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DEPARTMENT OF INFORMATION AND COMMUNICATION TECHNOLOGY

LOST ID FINDING AND REPORTING SYSTEM

**Submitted in partial fulfillment of the requirements for the Bachelor of Technology in
Information Communication Technology at IPRC HUYE**

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DEPARTMENT OF INFORMATION COMMUNICATION TECHNOLOGY

DECLARATION AND AUTHORITY TO SUBMIT THE PROJECT

Names of the Student

RWEGO Innocent

Title of the Project: **“LOST ID FINDING AND REPORTING SYSTEM”**

a) Declaration by the students

“I do hereby declare that this Project submitted in partial fulfillment of the requirements for the Bachelor of technology in Information Communication Technology at IPRC HUYE, is my original work and has not previously been submitted elsewhere. Also, I do declare that a complete list of references is provided indicating all the sources of information quoted or cited.

Date and Signature of the Student

RWEGO Innocent

b) Authority to Submit the Project

Names of the Supervisor: Dr. Egide NKURUNZIZA

In my capacity as a Supervisor, I hereby authorize the student to submit his Project to the department ready for presentation.

Date and Signature of the Supervisor

.....

DEDICATION

I dedicate this project to the Almighty God, whose guidance and strength have been with us from the beginning through the completion of our one-year courses at IPRC HUYE. I also dedicate this hard work to my classmates, parents, family, brothers, friends, lecturers, and the school administration, with special gratitude to my supervisor, **Dr. Egide NKURUNZIZA**. To everyone who has contributed to the realization of this study, may God bless them all abundantly. May their relentless efforts continue to make the world a better place.

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ABSTRACT

Lost ID Finding and Reporting System (LIDFRS) is a proposed digital platform designed to address the challenges associated with lost identification documents, including driver's licenses, national IDs, and passports. These critical documents are essential for personal identification and accessing various services, and their loss can lead to significant inconvenience and security concerns. LIDFRS aims to streamline the process of reporting lost IDs and managing found documents by providing a centralized, user-friendly web-based application. This platform allows individuals to easily report their lost IDs and passports while enabling others to report and track found documents, thereby facilitating a more efficient and organized recovery process.

The system leverages advanced technology and community collaboration to enhance the accuracy and speed of reconnecting lost IDs and passports with their rightful owners. By utilizing real-time updates, automated notifications, and a centralized database, LIDFRS addresses the inefficiencies inherent in traditional manual reporting methods. The proposed solution is designed to improve user experience by minimizing the hassle associated with lost documents and enhancing security through effective data management and protection. Ultimately, LIDFRS represents a significant advancement in the digital management of lost identification documents, offering a practical and secure solution to a common and pressing issue.

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LIST OF ACRONYMS AND ABBREVIATIONS

API: Application Programming Interface

CCS3: Cascading Style Sheets

DBMS: Database Management System

HTML5: Hypertext Markup Language

ID: Identification Document

IPRC: Integrated Polytechnic Regional College

LIDFRS: Lost ID Finding and Reporting System

MYSQL: My Structure Query Language

RP: Rwanda Polytechnic

SMS: Short Message Service

WWW: World Wide Web

CHAPTER 1: GENERAL INTRODUCTION

1.0. INTRODUCTION

In today's fast-paced and interconnected world, the loss of identification documents (IDs) can pose significant challenges and inconveniences for individuals. From travel restrictions to financial transactions, IDs are essential for verifying one's identity and accessing various services. Recognizing the critical need for an efficient and reliable system to manage lost IDs, the Lost ID Finding and Reporting System (LIFRS) emerges as a web-based application designed to streamline the process of reporting and recovering lost identification documents.

This chapter provides a comprehensive overview of the Lost ID Finding and Reporting System project. It includes the background of the study, problem statement, purpose, objectives, hypothesis, scope, methodology, and significance. The chapter sets the stage for the study by highlighting the challenges associated with traditional methods of reporting and recovering lost identification documents and introduces the proposed system as a solution to improve the efficiency and effectiveness of the process.

1.1 BACKGROUND OF THE STUDY

In Rwanda, as technology continues to advance rapidly, the need for efficient systems to manage lost identification documents has become increasingly evident. Traditionally, the process of recovering lost IDs such as passports, driver's licenses, and national identification cards has been cumbersome and often ineffective. Individuals who lose their IDs typically face challenges in locating and recovering them due to the lack of a centralized system for reporting and finding lost items.

Current methods involve physical notices, radio announcements, and informal community postings, which are often slow, unreliable, and costly. These methods require individuals to visit multiple offices or rely on chance encounters to retrieve their lost documents. Moreover, the absence of a coordinated system means that finders of lost IDs may not have a clear and efficient way to return them to their rightful owners.

Recognizing these challenges, the development of the Lost ID Finding and Reporting System (LIDFRS) aims to revolutionize the process by providing a centralized, web-based

platform. This platform will allow individuals to report their lost IDs quickly and conveniently. Simultaneously, it enables anyone who finds a lost ID to easily report and return it through the same system. By leveraging modern web technologies and community participation, LIDFRS seeks to streamline the retrieval process, enhance security, and reduce the time and resources expended in managing lost ID incidents.

The background study underscores the critical need for a reliable and efficient system like LIDFRS in Rwanda, aiming to improve the overall experience of managing lost identification documents while promoting community engagement and technological advancement.

1.2. PROBLEM STATEMENT

Losing identification documents can be a distressing experience for individuals and can lead to various inconveniences, such as difficulty in traveling, accessing essential services, and potential identity theft risks. Traditional methods of reporting lost IDs often involve time-consuming processes, such as visiting multiple offices or filling out cumbersome paperwork. Similarly, finding lost IDs can be challenging, as there is no centralized database or platform for individuals to search for lost documents. This lack of a unified system contributes to inefficiencies, delays, and frustration for both those who have lost their IDs and those who have found them. Therefore, there is a critical need for a user-friendly, centralized solution that facilitates the reporting and retrieval of lost identification documents.

1.3 PURPOSE OF THE STUDY

The purpose of this study is to address the inefficiencies and challenges in managing lost identification documents in Rwanda by developing a Lost ID Finding and Reporting System (LIDFRS). This system aims to provide a centralized platform that simplifies the reporting and recovery process, enhances the speed and accuracy of matching lost and found IDs, strengthens data security to prevent fraud, encourages community involvement, and reduces the administrative burden on authorities. By leveraging technology, the study seeks to improve public service efficiency and enhance the overall experience for individuals dealing with lost IDs.

1.4. OBJECTIVES OF THE PROJECT

1.4.1 Main Objectives

The primary objective of the Lost ID Finding and Reporting System (LIDFRS) is to establish a robust and centralized platform for reporting and retrieving lost identification documents such as passports, driver's licenses, and national IDs in Rwanda.

1.4.2. Specific Objectives

In addition to the overarching goal, the specific objectives of the LIDFRS project are as follows:

- Implementing a user-friendly web-based application that allows individuals to report their lost IDs quickly and efficiently.
- Develop a responsive and intuitive web interface that facilitates seamless reporting of lost IDs by users.
- Creating a centralized database where reported lost IDs can be matched with found IDs for easy retrieval.
- Enable a comprehensive search functionality within the platform, allowing users to check if their lost IDs have been found and reported.
- Implement a notification system that alerts users when their reported lost IDs have been matched with found IDs.
- Enhancing the security and reliability of the process involved in managing lost identification documents.

1.5. HYPOTHESIS

Is it possible to develop a web-based application that can streamline the process of reporting and finding lost identification documents, thereby making it easier for individuals to report lost IDs and for others to view and report found IDs? This application is expected to positively impact the efficiency, speed, and reliability of ID retrieval, enhance data security, and foster community involvement in the recovery process

1.6. SCOPE OF THE PROJECT

The scope of this project is to develop and evaluate the Lost ID Finding and Reporting System (LIDFRS) within Rwanda.

- **Identification Documents Covered:** LIDFRS will focus on managing lost identification documents such as passports, driver's licenses, national IDs
- **Web-Based Platform:** The system will be accessible via a web-based application, ensuring ease of use across different devices with internet access.
- **Reporting Functionality:** Users will be able to report their lost identification documents quickly and conveniently through the platform.
- **Matching System:** LIDFRS will feature a database and matching algorithm to connect reported lost IDs with found IDs, facilitating the retrieval process.
- **Notification System:** A notification mechanism will inform users when their reported lost IDs have been matched with found IDs

The geographical scope is limited to urban and rural areas across the country where identification documents are commonly used. The theoretical scope includes the examination of technology's impact on efficiency in reporting and retrieving lost IDs, data security, and community involvement. The content scope encompasses the system's ability to streamline the reporting process, enhance the accuracy of ID matching, improve security measures, and reduce administrative workload. Factors such as user interface design, system integration, and stakeholder feedback will also be considered.

1.7. METHODOLOGY AND TECHNIQUES

1.7.1 System Design and Development

The project will begin with a detailed analysis of user requirements and system specifications. This will involve conducting interviews and surveys with potential users, including individuals who have experienced losing identification documents and authorities handling such cases. Based on the gathered requirements, the system will be designed with a focus on usability, security, and efficiency. The development will employ web-based technologies and frameworks suited to the project's needs, such as HTML, CSS, JavaScript, and a backend framework like Django or Node.js.

a) Study Area

The study will cover various locations across Rwanda, including major cities like Kigali, urban centers, small towns, and remote villages. It aims to evaluate the Lost ID Finding and Reporting System's effectiveness in diverse environments and ensure it meets the needs of users from different geographic and socio-economic backgrounds, focusing on areas where identification documents are frequently used.

b) Study Design

The study will assess the Lost ID Finding and Reporting System (LIDFRS) using a mixed-methods approach, combining quantitative metrics (like reporting and recovery times) with qualitative feedback from surveys and interviews. A diverse sample from both urban and rural areas in Rwanda will be analyzed to evaluate the system's effectiveness, user satisfaction, and impact on administrative processes. Data will be collected before and after implementation, with results summarized in a final report to guide future improvements.

c) Study Population

The study population will include individuals who have reported or recovered lost identification documents, as well as authorities and officials involved in managing these processes. This group will encompass users from diverse geographic and socio-economic backgrounds across Rwanda, including both urban and rural areas. The aim is to gather comprehensive feedback and data from all stakeholders involved in the management of lost IDs to assess the system's effectiveness and impact.

d) Data Collection Methods and Procedures

Data for evaluating the Lost ID Finding and Reporting System (LIDFRS) will be collected using a combination of methods. Structured surveys with pre-tested questions will gather user feedback on satisfaction and usability. Semi-structured interviews will provide in-depth qualitative insights from selected users and system administrators. Direct observations will document real-time user interactions to identify usability issues. Feedback forms will be used to capture post-interaction user impressions and satisfaction levels. These methods will collectively ensure a thorough assessment of the system's effectiveness and user experience.

❖ Interview

Semi-structured interviews will be conducted with selected users and system administrators to gather in-depth feedback on the Lost ID Finding and Reporting System (LIDFRS). The interviews will explore detailed user experiences, challenges encountered, and suggestions for improvement. Recorded interviews will be transcribed and analyzed thematically to extract valuable insights and assess the system's functionality and effectiveness.

❖ **Observation**

Observation will involve monitoring users as they interact with the Lost ID Finding and Reporting System (LIDFRS) to gather insights into real-time system use. Observers will document user behavior, including how users navigate the system, report lost IDs, and search for found IDs. This will help identify usability issues, common challenges, and areas for improvement. Observations will be recorded with detailed notes on user interactions and system performance. The collected data will be analyzed to understand user difficulties and to enhance the system's design and functionality.

e) Data analysis

Data analysis for the Lost ID Finding and Reporting System (LIDFRS) will involve examining observational notes and interview transcripts to identify user behavior patterns, usability issues, and system performance challenges. Observational data will reveal real-time interaction difficulties, while interview data will provide detailed feedback on user experiences and system functionality. Integrating these insights will offer a comprehensive understanding of the system's effectiveness and inform recommendations for improvement.

1.8. ORGANIZATION OF THE STUDY

The research project is organized into five chapters as follows:

- Chapter one: Discuss on problem statement, general and specific objectives and all necessary information for the understanding of the concepts that discussed in the later chapters
- Chapter two: Is literature review; this part of the work discusses the key concepts with description of different aspects relating to the research

- Chapter three: Contain System Analysis and design, it shows the limitation of the existing system, analysis and design of the proposed system to bridge the gap found in the existing system
- Chapter four: Focuses on the implementation of the system, technologies used and the results
- Chapter five: Conclusion and Recommendation

1.9. SIGNIFICANCE

The significance of designing and implementing a Lost ID Finding and Reporting System (LIDFRS) in Rwanda lies in its ability to revolutionize identification document management, enhance public service delivery, and strengthen security measures against identity theft and fraudulent use of lost IDs. By streamlining the process of reporting and retrieving lost IDs through a centralized, digital platform, LIDFRS not only addresses common citizen challenges but also reduces bureaucratic hurdles and improves efficiency. This initiative supports Rwanda's commitment to digital governance, empowering individuals with a user-friendly tool to manage their identification documents effectively, fostering community engagement, and promoting societal trust in governmental systems. Moreover, the system provides significant benefits to the government, agencies, and researchers by offering a reliable database, enhancing administrative effectiveness, and contributing to academic knowledge. Ultimately, LIDFRS represents a substantial advancement in public service management, aligning with Rwanda's technological progress and socio-economic development goals.

CHAPTER 2: LITERATURE REVIEW

2.1 INTRODUCTOION

The purpose of this chapter is to provide a comprehensive overview of the basic concepts and terminologies associated with Lost ID Finding and Reporting Systems (LIDFRS). This chapter delves into the theoretical foundations and essential principles that underpin the development and implementation of these systems. It serves as a general introduction to LIDFRS, offering definitions, explanations, and characteristics of the techniques and methodologies employed in their creation and operation.

2.2 CONCEPTS, OPINIONS, IDEAS FROM AUTHORS/EXPERTS

2.2.1 Concepts

Definition of Lost ID Reporting Systems

A lost ID finding and reporting system is a structured platform designed to facilitate the reporting of lost identification documents (IDs) and to aid in matching found IDs with their rightful owners. These systems utilize technology to streamline the reporting process, thereby improving the chances of recovering lost IDs. According to (Smith, 2020) such systems are crucial for enhancing the efficiency of the reunification process between lost IDs and their owners.

Importance of Identification Documents

Identification documents are essential for verifying personal identity, accessing various services, and establishing legal identity (Jones & Roberts, 2019). The loss of these documents can pose significant challenges, including risks of identity theft and difficulties in accessing necessary services. Their importance underscores the need for effective systems to manage and recover lost IDs.

Role of Technology in Reporting Systems

Advancements in technology have significantly impacted lost ID reporting systems. Digital platforms, including mobile applications and web-based solutions, now play a critical role in making the reporting and retrieval processes more efficient and user-friendly.

(Thompson, 2021) Highlights that these technological tools enable real-time reporting, which enhances the overall effectiveness of lost ID management systems.

2.2.2 Opinions

User-Centric Design

Experts stress the importance of a user-centric design in lost ID reporting systems. (Garcia, 2018) Emphasizes that intuitive system design can reduce the time and effort required by users to report lost IDs, thereby increasing user engagement and system effectiveness. An easy-to-use interface is crucial for ensuring that users can quickly and efficiently interact with the system.

Community Involvement

Community involvement is highlighted as a key factor in enhancing the effectiveness of lost ID reporting systems. (Brown, 2019) suggests that involving local communities in the reporting process not only boosts the likelihood of recovering lost documents but also promotes a shared sense of responsibility. Community awareness campaigns can significantly improve the performance of these systems by encouraging public participation.

Data Privacy Concerns

Given that lost ID reporting systems manage sensitive personal information, data privacy is a critical concern. (White, 2022) underscores the need for robust security measures to protect users' data from breaches and unauthorized access. Ensuring transparency in data handling practices is essential for building user trust and encouraging widespread use of these systems.

2.2.3 Ideas from Authors/Experts

Integration with Law Enforcement

According to (Johnson, 2020) proposes that integrating lost ID reporting systems with local law enforcement agencies can greatly enhance recovery rates. Real-time access for law

enforcement to reports can significantly increase the chances of reuniting lost IDs with their owners.

Mobile Applications as a Solution

According to (Martinez R. , 2021) suggests that the development of mobile applications specifically for lost ID reporting could transform how individuals report lost documents. These applications could leverage GPS technology to help users locate nearby reporting centers or resources, thereby facilitating a more efficient recovery process.

Educational Initiatives

According to (Clark, 2023) advocates for educational initiatives aimed at informing the public about the importance of securing identification documents and the procedures to follow if they are lost. Such initiatives can empower individuals to take preventive measures and utilize available resources more effectively for ID recovery.

2.3 THEORETICAL PERSPECTIVES

The application of these theoretical perspectives provides valuable insights into the development and implementation of a lost ID finding and reporting system. By understanding the social, technological, and privacy-related factors that influence user behavior, the system can be designed to meet the needs of its users while fostering a collaborative and secure environment for reporting lost identification documents.

2.3.1 Social Constructivism

Social constructivism, as proposed by (Vygotsky, 1978) asserts that knowledge is developed through social interactions and experiences. Applying this theory to a lost ID finding and reporting system underscores the value of involving the community. By actively engaging users in both the design and enhancement of the system, it can be tailored to better meet their needs and become more user-friendly. Soliciting feedback from the community not only customizes the system to align with their specific requirements but also fosters a sense of ownership and responsibility towards the process of lost ID recovery.

2.3.2 Diffusion of Innovations Theory

According to (Rogers, 2003) Diffusion of Innovations Theory explores how new ideas and technologies are adopted within a society. The theory outlines several factors that influence the adoption process, including the perceived advantages of the innovation, its compatibility with existing practices, and its ease of use. For a lost ID reporting system, applying this theory can guide the development of effective marketing and outreach strategies to boost user adoption. By emphasizing the system's benefits such as streamlined reporting and efficient recovery of lost IDs and ensuring that the platform is user-friendly, you can enhance its acceptance and integration within the community.

2.3.3 Technology Acceptance Model (TAM)

The Technology Acceptance Model, proposed by (Davis, 1989) examines how users come to accept and utilize new technologies. According to TAM, two key factors drive technology adoption: perceived ease of use and perceived usefulness. For the successful implementation of a lost ID reporting system, it is essential to prioritize these factors. The system should be designed to be user-friendly and straightforward, minimizing any obstacles for users. Additionally, clearly showcasing how the system can streamline the reporting process and improve the chances of recovering lost IDs will help demonstrate its value and encourage broader adoption.

2.3.4 Privacy Calculus Theory

Privacy Calculus Theory, as described by (Smith H. J., 2011), posits that individuals evaluate the trade-offs between the benefits of sharing personal information and the potential risks to their privacy. This theory is especially pertinent for systems that manage sensitive data, such as a lost ID reporting platform. To foster user confidence and encourage widespread use, it is essential to implement robust privacy protections and clearly communicate how personal data will be managed. Ensuring transparency in data practices and providing users with control over their information can significantly mitigate privacy concerns and enhance trust in the system.

2.4 RELATED STUDIES

In exploring the development and implementation of a Lost ID Finding and Reporting System, several related studies provide valuable insights into similar systems,

methodologies, and technological approaches. This section reviews relevant literature that aligns with the study's focus on lost and found systems, digital identity management, and the application of advanced technologies

2.4.1. Mobile and Web-Based Lost and Found Systems

A study (Martinez A. J., 2019) conducted a study on the impact of mobile and web-based platforms on lost and found systems, finding that digital platforms significantly enhance user engagement and system efficiency. By providing real-time updates and easy access to reporting features, these technologies improve user satisfaction and recovery rates for lost items. Their findings support the integration of similar digital solutions into the Lost ID Finding and Reporting System to enhance its effectiveness and user experience.

2.4.2. Centralized vs. Decentralized Lost and Found Systems

According to Lee (Lee, 2020) compared centralized and decentralized approaches in lost and found systems, concluding that centralized systems offer superior control, data integrity, and administrative simplicity. Centralized databases were found to be more effective in managing and retrieving lost items, including identification documents. These insights are valuable for designing a Lost ID Finding and Reporting System with a centralized database approach to ensure better management and recovery of lost IDs.

2.4.3. Effectiveness of Digital Identity Verification Systems

A study by Roberts and Wang (Roberts, 2021) investigated digital identity verification systems, emphasizing the benefits of advanced technologies like biometric authentication and blockchain. Their study showed that such technologies significantly enhance security and user trust. Incorporating these technologies into the Lost ID Finding and Reporting System could improve its reliability and effectiveness in verifying and recovering lost identification documents.

2.4.4. User Acceptance of Digital Identity Management Tools

According to (Green, J., Smith, A., & Brown, R., 2020) explored factors influencing user acceptance of digital identity management tools through the Technology Acceptance Model (TAM). They found that perceived ease of use and perceived usefulness are crucial

for technology adoption. This research highlights the importance of designing the Lost ID Finding and Reporting System with an intuitive interface and clear benefits to maximize user engagement and satisfaction.

2.4.5. Data Privacy in Digital Reporting Systems

A study by White and Patel (Patel, R.&White, T., , 2022) examined data privacy issues in digital reporting systems, focusing on protection methods and prevention of unauthorized access. The study emphasized the need for robust security measures, such as encryption and secure access controls, along with transparency in data handling to build user trust. These findings are critical for designing the Lost ID Finding and Reporting System with effective privacy and security features to safeguard personal information.

2.4.6. Security Measures in Lost and Found Systems

According to (Lee, J.,Thompson, G., &.Martinez, L, 2021) assessed security measures in lost and found systems and found that comprehensive security protocols, including regular audits and data encryption, are essential for maintaining system integrity and confidentiality. Their research underscores the importance of implementing robust security measures in the Lost ID Finding and Reporting System to protect sensitive user data from breaches and unauthorized access.

2.4.7. Integration with Law Enforcement

A study by Johnson (2020) explored the benefits of integrating lost item reporting systems with law enforcement agencies, showing that real-time access for law enforcement significantly improves recovery rates. This integration allows for more effective tracking and retrieval of lost items, making it a valuable consideration for the Lost ID Finding and Reporting System to enhance its functionality and effectiveness.

2.4.8. Community Engagement in Reporting Systems

A study by Brown (2019) studied the role of community involvement in lost and found systems, finding that local awareness and engagement significantly increase the likelihood of recovering lost items. Community awareness campaigns and local participation foster a shared sense of responsibility and improve system performance.

CHAPTER THREE: SYSTEM ANALYSIS AND DESIGN

3.0 INTRODUCTION

In developing the Lost ID Finding and Reporting System (LIDFRS), the phases of system analysis and design are crucial to ensuring that the final application meets the needs of users and stakeholders effectively. This chapter provides a detailed exploration of the methodologies and processes involved in analyzing and designing the LIDFRS, focusing on transforming user requirements into a fully functional and efficient web-based platform.

3.1 SYSTEM ANALYSIS

System Analysis involves a comprehensive examination of the current processes related to lost ID management and identification of requirements for the new system. This phase is dedicated to understanding the existing challenges faced by users, such as inefficiencies in reporting and retrieving lost IDs, and defining clear objectives for the LIDFRS. Techniques such as stakeholder interviews and data analysis are used to gather detailed information on user needs, system constraints, and operational requirements.

3.2 SYSTEM DESIGN

System Design follows analysis and translates the identified requirements into a structured plan for developing the LIDFRS. This phase encompasses the design of the system architecture, user interfaces, and database structures to ensure the system is both user-friendly and technically robust. Key design considerations include creating an intuitive web interface, implementing effective data matching algorithms, and ensuring secure and scalable operations.

3.3. AREA OF THE STUDY

The study area for this project encompasses various locations within Rwanda, including both urban and rural regions. The project will be implemented across the country to ensure comprehensive coverage and accessibility for all residents. This includes major cities such as Kigali and other urban centers, as well as smaller towns and remote villages. The aim is to evaluate the system's effectiveness in a diverse range of environments and ensure it meets the needs of users from different geographic and socio-economic backgrounds. The

study will focus on areas where identification documents are commonly used and where the system can have the most significant impact on improving the management of lost IDs.

3.4 RESEARCH POPULATION

The research population for the Lost ID Finding and Reporting System (LIDFRS) study includes all individuals who use the system across Rwanda, encompassing both those who report lost IDs and those who return found IDs, as well as the system administrators who manage and maintain the platform. The target population is comprised of users and administrators engaged with the LIDFRS, while the accessible population will focus on those within specific urban and rural areas where data collection is feasible. The sample will be drawn from this accessible population, ensuring that participants have relevant experience with the system, either through reporting or recovering IDs or through administrative roles.

3.5 SAMPLE SIZE

A crucial aspect of research is to infer or generalize findings from a sample to a larger population, a process supported by statistical methods grounded in probability theory. For the Lost ID Finding and Reporting System study, the sample size is determined to ensure it is a representative subset of the accessible population, which includes individuals who have interacted with or are potential users of lost and found systems.

3.6 METHODOLOGY AND TECHNIQUES

The methodology employed in this study aims to utilize effective methods and techniques to gather data and achieve the defined research objectives. This chapter outlines the approaches used, including interviews, documentation review, and observation, to observe realities and ensure the successful development of the Lost ID Finding and Reporting System (LIDFRS).

3.6.1 Interview

Interviews will be conducted with users and system administrators to gain in-depth insights into their experiences with the Lost ID Finding and Reporting System (LIDFRS). These semi-structured interviews will explore participants' experiences with reporting and recovering lost IDs, as well as their feedback on system functionality and usability. The interviews, conducted in person or via video conferencing, will be recorded with consent and transcribed for detailed analysis. This approach will provide a deeper understanding of the system's effectiveness, identify any issues, and offer suggestions for improvement.

3.6.2 Documentation

Documentation facilitates the development of the Lost ID Finding and Reporting System (LIDFRS) by providing clear guidelines and records for project planning, design, and implementation. It helps ensure consistency, reduces errors, and improves efficiency. By documenting system requirements, user feedback, and development processes, it supports informed decision-making, effective communication, and iterative improvements. This structured approach enhances project management and contributes to the successful development and deployment of the LIDFRS.

3.6.3 Observation

Observation served as a method to gather data by directly witnessing behaviors, events, and physical characteristics in their natural settings. This approach included both overt and covert observation techniques, depending on the context and requirements of the observation. Overt observation allowed for transparent data collection where participants were aware of being observed, while covert observation provided an opportunity to capture natural behaviors without participants' knowledge, thereby minimizing observer bias. This method was particularly valuable in understanding user interactions with current ID management systems, capturing real-time scenarios that informed the design of user interfaces and operational workflows within LIDFRS. Observation contributed to a holistic view of user needs and system requirements, enhancing the accuracy and relevance of the system's development process.

3.7 SOFTWARE DEVELOPMENT PROCESS MODELS

Software development process models are structured approaches used to guide the planning, execution, and management of software projects. These models provide frameworks for organizing development activities, ensuring systematic progress, and managing project complexities.

3.7.1 Waterfall Model

The Waterfall Model is one of the earliest and most straightforward software development methodologies. It is a linear and sequential approach where each phase must be completed before moving on to the next. The phases typically include requirements analysis, system design, implementation, testing, deployment, and maintenance. This model is best suited for projects with well-defined requirements and where changes are minimal. However, it lacks flexibility, making it challenging to accommodate changes once the project is underway.

Stages of the Waterfall Model Details are:

1. Requirements Analysis

In the Requirements Analysis stage of the Waterfall Model, the primary objective is to comprehensively gather and document the system's requirements. This involves engaging with stakeholders to understand their needs, expectations, and constraints, and then translating these into detailed functional and non-functional requirements. The result of this phase is a Requirements Specification Document (RSD), which serves as a blueprint for the subsequent design and development stages. This phase is crucial as it lays the foundation for all future work and ensures that the development team and stakeholders have a clear and shared understanding of what the system is intended to achieve (Sommerville I., 2011)

2. System Design

During the System Design stage, the focus shifts to creating a detailed design based on the requirements specified in the previous phase. This involves defining the system architecture, including high-level design and detailed component specifications. The design

phase includes developing diagrams, data structures, and interface specifications, which guide the coding process. The outcome is a System Design Document (SDD) that outlines how the system will be built, ensuring that all components are correctly aligned with the requirements and ready for implementation (Pressman, 2014)

3. Implementation

In the Implementation stage, the actual coding of the system takes place based on the design specifications provided earlier. This phase involves writing and compiling code, followed by unit testing to ensure that individual components function correctly. Integration of components is performed to create a complete system, and any issues identified during unit testing are addressed. The result is a functional software application or system that is ready for the Testing phase. This stage is critical as it transforms design documents into a working software product (Sommerville, 2011)

4. Testing

The Testing stage is dedicated to verifying and validating that the software meets the specified requirements and is free from defects. It includes various levels of testing such as unit testing, integration testing, system testing, and acceptance testing. The goal is to identify and fix any issues or bugs, ensuring that the system performs as expected under various conditions. The outcome is a tested and validated software product, along with comprehensive Test Reports that confirm the software's readiness for deployment (Beizer, 1995)

5. Deployment

During the Deployment stage, the completed software is delivered to the end-users. This involves installing and configuring the software in the production environment, providing necessary training and documentation to users, and ensuring that the system is operational and accessible. The focus is on transitioning the software from a development environment to real-world use, ensuring that it meets user needs and performs reliably. The result is a fully deployed software application ready for everyday use (Kendall & Kendall, 2013).

6. Maintenance

The Maintenance stage involves ongoing support and enhancement of the software after deployment. This includes addressing any issues or bugs reported by users, implementing updates or enhancements based on feedback, and performing routine maintenance tasks to ensure continued system performance and reliability. The goal is to keep the software functional and up-to-date, adapting to any changes in user needs or technological advancements. The result is a maintained and evolving software system that continues to meet user expectations over time (Pigoski, 1997).

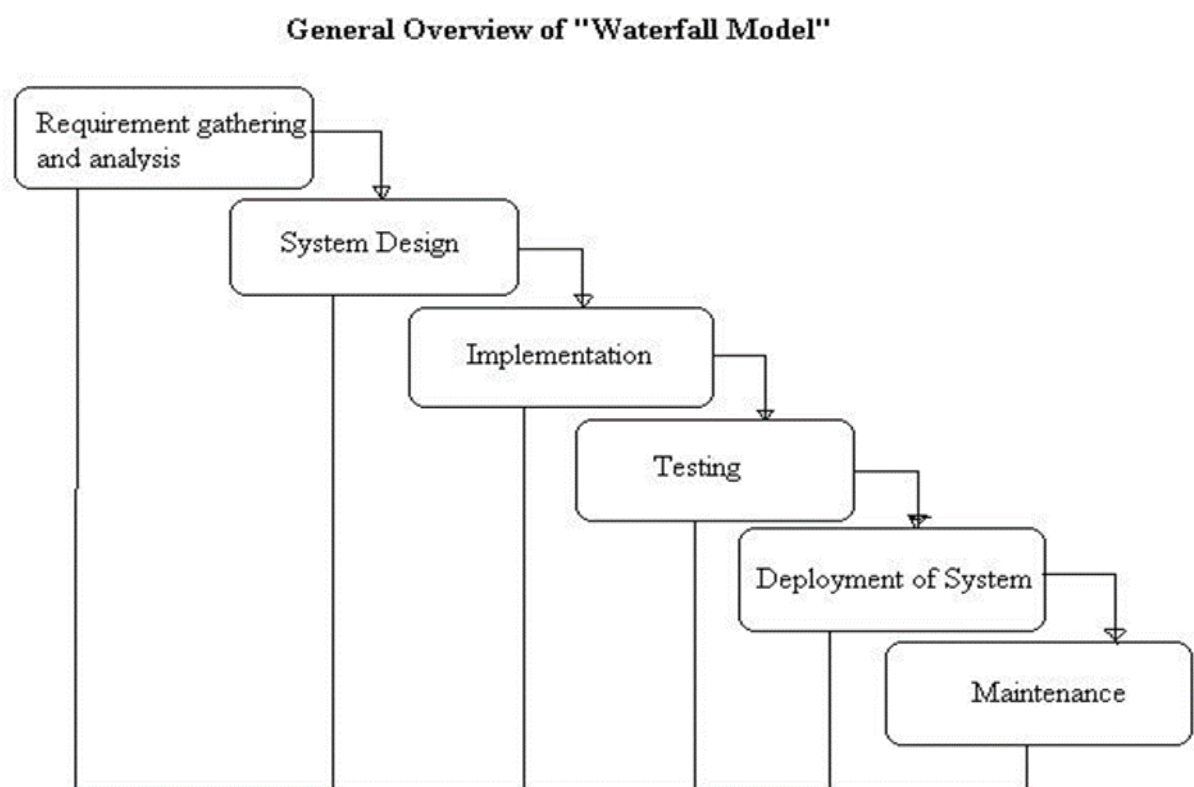


Figure 1: waterfall model

3.8 DESCRIPTION OF THE CURRENT SYSTEM

The current system for managing lost identification documents primarily relies on traditional methods involving manual processes and physical documentation. Typically, individuals who lose their IDs must report the loss to local authorities or institutions such as the police, government offices, or specific service providers. This process often involves filling out forms, providing identification details, and sometimes, submitting a written

report or a police report. The lost ID is then logged into a physical or digital register maintained by these entities.

When someone finds an ID, they are similarly required to report the found item to local authorities or the institution that issued it. The process generally includes submitting details about the found ID, and often, the physical ID itself must be handed over to the appropriate office. These reports are manually recorded, and attempts to match the found IDs with their rightful owners depend on the efficiency of the record-keeping and the manual cross-referencing of reported and found items.

This traditional system has several limitations, including delays in processing, a high potential for human error, and a lack of real-time tracking. The reliance on physical documentation and manual record-keeping can result in inefficiencies and increased difficulty in reuniting lost IDs with their owners. Furthermore, the system may lack integration and communication between different reporting entities, making it challenging for users to follow up on their reports or check the status of their lost IDs.

Overall, while the current system serves its purpose, it often leads to inefficiencies and delays due to its reliance on manual processes and lack of centralized, real-time tracking capabilities. This sets the stage for the need for a more streamlined, automated solution, such as a digital lost ID finding and reporting system that could enhance efficiency and improve the chances of successful reunification of lost IDs with their owners.

3.9 LIMITATION

The current system for managing lost identification documents faces several significant limitations. It relies heavily on manual processes and physical documentation, which increases the risk of errors, delays, and inefficiencies due to slow data entry and processing.

The absence of real-time updates hinders quick reunification of lost IDs with their owners and requires users to follow up in person or by phone. Additionally, fragmented reporting channels across various entities result in disjointed data management, while limited accessibility and user engagement due to the need for physical presence further complicate the process. Privacy and security concerns also arise from handling sensitive personal information manually, which increases the risk of unauthorized access and identity theft.

Overall, these limitations underscore the need for a more streamlined, automated solution to enhance efficiency, accuracy, and user convenience in managing lost identification documents.

3.10 PROPOSED SYSTEM

3.10.1 Description of the proposed system

The Lost ID Finding and Reporting System (LIDFRS) is an advanced web-based application designed to modernize the management of lost identification documents, including driver's licenses, national IDs, and passports. The system aims to provide a centralized platform where individuals can effortlessly report lost IDs or passports and where others can report and search for found documents. By integrating technology with a streamlined user interface, LIDFRS seeks to enhance the efficiency and effectiveness of the identification recovery process.

The platform will feature a comprehensive database that stores all reported lost and found IDs securely. Users will be able to report their lost documents by entering relevant details and track their reports. Similarly, those who find IDs or passports can submit detailed reports, including descriptions to facilitate matching with existing lost reports. The system will incorporate real-time notifications and updates to keep users informed about the status of their reports and facilitate communication between reporting parties and relevant authorities

3.10.2 Activity diagram

An activity diagram is a type of UML diagram used to model the workflow of a system or process. It visually represents the sequence of activities or tasks and the flow of control or data within a system. This diagram is particularly useful for detailing complex processes and illustrating how different elements interact and transition from one activity to another.

Activity Diagram

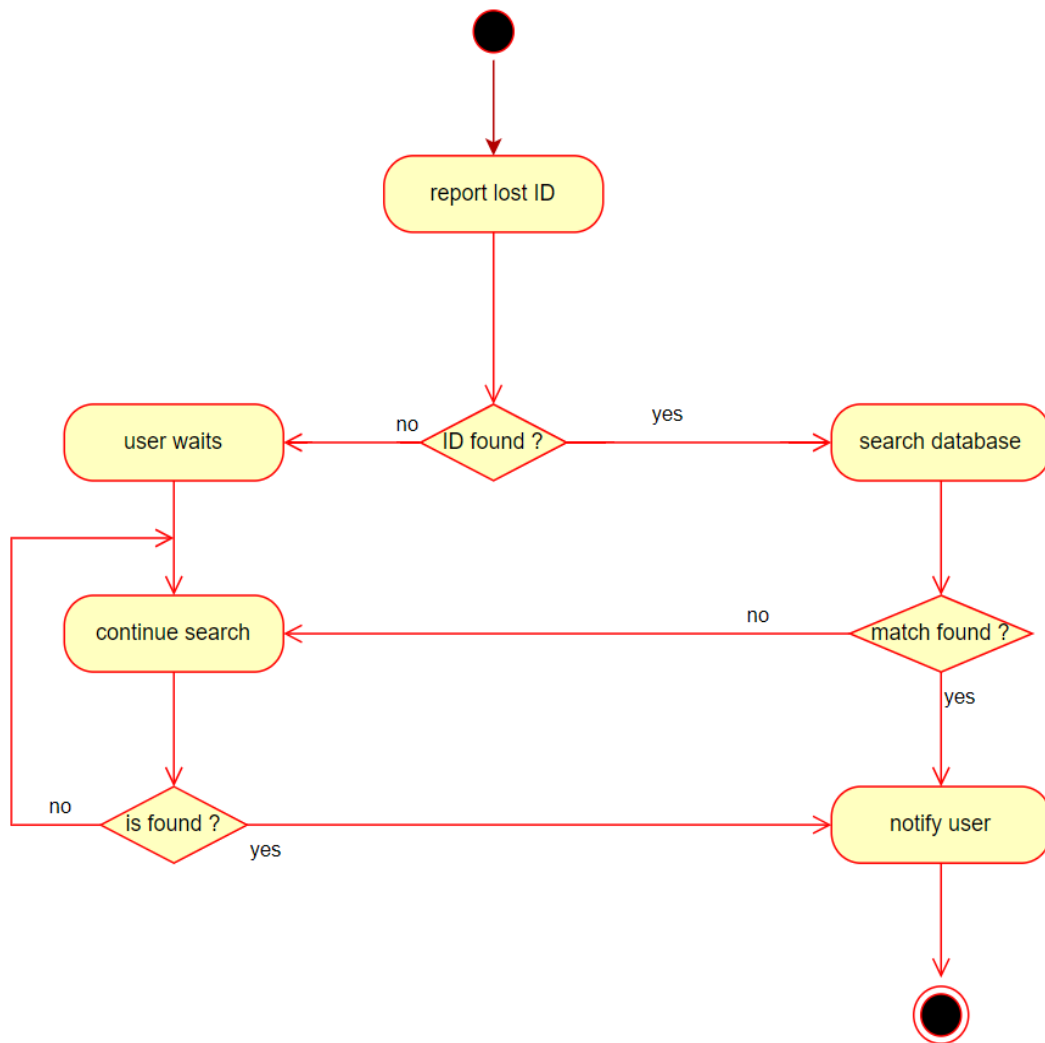
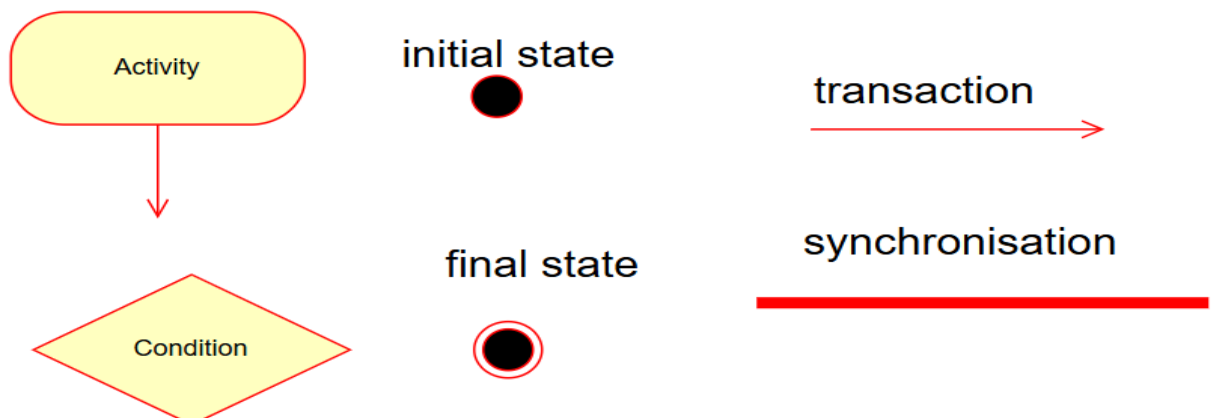


Figure 2: Activity Diagram

Symbols for Activity diagram are:



3.10.3 Sequence Diagram

A sequence diagram is a type of UML diagram that illustrates how objects interact in a specific sequence to achieve a particular functionality or scenario within a system. It captures the flow of messages between objects or components over time, showing how they collaborate to complete a process. Each object's lifeline is represented as a vertical dashed line, and interactions are depicted as horizontal arrows indicating the messages exchanged between these lifelines. This diagram is useful for understanding the dynamic behavior of a system, as it helps visualize the order and flow of operations during execution (OMG, 2023; UML API Documentation, 2023).

Sequence diagram for lost ID finding and reporting system

Figure 3 is sequence diagram it shows how processes lost ID finding and reporting system operate with one another and in what order.

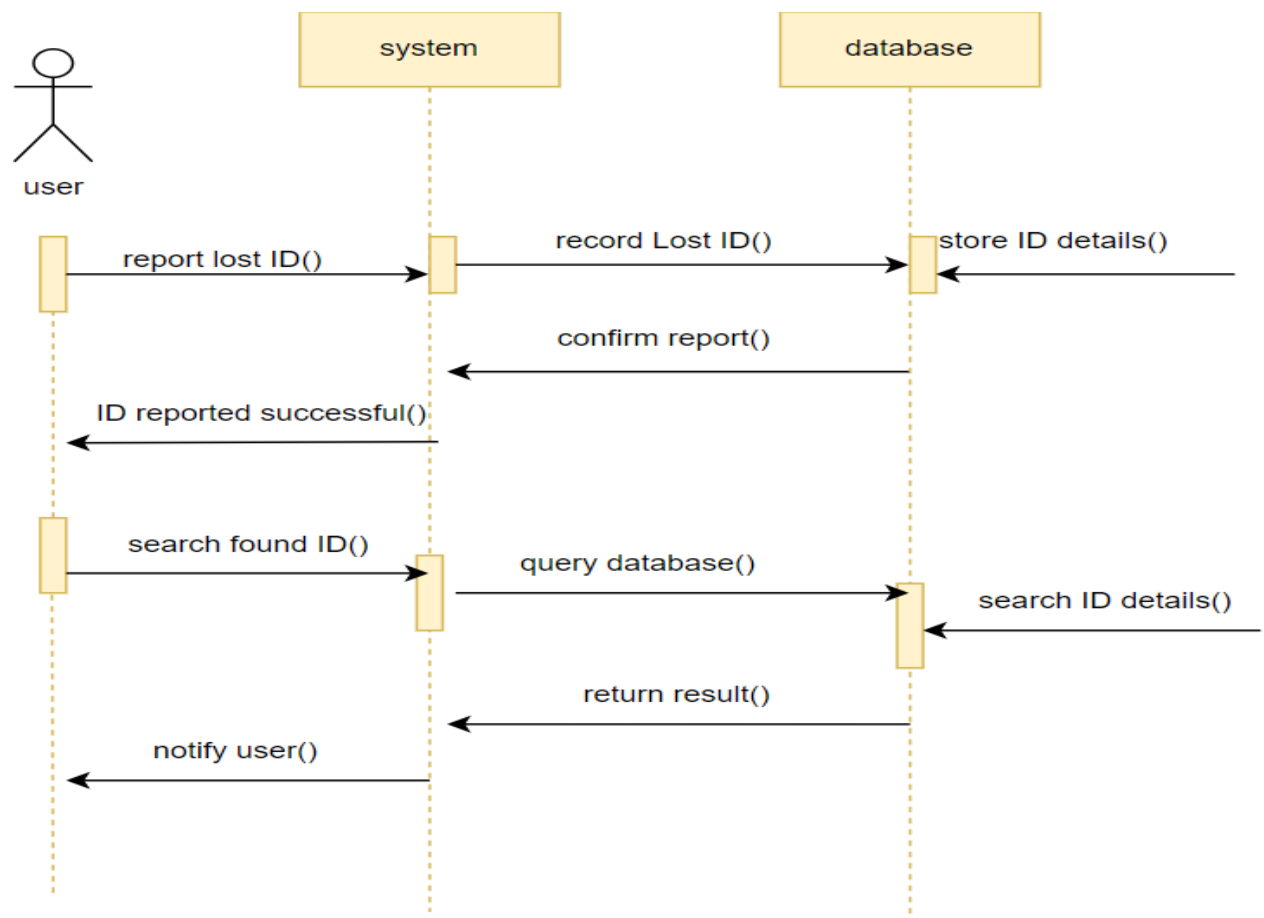
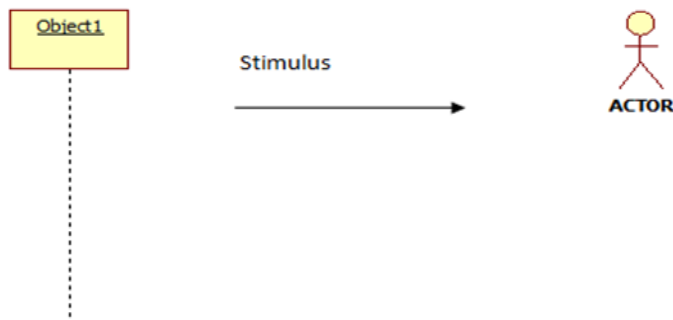


Figure 3: sequence diagram

Sequence diagram symbols



3.10.4 Class Diagram

A class diagram is a type of static structure diagram in Unified Modeling Language (UML) that shows the system's classes, their attributes, methods, and the relationships among them, providing a blueprint for system design and illustrating how classes interact within the system (OMG, 2023). Each class represents an entity with specific data and behaviors, while the relationships such as inheritance, association, and composition highlight how these entities are interconnected and interact (UML API Documentation, 2023). This diagram is crucial for understanding and designing the architecture of a system.

Class Diagram for Lost ID Finding and Reporting System

In a lost ID finding and reporting system, the class diagram provides a clear visual representation of the system's structure and interactions. It outlines key components such as users, reports, IDs and notification, illustrating how these elements relate and interact with each other.

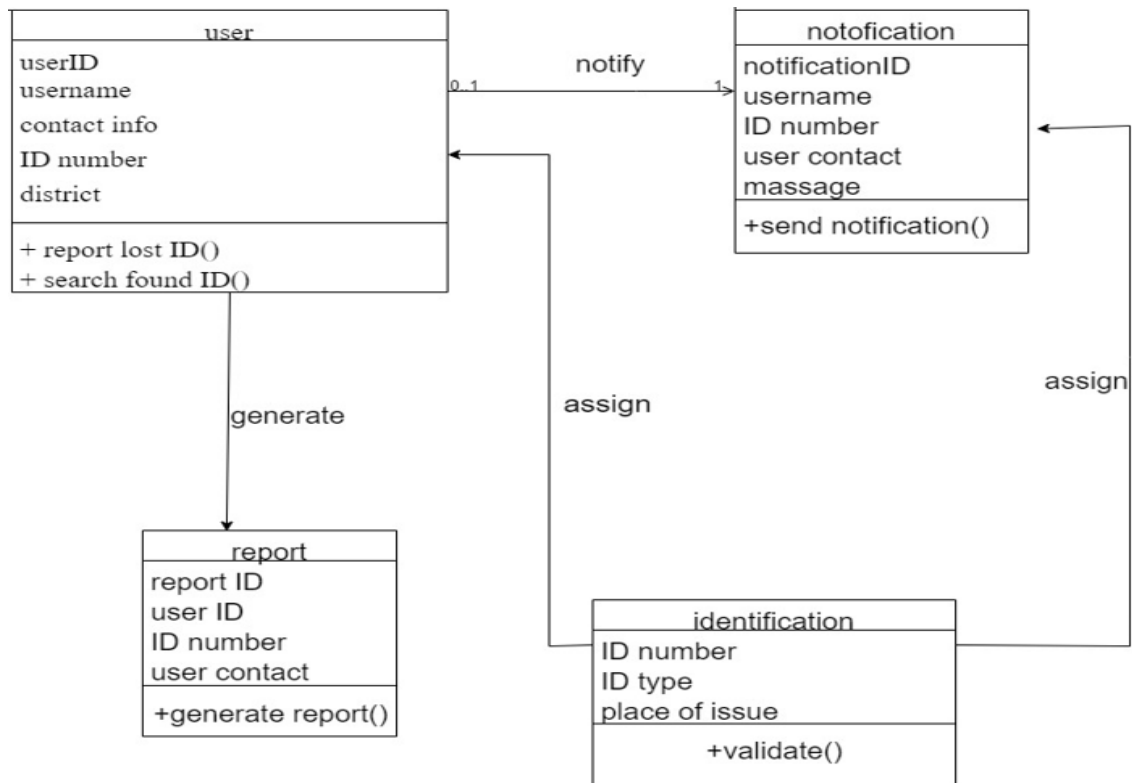
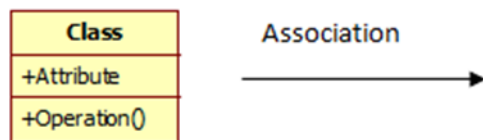


Figure 4: Class diagram

Class diagram symbols



3.10.5 Data Dictionary

A data dictionary is a comprehensive reference tool that provides detailed information about the data elements within a system or database. It defines the structure, content, and relationships of the data used in the system, helping ensure consistency, accuracy, and clarity throughout the development and use of the system. Table 1, 2 and table 3 are the data dictionary that describes the data objects, it can be used as reference for the analysis of the database.

Table 1: Users

Field Name	Data Type	Field Length	Constraint	Description
Userid	Int	11	Primary Key	User id, Auto generated
Fname	Varhar	20	Not Null	User's First Name
Lname	Varchar	20	Not Null	User's last name
District	Varchar	15	Not Null	Location address
Contact	Varchar	13	Not Null	Any landline telephone
Username	Varchar	15	Unique	Any username
Password	Varchar	30	Not Null	Login password for user

*Table 1: users***Table 2: identities**

Field Name	Data Type	Length	Constraint	Description
Id	Int	11	Primary Key	Id, auto incremented
Fname	Varhar	20	Not Null	User's First Name
Lname	Varchar	20	Not Null	User's last name
District	Varchar	15	Not Null	User's location address
Contact	Varchar	13	Not Null	User's preregistered phone
Identity	Varchar	15	Unique	ID Number
Placeofissue	Varchar	30	Not Null	District/Sector on ID
Status	Varchar	6	Not Null	Pick or Loss

Table 2: identities

Table3: report

Field Name	Data Type	Length	Constraint	Description
Reportid	Int	11	Primary Key	Id, auto incremented
Looserid	Varhar	20	Foreign Key	Userid from users
Pickerid	Varchar	20	Foreign Key	Userid from users
Identity	Varchar	15	Not Null	Posted id Number
Status	Varchar	15	Varchar	Pending/ Delivered

Table 3: report

CHAPTER FOUR: IMPLEMENTATION

4.1 INTRODUCTION

This chapter provides a comprehensive overview of the implementation phase for the Lost ID Finding and Reporting System (LIDFRS). It outlines the architectural framework of the system, detailing the technologies and methodologies used to bring the design into operation. This section covers the development process, including the steps taken from initial setup to deployment, and addresses the challenges faced during implementation along with the solutions applied. By examining the technical specifics, design choices, and deployment strategies, this chapter aims to offer insights into how the system was constructed to meet its intended goals of efficiently managing lost and found identification documents. The successful implementation of LIDFRS is crucial for delivering a functional and reliable solution that enhances the recovery process of lost IDs and improves user experience.

4.2 IMPLEMENTATION

The implementation phase of the Lost ID Finding and Reporting System (LIDFRS) involves the actual construction and integration of the system components based on the design specifications. It refers to the process of developing and deploying a comprehensive digital platform designed to streamline the reporting and recovery of lost identification documents.

4.3 DESCRIPTION OF TECHNOLOGY AND TOOLS USED

4.3.1 Html5

Html5 the latest version of Hypertext Markup Language, is designed to enhance the structure and presentation of web content with advanced features and APIs. It introduces new elements like video and audio for embedding media, the canvas element for drawing graphics, and APIs such as the Web Storage API for local data storage and the Geolocation API for accessing location information. These advancements enable the creation of dynamic, interactive web applications that perform well across various devices and platforms (W3C, 2023).

4.3.2 CSS3

CSS3 the latest version of Cascading Style Sheets, is a stylesheet language used to describe the presentation and layout of web pages, including visual and aural aspects. It builds on CSS2 by introducing new features such as advanced selectors, flexible box layout (Flexbox), grid layout, animations, transitions, and responsive design capabilities, which enhance the styling and adaptability of web content across various devices and screen sizes. These advancements allow developers to create more visually engaging and dynamically responsive web applications (W3C., 2023).

4.3.3 JavaScript

JavaScript is a high-level, versatile programming language primarily used to enhance the interactivity and functionality of web pages. It enables developers to create dynamic content, handle user events, and manipulate the Document Object Model (DOM) to update web page elements in real time (MDN, 2024,). Originally designed for client-side scripting, JavaScript has expanded to server-side development with Node.js (Node.js, 2024)and is also used in mobile and desktop application development through frameworks like React Native (React Native Documentation) and Electron (Electron Documentation). Its asynchronous capabilities, rich ecosystem, and widespread adoption make JavaScript a cornerstone of modern web development.

4.3.4 MySQLi

MySQLi (MySQL Improved) is an enhanced extension for PHP that offers a more secure and feature-rich interface for interacting with MySQL databases compared to the older MySQL extension. It supports both object-oriented and procedural programming styles, provides prepared statements to prevent SQL injection, and includes robust error handling and transaction support. These features contribute to improved performance and security, making MySQLi a preferred choice for modern PHP applications requiring efficient and safe database operations (MySQL., 2024).

4.3.5 Database

Database is an organized collection of structured information or data, typically stored electronically in a computer system. It is designed to manage, store, and retrieve data

efficiently and securely, using a database management system (DBMS) to ensure data integrity and accessibility. Databases allow for efficient data manipulation and querying through a structured framework, often using languages such as SQL (Elmasri, R., & Navathe, S. B. , 2015).

4.3.6 Xampp

XAMPP is a free and open-source software package that provides a local server environment by bundling Apache, MySQL, PHP, and Perl into a single installation. It is designed to help developers and administrators easily set up a local web server for testing and development purposes (Friends., 2024)

4.3.7 Visual Studio Code (Vs Code)

VS Code is a free, open-source code editor developed by Microsoft. It supports a wide range of programming languages and offers features such as debugging, syntax highlighting, and code completion. VS Code is highly extensible, with a rich ecosystem of extensions available through its marketplace, allowing developers to customize their development environment to suit their needs. The editor includes integrated Git support, a powerful terminal, and robust refactoring tools, making it a popular choice for modern software development (Microsoft., 2024,).

4.3.8 SMS API

An SMS API (Short Message Service Application Programming Interface) enables developers to integrate SMS messaging features into their applications, allowing them to send, receive, and manage text messages programmatically. This API facilitates various functions such as sending bulk messages, receiving user replies, managing contact lists, and tracking message delivery statuses. By leveraging an SMS API, businesses can automate notifications, alerts, and customer interactions, enhancing communication efficiency and reach (Twilio., 2024).

4.4 HARDWARE TOOLS REQUIREMENT

4.4.1 Computer

To effectively implement the Lost ID Finding and Reporting System (LIDFRS), a computer with at least an Intel i5 or Ryzen 5 processor, 8GB of RAM (16GB preferred), and a 256GB SSD is recommended.

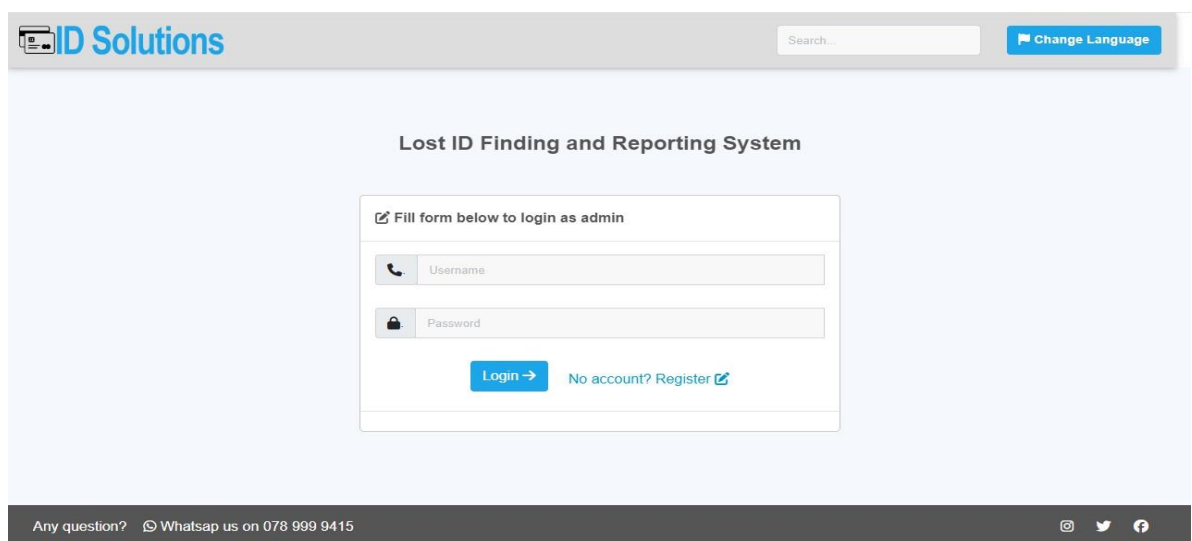
4.4.2 Smartphone

The Lost ID Finding and Reporting System (LIDFRS) Intended for use on computers and smartphones to streamline the process of managing lost identification documents. It is specifically focused on organizing and improving the efficiency of the document recovery process.

4.5 SCREEN SHOTS

4.5.1 Admin Login

The Admin Login page provides a secure entry point for administrators to access the system. It verifies the credentials entered by the admin, ensuring that only authorized users can log in. This page includes fields for the username and password, and registration to the new admin.



The screenshot shows the Admin Login page for the 'Lost ID Finding and Reporting System'. The page has a light blue background. At the top, there is a header bar with the 'ID Solutions' logo on the left, a search bar in the center, and a 'Change Language' button on the right. Below the header, the title 'Lost ID Finding and Reporting System' is centered. The main content area contains a login form with the instruction 'Fill form below to login as admin'. The form has two input fields: 'Username' with a phone icon and 'Password' with a lock icon. Below these fields is a blue 'Login →' button and a link 'No account? Register' with an external link icon. At the bottom of the page, there is a dark footer bar with the text 'Any question? Whatsap us on 078 999 9415' and social media icons for Instagram, Twitter, and Facebook.

Figure 5: Admin Login

4.5.2 Admin Dash Board

The Admin Dashboard serves as the main interface for administrators to monitor and manage the system. It provides an overview of key statistics, such as the number of lost IDs reported and pending cases.

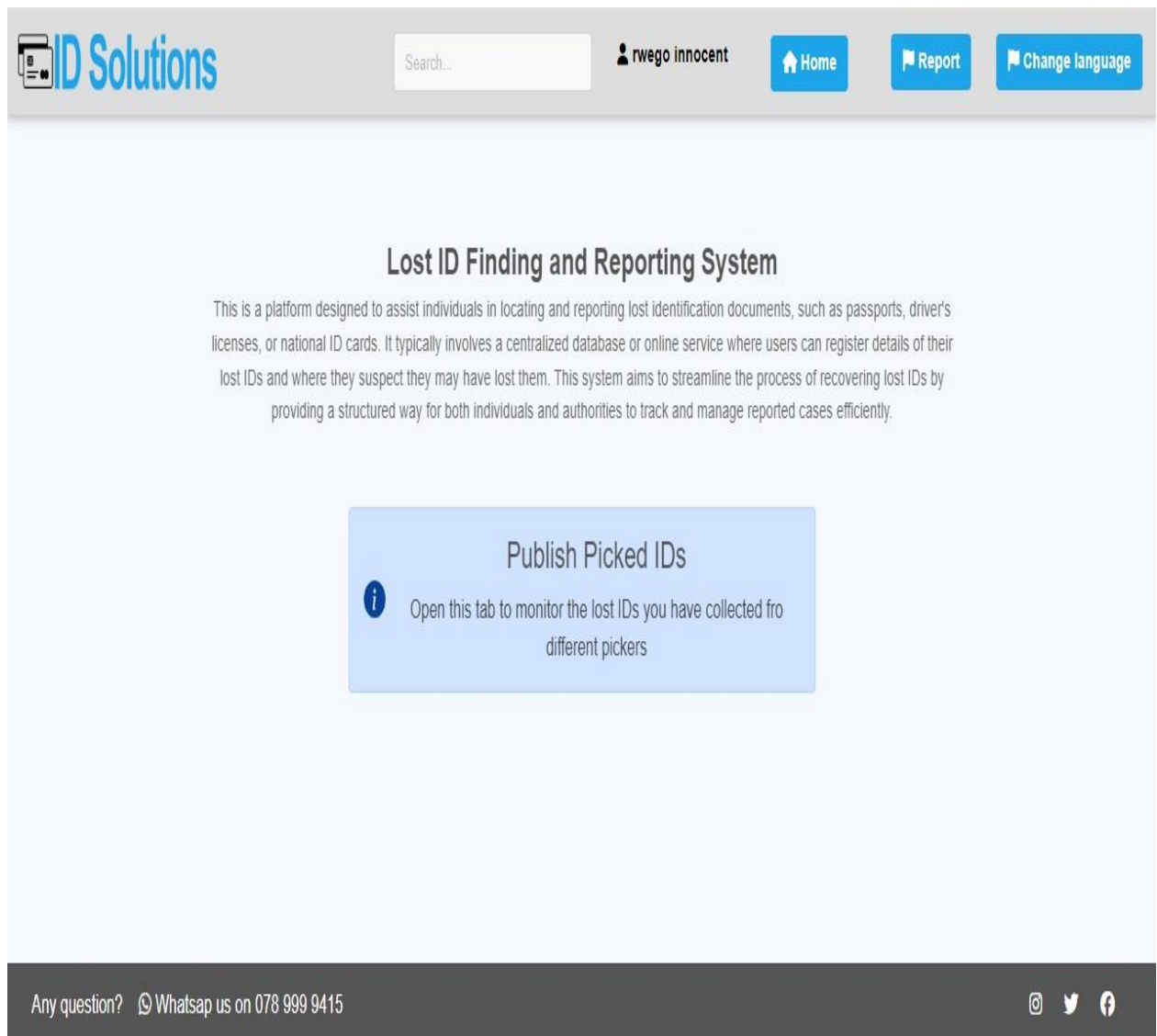


Figure 6: Admin Dash Board

4.5.3 User Dash Board

The User Dashboard is designed for users to manage their personal information and interactions with the system. It allows users to submit new reports of lost IDs, and track the status of their existing reports. Users also receive system notifications and updates relevant to their reports and account activities.

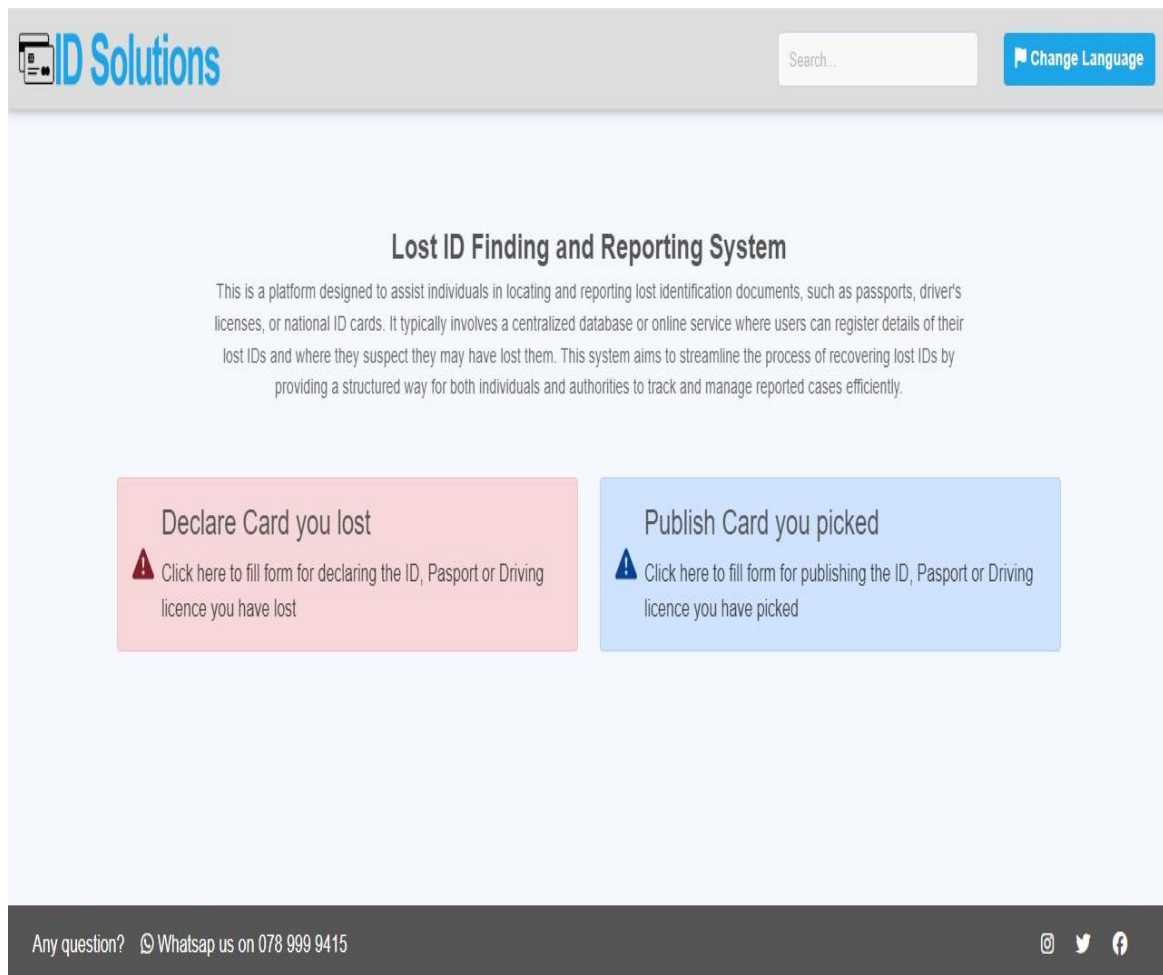


Figure 7: User Dash Board

4.5.4 Reporting Lost ID Page

The Reporting Lost ID Page enables users to formally report their lost IDs by filling out a detailed form. Users provide essential information about the lost ID, such as its number, contact of the loser, and place of issue of lost IDs.

The screenshot displays the 'Reporting Lost ID' form on the 'ID Solutions' website. The header features the 'ID Solutions' logo, a search bar, and links for 'Home' and 'Change Language'. The form itself is titled 'Declare the ID, Pasport or Driving Licence you have lost' and contains several input fields: 'First Name', 'Last Name', 'District', 'Contact 078/ 072/ 073', 'Email', 'ID Number', and 'Place of Issue'. A blue 'Submit' button is positioned at the bottom of the form. The footer includes the text 'Ugize ikibazo? 078 999 9415' and social media icons for Instagram, Twitter, and Facebook.

Figure 8: Reporting Lost ID Page

4.5.5 Notification Page

The Notification Page displays messages sent to users informing them about the status of their lost ID reports. It specifically notifies users when their lost ID has been found. Each notification typically includes name, phone number or email and location of the person who picked the ID.

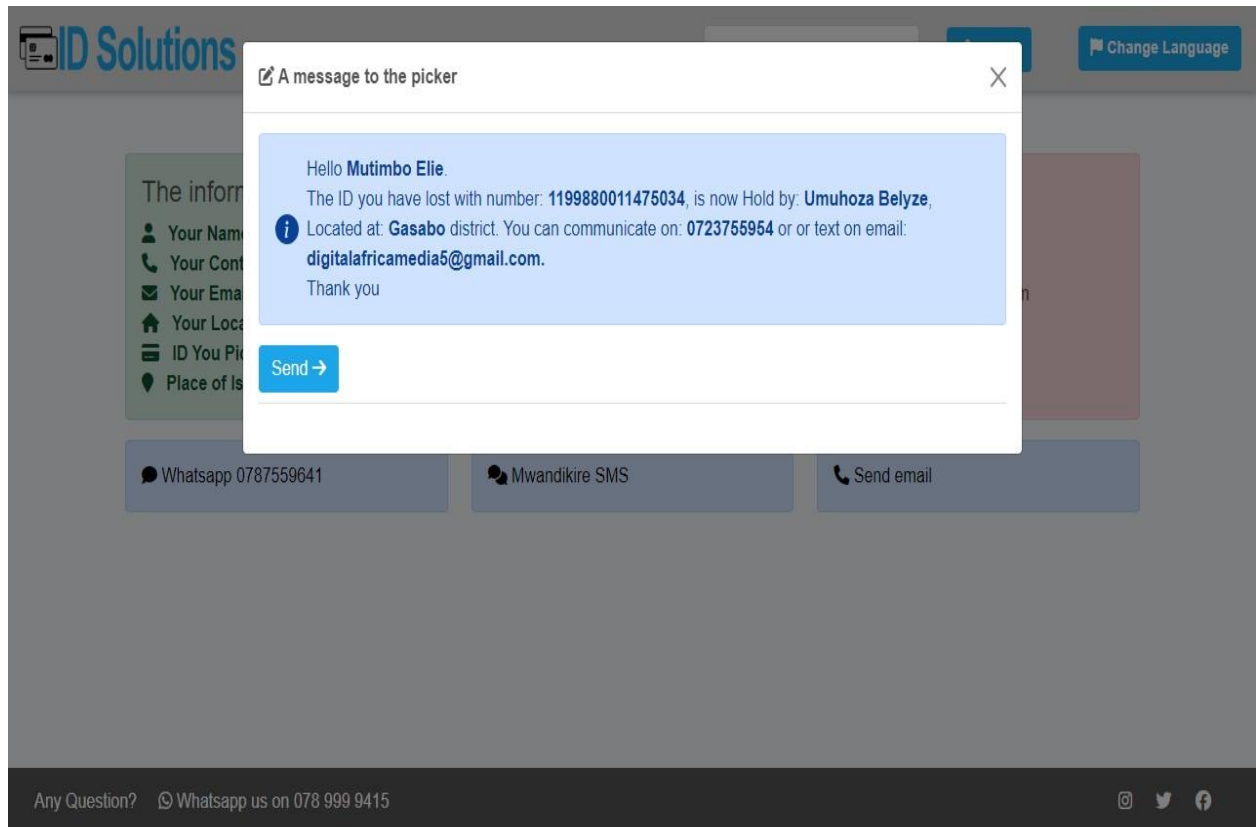


Figure 9: Notification Page

CHAPTER 5: CONCLUSION AND RECOMMENDATIONS

5.1 INTRODUCTION

This chapter provides a summary of the findings and outcomes of the Lost ID Finding and Reporting System (LIDFRS) project. This chapter consolidates the key insights gained from the development, implementation, and evaluation phases of the system. It reflects on the effectiveness of the LIDFRS in addressing the challenges associated with lost identification documents and assesses its impact on users and authorities. Additionally, this chapter offers recommendations for future improvements, aimed at enhancing the system's functionality, security, and overall user experience. The goal is to ensure that the LIDFRS remains a valuable tool for managing lost IDs and passports efficiently and effectively.

5.2 CONCLUSION

The Lost ID Finding and Reporting System (LIDFRS) has successfully addressed a critical need in the management and recovery of lost identification documents. By providing a centralized, user-friendly web-based platform, the system simplifies the process of reporting lost IDs and tracking found documents. The integration of real-time updates and automated notifications has significantly improved the efficiency and accuracy of document recovery, reducing the administrative burden on authorities and enhancing user experience.

The project has demonstrated that leveraging modern technology can transform traditional processes, making them more efficient and accessible. Through its comprehensive design and implementation, LIDFRS offers a practical solution to the common problem of lost identification documents, facilitating a more organized and effective recovery process.

In summary, the LIDFRS project has met its objectives by delivering a robust and secure system that improves document management and enhances public service delivery. The successful deployment and positive impact of the system highlight its potential to serve as a valuable tool in various contexts, addressing both immediate needs and contributing to long-term improvements in identification document management.

5.3 RECOMMENDATIONS

To further enhance the Lost ID Finding and Reporting System (LIDFRS), I recommend integrating the system with national and local databases for improved accuracy and efficiency in document recovery. Expanding user training and awareness initiatives will ensure that both the public and authorities can fully utilize the system's features. Additionally, incorporating mobile and offline capabilities could broaden accessibility, while ongoing performance monitoring and security updates will help maintain system reliability and protect sensitive information. Exploring partnerships and funding opportunities can support future growth and innovation, ensuring LIDFRS remains a valuable and scalable tool for identification document management

5.4 SUGGESTIONS FOR FURTHER STUDY

For further study on the Lost ID Finding and Reporting System (LIDFRS), it is suggested to focus on user experience analysis to refine system design, and conduct an impact evaluation to measure its effectiveness in improving document recovery rates. Investigating the feasibility of integrating LIDFRS with other databases and exploring advanced security measures will help address technical and privacy concerns. Additionally, researching the development of mobile and offline capabilities can enhance system accessibility, while a cost-benefit analysis can guide future investments and resource allocation. These studies will provide insights to optimize the system's performance and ensure its continued success and relevance.

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APPENDICES

APPENDIX 1: Gantt Chart

ID	START DATES	END DATES	TASKS	April	may	June	July	august
1	20/4/2024	27/6/2024	Research and data collection					
2	28/06/2024	20/7/2024	Implementation					
3	21/7/2024	15/8/2024	Writing report					

Table 4: Gantt Chart

APPENDIX 2. Project Budget

Nº	ITEMS	AMOUNT IN RWANDAN FRANCS
1	Communication	10,000Frws
2	Transport& Foods	110,000Frws
3	Internet Connection	20,000Frws
4	API Integration	15.000frws
5	Hosting Service	30.000frws
TOTAL		185,000Frws

Table 5: Project Budget

APPENDIX 3: Work plan

Nº	Task to be performed	Date to be completed	Person assigned to task
1	Project chosen and project proposal	On 15 th Jun 2024-17 th Jun 2024	RWEGO Innocent
2	Project suggestion submission presentation	On 18 th Jun -20 th Jun 2024	RWEGO Innocent
3	Data collection	On 24 th Jun-26 th Jun 2024	RWEGO Innocent
4	Data analysis	On 28 th Jun -10 th Jun 2024	RWEGO Innocent
5	Project design	On 11 th July-14 th July-2024	RWEGO Innocent
6	Project testing	On 15 th July- 18 th July 2024	RWEGO Innocent
7	Project submission	On 15 th Aug 2024	RWEGO Innocent

Table 6: Work plan