CENTRAL UNIVERSITY SIERRA LEONE MILE 91

RESEARCH PROJECT THESIS

Topic:

"CIVIL REGISTRATION MANAGEMENT SYSTEM"

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DECLARATION

This project report is unique, having never been submitted to another university before for a degree, higher diploma, or diploma award, nor has it ever been published.

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DEDICATION

I want to express my gratitude to Allah, who has richly blessed and guided me throughout my academic career, as well as to my dear parents, Mr. and Mrs. Sesay, who have supported me financially and provided me with guidance throughout my time at the university. I also want to express my gratitude to the Kamara and Kargbo Families for their love, support, and guidance, as well as to my brothers, sisters, friends, colleagues, lecturers, and teachers, as well as to my grandparents for everything they have done for me, **Alpha Sesay**

I dedicate this project to the Almighty God, for his protection over my life so far. I also dedicate it to my late dad who passed away whilst studying, my mom and my elder sisters as a sign of appreciation for their unflinching support towards my educational career. I am thankful for those words of encouragement that made me attain this level. I am grateful! **Yamarie Alfreda Sankoh.**

I first of all express my gratitude to my Heavenly Father who made it possible for me to go through this course and comes out successfully. I will also express my thankfulness to my Late Father, Mr. Reuben Sahr Lebbie and my Mother Fatmata Kumba Lebbie and to everyone who supported me one way or the other for the success of this course. May God Almighty bless you all in Jesus name. Amen! **Solomon Kai Lebbie.**

ACKNOWLEDGEMENT

We take this opportunity to thank the Almighty God who has always been there with us and also provided the knowledge, wisdom, and skills that have enabled us to complete this project.

We would like to extend our sincere gratitude to our Supervisor, Mr. Mohamed Foday Kamara for sparing time and effort to offer extraordinary assistance, advice, and support through this great undertaking. Thank you so much!

Alpha Sesay, Yamarie Alfreda Sankoh, and Solomon Kai Lebbie

ABBREVIATIONS

CRMS	Civil Registration Management System
NCRA	National Civil Registration Authority
UML	Unified Modeling Language
ERD	Entity Relationship Diagram
DFD	Data Flow Diagram
GUI	Graphical User Interface
MVC	Model-View-Controller
ORM	Object-Relational Mapping
SQLite	Structured Query Language Lite
SDLC	Software Development Life Cycle
HTML	Hypertext Markup Language
CSS	Cascading Style Sheets
OOP	Object Oriented Programming
RAM	Random Access Memory
HDD	Hard Disk Drive
JSON	JavaScript Object Notation
API	Application Programming Interface
HTTPS	Hypertext Transfer Protocol Secure
SQL	Structured Query Language
UID	Unique Identification Number
CRUD	Create, Read, Update and Delete

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ABSTRACT

Systems of civil registration that document important life events are essential for obtaining legal identity and gaining access to public services. The current desktop-based, centralized system in Sierra Leone has created obstacles to user involvement, efficiency, and accessibility, particularly for rural residents. The goal of this project is to create an online Civil Registration Management System in order to automate processes, increase reach, and make better use of technology.

A thorough qualitative requirements study process, which includes stakeholder interviews, surveys, and direct observation, was used in the design of the new system. Agile development places a high value on iterative prototyping and ongoing user feedback. To give a thorough blueprint, the design makes use of UML diagrams such as activity charts, ER models, and sequence diagrams.

For improved security, dependability, and scalability, the Django web framework and SQLite database are used in the system's implementation. Administrators, staff members, and residents can all communicate with ease in their digital responsibilities thanks to customized interfaces. Workflows that are automated standardize and expedite the necessary documentation for births, deaths, and other important events.

Comprehensive testing confirms the functionality requirements, and usability and accessibility are prioritized to boost registration rates. The centralized portal can support e-governance and the use of civil registration for legal, administrative, and statistical reasons with possible linkages to other government databases. In the end, the online system aims to change services so that they are inclusive and focused on the user

CHAPTER ONE

1.0 INTRODUCTION

Governments all over the world have started the crucial process of registration to understand the status of their citizens and to further prepare for the utility of resources. For future purposes, such as conducting a census every ten years to ascertain the population status, records of births are stored at the appropriate hospitals in the form of birth certificates.

Food, water, and education are all major factors for a government as they need to estimate how much of a resource they need to cater to the population. This is important for government resource planning because it allows them to plan resources according to the number of people in a particular country. Death certificates are equally significant in this regard because they aid governments in figuring out their population density.

The implementation of an online registration system that assists in the nationwide registration of births, deaths, and marriages is one way that Sierra Leone is attempting to address this issue. This alone aids in the resolution of a variety of issues, including bribery, bureaucracy, corruption, forgery, security, and careless record-keeping practices, as a result, document processing becomes slower and busier.

Additionally, civil registration a crucial process for every nation enables the legal recognition of births, deaths, marriages, and other significant life events. Due to the country's current centralized system, residents must go to the capital and other regional cities, which is inconvenient and slows down traffic.

The verification of information was very slow significantly by the use of desktop apps. This project aims to solve these issues by building a successful and user-friendly online Civil Registration Management System.

1.1 SIGNIFICANCE OF STUDY

Citizens as well as government systems have major difficulties with the current citizenship verification process. People who live in remote areas especially are burdened when required to go to urban centers for verification, which also puts a demand on administrative resources. Additionally, the digital divide exacerbates these problems by denying certain demographic segments access to online verification techniques.

The proposed Civil Registration Management System (CRMS) for Citizenship Verification aims to transform the verification process to address these deficiencies. Citizens can easily access and confirm their citizenship Verification status without having to be physically present by building a centralized web application System. The CRMS intends to improve efficiency, offer fair access to citizenship verification services, and streamline procedures. The initiative intends to empower citizens while reducing administrative responsibilities through user-friendly interfaces, strong authentication, and connectivity with government databases.

The CRMS can transform the citizen-government interaction by embracing technology and data integration. With a focus on data protection and accessibility, it intends to close gaps, eliminate inefficiencies, and provide a safe and inclusive solution to citizenship verification, reflecting a global trend toward digital governance. The project's ultimate goal is to revolutionize the verification environment, improve citizen happiness, and promote a more cohesive community.

1.2 PROBLEM STATEMENT

In Sierra Leone, the Civil Registration System confronts a number of severe obstacles that limit its usability and efficacy. The following is a brief overview of these issues:

Firstly, there are very few registration centers in rural communities and most are centered in urban regions. Citizens who live in rural areas are inconvenienced by this geographic inequality since they must make a time-consuming and cumbersome trip into the city for registration. Therefore, there is a need to researchers to come out with a secure and more effective automated system to streamline some business processes such as registration and applications to improve efficiency and enhance planning and decision-making.

Secondly, the existing system relies on desktop programs to validate citizen data. Due to this technological limitation, accessibility is only limited, and processing times are incredibly slow. This affects the system's effectiveness and citizens' access to it.

Additionally, the National Civil Registration Authority (NCRA) faces a serious issue with a lack of office space (National Civil Registration Authority(NCRA), 2023). The NCRA has had difficulty finding an appropriate office location that can house all of the NCRA's necessary components, including the Civil Registration Component.

Given these difficulties, it is clear that comprehensive changes are needed to the Sierra Leonean civil registration system in order to improve rural coverage, upgrade the technology infrastructure for information verification, and address the immediate need for adequate office space for the NCRA's operations.

1.3 RESEARCH AIM

The Civil Registration Management System (CRMS) for Citizenship Verification's primary aim is to create a centralized, technologically sophisticated web application that enables people from all works of life and in a variety of geographical locations to quickly and securely access and verify their citizenship Verification status.

1.4 RESEARCH OBJECTIVES

The project's main objective is to develop an online civil registration management system that meets the following criteria:

- ➤ To automate citizen civil registration.
- ➤ To Utilize a productive online method, to speed up the authentication of information.
- ➤ To safely offer access to information about residents nationwide and worldwide.

1.5 RESEARCH QUESTIONS

1. What are the main issues that Sierra Leoneans, especially those who live in urban areas, have with the country's present civil registration system?
2. How are the effectiveness and accessibility of citizens' essential papers in Sierra Leone affected by the country's current desktop-based information verification process?
3. How will using an online Civil Registration Management System for citizens' registration and verification processes assist them?
4. How can the suggested web application increase citizens' access to services and benefits while enhancing the global accessibility of their important documents?
5. How can the proposed Civil Registration Management System's use of the Django framework and other technologies improve its efficacy and efficiency?

1.6 RESEARCH SCOPE:

The suggested system will include the following attributes:

- ➢ System for user registration and login.
- ➢ Automated evaluation of submitted data.
- ➢ Online storage for official papers (such as birth certificates).
- ➢ Search capabilities enable citizens to access their data.

1.7 RESEARCH LIMITATIONS:

- ➢ The system will augment and speed up current legal and administrative procedures rather than replacing them.
- ➢ Users' ability to access the system may be hampered by internet connectivity concerns.
- ➢ The system will only be available in English and cannot support all of Sierra Leone's official languages

1.8 RESEARCH METHODOLOGY

Based on the nature of our project, Qualitative research method was used to collect data from Administrator, registration officers and the Customers.

According to QuestionPro (n.d.) Qualitative research is a method that collects data using conversational methods, usually open-ended questions. The Data Gathering Techniques we used are: Surveys and Observation.

1.9 SURVEY

As a group we also used the surveys through series of questions asked to both the Administrator and customers. We used the Close-ended questionnaires to obtain statistically useful information about our topic that was used to design an online Civil Registration Management System.

OBSERVATION

We carried out an observation of the current procedures inside the National Civil Registration Authority in order to ensure a well-informed approach to the creation of the Civil Registration Management System. We closely scrutinized the processes used to record important occurrences, update information, and provide services to citizens. The understanding of the workflow procedures and procedural shades was much helped by this practical observation. The knowledge

gained from our observations helped to simplify data administration, which in turn helped with the design of the database system and ultimately aided in the implementation

CONCLUSION

With reference to the introduction given above, incorporating a web application to modernize civil registration in Sierra Leone is a key step in enhancing registration process efficiency, accessibility, and data accuracy. With performance indicators and feedback systems in place to enable continual improvement and, if successful, a successful rollout across the country, the pilot project will offer insightful information into the viability and effectiveness of the online registration system.

CHAPTER TWO
LITERATURE REVIEW

2.0 OVERVIEW

Reviewing Literature is one of the most essential aspects of scholarly work. It involves thorough search, critical appraisal and analysis of available literature on the topic under scrutiny. This chapter presents analysis based on a number of published articles that were acquired from online research databases and libraries like Google Scholar and Research Gates, using keywords such as; Civil, Registration, Management and System. This chapter is discussed under the following headings; Concept of Civil Registration, Online Civil Registration system, Performance barriers of civil registration system, and factors that contribute to stronger civil registration management system

2.1 CONCEPT OF CIVIL REGISTRATION

Civil registration is the universal, continuous, permanent, and required recording of vital events occurring in a country's population according to the legal requirements of each country. According to the United Nations there are ten vital events that are recommended for recording: live birth, death, fetal death, marriage, divorce, annulment of marriage, judicial separation of marriage, adoption, legitimation, and recognition (Mills et al. 2019). Civil Registration is a fundamental responsibility of the national government, and its primary functions can be largely categorized into three aspects: legal, administrative, and statistical.

 Firstly, civil registration establishes an individual's legal identity. In some countries, legal documents (e.g., a birth certificate) are often needed by individuals for proof of name and other facts surrounding their identity when applying for access to government services such as:

1) access to education, health, age-based cash transfer, and other government social services;
2) access to formal employment and benefits, for example, death and disability insurance as well as health insurance; and
3) the right to claim inheritance, among others.

Second, the CRVS system plays an important role in supporting the administrative functions of the government. Based on the data that are recorded through civil registration, the government can have access to reliable and continuous population data to be able to make informed decisions on government policies, programs, and services. Disaggregated data from civil registration can inform

the condition and needs of the population at any size and administrative-level to enable the government to carry out more targeted planning and monitoring of programs, resulting in improved resource allocation.

2.1.1 ADVANTAGES OR BENEFITS OF CIVIL REGISTRATION MANAGEMENT SYSTEM

Online Civil Registration Management system is a web-based information system made based on procedures, and it uses particular standardization, aimed to manage the administrative system Population and Civil Registration sector to achieve discipline in administration, and also assist officers at the Regional Government level, especially the National Civil Registration Authority (NCRA) in providing the population and Civil Registration services (Dilapanga et al., 2019). Online Civil Registration Management systems provide measures of potential gains in registration rates from different actions, such as providing services closer to household residence, reducing out-of-pocket costs of registration, among others. The potential effect on overall registration rates if various obstacles leading to low registration rates are resolved with web-based Registration system. Moreover, the web-based Registration system is a vital tool in effectively "achieving universal civil registration of births, deaths, and other vital events—including reporting cause of death and providing access to legal proof of registration for all individuals by 2030" (UN SDG 2015).

For example, live birth, death, and fetal death are often attended by healthcare providers, making them ideal informants who can directly notify and provide pertinent information of the vital event to the civil registration authority. The same applies to the institutions responsible for authorizing marriage, divorce, adoption, and other events. Notification and transmittal of data involving vital events directly from these institutions to civil registration authorities in a way that provides the civil registry with all information required for the registration of the event can significantly increase the coverage of civil registration and lessen the burden on families.

2.1.2 PERFORMANCE BARRIERS OF CIVIL REGISTRATION SYSTEM

2.1.2.1 LOW AWARENESS AND INADEQUATE KNOWLEDGE OF REGISTRATION CIVIL PROCEDURES AND ITS BENEFITS.

A study conducted by (Kumar et al., 2022), citizens in developing countries are often less aware of the benefits of civil registration. This is the current situation in Sierra Leone. Lack of awareness in Sierra Leone is largely due to the fact that NCRA was established as recently as 2018, and this has created an awareness gap in the local communities about the benefits of Civil Registration.

2.1.2.2 CENTRALIZATION OF SERVICES

National Civil Registration Authority (NCRA) registration centers are hardly established in rural areas (villages). For the few citizens that have little awareness, traveling to the city for registration becomes inconvenient.

2.1.2.3 ADMINISTRATIVE AND TECHNICAL BARRIERS

Despite governments efforts to increase civil registration for all citizens, there remain seemingly endless administrative and technical bottle-necks and registration at a real-time basis in all the registration offices are often less effective due to irregular electric supply and many other technical and logistical barriers (Kumar et al., 2022).

2.2 FACTORS THAT CONTRIBUTE TO STRONGER CIVIL REGISTRATION MANAGEMENT SYSTEMS

In addition to the lessons learned and recommendations presented in a number of manuscripts reviewed, there are other factors that contribute to stronger Civil Registration Management systems that the authors have highlighted in developing countries on improving these systems.

First, it is very important to have a national coordinating committee (including ministries and development partners) with an anchor ministry/agency to oversee the development and implementation of a Civil Registration Management plan. Because Civil Registration Management system involves several sectors dealing with different types of vital events, coordination is key to its success.

Second, a comprehensive assessment of the Civil Registration management system should be completed as one of the first steps to review the system's current status and to identify weaknesses. Third, findings of the comprehensive assessment should feed into developing a cost investment case/strategic plan. In this process, prioritizing and sequencing of activities of the strategic plan is

critical. From 2010, at least 30 countries in Africa have conducted CRVS assessments and developed plans in Africa ([APAI-CRVS 2019](#)) and 37 in Asia and the Pacific ([United Nations Economic and Social Commission for Asia and the Pacific 2019](#)) the majority of them have established high-level coordination committees as well as technical working groups.

The major challenges relate to civil registration are chiefly due to limited country capacity and lack of donor coordination. One of the priority areas is to improve develop an online civil registration management system that Utilize a productive online method to speed up the authentication of information and to safely offer access to information about residents nationwide in order to support the proper functioning of national Civil Registration Management institutions.

CONCLUSION

With overwhelming available literature on the subject of Civil Registration management system highlighting numerous gaps and factors resulting to underperformance and inefficiency in Civil Registration systems, our team hopes to develop a centralized, technologically sophisticated web application that enables people from all works of life and in a variety of geographical locations to quickly and securely access and verify their citizenship status.

CHAPTER THREE
METHODOLOGY

3.0 INTRODUCTION

This chapter explores the thorough approach used in the creation and deployment of the Civil Registration Management System. Any project's ability to succeed is closely related to the strategies and procedures used to carry it out. This chapter provides a thorough explanation of the research and development approaches we used, which were especially designed to meet the particular goals our project had in mind.

3.1 RESEARCH METHODOLOGY:

The "how" of a research study in its practical form is called methodology. To be more precise, it deals with the methodical ways in which a researcher plans a study to guarantee accurate and trustworthy outcomes that answer the goals, objectives, and research questions (Darek & Kerryn 2020). Investigating, designing, developing, and assessing civil registration management system (CRMS) requires a systematic approach in research methodology.

Our aim of developing a strong Civil Registration Management System was greatly aided by the study approach. We will go into detail about the several methods used for gathering data, surveys, and research projects that were carried out in order to obtain a thorough grasp of the current systems, stakeholder needs, and the state of technology. This chapter will shed light on the methods used to collect and evaluate data as well as the methods and instruments used to extract valuable information.

To develop a user-friendly and effective Civil Registration Management System, we carefully planned our research technique to include both qualitative and quantitative data sources. This phase's main goal was to obtain a thorough grasp of the advantages and disadvantages of the current desktop program as well as the unique requirements of managers and users. The new web-based system will be constructed with this understanding as its cornerstone in order to guarantee accessibility and registration capabilities even in remote locations.

3.2 DATA COLLECTION METHODS:

➢ **INTERVIEWS**: We performed structured interviews with managers and users of the current system, among other important stakeholders. The purpose of these interviews was to elicit information about their expectations, pain areas, and experiences. Understanding the operational and human aspects issues with the current desktop application was made possible thanks in large part to this qualitative data.

➢ **SURVEY:** We created a thorough survey questionnaire in order to guarantee a wider audience and collect a variety of viewpoints. We disseminated the poll to a broad spectrum of possible participants by utilizing internet survey tools like Google Forms. We were able to gather a significant amount of quantitative data using this method, which provided statistical insights on user priorities, preferences, and demographic data.

➢ **OBSERVATIONS:** We also actively watched the functioning of the current system. Using this approach, we were able to observe how the system was being used, locate any bottlenecks, and evaluate its overall performance. Observations provide insightful, practical context to the input obtained from surveys and interviews.

3.3 DATA ANALYSIS:

Extensive analysis was done on the information gathered through surveys, observations, and interviews. We were able to find reoccurring problems and areas for improvement by classifying qualitative data into themes and patterns. Statistical analysis was used to quantitative data, giving us numerical insights into trends, preferences, and possible areas for improvement.

Through the combined methods of data collection and analysis, we were able to fully comprehend the current system and its users. The creation of the new web-based Civil Registration Management System will be guided by this knowledge. We can develop a system that meets the specific requirements of both urban and remote users, guaranteeing a more inclusive and efficient civil registration process, by seamlessly integrating the feedback and insights gathered through surveys, heading analysis, interviews, and observations.

3.4 DEVELOPMENT METHODOLOGY:

Every system's ability to be developed successfully depends on the methodical and organized strategy used to realize it. Here, we clarify the methods and resources used for obtaining, capturing, and organizing requirements as well as the system development approaches that

shaped our project. We'll talk about the tactics that streamlined the idea-to-functional component process by ensuring efficient communication between development teams and stakeholders.

Agile methodology was used in the development of the Civil Registration Management System. This flexible and iterative approach proved essential in comprehending and meeting the specific needs of our managers and clients. We were able to develop a system that is not only technically sound but also in line with the changing needs and expectations of our stakeholders thanks to this Agile approach, which placed a strong emphasis on cooperation, adaptation, and continuous improvement

3.4.1 IMPORTANCE OF AGILE METHODOLOGY

1) **Client-Centric-Focus**: The Agile methodology is very focused on client satisfaction and collaboration. We were able to obtain important insights into our clients' changing needs, preferences, and priorities by keeping them involved in the development process. Because of our client-centric approach, we were able to develop a system that precisely meets their needs, giving the end users a sense of confidence and ownership.

2) **Iterative development:** Agile development is distinguished by brief iterations or development cycles. Every iteration yields a product increment that might be shipped. We were able to promptly integrate suggestions and make the required modifications as the project moved forward thanks to this iterative methodology. It minimized the possibility of expensive last-minute modifications and made sure the final system closely matched the expectations of the stakeholders.

3) **Continuous Feedback**: Open and transparent communication with stakeholders is encouraged by agile methodologies. Frequent feedback sessions, demonstrations, and review meetings made sure that any new problems or issues were dealt with right away. This strategy increased our stakeholders' trust in the development process while also improving the system's quality.

4) **Flexibility**: Agile's adaptability was essential in the Civil Registration Management System context, where user needs and requirements can change. Without significantly disrupting the project, we were able to adjust to changing circumstances, like changes in registration procedures or the addition of new features.

5) **Risk Mitigation**: Early risk identification and mitigation are encouraged by agile methods. We decreased the possibility of project delays or budget overruns by proactively addressing possible problems. We were able to maintain project progress and deliver results on schedule because of our risk awareness.

6) **Quality Assurance**: Delivering functional and tested features is given top priority in the Agile methodology with every iteration. Through constant testing and quality control, the system's dependability, security, and lack of serious flaws were guaranteed.

3.5 SCHEDULE AND DELIVERABLES:

We provide a completed project schedule that details the project's timetable, milestones, and important deliverables as a crucial part of this chapter. This timeline gives the team a clear path to follow and acts as a blueprint for the project. We'll talk about the deliverables and expected results that need to be met by the end of the project, tying them in with the more general aims and objectives that were established at the beginning of the project.

3.5.1 Table 3. 1 PROJECT TIMELINE

PROJECT NAME: CIVIL REGISTRATION MANAGEMENT SYSTEM				
PROJECT DURATION: 60 DAYS				
PROJECT START DATE: 11/09/2023				
PROJECT END DATE: 09/11/2023				
NO.	ACTIVITIES	DURATION	START	END
1	Planning/Design	5	11/09/2023	15/09/2023
2	Project Definition	2	16/09/2023	17/09/2023
3	Interface Design	5	18/09/2023	22/09/2023
4	Project Design	10	23/09/2023	2/10/2023
5	Coding	15	3/10/2023	17/10/2023
6	Additional Features	4	18/10/2023	22/10/2023
7	Testing	2	23/10/2023	25/10/2023
8	Documentation	15	26/10/2023	09/11/2023

3.5.2 Table 3. 2 GRANT CHART OF THE VARIOUS ACTIVITIES

Activity	Start	Duration
PLANNING/DESIGN	11/09/2023	5
PROJECT DEFINITION	16/09/2023	2
INTERFACE DESIGN	18/09/2023	5
PROJECT DESIGN	23/09/2023	10
CODING	03/10/2023	15
ADDITIONAL FEATURES	18/10/2023	4
TESTING	23/10/2023	2
DOCUMENTATION	26/10/2023	15
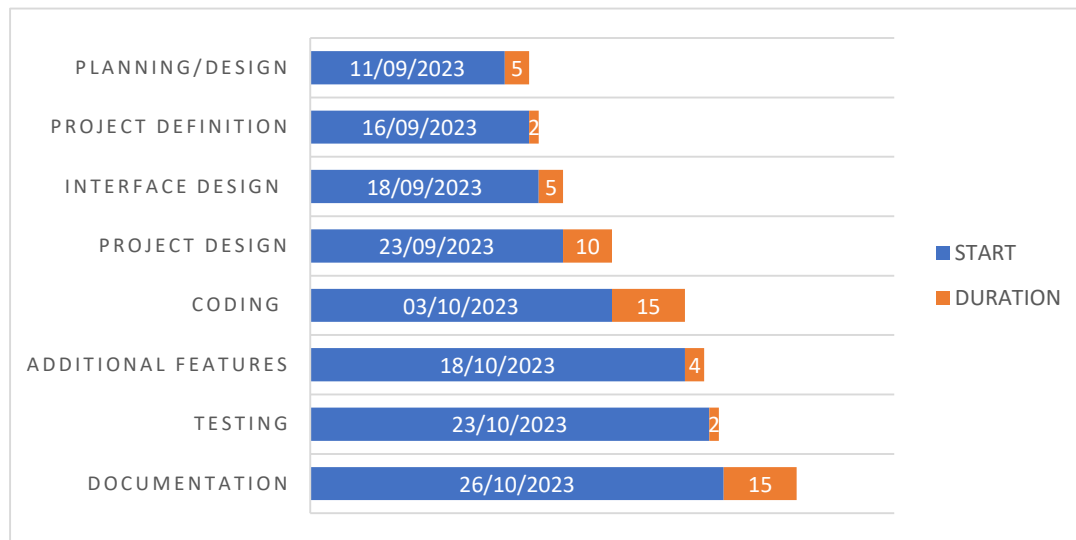
3.6 REQUIREMENTS ANALYSIS

3.6.1 FUNCTIONAL REQUIREMENTS

1. **User registration and Managements**:
   a. Administrators possess the ability to govern and oversee system users.
   b. Staff are also able to register customers in the system.
   c. Only system administrators and staff members are able to register clients.

2. **Civil Registration:**
   a. It is possible for users to request registration for different life events, such as births, marriages, and deaths.
   b. Essential information about these events, like names, dates, and locations, must be able to be entered into the system.

3. **Search and Retrieval:**
   a. In order to quickly locate and retrieve registered records, the system have a search function.
   b. Searches by nin, name, date, location, or registration number are possible for users.

4. **Data validation and Verification:**
    a. To guarantee accuracy and completeness, the system needs to validate data entries.

5. **Security and access control:**
    a. Access to data is been controlled according to roles and permissions, and it is being stored securely.
    b. Privacy regulations require the protection of sensitive personal data.

3.6.2 NON-FUNCTIONAL REQUIREMENTS

1. **Scalability:**
    - In order to handle an increasing number of users and registrations without experiencing a decline in performance, the system needs to be scalable.

2. **Performance:**
    - User requests been handled quickly and effectively by the system.
    - The procedures for document retrieval and registration ought to be finished in a fair amount of time.

3. **Reliability**:
    - For the system to guarantee data availability and integrity, it must be extremely dependable.
    - For maintenance, downtime should be kept to a minimum

4. **Security:**
    - To safeguard sensitive data, the system needs to abide by strict security regulations.
    - It is necessary to implement authorization, authentication, and encryption.

5. **Compliance:**
    - Both data protection laws and civil registration laws should be complied with by the system.

6. **Backup and Disaster Recovery**:
    - To avoid data loss, regular backups and a disaster recovery strategy should be implemented.

3.7 FEASIBILITY ANALYSIS

3.7.1 ECONOMIC FEASIBILITY

The Civil Registration Management System's financial viability is assessed through economic feasibility. Together with the anticipated advantages, it takes into account the expenses related to development, upkeep, training, and operations.

Costs:

➢ **Development costs:** These cover the creation of software, the purchase of hardware, licensing, and setup fees. A projected cost of $250,000.

➢ **Maintenance costs:** are ongoing expenditures for infrastructure upkeep, technical support, and system updates. About $40,000 a year is the estimate.

➢ **Training Costs:** The price of educating employees on how to operate the new system efficiently. A $20,000 is the estimate.

➢ **Operational Costs**: Regular operating expenses such as server maintenance, backup, and data storage. About $30,000 a year.

3.7.2 Benefits:

➢ **Gains in Efficiency:** It is anticipated that the system will simplify the registration procedure, cutting down on paperwork and administrative effort, saving roughly $50,000 annually.

➢ **Cost Reduction:** The system is anticipated to save long-term operating expenses by roughly 15%, or $25,000 annually, by eliminating the need for manual paperwork and data entry in some regions in the country.

➢ **Increased Accuracy:** Automation and data validation should result in higher-quality data and a 10% annual reduction in error-related expenses, or $10,000.

➢ **Enhanced User Experience:** It is anticipated that 20% more registrations will result from improved accessibility, adding about $60,000 in annual revenue.

3.7.3 Technical Requirements:

➢ **Hardware:** Within the project budget, the required hardware, such as workstations and servers, is easily accessible.

➢ **Software:** The software stack that was chosen complies with the system specifications.

    ○ Visual studio code.

    ○ Any computer Operating System

    ○ A compatible browser such as Google Chrome, Firefox Opera, etc., for accessing the online module.

➢ **Development Tools:** The programming languages and necessary development tools are available and appropriate for the project.

    ○ Html

    ○ Css

    ○ JavaScript

    ○ Bootstrap

    ○ Django

    ○ Python

    ○ SQLite

➢ **Integration:** To guarantee data accuracy and consistency, the system can integrate with other government databases.

➢ **Scalability:** The system is able to accommodate a growing volume of data, users, and registrations.

3.8 Operational Feasibility:

Operational viability assesses how well intended users can use and maintain the system.

➢ **User Training:** To guarantee effective system use and the possibility of user adaptation, extensive user training programs have been developed.

➢ **User Acceptance:** According to user satisfaction surveys, there is a high degree of acceptance, and change-resistant behavior is being proactively addressed.

➢ **Maintenance and Support:** The system can be kept up to date and problems can be resolved with sufficient resources and support networks.

➢ **Workflow Integration:** By integrating the system easily with current workflows and registration procedures, operations can be streamlined.

SUMMARY

The successful implementation of research and development methodologies is crucial to the Civil Registration Management System project. Chapter Three provides a thorough overview of these approaches. A range of data collection techniques, such as surveys, interviews, and observations, were used in the research methodology to acquire in-depth understanding of the state of the system, stakeholder needs, and the technological environment. Building a web-based Civil Registration Management System that is user-friendly and satisfies the unique needs of managers and users, even in remote areas, requires a foundation built on this data-driven approach. The development process emphasizes the value of a client-centric approach, iterative development, ongoing feedback, flexibility, risk mitigation, and quality assurance by utilizing the Agile methodology. Agile methodology is essential for developing a system that is both technically sound and flexible enough to adjust to changing stakeholder needs, guaranteeing a civil registration process that is both more effective and user-friendly.

To further facilitate the project's execution, the chapter also includes a comprehensive project schedule that specifies the timeline, deliverables, and milestones. It ends with a thorough examination of the functional and non-functional requirements, guaranteeing that the Civil Registration Management System is built to satisfy particular user requirements while upholding technical specifications and legal compliance. The feasibility analysis, which emphasizes the cost-benefit analysis and the technical capabilities of the system, covers economic, technical, and operational aspects and further validates the project's viability.

CHAPTER FOUR
SYSTEM ANALYSIS AND DESIGN

4.0 SYSTEM ANALYSIS

It involves gathering and analyzing data, determining the issues, and breaking down a system into its constituent parts.

System analysis is the process of examining a system or its components to determine its goals. It is a method of problem-solving that makes the system better and guarantees that each part functions effectively to fulfill its intended role.

4.1 ANALYSIS OF THE CURRENT SYSTEM OF THE CIVIL REGISTRATION MANAGEMENT SYSTEM

The analysis of the current Civil Registration Management System concludes by highlighting the system's strengths in data accuracy and historical data management. But among its serious flaws are its lack of user engagement, data duplication, inefficiencies, and restricted accessibility. These make an online system the only option. The new web-based system streamlines workflows, ensures user-friendly registration capabilities for both urban and remote users, and makes services available online in an effort to address these shortcomings and offer a more inclusive and effective civil registration process.

4.1.1 ADVANTAGES OF THE CURRENT SYSTEM

1) **Historical data Management**: The desktop-based system has effectively handled historical data related to civil registration, keeping track of important life events like births, marriages, and deaths. Over the years, it has functioned as a repository for significant demographic data.

2) **Data Accuracy**: Due to the controlled desktop environment in which data entry and record-keeping are carried out, the system has managed to retain a certain level of data accuracy. The accuracy of these records is essential to the validity of civil registration records.

3) **Security Measures:** A certain degree of data security is enabled by the desktop application, guaranteeing that private data is shielded from unwanted access.

4.1.2 DISADVANTAGES OF THE CURRENT SYSTEM:

1) **Limited accessibility**: The main issue with the desktop application is its restricted accessibility. It limits the system's accessibility to particular physical locations, rendering it unusable for users who live in remote areas or are unable to physically visit the registration office.

2) **Inefficiency:** Inefficiencies may arise from the desktop system's manual nature, which necessitates clerks to enter data and keep records. The lengthy procedure can cause users to wait a long time, particularly during busy times.

3) **Data Duplication:** Due to the frequent need for manual labor, data entry and record-keeping are more likely to contain errors and duplicate data. This may jeopardize the system's overall accuracy and data integrity.

4) **Limited User Engagement:** Interactions with end users are limited by the desktop application's lack of user engagement features. An opportunity to improve the system through client and manager feedback and insights was lost.

5) **Scalability Concerns:** The current system might have trouble expanding to handle more users, registration requests, and data volume as user needs change and grow.

6) **Limited Remote Access:** The lack of an online presence restricts the system's ability to adjust to the requirements of users who want remote access to registration services in an era that is becoming more and more digital.

4.2 SYSTEM DESIGN:

System design is the process of developing an architecture for the various parts, interfaces, and modules of the system as well as offering relevant information that is useful for putting such parts into systems. Systems architectures can be represented as models using the Unified Modeling Language (UML) concept. The UML is a process for drawing diagrams that explain the different aspects of the design of a system. A system's design can be divided into behavioral and structural diagrams. The static structure of the components in your system is shown in structure diagrams. basically, the relationship between two objects. Classes, objects, packages or modules, physical nodes, components, and interfaces are all displayed. The UML class diagram is a common illustration of a structural diagram. Behavioral diagrams depict the actions and interactions of the system with other entities (users, other systems) as well as with itself. They demonstrate how information flows through the system, how items interact with one another, how time impacts the

system, and what triggers internal state changes in the system. Behavior diagrams are widely used to describe the functionality of software systems because they show a system's behavior. Use case, entity relationship diagrams (ERD), activity diagrams, sequence diagrams, and data flow diagrams are a few examples of behavioral diagrams.
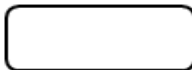
4.3 CIVIL REGISTRATION MANAGEMENT SYSTEM ACTIVITY DIAGRAMS

An activity diagram is a type of flowchart that illustrates how a system or process flows from one activity to another using the Unified Modeling Language (UML). Because it outlines what should occur in the modeled system, it is called a "behavior diagram" and is used to describe the various dynamic aspects of a system. The Main Activity Diagrams that are included on this Civil Registration are:

1. Admin Activity Diagram
2. Staff Activity Diagram
3. Clients Activity Diagram

The various symbols used in an activity diagram which shows how the activities are been done within the system:

o Start – indicates the start of an activity
o End/Terminate – indicates the end of an activity
o Activity Flow – indicates how the activity flows from one point to another
o Action – indicates the action/activity been done
o Decision – checks to know if the condition is true or false (yes or no)

Name	Symbol
Start	●
End/Termination	◉
Activity Flow	
Action	
Decision	◇

Figure 4. 1 Activity Diagram symbols

4.3.1 ADMIN ACTIVITY DIAGRAM

Activity diagram for Admin

Start

Login

No

Yes

Manage Client | Manage Staff | Manage Locations | Register Death | Print Report

Logout

End
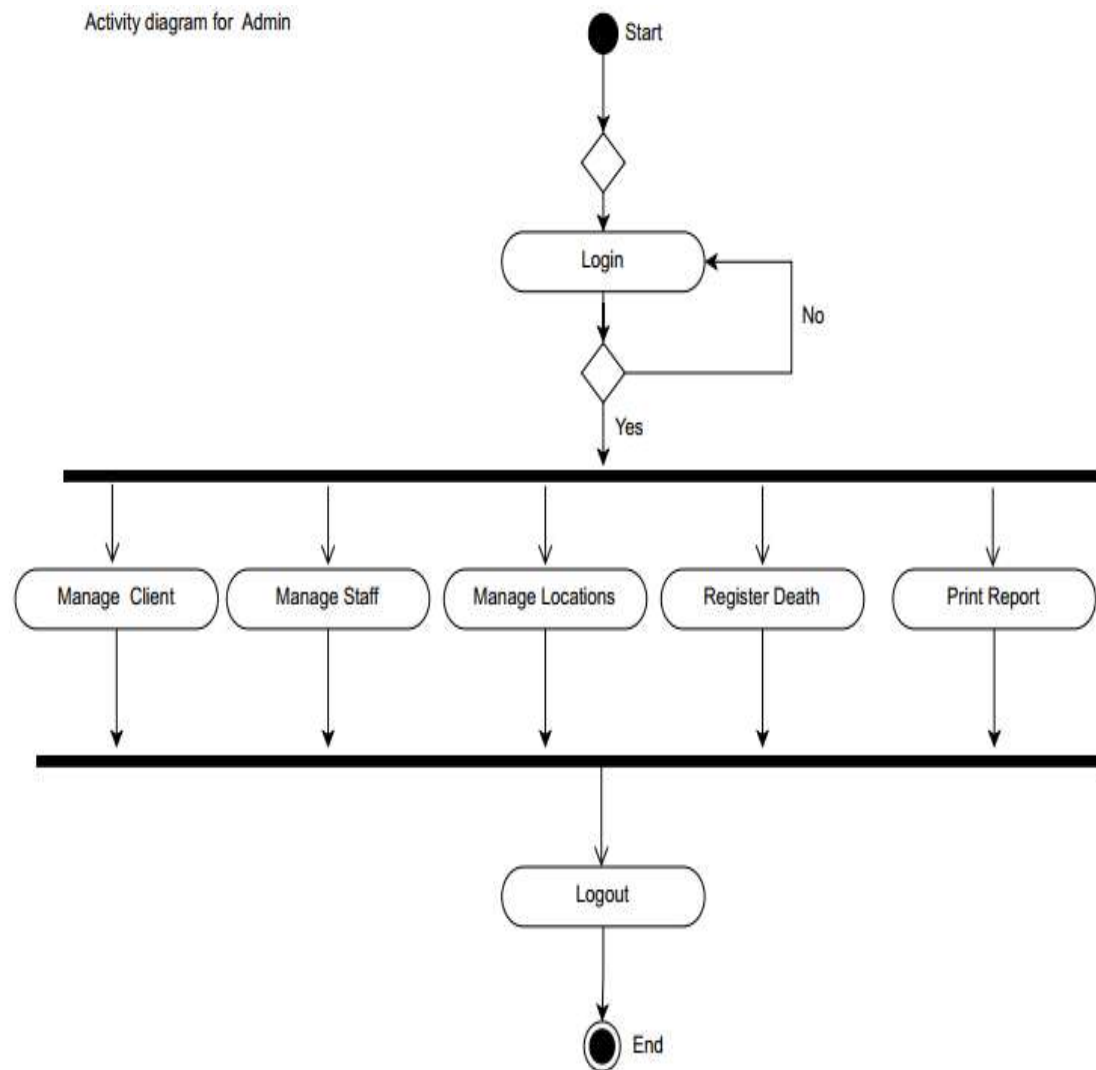
Figure 4. 2 Activity Diagram of the admin of the system

4.3.2 STAFF ACTIVITY DIAGRAM:
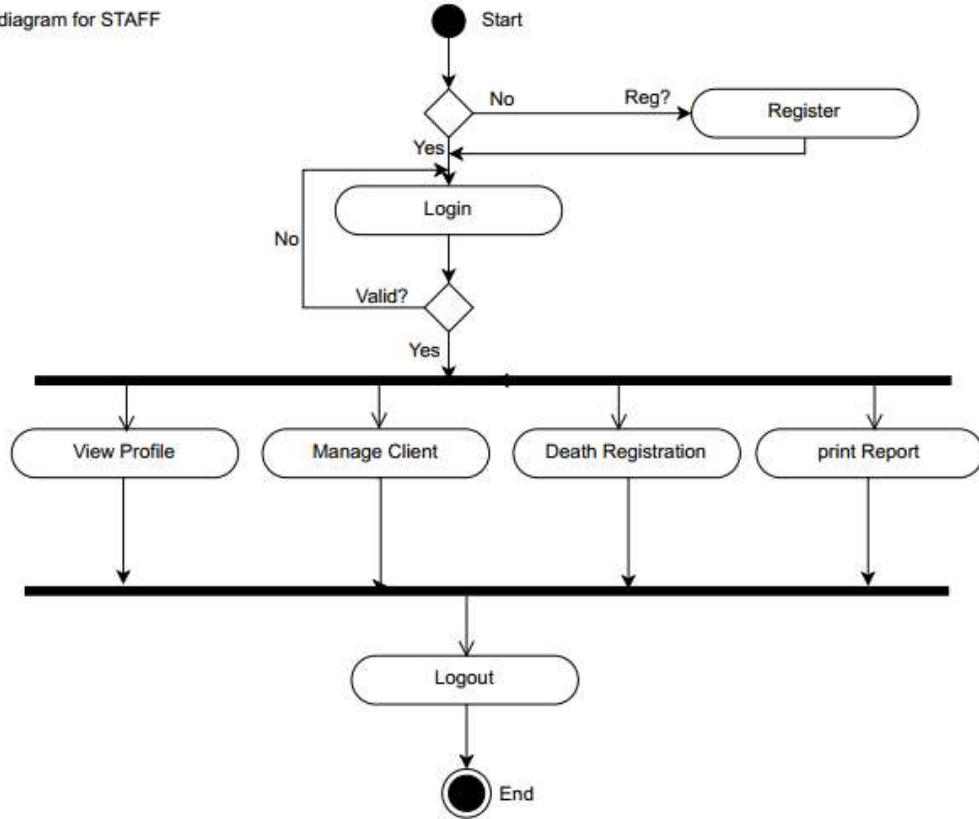
Figure 4. 3 Activity Diagram of the Staff of the system

4.3.3 CLIENTS ACTIVITY DIAGRAM:
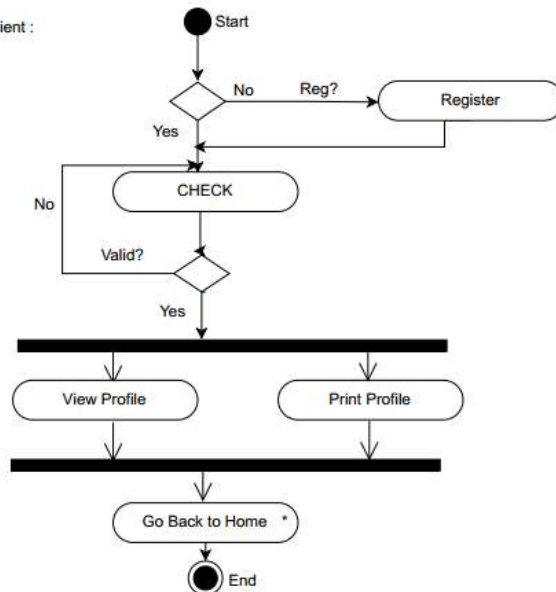
Figure 4. 4 Activity Diagram of the Client of the system

From the start of the various activities of the different users of the system, we see that the various users need to login with their login credentials. The system will then check to know if the users are registered on the system and if their username and password provided is correct, before allowing/granting the user to access into the internal functionalities of the system. But if the username and password provided is incorrect and they are not registered, the user will not be granted access into the internal functionalities of their various activities they can perform. Therefore, the system will continually inform the user that his/her login credentials are invalid if he/she persist to attempt to login again.

4.3.4 USE CASE DIAGRAM:

The illustration in figure explains the various symbols used in a use case diagram which shows how the interaction takes place within the system:

o Actor – can be a person, an organization or an external system that plays a role in one or more interactions within the system

o Use Case – describes a sequence of actions that provides something of measurable value to an actor

o Communication Link – shows the participation of an actor in a use case by a solid link

o Boundary of System – a rectangular box drawn around the use case to indicate the scope of the system

Name	Symbol
Actor	
Use Case	
Communication Link	
Boundary of System	

Figure 4. 5: Use Case Diagram Symbols
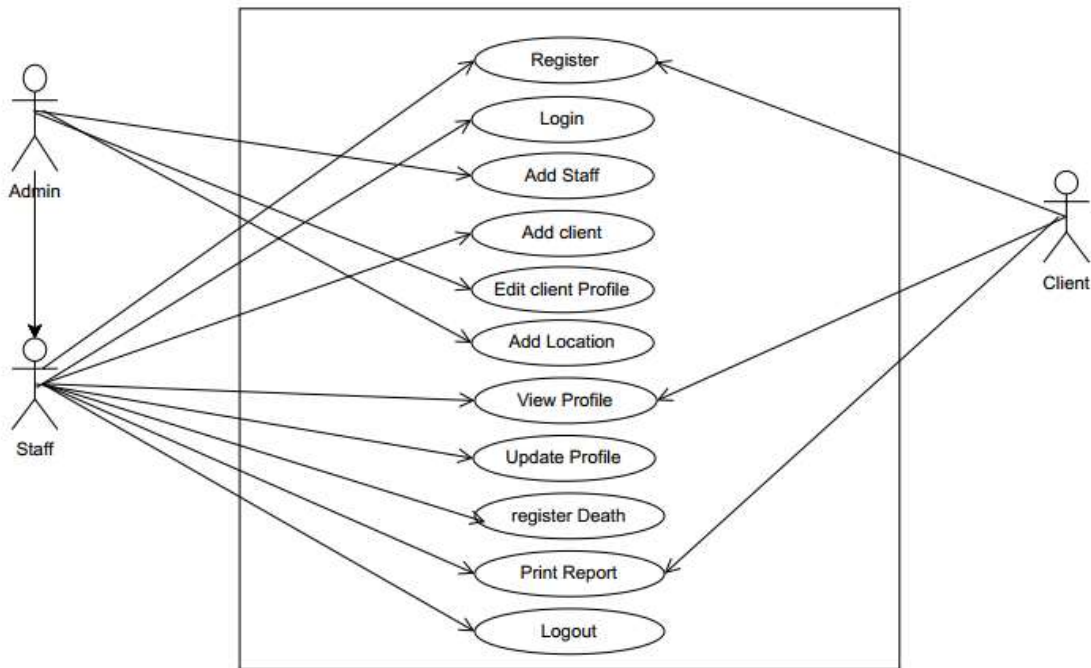
Figure 4. 6: Use Case Diagram of the different actors of the system

From the illustration in figure 6, we have seen the various roles played by both the admin staff and client. All their functions or roles are shown within the system boundary

4.3.5 DATA FLOW DIAGRAMS:

Give a graphic depiction of the information flow via the system. A data flow diagram (DFD) shows how information moves through a system or process. It illustrates data inputs, outputs, and storage locations using well-defined symbols like rectangles, circles, and arrows along with brief text markings.

as well as the paths that connect each location. The data flow diagram, which is derived from the RMS, shows how data moves from processing to the external entities connected to the system. The system's modules, interfaces, and other functionalities can be vividly represented by the entities. Level 0, Level 1, Level 2, and so on are the three separate stages into which a data flow diagram can be further divided.

4.3.5.1 LEVEL 0 DATA FLOW DIAGRAM

Another name for DFD Level 0 is a context diagram. It provides a fundamental synopsis of the entire system or process under analysis or modeling. It is intended to be a quick overview that presents the system as a single, high-level process along with its connections to other entities. The CRMS level 0 describes in detail how the system is linked to other functionalities and interfaces as well as external entities like actors. This level shows how the system receives and distributes data.
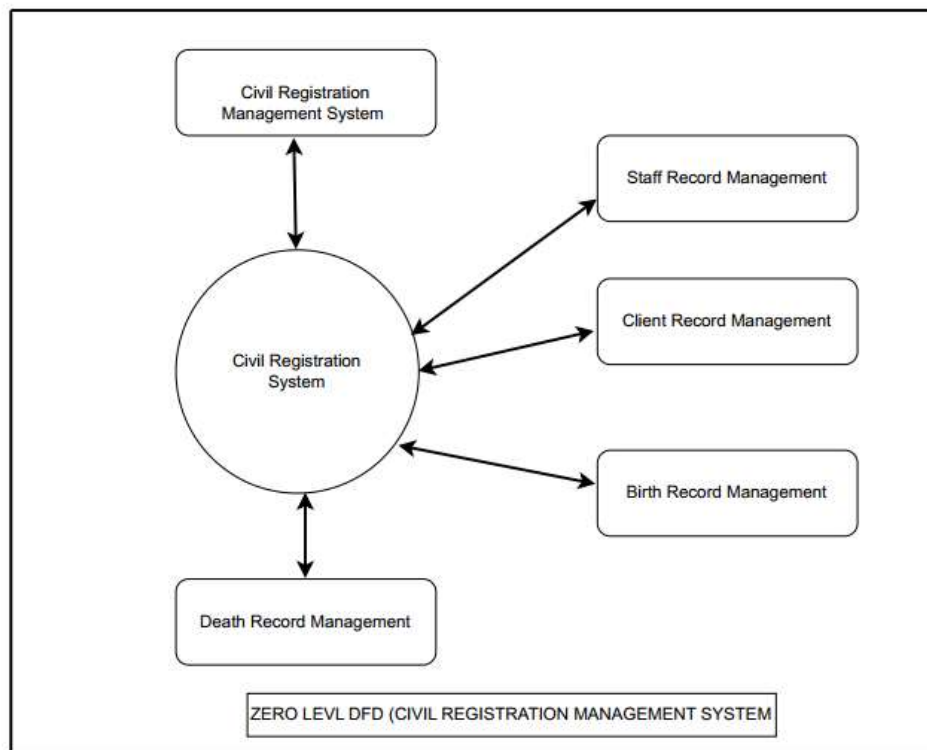
Figure 4. 7 : Level Zero of the CRMS DFD Diagram

4.3.5.2 LEVEL 1 DATA FLOW DIAGRAM

The Context Level Diagram's component parts are broken down into greater detail in DFD Level 1. As you divide the high-level process of the Context Diagram into its smaller processes, you will draw attention to the primary tasks that the system performs. This level describes data delivery into sub-entities and how these entities relate to other system modules and interfaces in further detail.
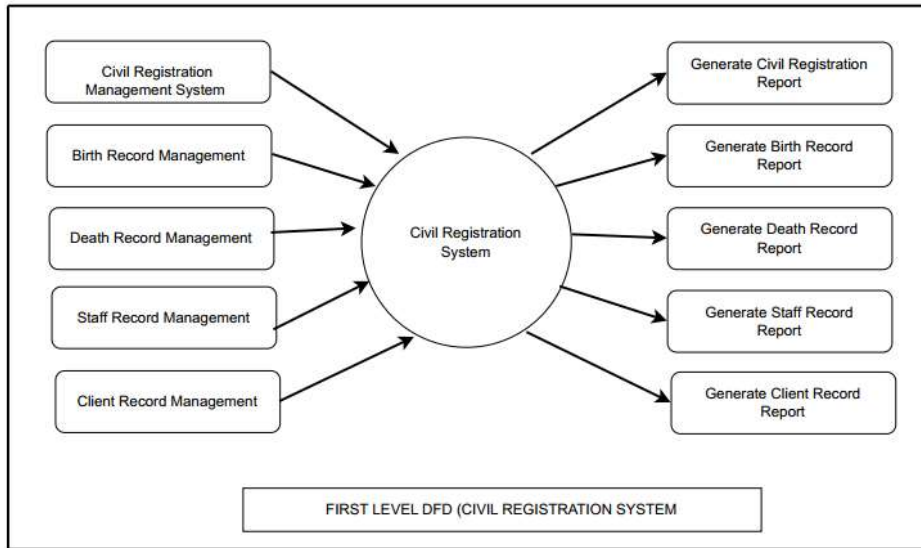
Figure 4. 8 Level one of the CRMS DFD Diagram

4.3.5.3 LEVEL 2 DATA FLOW DIAGRAM

Then, DFD Level 2 delves even further into some areas of Level 1. To provide the appropriate level of detail about how the system operates, more description might be needed. This level explains the functionality of each module and interface, as well as how these interfaces are broken down in detail and interact with one another and other RMS interfaces. In contrast to levels 0 and 1, level 2 describes or includes an explanation of the functionality of each module in the system.
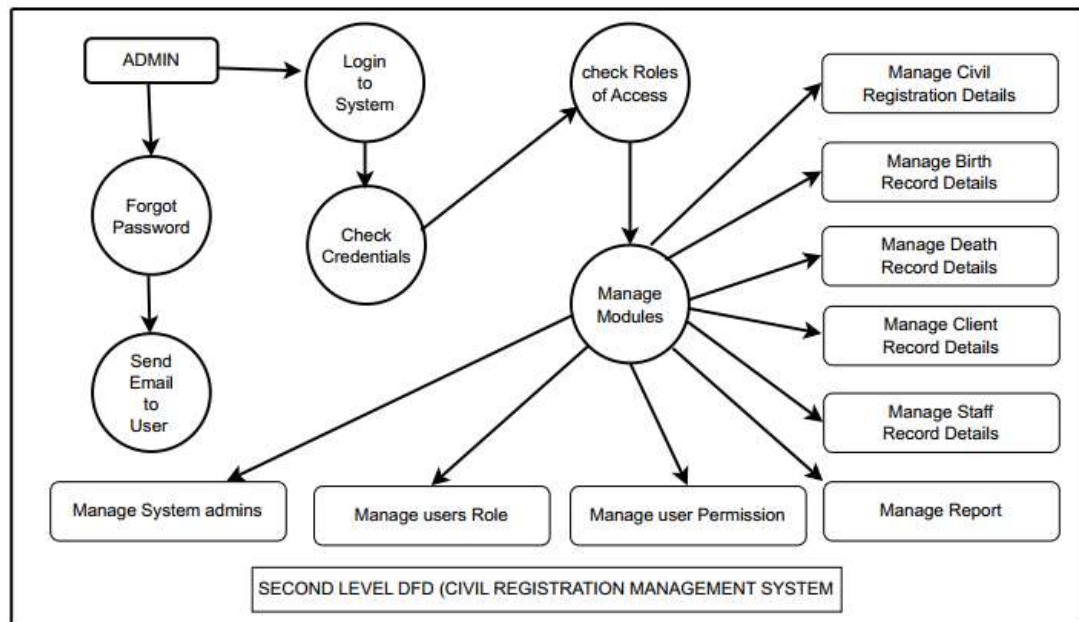
Figure 4. 9 Level two of the CRMS DFD Diagram

4.3.6 ENTITY RELATIONSHIP DIAGRAM:

illustrates the relationships between "entities"—people, things, or concepts—with one another within the system. Relational database design and debugging is a common use case for ER Diagrams in the domains of software engineering, business information systems, education, and research. The Entity Relationship Diagram (ERD) illustrates the relationships between the entities and the links that allow the data stored in the database to be distributed.
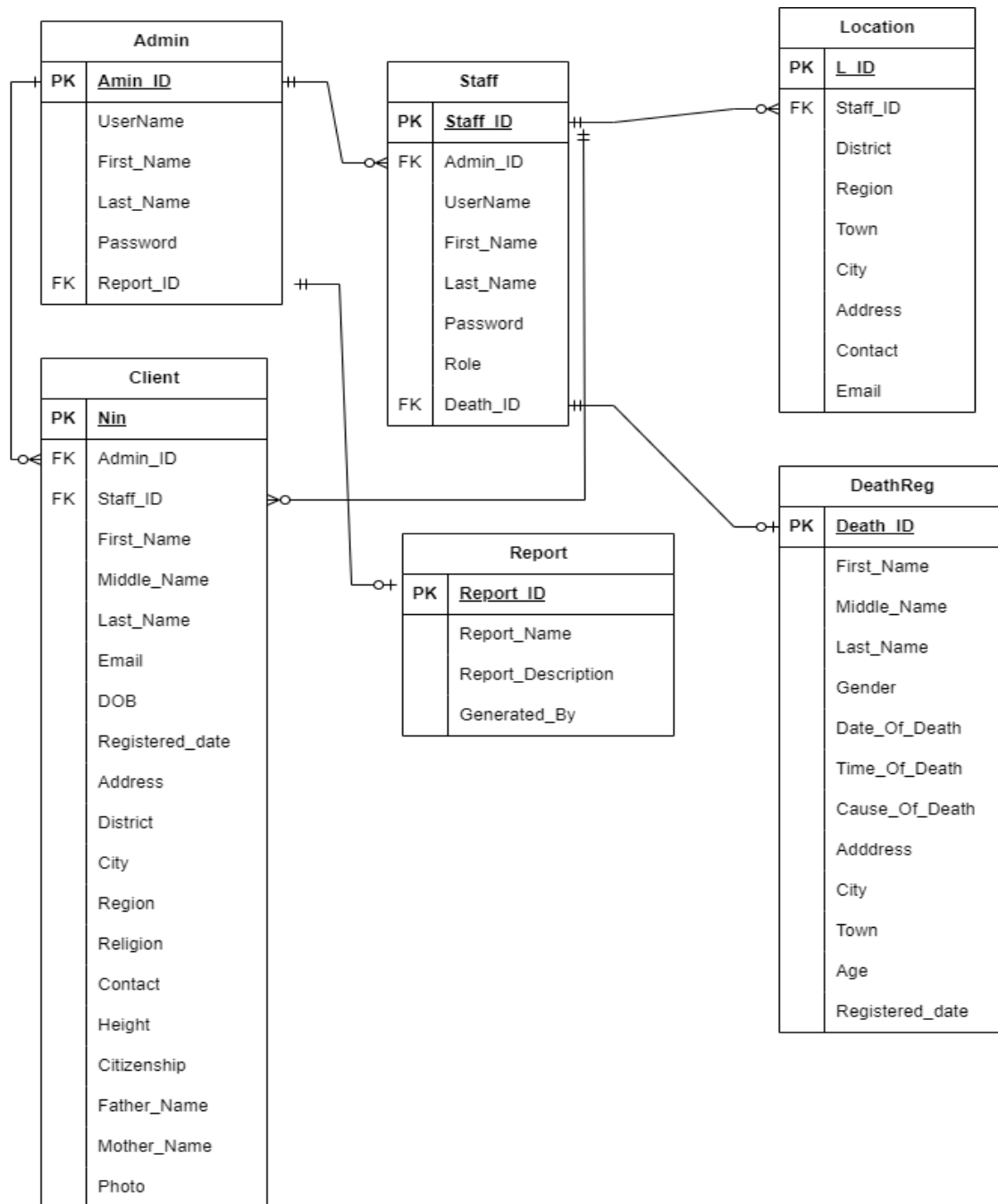
Figure 4. 10 ER diagram of the CRMS project

4.3.7 SEQUENCE DIAGRAMS:

shows the interactions between items in a system. Because they specifically focus on lifelines, i.e., the processes and objects that exist simultaneously and the messages that are exchanged between them in order to accomplish a task before the lifeline ends, sequence diagrams are a popular dynamic modeling solution in UML. The CRMS sequence diagram shows how various system objects modules and interfaces interact with the actors the system administrator, the exams officer, the employer or organization, and the student and how they can access each interface's full functionality.

4.3.8 ADMIN LOGIN SEQUENCE DIAGRAM:

This is the login sequence diagram of the Civil registration management system, where the admin will be able to login to his account using his credentials. After the he has successfully login he then can manage all his functionalities. The diagram below helps demonstrate how the login pages works in the Civil Registration Management System.
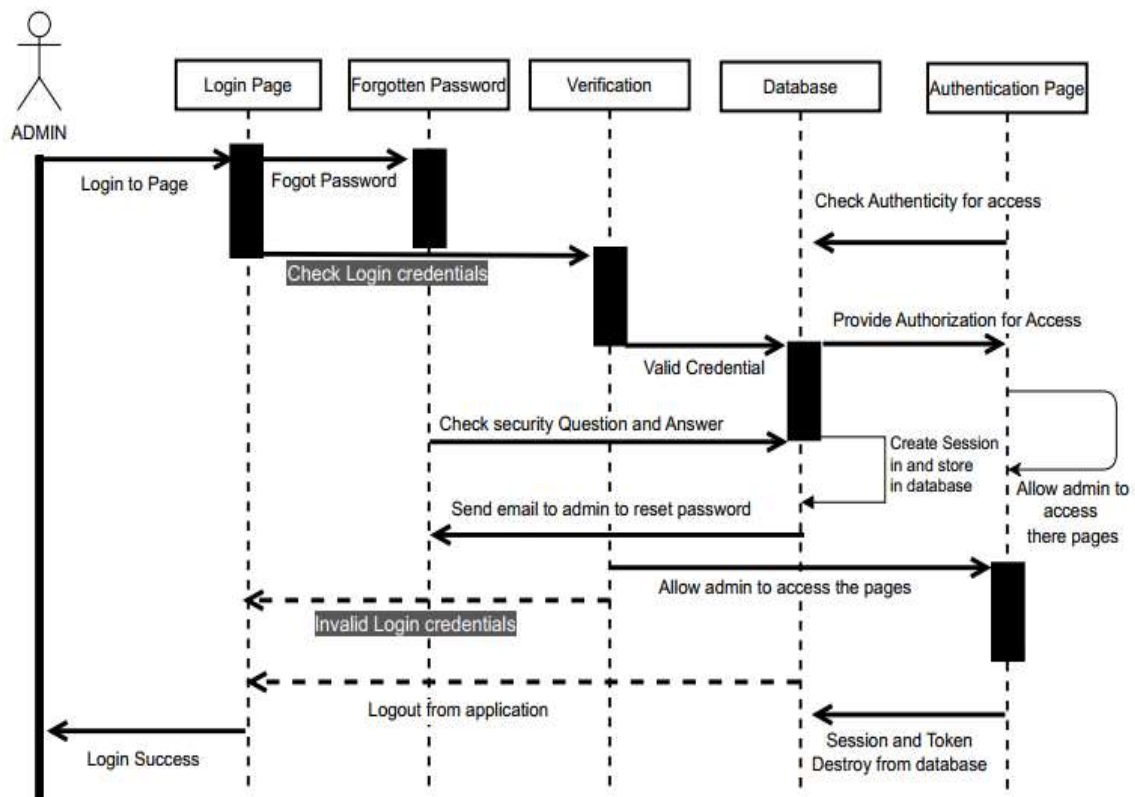
Figure 4. 11 Admin Login Sequence Diagram

4.3.9 ADMIN SEQUENCE DIAGRAM:

This diagram shows how the Admin uses the system's modules and interfaces that he is authorized to access. Because he is in charge of the entire system components, he manages the system as a whole and provides pertinent data that staff and other clients can access.
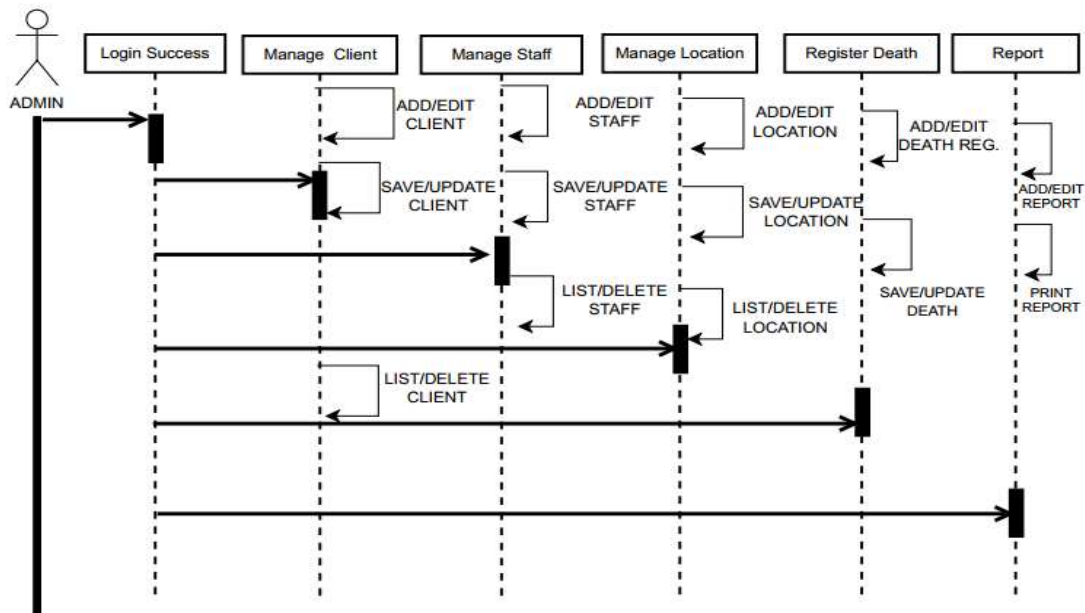
Figure 4. 12 Admin Sequence Diagram

4.4 STAFF LOGIN SEQUENCE DIAGRAM:

This is the login sequence diagram of the Civil registration management system, where the Staff will be able to login to his account using his credentials. After the he/she has successfully login, he/she can manage all his own functionalities. The diagram below helps demonstrate how the login pages works in the Civil Registration Management System of the staff.
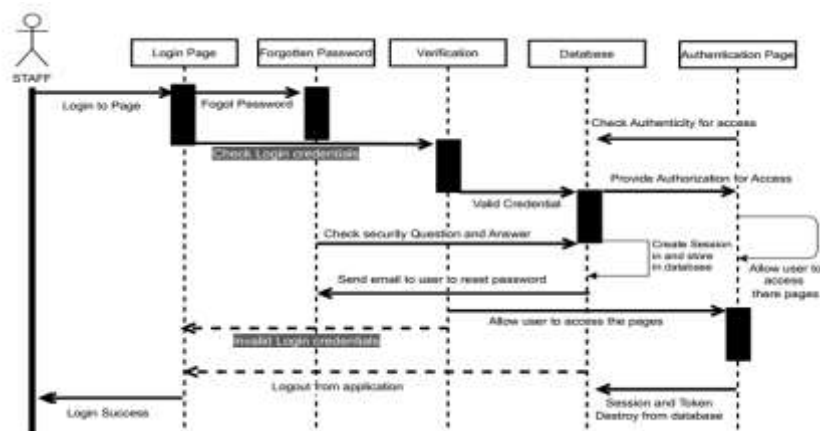
Figure 4. 13 Staff Login Sequence Diagram

4.4.1 STAFF SEQUENCE DIAGRAM:

This diagram shows how the Staff uses the system's modules and interfaces that he is authorized to access. Because he is in charge of the Client and other vital system components, such as Birth, death etc.
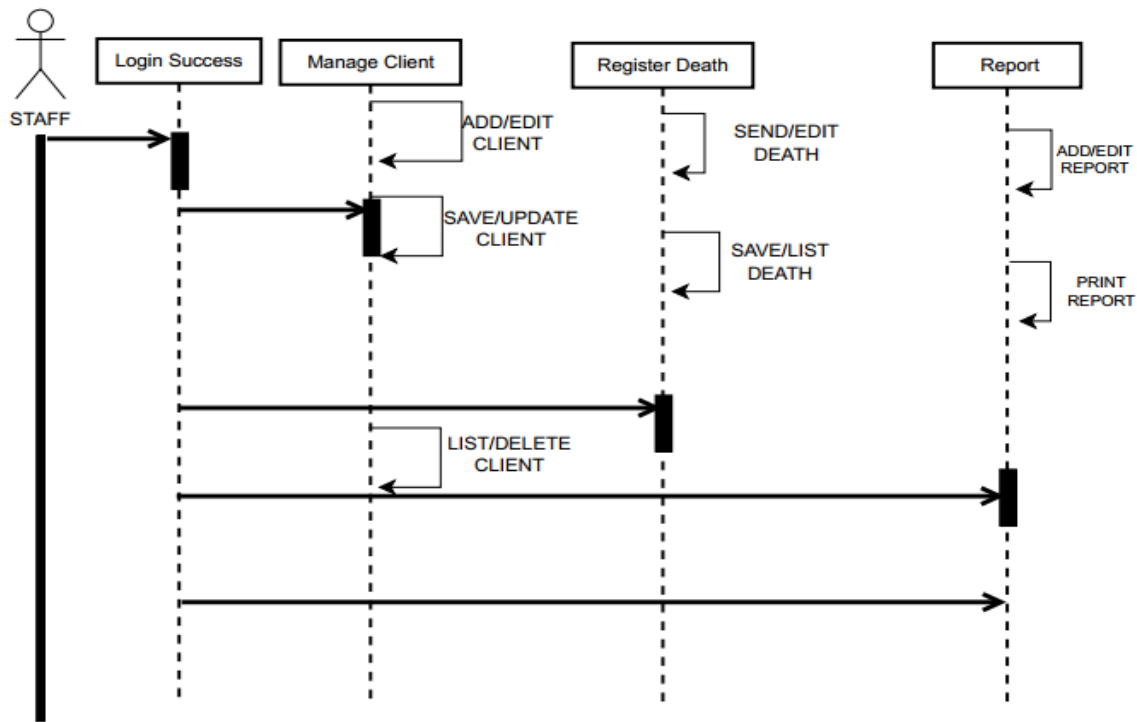
Figure 4. 14 Staff Sequence Diagram

4.4.2 CLIENTS SEQUENCE DIAGRAM:

This diagram shows how the Client uses the system's modules and interfaces that he is authorized to access. Because he can only view his own profile and print it and a report.
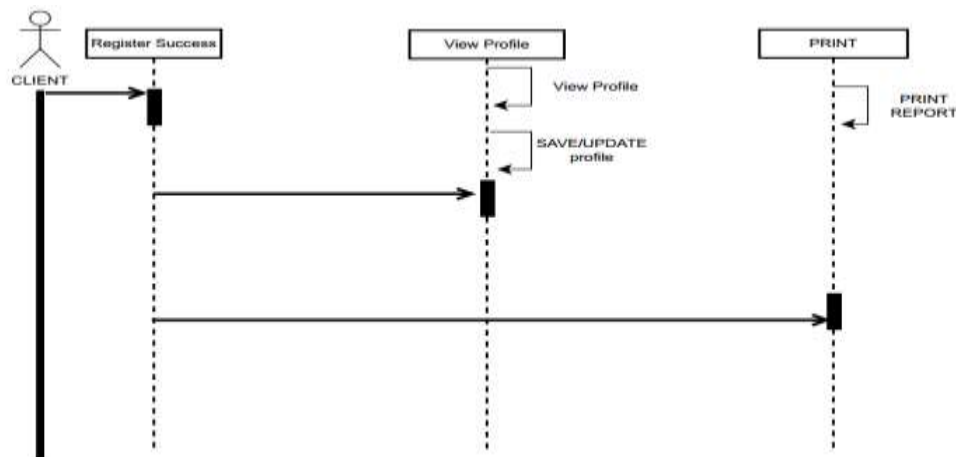
Figure 4. 15 Client Sequence Diagram

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SUMMARY:

This chapter moves the emphasis to the critical stage of the Civil Registration Management System (CRMS) system analysis and design. According to its definition, system analysis is the process of gathering and examining data in order to comprehend the objectives and problems of the system while dissecting it into its component elements. The examination of the current desktop-based system reveals important drawbacks as well as benefits, such as restricted user engagement, limited accessibility, inefficiency, and data duplication. Benefits include historical data management and data accuracy. The need to move to an online platform is highlighted by this analysis. The introduction of the system design phase highlights the creation of an architectural framework for the system's constituent parts. The structure and interactions of the system are depicted using a variety of modeling tools, such as entity-relationship diagrams, activity diagrams, use case diagrams, data flow diagrams, and sequence diagrams. Together, these chapters provide the groundwork for the CRMS's complete modernization and transformation, guaranteeing improved security, global accessibility, increased efficiency, and user-centric design for a more successful civil registration procedure.

CHAPTER FIVE

SYSTEM IMPLEMENTATIONS AND TESTING

5.0 SYSTEM Implementation

The successful implementation of the proposed system design is a critical phase in the system development life cycle. The term "implementation" refers to the process of bringing a new system design into operation. Thus, the proposed system design interfaces and proper implementation is described below.

5.1 HOME PAGE

Figure 5. 1 Home page of the system

5.2 LOGIN PAGE

The safe entry point for users to enter their credentials is the project's login page. To ensure accuracy and security, the system thoroughly verifies the entered data against the user database that is stored after submission. After successfully authenticating, users are automatically redirected to their customized access control dashboard, which is specifically designed for their designated role, such as staff member or administrator. This dynamic redirection guarantees a user-friendly and effective experience by displaying pertinent tools and features according to specific responsibilities in the system.
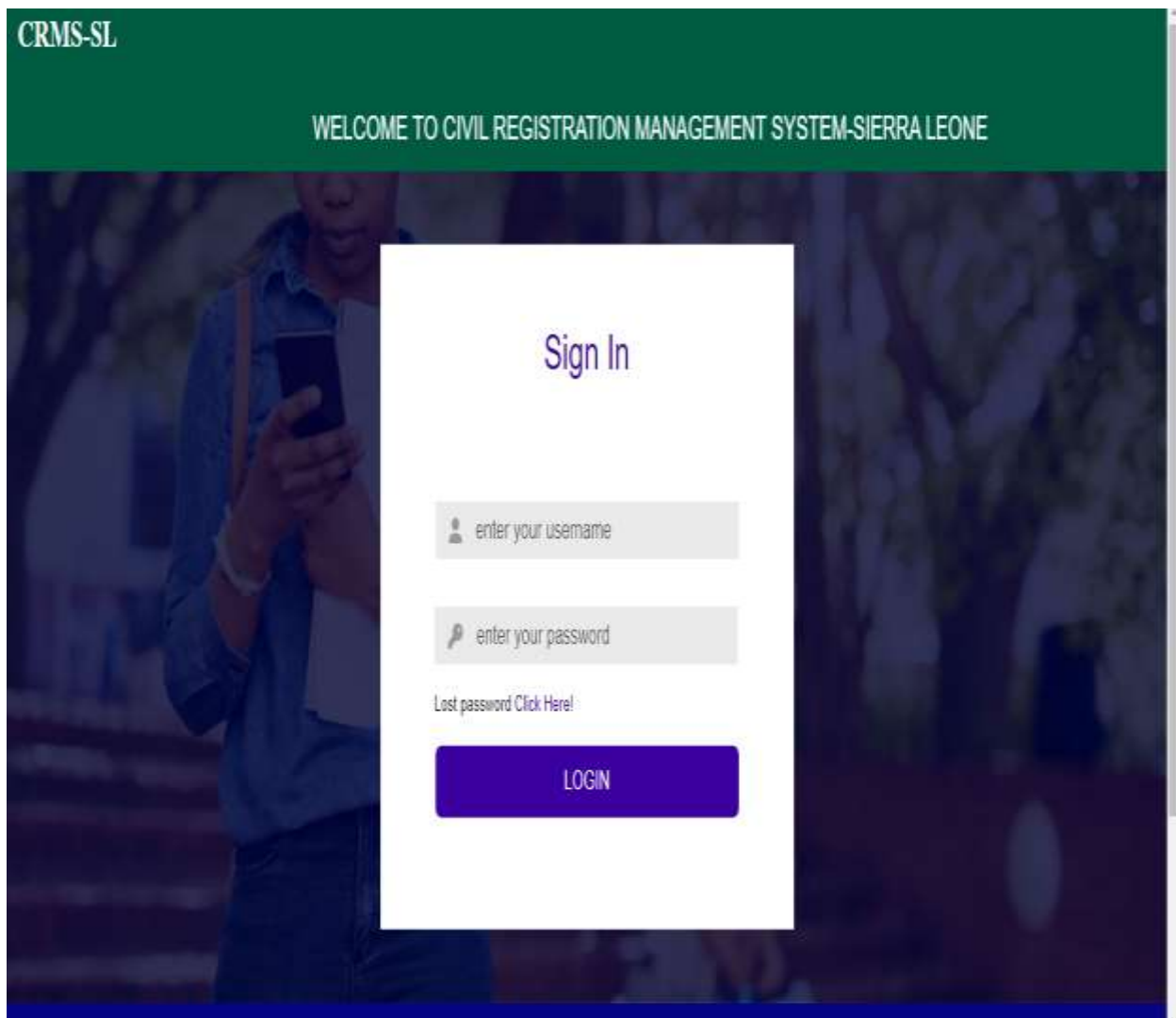
Figure 5. 2 Login page of the system

5.3 CHANGE PASWORD PAGE

In the event that users forget their password, the "Change Password" option offers a simple and safe way to change it. Users can start the procedure by entering the email address they used to register, if they have forgotten their password. A secure email with a special verification link is delivered to the specified email address after submission. Through this link, users can get to the "Change Password" page, where they can reset their password and get back into their accounts. This method guarantees maximum security with a reliable and easy-to-use password recovery solution**.**
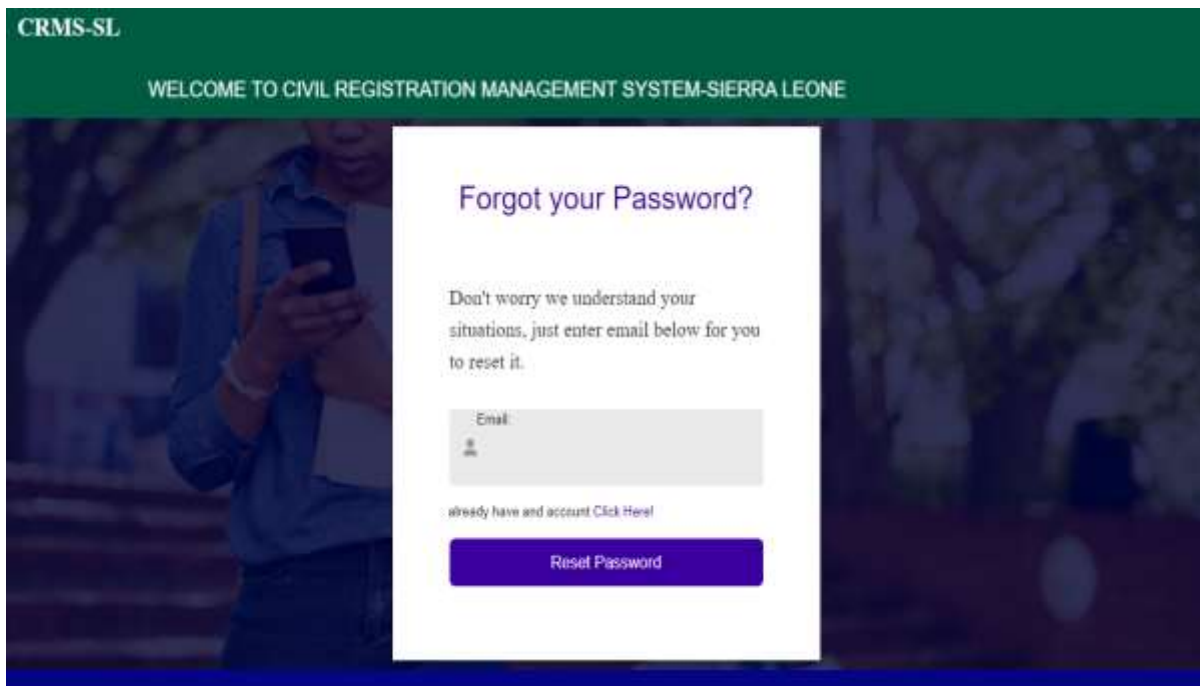
Figure 5. 3 Change password page of the system

5.4 ADMIN DASHBOARD PAGE

As the main hub for system management, the Admin Page gives administrators complete control over important features. Staff members can be easily added and managed by administrators, which makes teamwork more effective. The website also expedites the client registration process and gives administrators the resources they need to manage and maximize user onboarding. Apart from managing clients, the admin interface also oversees the death registration procedure, guaranteeing a methodical and well-structured approach. Administrators may easily go through these crucial activities with the help of user-friendly controls and an intuitive interface, which helps to ensure

the seamless functioning and administration of the entire system. The Admin Page serves as the command center and provides a comprehensive solution for managing employees, client registrations, and the complex procedures inside the system.
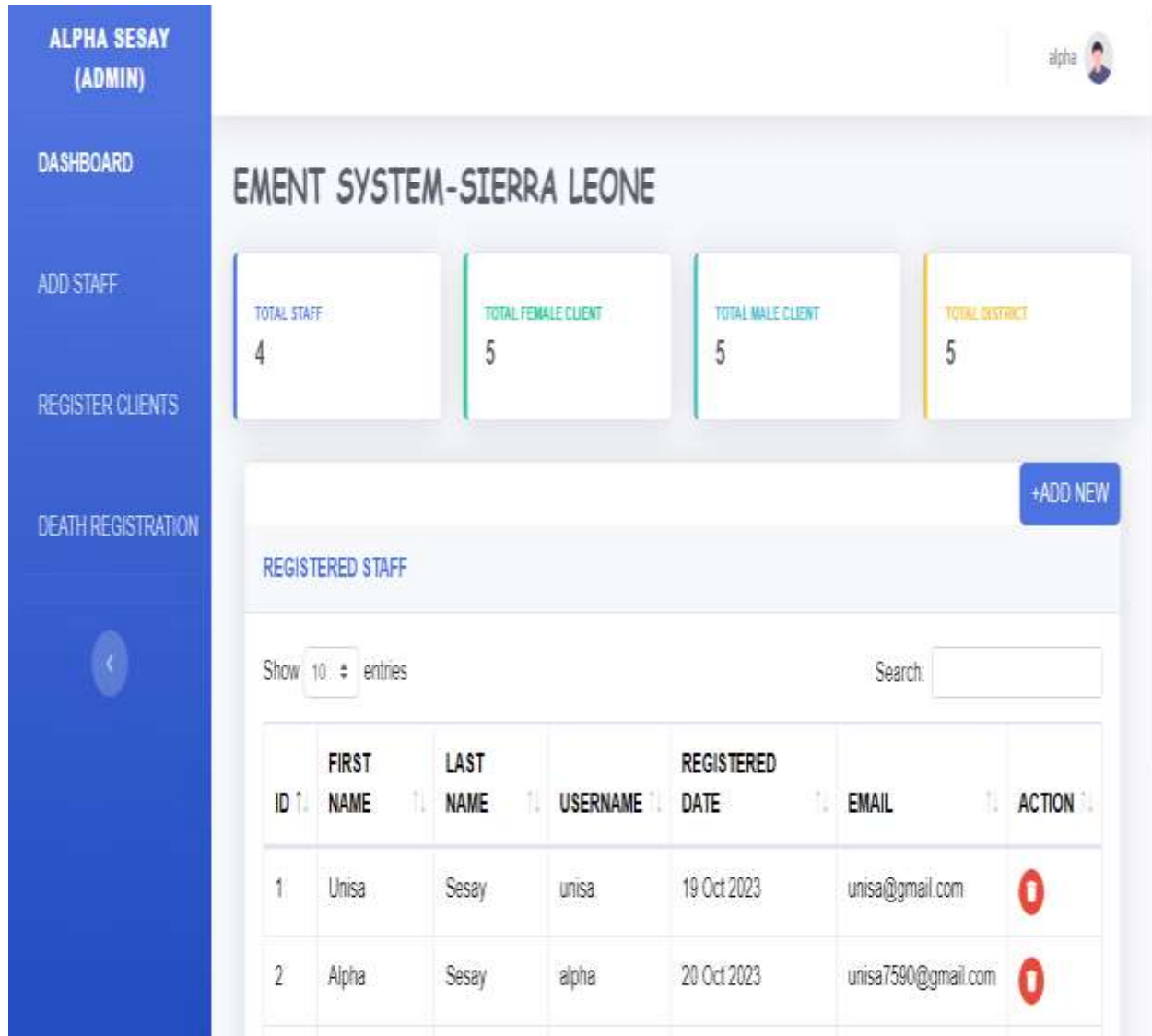
Figure 5. 4 Admin dashboard page of the system

5.4.1 ADMIN DASHBOARD TO REGISTER STAFF

Figure 5. 5 Admin dashboard page of the system to register Staff

5.4.2 ADMIN DASHBOARD TO REGISTER CLIENTS

Figure 5. 6 Admin dashboard page of the system to register client

5.4.3 ADMIN DASHBOARD TO VIEW ALL THE CLIENT OF THE SYSTEM

Figure 5. 7 Admin dashboard page of the system to view all the client

5.4.4 ADMIN DASHBOARD TO VIEW A SINGLE CLIENT INFORMATION

Figure 5. 8 Admin dashboard page of the system to view a single client information

5.4.5 ADMIN DASHBOARD TO REGISTER THE DEATH CLIENT INFORMATION

Figure 5. 9 Admin dashboard page of the system to register a death case

5.4.6 ADMIN DASHBOARD TO VIEW ALL THE DEATH CASES OF ON THE SYSTEM

Figure 5. 10 Admin dashboard page of the system to view all the death cases

5.5 STAFF DASHBARD PAGE

The Staff Page provides staff with important tasks and acts as the core point for system management. Employees have crucial control over the customer registration process, even when they are unable to add other employees, thus the workflow is streamlined and effective. They are also capable of supervising the careful administration of the system's death registration procedure. Staff personnel are essential to the system's smooth operation and precise record-keeping, from customer onboarding to the delicate responsibility of handling death registrations. This centralized control improves the system's overall dependability and efficiency in addition to enhancing security.
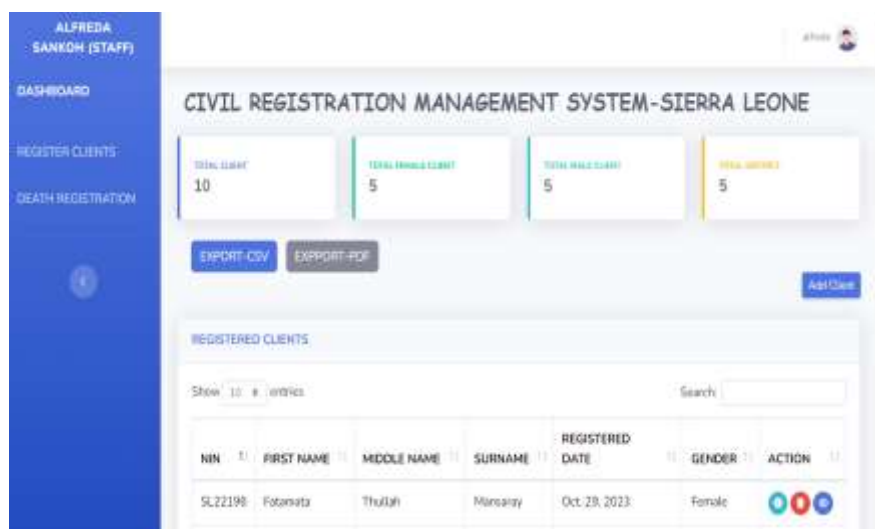

Figure 5. 11 Staff dashboard page of the system
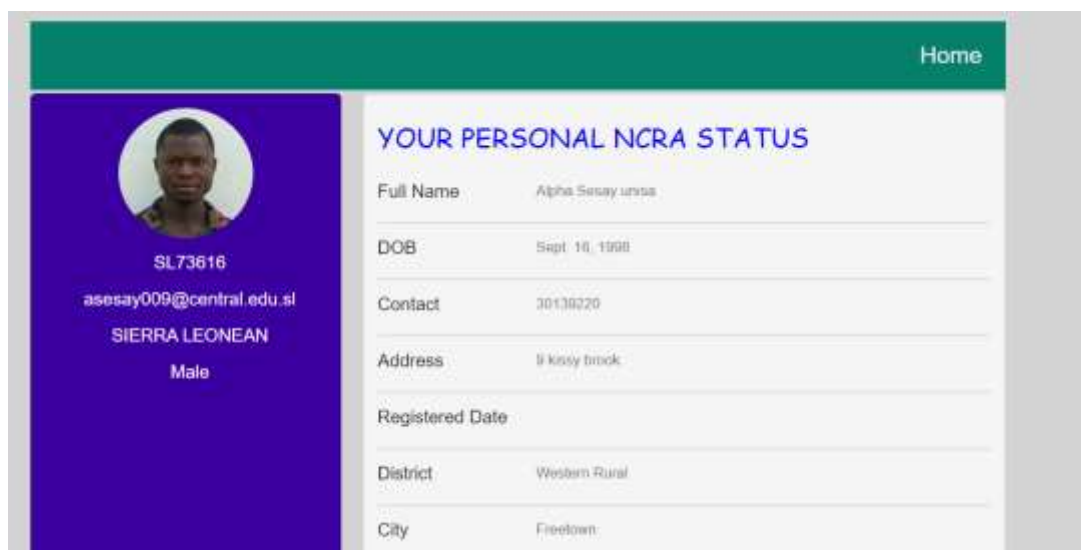
5.6 USER/CLIENT INTERFACE

Figure 5. 12 Client interface page

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5.7 SYSTEM TESTING

Testing of the software is necessary in order to check the existence of fault in the software so as to make changes that will remove the faults. Testing is necessary to prevent system failure.

The major testing done include

Unit testing: breaks down the software into components and verifies the functionalities of each individually within the programming environment. Also known as component testing, it tests

If each component works as it is supposed to, why it gets the required input and returns the required output.

Integration Testing: this was done after successfully testing each module of software. Testing is done by creating interfaces between components and making sure that they communicate efficiently and that necessary input and output is transferred for the overall efficient functioning of the system.

Acceptance Testing: Acceptance testing was done after the implementation of the system. The acceptance testing will check if the system works correctly in the user environment and if all user specified functionalities are present. It also tests if the system adheres to the policies and qualities standard.

SUMMARY

This chapter provides the information about how the system needs to be set – up in order to function optimally as well as highlighting steps needed to be followed by all users of the application. It gives a documentation brief for the users and also gives information on testing procedures implemented on the application.

CHAPTER SIX
RECOMMENDATIONS AND CONCLUSION

6.0 SUMMARY

Django, Python, and SQLite were used to create a revolutionary online Civil Registration Management System in response to the shortcomings of Sierra Leone's antiquated and centralized desktop-based civil registration system. This updated system automates processes associated with important life events including civil and death registrations in an effort to improve productivity, accessibility, and user happiness. The platform provides a dependable, secure, and scalable solution by tackling problems including manual operations, limitations on accessibility in rural areas, data duplication, and verification delays. Extensive requirements collection, encompassing user surveys, interviews, and observations, guaranteed that the system was customized to meet the requirements of citizens. Agile development made it possible to incorporate user feedback continuously, which enhanced usability. Simplified procedures minimized redundancy, and thorough testing verified that the functional and technical criteria were satisfied.

Utilizing a user-centric design methodology, the recently enacted Civil Registration Management System increases documentation rates across both urban and rural communities by utilizing technology. The wide backends and centralized architecture provide the groundwork for future interoperable e-governance services, while the inclusive online portal encourages accessibility. The system, which is seen as a crucial step toward open and effective governance, helps Sierra Leone better serve its people, and further development and support will open the door for a more approachable and responsive government.

6.1 RECOMMENDATIONS

A lot of improvements can be made to this project, to enhance the usability and human computer interaction as listed below:

1. Implement user training programs to ensure staff and clients can fully utilize the new online system
2. Conduct periodic reviews to identify areas for improvement in system design and user experience
3. Expand language support beyond English to increase accessibility
4. Integrate with additional government databases to enhance data accuracy and consistency

6.2 CONCLUSION

Modernizing citizen services has advanced significantly with the launch of an online Civil Registration Management System powered by Django and SQLite. Scalability and security are provided by this automated platform, which also streamlines procedures pertaining to important life events. By overcoming technological and geographic limitations, the centralized web portal guarantees inclusive and effective services, revolutionizing the desktop-centric approach that existed before. User demands are prioritized and usability is improved by rigorous qualitative and quantitative studies combined with an agile development methodology. Increased national documentation rates are made possible by rigorous testing that confirms compliance with benchmark criteria. The system's extensive database, which is positioned for future interoperability, provides the necessary framework for faster coordination between government agencies and promises effective resource usage and scalability. The Civil Registration Management System is positioned as a major force behind the advancement of e-governance to better meet user and administrative needs thanks to ongoing improvements and support.

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