organization.

CHAPTER TWO: LITERATURE REVIEW

2.0. Introduction

The literature review provides a comprehensive examination of existing research and theories related to intranet mailing systems, particularly within the context of educational institutions. This chapter explores key concepts, including the evolution of internal communication technologies, the benefits and challenges of intranet systems, and their impact on organizational efficiency and security. By reviewing relevant studies, case examples, and theoretical frameworks, this section aims to establish a foundation for understanding the design, implementation, and potential outcomes of an intranet mailing system at Kigali Independent University. The review will also highlight gaps in current research, offering insights into how this project can contribute to the existing body of knowledge.

2.1 Definition of concepts

In this section, key concepts related to the intranet mailing system are defined to provide clarity and context for the study [3]

Intranet: An intranet is a private network that is accessible only to an organization's members, employees, or others with authorization. It is often used to share information, resources, and services within the organization, enabling internal communication, collaboration, and access to critical systems [4].

Mailing System: A Mailing System refers to a system designed to send, receive, and manage electronic mail (email). It involves software and protocols that enable users to exchange messages over a network, typically the internet or an organization's intranet [5].

Internal: refers to something that exists, occurs, or is situated within a specific entity, organization, or system, as opposed to being external or outside of it. The term is commonly used to describe activities, processes, or structures that are confined within the boundaries of a particular group or organization [5].

Communication: is the process of exchanging information, ideas, thoughts, or feelings between individuals or groups. It involves a sender transmitting a message to a receiver through various channels, such as spoken words, written text, gestures, or electronic media. Effective communication requires that the message is clearly conveyed, understood, and appropriately responded to by the recipient [3].

Data: refers to raw, unprocessed facts, figures, or information that can be collected, observed, and measured. It can take many forms, such as numbers, text, images, or even audio and video recordings. Data itself does not convey meaning until it is analyzed or processed to extract insights or knowledge [4].

Security: refers to the measures, practices, and technologies put in place to protect individuals, organizations, systems, or assets from threats, harm, or unauthorized access. Security is crucial across various domains, such as physical environments, information technology, and digital systems, ensuring the safety, integrity, and confidentiality of people, data, and resources.

Intranet Mailing System: An intranet mailing system is a private, internal communication platform used within organizations to facilitate secure and efficient exchange of messages and documents. Unlike external email systems, it operates within a closed network, offering enhanced security and control over communication [11].

Internal Communication: Internal communication refers to the exchange of information between members of an organization, including staff, faculty, and students in educational settings. Effective internal communication is essential for operational efficiency and organizational cohesion [11]. "The impact of internal communication on organizational performance: A case study of a large educational institution.

Data Security: Data security involves protecting information from unauthorized access, breaches, or theft. In the context of an intranet mailing system, data security is crucial to ensure that sensitive internal communications remain confidential and secure from external threats [12].

2.2. Related Works

Study on Intranet Systems in Higher Education Institutions. In their study, Iacovou and Dexter examined the implementation of intranet systems in several higher education institutions. They found that while these systems significantly improved communication and document sharing, institutions often faced challenges related to system integration with existing legacy infrastructure. Technical issues, such as incompatibility with older systems and limited IT expertise within the organization, slowed down implementation and reduced system adoption. The authors recommended phased implementation strategies and collaboration with external IT consultants to address technical integration challenges.

By adopting a phased approach, this research can plan the intranet system's integration with existing infrastructure at Kigali Independent University, ensuring compatibility and minimizing disruption. Additionally, training and external support could be prioritized to smooth the transition [13].

Case Study on Intranet Communication Systems in Large Universities Bejerano's study highlighted the introduction of intranet mailing systems in large universities, focusing on the benefits and hurdles of large-scale adoption. The main challenges identified were resistance to change among staff and students and the difficulty of training users on the new system. Many users preferred familiar communication methods and were reluctant to adopt new technology, which hindered the effectiveness of the system. The study suggested comprehensive training programs and continuous support to facilitate the transition and increase user confidence. This research can address user resistance by implementing detailed training sessions for both faculty and students at ULK, accompanied by ongoing user support. User feedback mechanisms can be integrated to continuously improve the system's usability and address concerns in real-time [14].

Research on Intranet Systems for Small to Medium-Sized Universities Alavi and Leidner focused on small and medium-sized universities that implemented intranet systems. Their research identified a key challenge: limited budget and resources, which restricted the scope and capabilities of the intranet system. These financial constraints often led to incomplete implementations that lacked essential features, reducing the system's effectiveness. Solution: The study recommended

prioritizing core functionalities in the initial deployment phase and seeking external funding or partnerships to supplement resources. This research can address budget limitations by prioritizing the most essential communication features in the initial phase of the intranet system implementation at ULK. Additionally, exploring potential partnerships with technology providers or seeking external grants could be part of the project strategy to expand the system's capabilities over time [15].

Implementation of Secure Intranet Mailing Systems O'Brien and Marakas examined secure intranet mailing systems implemented in various organizations, including universities. They identified data security as a critical challenge, especially in environments handling sensitive academic and administrative information. Many institutions struggled with implementing robust security measures that could protect against external threats and unauthorized access. The authors recommended the adoption of advanced encryption technologies and regular security audits to ensure the integrity and confidentiality of communications. This research can focus on implementing strong encryption and security protocols in ULK's intranet system, including regular security audits to maintain high standards of data protection. A dedicated IT security team could also be established to manage ongoing security risks [5].

Comparative Study on Intranet Systems Across Different Sectors Laudon and Laudon conducted a comparative study of intranet systems across different sectors, including education, healthcare, and business. Their research revealed that education institutions often lagged behind other sectors in adopting cutting-edge intranet features, primarily due to limited IT infrastructure and a lack of focus on user-centric design. They suggested that universities could benefit from adopting best practices from other sectors, such as investing in modern IT infrastructure and focusing on user-friendly design elements to enhance adoption. This research can incorporate best practices from other sectors, ensuring that ULK's intranet system is user-friendly and built on modern IT infrastructure. The design of the system can be centered around ease of use and intuitive interfaces to encourage wide adoption by all users [11].

Addressing Challenges Through This Research

This research aims to overcome the challenges identified in past works by incorporating solutions such as phased implementation, comprehensive user training, prioritization of core features within

budget constraints, robust security measures, and user-centered design. By drawing on lessons from previous studies, this research will implement a tailored approach that addresses ULK's specific needs, ensuring a successful deployment of the intranet mailing system [8].

2.2.1. Conclusion

The review of past works on intranet mailing systems highlights several key challenges, including system integration, user resistance, budget constraints, data security, and user-centered design. Despite these hurdles, successful implementations in various institutions demonstrate that these obstacles can be overcome with careful planning, strategic prioritization, and a focus on both technical and human factors. This research on implementing an intranet mailing system at Kigali Independent University builds upon these lessons, offering solutions such as phased deployment, comprehensive training, and secure, user-friendly design. By addressing the specific needs and challenges of ULK, this research aims to create an efficient and secure internal communication platform that enhances operational efficiency and aligns with Rwanda's broader ICT goals. Ultimately, this project not only contributes to the university's modernization efforts but also provides insights for other institutions facing similar challenges.

CHAPTER III: SYSTEM ANALYSIS AND DESIGN

3.1 Introduction

The study and design of Kigali Independent University's (ULK) intranet mailing system are the main topics of this chapter. Determining system requirements, creating functional and non-functional specifications, and comprehending the university's current communication issues are all part of the system analysis process. These criteria will be translated into a workable system architecture, database schema, and user interface design during the design process. This chapter acts as a guide for creating the intranet mailing system, making sure it is secure, scalable, and easy to use while satisfying the unique requirements of ULK.

3.1. Analysis of the Current System

Kigali Independent University (ULK) now uses manual procedures and external email services as its main means of internal communication between staff, students, professors, and administrators. Although these approaches work, there are a number of issues with them that make communication inside the university less effective.

External Email Providers Reliance: ULK is jeopardizing the security of sensitive internal information by relying on external email providers and reducing the control over data management of the institution. This habit of dependency makes the system susceptible to potential outages or service disruptions beyond the university's influence.

Internal Communication Diminishes: The system at present does not have a centralized platform where the students can send messages to one another and to the teachers. Therefore, important announcements, academic coordination, and administrative tasks are often delayed due to scattered communication methods. This can lead to miscommunication, especially when dealing with time-sensitive information.

Issues of Scalability: The current system is facing difficulties in coping with the growing student body and faculty members, which causes a backlog in the communication process whenever the university expands. One of the main consequences of this is the fact that some information hits the

board as the funnel clogs up. It reaches the top management only to be poorly or never communicated to the faculty whose jobs are directly submitted to students through the portal or get turned down due to populating the class to max levels but other periods having freely placed positions. These cases may arise in the misallocation of resources or student dissatisfaction.

Manual Activity: Most of the tasks of this Communication are communicated through human-based technology, as they are mainly at the center level. For example, the manual methods used to facilitate communication, such as printed flyers and booth lines, have negative effects in terms of time-wastage and efficiency.

3.2.1 Problems of the Current System

The current communication framework at Kigali Autonomous College (ULK) faces a few challenges that prevent its adequacy. These incorporate security vulnerabilities due to dependence on outside e-mail suppliers, driving to potential information breaches. The need of a centralized communication stage comes about in divided data and delays in communication. Moreover, the framework battles with adaptability as the college grows, causing execution issues and slower reaction times. Moreover, availability issues emerge, as vital data is not continuously promptly accessible to all clients. These issues emphasize the require for a secure and proficient intranet mailing framework custom fitted to ULK's particular needs.

3.3 Analysis of the new system

3.3.1 Introduction

The new intranet mailing system for Kigali Independent University (ULK) is designed to address the limitations of the current communication system. This system aims to provide a secure, centralized platform for internal communication among administrators, staff, lecturers, and students. The new system will offer enhanced data security, improved accessibility, and streamlined communication processes. By leveraging modern technologies, the intranet mailing system will support ULK's growing user base and meet the university's specific communication needs. This section outlines the key features and functionalities of the new system, detailing how it will resolve existing challenges while ensuring scalability, usability, and efficiency.

3.3.2 System requirements (Functional Requirements and Non-Functional Requirements)

There are two types of system requirements for Kigali Independent University's (ULK) intranet email system: functional requirements and non-functional needs. By imposing these requirements, the system is guaranteed to fulfill the communication requirements of the university while upholding performance, security, and usability standards.

3.3.2.1. Functional Requirements

User Authentication and Roles: The system should ensure secure login and registration for users, define different roles like Administrator, Lecturer, Staff, and Student, each with unique access levels and permissions.

Email Messaging: The system should enable users to send, receive, and delete emails, attach files, and organize messages into inbox, sent messages, drafts, and trash.

Admin Management: The administrator should have complete control over user accounts, generate reports on system usage, manage communication settings, and monitor system performance.

Notification System: The system should provide real-time notifications to users for new messages, important announcements, or system alerts, accessible via both the web interface and email.

Search and Filter: The system should enable users to search for specific emails or filter messages based on date, sender, or subject.

Security and Encryption: The system must ensure secure message transmission by encrypting all communication data, hashing passwords, and providing two-factor authentication.

Database Management: The system should efficiently manage email data, user profiles, and system settings in a database, ensuring efficient retrieval, storage, and backup of data.

Logging and Monitoring: The system should log all significant actions and provide the administrator with monitoring capabilities to track performance and detect potential issues.

3.3.2.2. Non-Functional Requirements

Performance: The system must efficiently handle numerous users without compromising performance, ensuring quick response times for sending and receiving emails.

Scalability: The university's system must be adaptable to accommodate the growing number of users and communication needs without necessitating significant overhauls.

Security: The system should adhere to optimal security practices, including data encryption, secure user authentication, and protection against SQL injection and cross-site scripting vulnerabilities.

Availability and Reliability: The system should be highly available, ensuring reliable message and notification delivery, and have redundant backups and recovery mechanisms to prevent data loss.

Usability: The system must have a user-friendly interface that is intuitive and easy to navigate for all user roles.

Compatibility: The system should be compatible with various web browsers, accessible on desktop and mobile devices, and adaptable to various screen sizes and resolutions.

Maintainability: The system should be easy to maintain, with clear documentation and modular code that allows for updates and improvements without disrupting ongoing operations.

3.3.3 Functional Diagram

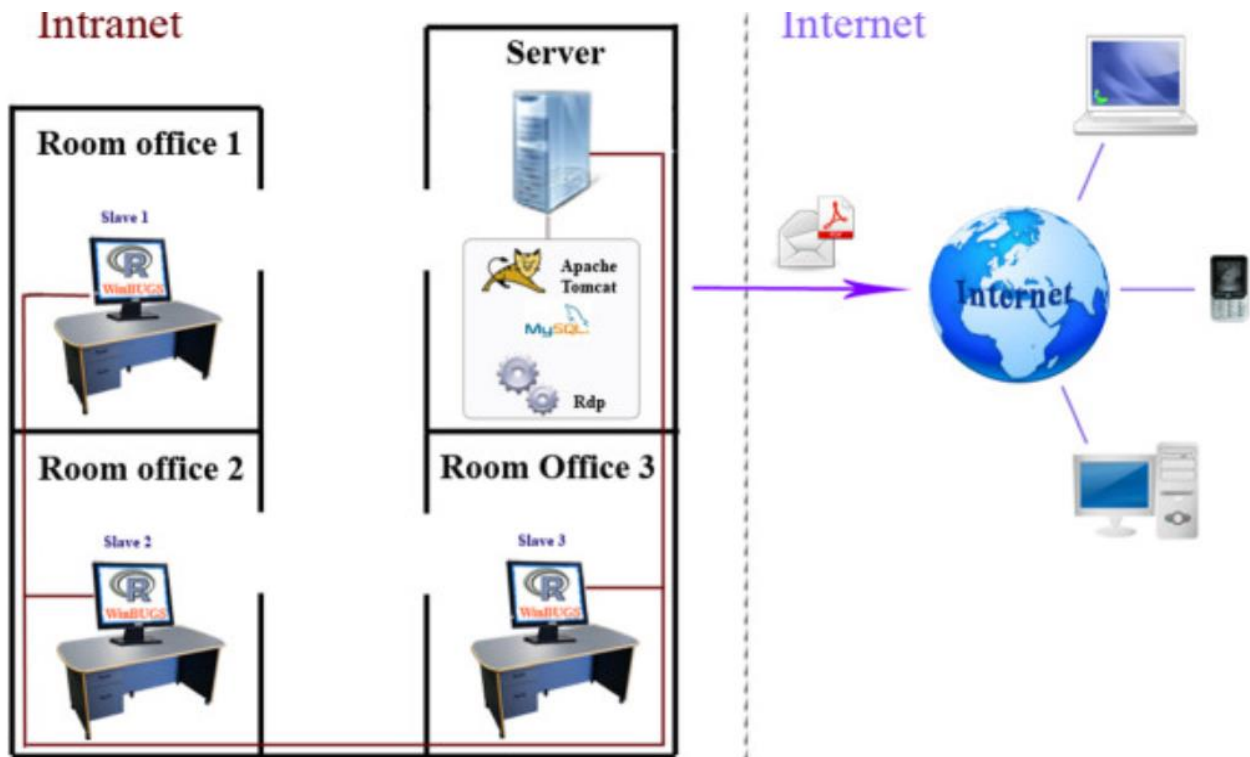


Figure 1: Functional Diagram

The intranet mailing system diagram illustrates a local network setup where three room offices (1, 2, and 3) have computers (labeled as "Slave 1," "Slave 2," and "Slave 3") running WinBUGS software, all connected to a central server. The server hosts Apache Tomcat, MySQL, and Remote Desktop Protocol (RDP) services, facilitating communication between the local computers and the server. The server is also linked to the internet, enabling users to send and receive emails or documents externally. The system operates within an intranet for internal office communication, while having the ability to interact with external devices connected to the internet.

3.3.4 Methodological approach

3.3.4.1 Data Collection Techniques

This study used questionnaires, interviews, and document analysis as data collection methods. A wide range of academics, staff members, and students are given surveys to complete in order to collect quantitative information about their preferences, difficulties, and present communication methods. In order to gain comprehensive qualitative insights into the particular requirements and expectations for the intranet email system, interviews are performed with key stakeholders, including department heads and IT administrators. Furthermore, ULK uses document analysis to examine its current communication records and policies. This helps to contextualize the current communication infrastructure and pinpoint any gaps that need to be filled by the new system. When combined, these strategies provide a thorough comprehension of the dynamics of communication within the university.

3.3.4.2 Software Development Methodology

The Agile software development process, which makes use of the Scrum framework, was used for this investigation. Agile is preferred because of its adaptability and iterative structure, which permits ongoing input and modification across the whole development process. The project is broken up into multiple sprints, each of which is responsible for completing a particular intranet mailing system feature. Every sprint starts with a planning session where goals are established. Daily stand-up meetings are then held to assess progress and resolve any problems. Every sprint concludes with a review and retrospective to evaluate the results and improve the procedure for the following iteration.

With constant feedback from users and stakeholders, this strategy guarantees that the system is created incrementally and that the ultimate product closely corresponds with Kigali Independent University's goals.

3.3.4.3 System Design Methodology

The intranet mailing system's system design process is modular and iterative, with a focus on user experience and functionality. To guarantee that the system satisfies Kigali Independent University's criteria, the design process starts with the identification of system requirements through user stories and stakeholder feedback. The development of a high-level system architecture that outlines the essential elements such as the database, network infrastructure, and user interface come next.

Next, the system is broken down into modules, each of which stands for a particular function, like message archiving, email composing, and user authentication. Though each module is created separately, the way it will work with the others in the system as a whole is carefully taken into account. For the user interface, wireframes and prototypes are created to enable early user feedback and iterative improvement.

Integration with current university systems, security, and scalability are prioritized throughout the design process. To make sure the system stays in line with the project goals, regular design reviews are carried out, and modifications are made as needed. This process guarantees that the finished product is reliable, easy to use, and flexible enough to meet changing requirements.

3.3.4.4. Structured System Analysis Design Methodology (SSADM)

The Structured Systems Analysis and Design Methodology (SSADM) is a detailed, waterfall-based approach traditionally used for system analysis and design. However, by integrating it with Agile methodology, the process becomes more iterative and flexible. In this hybrid approach, SSADM's structured stages—such as requirements analysis, system design, and testing—are broken into smaller, more manageable Agile sprints. Each sprint focuses on delivering a functional part of the system, allowing for continuous feedback, quick adaptation to changes, and iterative development. This blend provides the rigor of SSADM while retaining the flexibility and responsiveness of Agile, ensuring that the system meets user needs efficiently.

3.3.4.5. Data Flow Diagram Level Zero

Zero Level Data Flow Diagram (0 Level DFD) Of Intranet Mailing System: This is the Zero Level DFD of Mailing System, where we have elaborated the high-level process of Mailing. It's a basic overview of the whole Mailing System or process being analyzed or modeled. It's designed to be an at-a-glance view of Message data, Mailserver Address and Login showing the system as a single high-level process, with its relationship to external entities of Mailbox name, Domain name and Userdata. It should be easily understood by a wide audience, including Mailbox name, Userdata and Message data in zero level DFD of Mailing System, we have described the high-level flow of the Mailing system

DFD Level Zero

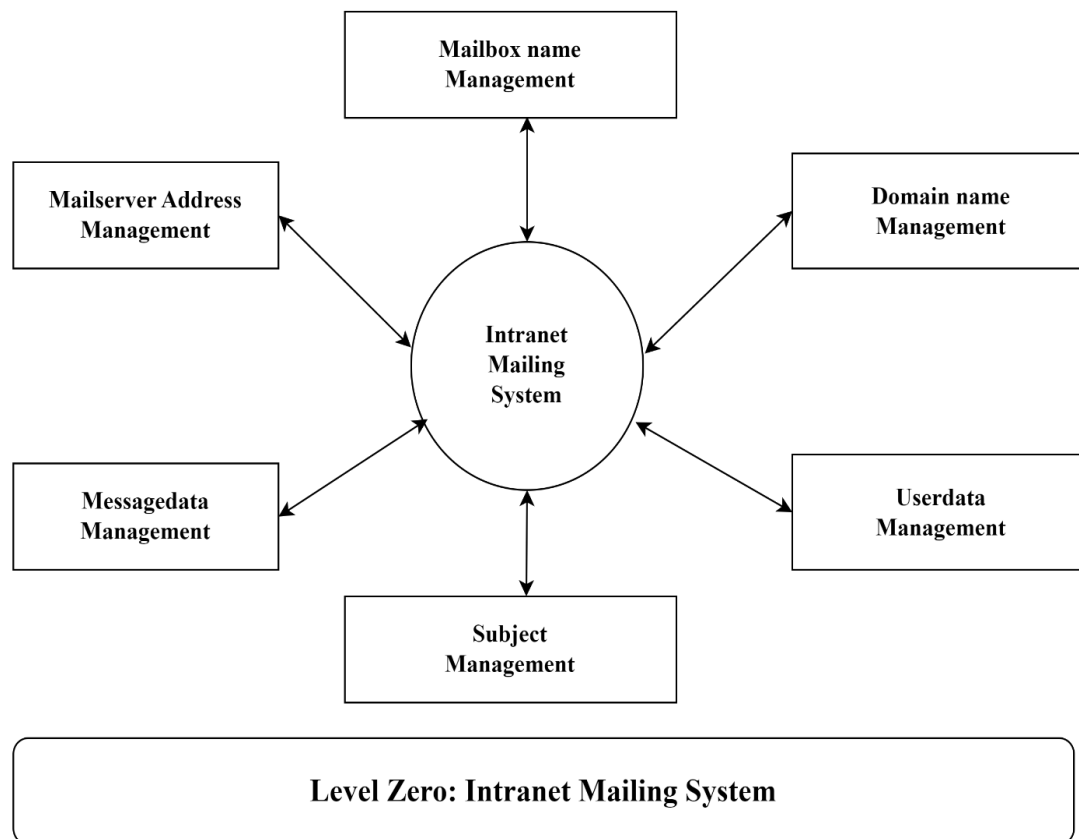


Figure 2: Zero level DFD

3.3.4.6. Data Flow Diagram Level One

First Level DFD (1st Level) of Intranet Mailing System shows how the system is divided into sub-systems (processes), each of which deals with one or more of the data flows to or from an external agent, and which together provide all of the functionality of the Intranet Mailing System a whole. It also identifies internal data stores of Login, Mailserver Address, Message data, Subject, Userdata that must be present in order for the Mailing system to do its job, and shows the flow of data between the various parts of Mailbox name, Userdata, Mailserver Address, Login, Message data of the system. DFD Level 1 provides a more detailed breakout of pieces of the 1st level DFD. You will highlight the main functionalities of Mailing.

DFD Leve-1

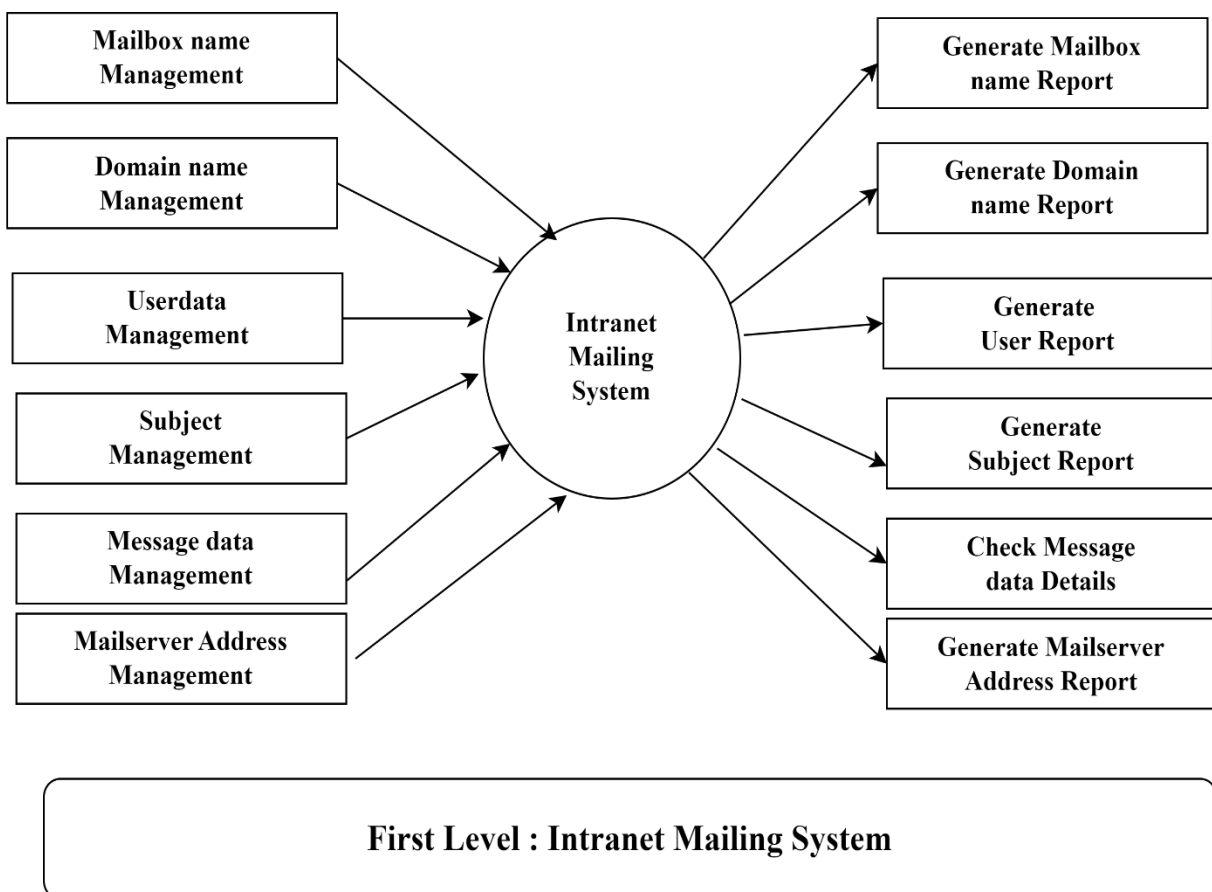


Figure 3:DFD Level-1

3.3.4.6. Entities Relationship Diagram (ERD)

This ER (Entity Relationship) Diagram represents the model of Mailing System Entity. The entity-relationship diagram of Mailing System shows all the visual instrument of database tables and the relations between Domain name, Subject, Mailbox name, Mail server Address etc. It used structure data and to define the relationships between structured data groups of Mailing System functionalities. The main entities of the Mailing System are Mailbox name, Domain name, User data, Subject, Message data and Mail server dress.

System Entities and their attributes

Mailbox name Entity: Attributes of Mailbox name is mailbox_id, mailbox_user_id, mailbox_name, mailbox_type, mailbox_description

Domain name Entity: Attributes of Domain name is domain_id, domain_user_id, domain_name, domain_type, domain_description

Userdata Entity: Attributes of Userdata are user_data_id, user_data_user_id, user_data_name, user_data_type, user_data_description

Subject Entity: Attributes of Subject are subject_id, subject_name, subject_type, subject_description

Messagedata Entity: Attributes of Messagedata are message_data_id, message_data_user_id, message_data_name, message_data_type, message_data_description

MailserverAdress Entity: Attributes of MailserverAdress are mail_server_id, mail_server_domian_id, mail_server_name, mail_server_type, mail_server_address, mail_server_description

Description of Mailing System Database:

The details of Mailbox name are store into the Mailbox name tables respective with all tables Each entity (MailserverAdress, Userdata, Messagedata, Domain name, Mailbox name) contains primary key and unique keys. The entity Userdata, Messagedata has banded with Mailbox name, Domain

name entities with foreign key There is one-to-one and one-to-many relationships available between Messagedata, Subject, MailserverAdress, Mailbox name All the entities Mailbox name, Messagedata, Userdata, MailserverAdress are normalized and reduce delicacy of records We have implemented indexing on each table of Intranet Mailing System tables for fast query execution.

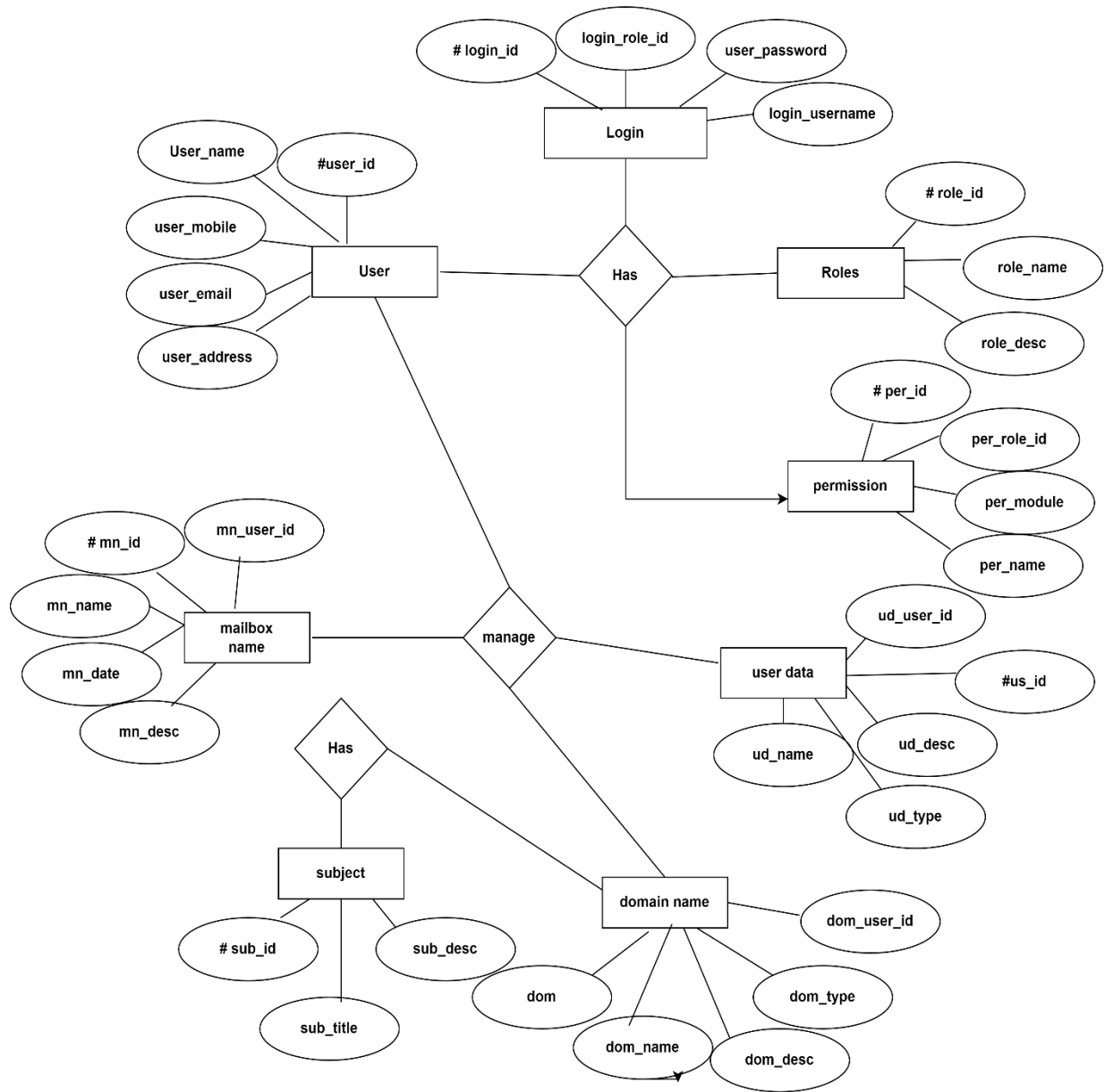


Figure 4: Entity relationship Diagram

Table 1. Data Dictionary

Table Name	Definition	
Login the process of gaining access to a system	Login_ID	A unique identifier assigned to a user when logging into the system
	login role_ID	An identifier that associates the user's login with a specific role within the system.
	User_password	The password that a user uses to log in to the system.
	Login_username	The username used by a user to log in to the system.
Users a person who access a system, application or service	user_ID	A unique identifier for each user in the system.
	user_name	The full or display name of the user.
	user_mobile	The user's mobile phone number.
	user_email	The email address of the user.
	user__address	The physical or mailing address of the user.
Roles a specific assigned to users that de4fine there level of access and permissions within a system	Role_ID	A unique identifier for each role within the system.
	role_name	The name of a specific role (e.g., Admin, User, Manager)
	Role_desc	A description of the role, detailing its permissions and functions.
Permission a specific rights granted to users	per_ID	A unique identifier for each permission in the system.
	per role _ID	The identifier linking a permission to a specific role
	Per_module	The module or feature that the permission applies to.
	per_name	The name of the specific permission.
Mailbox name is a special identity for a user's email mailbox	mn_user_ID	A unique identifier for the user related to the mailbox name.
	mn_ID	A unique identifier for the mailbox
	mn_name	The name of the mailbox.
	mn_date	The date the menu or feature was created or last modified.
	mn_desc	A description of the menu or menu item.

User Data Refers to all information related to a user within the system	ud_user_ID	The identifier for the user related to a user-defined feature or setting.
	ud_ID	A unique identifier for a user-defined feature or setting.
	ud_desc	A description of the user-defined feature or setting.
	ud_type	The type of the user-defined feature or setting.
	ud_name	The name of the user-defined feature or setting.
Domain Name often used to define the scope within which users and systems operate.	dom_user_ID	The unique identifier for a user associated with a domain.
	dom_type	The type of domain (e.g., finance, education).
	dom_desc	A description of the domain.
	dom_name	The name of the domain.
	dom	The domain entity or environment itself.
Subject a specific topic or area of interest within a system	sub_ID	A unique identifier for a sub-item, sub-entity, or subscription.
	sub_title	The title of the sub-item or subscription.
	sub_desc	A description of the sub-item or subscription.

CHAPTER IV: SYSTEM IMPLEMENTATION

4.1. Implementation and Coding

The implementation and coding phase of the intranet mailing system involves translating the system design into functional software using appropriate programming languages, frameworks, and tools.

4.1.1. Introduction

The implementation and coding phase is the critical step where the design and planning of the intranet mailing system are transformed into a functional software application. This stage involves setting up the necessary development environment, writing the code for various system modules, and ensuring that all components work together seamlessly. The implementation is carried out using an Agile approach, allowing for continuous development, testing, and refinement. By breaking down the system into manageable pieces, developers can address issues quickly, integrate feedback, and ensure that the system aligns with the requirements set during the earlier stages of the project.

4.1.2. Description of Implementation tools and technology

HTML (Hyper Text Markup Language)

HTML is the foundational language used to create the structure of web pages. In the Crime Record Management System (CRMS), HTML is utilized to define the various web page elements, including forms, tables, buttons, and links that allow users to interact with the system. HTML serves as the skeleton of the web application, enabling the browser to render the system's interface. It provides a structured layout for data entry forms, report displays, and dashboards, making the system's functionalities accessible to users.

CSS (Cascading Style Sheets)

CSS is used to style the HTML elements in the CRMS application. It defines the visual appearance of the web pages, including colors, fonts, layout, and responsiveness. CSS helps in ensuring that the CRMS interface is aesthetically pleasing and easy to navigate across different devices. By

separating content from design, CSS allows for more flexible and maintainable code, making it easier to update the system's visual aspects without affecting its functionality.

Bootstrap

Bootstrap is a popular front-end framework that provides pre-designed components and responsive layouts. It is used in the CRMS to create a mobile-friendly and responsive interface that adjusts seamlessly across different screen sizes and devices. Bootstrap offers a range of UI components, such as navigation bars, forms, and buttons, which significantly reduce development time while ensuring a consistent and modern design for the system.

JavaScript

JavaScript is the scripting language used to add interactivity and dynamic features to the CRMS. It enables client-side validation of forms, enhances user interaction with real-time updates, and allows for dynamic content loading without refreshing the entire page. JavaScript also powers features like dropdown menus, modals, and other interactive elements that improve the user experience within the system.

MySQL

MySQL is the relational database management system (RDBMS) used in the CRMS to store, manage, and retrieve data. It handles the backend data storage for users, police records, crime details, and other critical information. MySQL provides efficient querying capabilities to perform CRUD operations on the database, ensuring that all data is securely stored and easily retrievable whenever needed.

PHP (Hypertext Preprocessor)

PHP is the server-side scripting language used to develop the logic and functionality of the CRMS. It processes user inputs, manages sessions, interacts with the MySQL database, and generates dynamic content. PHP enables the CRMS to handle requests such as user authentication, data submission, and report generation by executing scripts on the server and sending appropriate responses back to the client.

XAMPP

XAMPP is a free, open-source web server solution stack package that includes Apache, MySQL, PHP, and Perl. It serves as the local development environment for the CRMS. XAMPP allows developers to run the CRMS on a local server during the development phase, enabling testing and debugging before deployment to a live environment. It provides all the necessary tools to set up and manage the PHP environment and MySQL database locally.

Laravel

Laravel is a popular PHP framework that provides a robust structure for developing web applications. It offers features like routing, middleware, authentication, and ORM (Eloquent) to simplify and accelerate the development process. Laravel follows the MVC (Model-View-Controller) architecture, which helps in separating concerns and writing clean, maintainable code.

PHP Mailer

PHPMailer is a library used to send emails from PHP applications. It is a more robust alternative to the built-in mail () function in PHP, providing support for sending emails via SMTP and handling attachments. PHPMailer can be used in the CRMS for sending notifications or alerts to users and administrators.

PHP My Admin

phpMyAdmin is a web-based interface for managing MySQL databases. It allows developers to interact with the MySQL database in a more user-friendly way, offering capabilities like database creation, table management, and query execution. phpMyAdmin is often used during the development and testing phases to manage and manipulate data directly.

Apache Web Server

Apache is one of the most commonly used web servers with PHP. While XAMPP includes Apache, understanding and configuring Apache independently may be necessary for production deployments. Apache serves the PHP application to users and manages HTTP requests.

cURL

cURL is a library used in PHP to make HTTP requests. It can be used in the IMS to communicate with external APIs, such as fetching crime statistics from public datasets or integrating third-party services.

4.1.3. Screen shorts

Screenshots provide a visual representation of the user interface and various functionalities of the intranet mailing system during its implementation. These images showcase key elements such as the login page, user dashboard, email composition interface, and administrative controls. By capturing the system's interface at different stages of development, screenshots help illustrate how users will interact with the system, navigate between features, and complete tasks such as sending and receiving emails. They also demonstrate the layout and design, reflecting how the HTML, CSS, JavaScript, and Bootstrap were applied to create a responsive and user-friendly experience. These visuals are essential for reviewing the look and feel of the system, ensuring it meets user expectations and project requirements.

4.1.3.1. Login Page

The diagram below shows the login interface for the "ULK Intranet Mailing System." The design includes a simple login form with two input fields labeled "Username" and "Password." Below these fields, there is a button labeled "GO" for submitting the login credentials.

Abi Mailing - Storage System

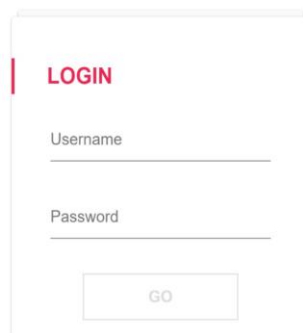


Figure 5: Login page

4.3.1.2. Home Dashboard

The "Abi - ULK - MSS" system dashboard offers a user-friendly interface for managing functionalities. It features a navigation menu, colorful tiles, and a personalized user ID. The dashboard includes sections like "Dashboard," "Mailing Files," "Signatures," "Employee," "Users," and "Contacts," with each tile providing detailed information. The dashboard provides a clear, organized layout for managing tasks within the mailing system.

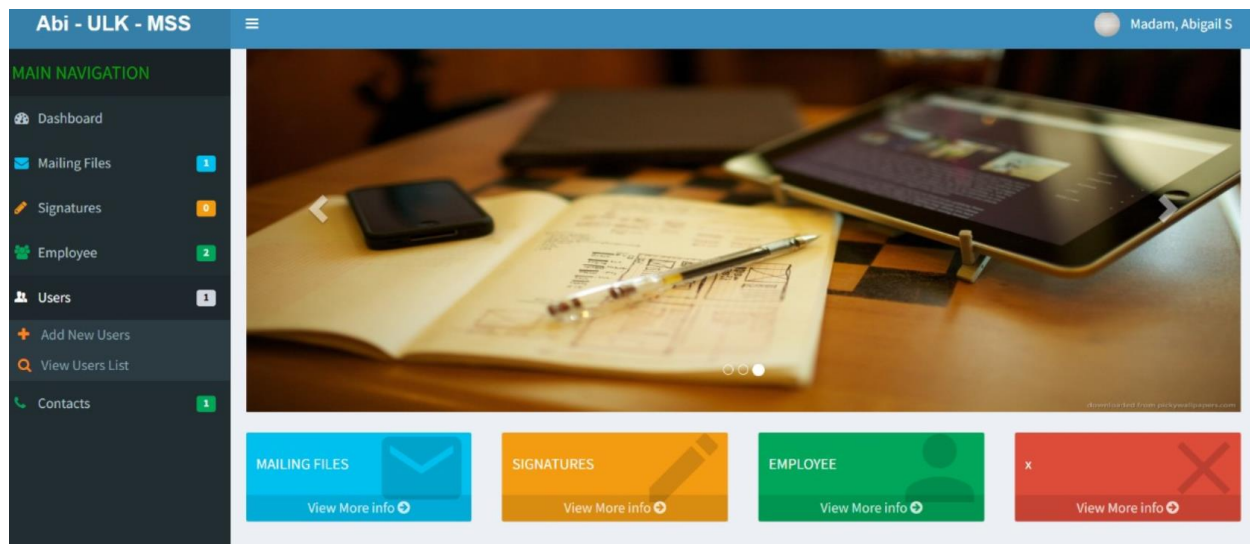


Figure 6: Home Dashboard

4.1.3.4. Upload Mailing Receipt

The diagram shows a web interface for uploading mailing receipts, titled "MAILING RECEIPTS UPLOADER PAGE!!!". The page features fields for entering project details, including "Project Name," "Cut-off Period," "Type," "Date Sent," and a description box. The interface also has a sidebar navigation menu with various sections such as Dashboard, Mailing Files, Signatures, Employee, Users, and Contacts. The user logged in appears to be "Madam, Abigail S". The design is clean with a control panel and a breadcrumb navigation path at the top.

Figure 7: Uploading mailing

4.1.3.5. Add Employee

The image displays a web page from a "Users" control panel, which allows for adding new users. It contains fields such as "Employee ID," "First Name," "Last Name," "Middle" (optional), "Address," "Contact," and "Position." There's also an option to upload a profile picture with the button "Choose File" next to it. The page features two action buttons at the bottom labeled "Save" and "Save and Add New." The navigation menu on the left includes sections like Dashboard, Mailing Files, Signatures, Employee, Users, and Contacts.

Figure 8: Add employee

4.1.3.6. View Edit and Delete Employee

The diagram shows an "Employee" control panel page, displaying a list of employees with details. Each employee has an ID, name, position, address, hire date, and contact number.

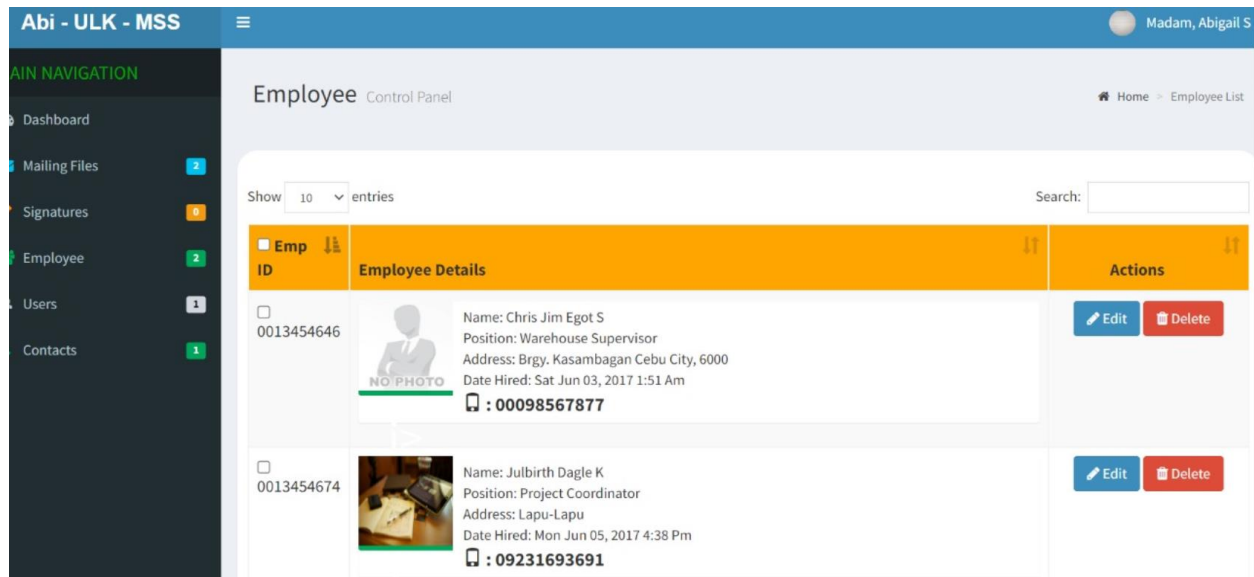


Figure 9: View Employee

4.2. Testing

4.2.1. Introduction

Testing is a vital phase in the software development lifecycle that ensures the intranet mailing system operates as expected and meets the defined requirements. The primary goal of testing is to identify and resolve defects, ensuring the system's functionality, security, performance, and user experience are up to standard. This phase involves various levels of testing, such as unit testing, integration testing, and user acceptance testing, each targeting different aspects of the system. By rigorously testing the system throughout the development process, potential issues can be identified and fixed early, leading to a more stable and reliable final product.

4.2.2. Unit testing outputs

Unit testing is a software testing technique where individual components or units of a program are tested in isolation to ensure that they function as intended. It involves writing specific tests for small, self-contained parts of the application, such as functions, methods, or classes, to verify that they return the correct output for given inputs. The goal of unit testing is to catch bugs early in the development process, make debugging easier, and improve the overall quality of the software. These tests are typically automated and allow developers to quickly identify issues in specific components before they are integrated with other parts of the system.

Table 1. Unit Testing table report

Tested Area	Expected Output	Test Result	Status
User Registration	Successful registration and redirection to the dashboard	Success	Passed
Login Functionality	Valid user credentials should allow access to the system	Success	Passed
Password Reset	Password reset email sent successfully and password updated	Success	Passed
File Upload (Mailing Receipts)	Files uploaded and stored correctly in the system	Success	Passed
User Roles Management	Admin can create, update, and delete users	Success	Passed
Mailing System Dashboard	Displays mailing statistics and file details	Success	Passed
Error Handling	Displays proper error messages for invalid inputs	Success	Passed

4.2.3. Validation Testing outputs

Validation testing is a process in which software or a system is tested to ensure it meets the user requirements and operates in the intended environment. It differs from verification testing, which checks if the software meets specified internal design specifications. Validation testing ensures the product delivers the correct output and user experience as expected by the stakeholders. It is typically performed after unit and integration testing and can include a variety of tests such as user acceptance testing, system testing, and performance testing. The objective is to demonstrate that the software meets all functional, behavioral, and performance standards as required by the client or end-user.

Table 2. Validation Testing Table

Functionality	Expected Outcome	Actual Result	Status
User Login	Successful login with valid credentials	Successful login	Passed
Email Sending	Email sent successfully to recipient	Email sent successfully	Passed
Document Upload	Document uploads and is accessible	Document uploaded successfully	Passed
User Registration	New user added to the system	New user added successfully	Passed
Password Reset	User receives reset link	Reset link sent	Passed
Signature Creation	Signature saved and usable for emails	Signature saved	Passed
Search Function	Return results based on query	Correct results returned	Passed

4.2.4. Integration Testing Outputs

Integration testing is the process of testing combined modules or components of a software application to verify that they work together as intended. After individual modules pass unit testing, integration testing ensures that the interaction between different parts of the system

functions correctly, identifying issues related to data flow, interfaces, and communication between modules. In this process, errors like mismatched data types, interface failures, and module incompatibilities are detected. The objective is to validate that the system works as a cohesive unit.

Table 3. Integration Testing Table

Modules Integrated	Expected Outcome	Actual Result	Status
User Registration + Login	New users can register and immediately log in	Registration and login successful	
Email Sending + Signature Creation	Email sent with correct signature attached	Email sent with signature	Passed
Document Upload + Email Sending	Uploaded document is attached and sent via email	Reset link sent to email	Passed
User Profile Update + Email	Profile updated and confirmation email sent	Profile updated; email confirmation sent	Passed
Dashboard + Mailing Files Module	User dashboard correctly displays recent mailing files	Dashboard shows recent mailing files	Passed
Contacts + Email Sending	Selected contacts are added to email recipients list	Contacts added successfully to email	Passed

4.2.5. Functional and System Testing

Functional Testing is a type of software testing that focuses on verifying that the functionality of the system matches the specified requirements. It checks whether the application performs the actions it is supposed to perform. Each function of the system is tested by feeding it input and examining the output, ensuring it meets the expected behavior. The goal is to validate that the features work as intended, such as user registration, email sending, file uploads, and system alerts in the **Intranet Mailing System**. Functional testing usually involves testing the user interface, APIs, databases, security, and other elements tied to the system's functionalities.

System Testing, on the other hand, is a more comprehensive testing approach that evaluates the complete and fully integrated system to ensure it meets the specified requirements. It encompasses

functional as well as non-functional testing aspects, such as performance, security, and usability. The purpose of system testing is to assess the end-to-end working of the entire application in a real-world-like environment. It checks how all the modules and components interact with each other, covering both hardware and software aspects if applicable.

Testing how the user interface behaves under different load conditions. Validating that all modules (user management, mailing, file handling, etc.) interact smoothly. Ensuring that the system's security features, like access control, work effectively. Checking that the system performs well in real-world scenarios, like handling large volumes of email traffic or file uploads.

4.2.6. Acceptance Testing Report

Acceptance Testing is the final phase of testing performed before the software product is delivered to the customer. It focuses on validating that the system meets the business requirements and is ready for deployment. The main objective of acceptance testing is to ensure that the system functions according to the agreed-upon specifications and satisfies the end-users' needs.

In the **Intranet Mailing System**, the acceptance testing report would document the results of user-driven testing sessions, often referred to as **User Acceptance Testing (UAT)**. This testing phase is typically conducted by the users or stakeholders to ensure that the system performs as expected in real-world usage scenarios. The users execute a series of test cases based on actual business processes to verify that the system:

- Meets all functional requirements (e.g., user registration, email functionality, file uploads, etc.).
- Is user-friendly and intuitive to operate.
- Handles data correctly and securely.
- Operates without critical bugs or issues in the intended production environment.

CONCLUSIONS AND RECOMMENDATIONS

1 Conclusion

The implementation of an intranet mailing system at Kigali Independent University is expected to significantly enhance internal communication by providing a centralized, secure, and efficient platform for information exchange. Unlike traditional email systems, the intranet mailing system is tailored to the specific needs of the university, ensuring that faculty, students, and staff can communicate easily within a controlled environment. This system minimizes the dependence on external email providers, reduces the risk of data breaches, and improves communication efficiency by providing features such as message organization, internal notifications, and advanced search functionalities. By integrating with existing university systems, such as student information and staff portals, the intranet mailing system offers a cohesive experience that improves overall operational efficiency.

Moreover, the system's design, based on object-oriented principles, ensures that it is both scalable and adaptable to the university's evolving needs. The modular structure allows for easy updates and feature enhancements, making it a future-proof solution. Additionally, the system offers secure authentication methods and access controls, ensuring that only authorized users can access sensitive information. In conclusion, the intranet mailing system will streamline communication, foster better collaboration, and provide a secure digital environment for academic and administrative exchanges, thereby contributing to the overall success and

2 Recommendations

To ensure the successful adoption and continuous improvement of the intranet mailing system at Kigali Independent University, several recommendations should be considered. First, ongoing user training should be provided to both students and staff to familiarize them with the system's features and functionalities. This can be done through workshops, online tutorials, and user guides. A support system should also be established to address any technical issues or user concerns in real-time, ensuring a smooth transition from the previous communication methods. Additionally, user feedback should be regularly collected through surveys or feedback forms, allowing the development team to identify areas of improvement and address any usability challenges.

Secondly, it is recommended that the university invests in continuous system updates and security enhancements. Regular system maintenance should be scheduled to address bugs, add new features, and ensure compliance with emerging data security standards. Implementing features such as two-factor authentication (2FA) and encryption for sensitive communications will further protect users' data. As the university grows, the system should be scalable to accommodate an increasing number of users and messages, ensuring long-term sustainability. Furthermore, expanding the system's functionalities, such as integrating it with mobile applications for on-the-go access, will enhance its utility and foster higher user engagement.

3 Future work

For future work, it is recommended that the intranet mailing system at Kigali Independent University explore advanced features that can further enhance communication and collaboration within the university. One potential direction is the integration of artificial intelligence (AI) to automate routine tasks such as sorting emails, prioritizing important messages, and flagging urgent communications. AI-powered chatbots could also be implemented to assist users in navigating the system, answering common questions, or directing users to the appropriate departments. Additionally, incorporating analytics tools that track communication trends could provide valuable insights for university administrators to improve the efficiency of internal communication and identify areas where further support is needed.

Another area of future work is the development of a mobile application for the intranet mailing system, allowing users to access the platform conveniently from their smartphones or tablets. This would increase the system's accessibility and ensure that students and staff stay connected, regardless of their location. Future updates could also focus on integrating the mailing system with other university services, such as learning management systems (LMS), to create a more seamless digital environment where users can access academic resources, submit assignments, and communicate—all from a unified platform. These enhancements would help keep the system aligned with the evolving technological landscape and the growing needs of the university community.

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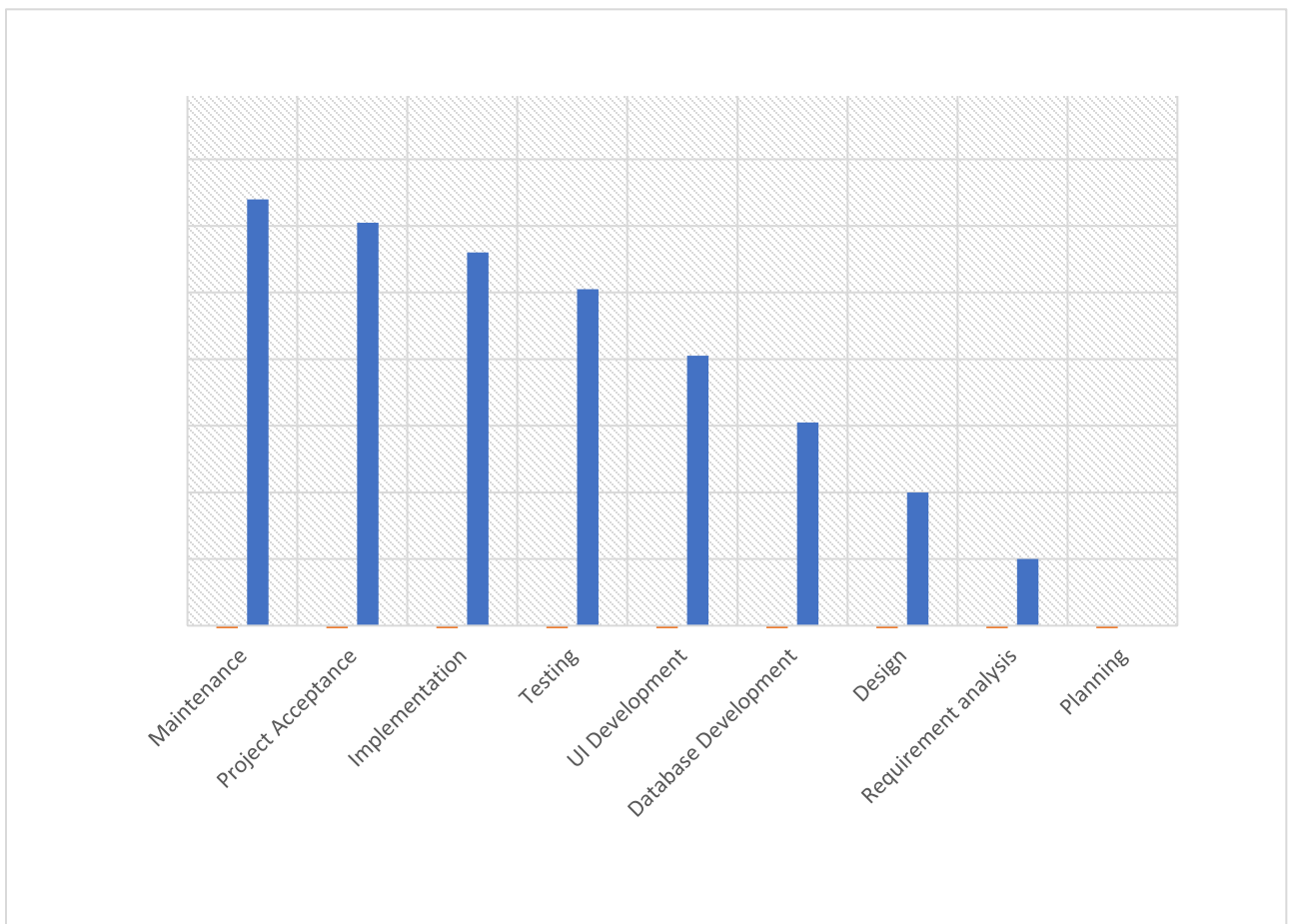
Appendix

Appendices A

Time Frame

A project time frame is the predetermined period of time allocated to the planned execution and completion of a project. It is also commonly referred to as the project's timeline or schedule. It includes a schedule of all project tasks, due times, and deliverables.

The sequence and duration of the tasks required to meet the goals of the project. The project timeframe provides a well-structured timetable for project management, execution, and planning. This makes it possible for project participants to keep an eye on progress, manage resources, and ensure that the project is completed within the set parameters—such as the budget, scope, and quality standards.



Planning of the Project

Activities/Period	March – April 2024	May – June 2024	June- July 2024	June- July 2024	July- Aug 2024	Aug- Sep 2024
Research Proposal						
CHAPTER 1 General Introduction						
CHAPTER 2 Literature review						
CHAPTER 3 System analysis and design						
CHAPTER 4 System implementation						
CHAPTER 5 Conclusion and suggestion						

Appendices B

Source Code

Computer program developed in a programming language that can be read by humans. It is the collection of guidelines written by a programmer to direct a computer's actions. Source code outlines a computer's actions step-by-step, much like a cookbook. It serves as the guide for software development since it is written in a language that is comprehensible to both people and machines.

Home Page

```
<?php
include('includes/initialize.php');
// include('db.php');
//login confirmation
confirm_logged_in();
?>

<!-- Content Header (Page header) -->
<section class="content-header">
  <h1>
    Dashboard
    <small>Control Panel</small>
  </h1>
  <ol class="breadcrumb">
    <li><a href="#"><i class="fa fa-home"></i> Home</a></li>
    <li class="active">Dashboard</li>
  </ol>
</section>
```

```
<br>
```

```
<!-- UPDATE ACCOUNTS TO ONLINE -->
```

```
<?php
```

```
    // echo "SELECT oic_id FROM accounts WHERE acct_id = '$_SESSION[acct_id]'";
```

```
    // $user = $conn->prepare("SELECT oic_id FROM accounts WHERE acct_id =
    '$_SESSION[acct_id]')->execute();
```

```
    // $res = $user->fetch();
```

```
    $stmt = $conn->prepare("UPDATE accounts SET status = 'Online' WHERE oic_id =
    '$_SESSION[oic_id]'");
```

```
    $stmt->execute();
```

```
?>
```

```
<!-- END UPDATE -->
```

```
<!-------START SLIDER-----
```

```
->
```

```
<div class="row carousel-holder">
```

```
    <div class="col-md-12" >
```

```
        <div id="carousel-example-generic" class="carousel slide" data-ride="carousel">
```

```
            <ol class="carousel-indicators">
```

```
                <li data-target="#carousel-example-generic" data-slide-to="0"
                class="active"></li>
```

```
                <li data-target="#carousel-example-generic" data-slide-to="1"
                class="active"></li>
```

```
                <li data-target="#carousel-example-generic" data-slide-to="2"
                class="active"></li>
```

```
            </ol>
```

```
        <div class="carousel-inner" >
```



```
<div class="item active" >  </div>
```

```
        <div class="item" >    </div>
```

```
        <div class="item" >    </div>
```

```
</div>
```

```
        <a class="left carousel-control" href="#carousel-example-generic" data-
slide="prev">
```

```
        <span class="glyphicon glyphicon-chevron-left"></span>
```

```
</a>
```

```
        <a class="right carousel-control" href="#carousel-example-generic" data-
slide="next">
```

```
        <span class="glyphicon glyphicon-chevron-right"></span>
```

```
</a>
```

```
</div>
```

```
</div>
```

```
</div>
```

```
<!-------END SLIDER----->
```

```
<br>
```

```
<!-- Small boxes (Stat box) -->
```

```
<div class="row">
```

```
<div class="col-lg-3 col-xs-6">
```

```
<!-- small box -->
```

```
<div class="small-box bg-aqua">
```

```
<div class="inner">
```

```

<?php
    // echo 'SELECT COUNT(id) FROM random';
    $random = $conn->prepare('SELECT COUNT(id) as count FROM random')-
>fetchColumn();
    echo'<h3>'.$random.'</h3>';?>
    <p>MAILING FILES</p>
</div>
<div class="icon">
    <i class="ion-android-mail"></i>
</div>
    <a href="<?php echo WEB_ROOT; ?>modules/random/index.php" class="small-box-
footer">View More info <i class="fa fa-arrow-circle-right"></i></a>
</div>
</div><!-- ./col -->
<div class="col-lg-3 col-xs-6">
    <!-- small box -->
    <div class="small-box bg-yellow">
        <div class="inner">

<?php

    $sign = $conn->prepare('SELECT COUNT(sign_id) FROM sign')->fetchColumn();
    echo'<h3>'.$sign.'</h3>';

?>
    <p>SIGNATURES</p>
</div>
<div class="icon">
    <i class="ion ion-android-create"></i>
</div>

```

```

        <a href="<?php echo WEB_ROOT; ?>modules/sign/index.php" class="small-box-
footer">View More info <i class="fa fa-arrow-circle-right"></i></a>
    </div>
</div><!-- ./col -->
<div class="col-lg-3 col-xs-6">
    <!-- small box -->
    <div class="small-box bg-green">
        <div class="inner">

            <?php

                $emp = $conn->prepare('SELECT COUNT(emp_id) FROM employee')-
>fetchColumn();
                echo'<h3>'. $emp.'</h3>';

            ?>
            <p>EMPLOYEE</p>
        </div>
        <div class="icon">
            <i class="ion ion-android-person"></i>
        </div>
        <a href="<?php echo WEB_ROOT; ?>modules/employee/index.php" class="small-box-
footer">View More info <i class="fa fa-arrow-circle-right"></i></a>
    </div>
</div><!-- ./col -->
<div class="col-lg-3 col-xs-6">
    <!-- small box -->
    <div class="small-box bg-red">
        <div class="inner">

            <?php

```

```
$random = $conn->prepare('SELECT COUNT(id) FROM random')->fetchColumn();
echo'<h3>'.$random.'</h3>';
?>
<p>x</p>
</div>
<div class="icon">
  <i class="ion ion-android-close"></i>
</div>
  <a href="errorpage/page_404.html" class="small-box-footer">View More info <i
class="fa fa-arrow-circle-right"></i></a>
</div>
</div><!-- ./col -->
</div><!-- /.row -->
```