

FACULTY OF SCIENCE AND EDUCATION

FINAL YEAR PROJECT REPORT

A WEB-BASED RECORDS MANAGEMENT SYSTEM

CASE STUDY: CHESIMAT CHILD DEVELOPMENT CENTER.

By

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A FINAL YEAR REPORT SUBMITTED TO BUSITEMA UNIVERSITY IN
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SEPTEMBER 2026

DECLARATION

I **KIBET LEVI**, with **Registration Number: BU/UP/2023/1491**, humbly hereby declare that this final year project report is the outcome of information concerning my own work.

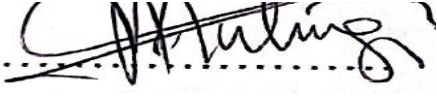
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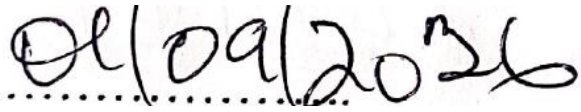
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APPROVAL

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DEDICATION

First and most importantly, I humble myself and thank the Almighty God who has enabled me to complete this report with all the divine wisdom and sound mind.

I then dedicate this report to the most wonderful parents I have, my mum in the names of **MADAM CHEMUTAI BETTY**, my daddy **Mr. MUTAI SIMON**, and my loving Siblings **chepkwemoi selly, yeko stella, kiplimo sam, kiprotich Wycliffe and kipsang shemick**. Thank you so much for the support and may the Almighty reward you abundantly.

I also dedicate this report to my dear supervisor **DR. MUTUNGI FREDRICK** who guided me throughout the process of making this report successfully. Thank you so much sir for imparting knowledge in me.

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ACRONYMS

CDC	Child Development Centre
DFD	Data Flow Diagram
ERD	Entity Relationship Diagram
UML	Unified Modeling Language
RBAC	Role-Based Access Control
MVC	Model-View-Controller
ICT-	Information and Communication Technology
NGO	Non-Governmental Organization
HTML	Hypertext Markup Language
CSS	Cascading Style Sheets
PHP	Hypertext Preprocessor
MySQL	My Structured Query Language
SQL	Structured Query Language
UI	User Interface
RAM	Random Access Memory
UPS	Uninterruptible Power Supply
XAMPP	Cross-Platform, Apache, MySQL, PHP and Perl
WAMP	Windows, Apache, MySQL and PHP
SMS	Short Message Service
JPG-	Joint Photographic Experts Group
PNG	Portable Network Graphics
UGX	Uganda Shillings
IT	Information Technology
VS Code	Visual Studio Code

ABSTRACT

The increasing need for effective management of child development Centre records highlighted the limitations of traditional manual systems used at Chesimat Child Development Centre (CDC). These methods were associated with inefficiencies such as data duplication, loss of records, delayed reporting, and difficulties in tracking sponsorship and donation activities, which affected transparency and accountability. To address these challenges, this study developed a Web-Based Records Management System aimed at providing a centralized, automated, and user-friendly platform for managing child records, sponsor information, and donations.

The project employed the **agile methodology**, which facilitated iterative development, continuous user feedback, and incremental system improvement throughout the development process. System requirements were gathered through interviews, observation, and document analysis, ensuring that the system reflected both user needs and organizational requirements. The system was designed using structured design approaches, including UML diagrams, to model system processes, user interactions, and data flow.

The implementation phase utilized HTML, CSS, and JavaScript for the frontend, while PHP and MySQL were used for backend development and data management. These technologies were selected for their reliability, scalability, and suitability for web-based applications. After development, the system was tested and validated with input from staff, administrators, and sponsors at Chesimat CDC.

The results showed that the system improved efficiency in record management, enhanced transparency, reduced data redundancy, and enabled faster access to information. The study concludes that a web-based system effectively improves operational efficiency and accountability in child development Centre's. It is recommended that Chesimat CDC adopts the system to replace manual processes and further enhance service delivery.

CHAPTA ONE: INTRODUCTION

1.1 Introduction

Child Development Centers (CDCs) played an important role in supporting vulnerable children through services such as education, healthcare, and sponsorship programs. Effective management of child records, donations, and sponsorship information was essential for ensuring transparency and efficient service delivery.

With the advancement of technology, many organizations are adopted web-based systems to improve data management, enable real-time access to information, and enhance accountability (**Mahmood, Abdulqader, Abdullah, & Rasheed, 2024**). However, small community-based centers, especially in developing countries like Uganda, still relied on manual or semi-digital systems, which are inefficient and prone to errors.

This study proposed the development of a Web-Based Records Management System for Chesimat Child Development Center to improve record-keeping, enhance efficiency, and support better decision-making (**Monira Libadia, 2020**). This chapter presented the background of the study, problem statement, objectives, research questions, significance, and scope of the study.

1.2 Background of the Study

1.2.1 Globally

Child Development Centre's (CDCs) played a vital role in supporting vulnerable children through education, healthcare, nutrition, psychosocial support, and sponsorship programs (**Knitzer, 2002**). Worldwide a significant portion of the global child population lived in extreme poverty, struggling to survive on very limited daily income (**Khan & Institute, 2020**). Many of these children lacked access to basic necessities such as adequate food, healthcare, education, and safe living conditions, which negatively affected their growth, development, and

overall well-being. In response, international organizations such as Compassion International implemented digital child management and sponsorship systems to enhance accountability, real-time child monitoring, and holistic development through structured partnerships with local churches **(Strother, 2025)** . However, these systems were often centralized, technologically complex, and costly, limiting their suitability for small, community-based CDCs. Consequently, many local centers continued to rely on manual or semi-digital record-keeping methods, which constrained efficiency, transparency, and timely decision-making **(Shumona Sharmin, Becky Faith, 2017)**.

1.2.2 Africa and Uganda

In Africa, children, representing approximately 57.16% of the continent's child population, lived in multidimensional poverty with limited access to education, healthcare, and nutrition (Mobolaji, An, & Journal, 2024) . Child Development Centers (CDCs), supported by NGOs and faith-based organizations, played a key role in improving child survival and wellbeing. Studies in Kenya showed that Compassion International programs significantly improved maternal nurturing capacity and child survival outcomes. In Uganda, Compassion International supports children, contributing to poverty reduction and child development **(SANDRAH, 2019)** . Despite this impact, many rural CDCs still relied on manual record-keeping, leading to delayed reporting, data duplication, and weak accountability.

1.2.3 Existing Systems and Gaps

Several global and regional digital systems existed for child welfare management, such as Oxfam's Beneficiary Management System and Save the Children's Case Management Tool. These systems provided functionalities like sponsorship tracking, donation management, and automated reporting. However, they remained high-cost, technically complex, and centralized, limiting their accessibility to smaller centers **(Latif, 2025)**. In Uganda, some CDCs used basic

tools such as Excel or Access, but these were not integrated, lacked automation, and could not handle the full range of operational requirements, leaving a technological gap at the grassroots level **(Ndejjo et al., 2023)**. The technical ideas for Chesimat CDC include: Role-Based Access Control (RBAC); Most existing systems lack fine-grained role-based access control, limiting the ability to restrict system functionalities based on user roles such as administrators, staff, and sponsors **(Wang, 2026)**. Audit Trail System; additionally, did not provide comprehensive audit trail mechanisms to track user activities, making it difficult to ensure accountability and trace system changes. Real-Time Data handling; many systems also lacked real-time data synchronization capabilities, resulting in delays in updating child records, sponsorships, and donation information **(Raj, Singh, Ashraf, Samim, & Sudha, 2025)**. Data Integrity & Validation provided limited data validation and integrity controls, increasing the risk of inconsistent or duplicated records.

1.2.4 Knowledge Gap

Chesimat Child Development Centre **(CDC)**, located in Bukwo District, Uganda, was established in **2013** under the Full Gospel Churches of Uganda in partnership with Compassion International. The center supported over 300 children, representing about 85% of the vulnerable child population in its community, by providing education, healthcare, nutrition, spiritual guidance, and psychosocial counseling. Despite these achievements, Chesimat CDC still relies on paper files and spreadsheets to manage child registration, sponsorships, and donation records. This led to data duplication, misplaced records, and slow reporting, reducing transparency and operational efficiency. Therefore, there was a need for a Web-Based Child Development Centre Management System that automated child registration, sponsor management, donation tracking, and report generation, enhancing accountability, role-based access control, audit trails, and real-time processing, transparency, security, and operational efficiency and effectiveness in child development programs.

1.3 Problem Statement

Child development centers worldwide have adopted digital systems to improve data management, accountability, and service delivery(Shumona Sharmin, Becky Faith, 2017) . However, in developing regions like Uganda, many centers including Chesimat CDC in Centre Village, Kortek Sub-County, Bukwo District, which supported over 300 children still relied on manual record-keeping using paper files and spreadsheets. This led to data duplication, inconsistencies, misplaced records, and delays in reporting, which severely limited transparency and accountability for both staff and sponsors (Sampson et al., 2021) . Furthermore, tracking sponsorships and donations was highly inefficient, as contributions had to be matched manually. This administrative burden increased the risk of financial errors, delayed critical support to the children, and drastically reduced visibility for external donors.(Imediegwu & Elebe, 2023).

1.4 General Objective

To develop a Child Development Centre Management System that improves record-keeping, enhances efficiency, and supports decision-making at Chesimat CDC.

1.5 Specific Objectives

1. To identify the system requirements for the Web-Based Child Development Centre Management System at Chesimat CDC.
2. To design the proposed web-based management system for Chesimat CDC.
3. To implement the designed system for managing child, sponsor, and donation records.
4. To test and validate the functionality and performance of the developed system.

1.6 Research Questions

1. What are the requirements for the Web-Based Child Development Centre Management System at Chesimat CDC?
2. How can the proposed system be designed?
3. How can the Web-Based Child Development Centre Management System be implemented?
4. How effective and usable is the developed system?

1.7 Significance of the Study

The study and development of the Chesimat Child Development Center (CDC) Management System hold significance for stakeholders in as far as the Centre is concerned.

For Staff. The system will greatly simplify daily operations, particularly in data entry and child monitoring. By automating child registration and record-keeping, staff will be able to manage information more efficiently, reduce manual errors, and focus more on child care activities.

For Sponsors. Sponsors will benefit from increased transparency and accountability regarding their contributions. The system will allow sponsors to track how donations are allocated, monitor the progress of sponsored children, and receive timely updates on donation usage, thereby fostering trust and encouraging continued support.

For Management (admins). The management team will be able to access accurate and timely reports on child registration, sponsorship activities, and donations. This will enhance decision-making, improve oversight, and strengthen accountability mechanisms, enabling more effective management of resources and program outcomes.

For Researchers and Future Developers. The system provides a structured reference for researchers and developers interested in child development and

management information systems. It can serve as a baseline model for designing similar systems, facilitating further studies, innovations, and improvements in child care and development management.

1. 8 Scope of the Study

The scope of this study is defined along three major dimensions; content, geographical, Time, functional and technical scope.

1.8.1 Geographical Scope:

The study was conducted at Chesimat Child Development Centre located in Centre village, Kortek Sub County, Bukwo District, Eastern Uganda.

1.8.2 Content Scope

This study focuses on the development of a Web-Based Child Development Centre Management System for Chesimat CDC, covering key operations such as child registration with guardian details and photographs, sponsor management and linking sponsors to specific children, donation tracking and monitoring of contributions, and report generation to enhance transparency, accountability, and informed decision-making within the center.

1.8.3 Functional Scope

The system will support key functionalities including child registration with guardian details and photos, sponsor management and linking sponsors to children, donation tracking and recording, user authentication with role-based access (Admin, Staff, Sponsor), and report generation for monitoring child welfare and donations.

1.8.4 Technological Scope

The system will be developed as a web-based application using PHP for backend processing, MySQL for database management, and HTML, CSS, and JavaScript for the user interface. The system will be deployed on a local server environment WAMP and accessed through web browsers.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter reviews existing literature related to digital management systems used in child development and sponsorship organizations. The purpose of the review is to examine previous studies and systems relevant to the objectives of this study. It focuses on understanding current practices, system designs, implementation strategies, and evaluation methods. The review also identifies gaps in existing knowledge and systems, emphasizing the need for a tailored web-based management solution for Chesimat Child Development Centre (CDC).

2.2 Review of Existing Child Record Management Systems

This section identifies the requirements for a child development management system by critically comparing existing approaches. Literature highlights three primary categories of management platforms: manual records, spreadsheet-based frameworks, and enterprise NGO systems.

First, small organizations frequently rely on **manual record systems**, such as paper files and registers(ANGELLA, 2011). While these methods require no initial financial investment or technical expertise (**strength**), they possess severe operational **weaknesses**, as they are highly prone to physical damage, data duplication, and slow report generation.

Second, **spreadsheet-based approaches** offer the **strength** of improved data entry speed, basic digital calculations, and low deployment costs (**Richard Clarke, RTware, 1993**). However, their core **weaknesses** include a total lack of multi-user capabilities, no real-time updates, and absent security measures like role-based access control.

Third, **large enterprise systems**, such as those developed by Compassion International and Save the Children, display the **strength** of centralized data management, automated donor tracking, and comprehensive child progress monitoring. Nonetheless, their primary **weakness** is that they are highly resource-intensive, expensive, complex, and completely unsuitable for small-scale community centers (**Elbawab, 2024**). Identifying functional requirements such as child registration, sponsor tracking, donation management, and reporting is therefore critical to designing an effective system tailored to local needs.

2.3 System Design

This section focuses on the architectural design configurations required for child development management systems. Existing literature highlights that effective system design for child centers includes user-friendly interfaces, modular architectures, and secure access control (**Zhou, 2025**). When evaluating structural frameworks, studies compare traditional monolithic architectures against modern **Model-View-Controller (MVC) and modular frameworks**. Monolithic structures offer the **strength** of simple initial deployment; however, their core **weaknesses** are poor scalability and difficult code maintenance as system features grow. In contrast, modular MVC frameworks possess the distinct **strengths** of high scalability, easier maintainability, and clean separation between the user interface and database logic. Furthermore, while offline desktop applications provide the **strength** of working without internet, their primary **weakness** is the lack of real-time data synchronization across multiple users. **Web-based architectures** overcome this by providing the **strength** of centralized data consistency and seamless multi-user access. A critical **gap** in existing system

design literature is that complex MVC frameworks are rarely optimized for rural deployment where bandwidth is low and users have minimal technical expertise. The design for the Chesimat CDC system directly **fills this gap**. It utilizes a lightweight web-based MVC architecture that retains the robust security and multi-user strengths of modern frameworks, but simplifies navigation into an ultra-low-overhead interface. This allows staff, administrators, and sponsors to interact with the system efficiently while ensuring strict data security and operational simplicity.

2.4 System Implementation

It relates to the implementation of the system. Literature indicates that web-based technologies such as **PHP, MySQL, HTML, CSS, and JavaScript** are widely used for similar management systems due to their cost-effectiveness, flexibility, and ease of deployment (**Dr. A. S. Manekar, 2023**). Implementation studies highlight the importance of database normalization, secure authentication, and multi-user concurrency to maintain data integrity. In the context of Chesimat CDC, a system implemented using these technologies can support multiple users simultaneously, centralize child and sponsor information, and enable real-time updates, providing a practical and affordable solution.

2.5 System Testing and Evaluation

This addresses system testing and evaluation. Literature identifies several key testing techniques for management systems, including **unit testing, integration testing, and user acceptance testing**. Unit testing ensures individual components function correctly, integration testing verifies that modules interact seamlessly, and user acceptance testing evaluates whether the system meets user expectations and requirements. Evaluation studies also emphasize usability testing, which assesses ease of use, navigation, and satisfaction among system users. Applying these testing and evaluation techniques ensures that a system like the one proposed for Chesimat CDC is reliable, secure, and meets the operational needs of staff and sponsors.

2.6 Research Gap

A review of existing literature and systems revealed several structural limitations. Prior researchers primarily evaluated systems implemented by large, resourceful non-governmental organizations (NGOs) (**Gillespie, 2004**). While these enterprise systems possessed the **strength** of robust, comprehensive data tracking across multiple international branches, they also carried significant **weaknesses**. Specifically, they were highly complex, resource-intensive, expensive, and completely untailored to local operational challenges, such as intermittent internet connectivity and minimal technical expertise. Furthermore, existing systems suffered from a major **literature and functional gap**, as there was limited documentation and design focus on how digital platforms could practically improve sponsor transparency, child progress tracking, and localized reporting efficiency in small, rural centers.

The system developed for Chesimat CDC directly **filled these gaps** by introducing a low-cost, lightweight web-based management system. Unlike the complex enterprise software reviewed, this system provided a highly simplified, localized interface that eliminated resource-heavy overhead, balanced manual administrative workflows, and offered direct visibility to external sponsors within a resource-constrained setting.

CHAPTER THREE: METHODOLOGY

3.1 Introduction

This chapter presents the methodology adopted in the design and implementation of the Chesimat Child Development Centre (CDC) Management System. It outlines the research type, area of study, population, data collection methods, and the system development process. The chapter further explains the tools, technologies, and design models used, including the use case and entity-relationship diagrams. The goal is to ensure that the proposed system is developed systematically, efficiently, and effectively to address the existing challenges in Chesimat CDC's manual operations.

3.2 Type of Research and development approach

The study adopted an applied research approach combined with a system development methodology, suitable for addressing real-world problems through practical implementation of ICT tools. Applied research was chosen because the project sought to design and implement a working digital solution to replace manual record management at Chesimat CDC. The Agile methodology was adopted due to its iterative nature, allowing for flexibility and regular feedback from users throughout system development. This ensured that the final system meets user needs, is easy to use, and is adaptable to future changes.

3.3 Area of Study

The project was conducted at Chesimat Child Development Centre (**CDC**) kortek Sub County, located in Eastern Uganda under the Full Gospel Churches of Uganda. The center provided education, healthcare, and sponsorship support to over 300 children from vulnerable communities. The Centre used manual records such as registers and spreadsheets, which presented several operational challenges. Therefore, Chesimat CDC provided an ideal study area for the implementation of a digital child management system.

3.4 Population and Sampling Method

The study population included staff, administrators, and sponsors at Chesimat CDC. A purposive sampling technique was used to select individuals directly involved in managing child data, sponsorships, and donations. The sample included at least one administrator, 5 staff members responsible for data entry, and 10 sponsors and 4 care takers all totaling to 20. Their feedback was essential in gathering accurate system requirements, testing the system, and evaluating its effectiveness.

3.5 Data Collection methods and instruments

Data was collected using interviews, observation, and document review methods. Interviews were conducted with the Centre's staff and administrators to understand the challenges of the manual record system and identify user requirements for the new digital platform. Observation was used to analyze daily workflows and how data was recorded, accessed, and reported. Document review involved examining existing registers and spreadsheets to understand the data structure. The collected information was analyzed qualitatively to identify system functionalities, user roles, and non-functional expectations such as performance, usability, and security.

3.6 Data analysis methods

The data collected was analyzed using qualitative and quantitative methods. Qualitative data obtained from interviews and observations was analyzed using thematic analysis to identify key patterns, challenges, and system requirements. Quantitative data, where applicable, was analyzed using descriptive statistics to summarize findings. The results of the analysis was used to guide system design and development.

3.7 System Design

3.7.1 Context Diagram

The context diagram presented the system as a single, unified process and illustrated its interactions with external entities, including Admin, Staff, and Sponsors. It provided a high-level overview of how information flowed between the system and these users, showing inputs such as child and sponsor data, and outputs such as reports and notifications. This diagram ensured a clear understanding of the system boundaries and the main sources and destinations of information.

3.7.2 Data Flow Diagrams (DFDs)

Data Flow Diagrams described how data moved through the system at different levels of detail. The Level 0 DFD gave an overall view of the system, showing major processes like registration, donation tracking, and reporting. Level 1 and Level 2 DFDs broke down these processes further, detailing how child, sponsor, and donation data were captured, validated, stored, and processed. DFDs helped identify inputs, outputs, storage, and processing steps, ensuring that data flow was logical and efficient.

3.7.3 Use Case Diagram

The Use Case Diagram illustrated the interactions between the system and its users. It defined the roles and responsibilities of Admin, Staff, and Sponsors. For example, Admin could manage users, approve sponsorships, and generate reports; Staff could register children and record donations; Sponsors could view sponsored children and monitor their contributions. This diagram ensured that all functional requirements were mapped to specific user actions, improving clarity during system development.

3.7.4 Entity Relationship Diagram (ERD)

The ERD defined the database structure of the system, showing the main entities such as Children, Sponsors, Donations, and Users, and their relationships. Primary and foreign keys were used to maintain data integrity and ensure consistency across tables. The ERD guided the creation of the relational database, helping developers understand how records are linked and how queries can efficiently retrieve information for reporting and operations.

3.8 System implementation

The implementation of the Chesimat CDC system involved developing a stable backend and a user-friendly frontend that support the daily operations of child registration, sponsor management, and donation tracking. The backend was implemented using **PHP** as the core server-side language because of its compatibility with WAMP/WAMP and its ability to efficiently process form submissions, handle file uploads such as child photos, and manage user authentication. **MySQL** was used to store all system data, including child profiles, sponsor information, staff accounts, and donation records. Structured queries, secure prepared statements, and relational tables ensured that data was stored consistently and could be retrieved quickly when generating reports or dashboards. The frontend was built using **HTML, CSS, and JavaScript** to provide an intuitive interaction layer for staff and sponsors. HTML structured the content, CSS ensures a clean and professional design that reflects the organization's identity, and JavaScript enhanced the system with real-time validations, responsive navigation, and dynamic interface behaviors. Together, these technologies created a functional, secure, and easy-to-use system that supported all Chesimat CDC workflows.

3.9 System Testing and evaluation

3.9.1 Unit Testing

Unit testing involved verifying the functionality of individual modules of the Chesimat CDC Management System, such as child registration, sponsor

management, and donation recording. Each module was tested separately to ensure it could perform correctly, accept valid inputs, and handle invalid inputs gracefully. This ensured that each part of the system works as intended before integrating it with other modules.

3.9.2 Integration Testing

Integration testing focused on ensuring that all modules of the system worked together seamlessly. For example, when a sponsor makes a donation, the system correctly links the contribution to the child's record and updates reports in real time. This testing ensured that data flows properly between modules and that combined functionality met user requirements.

3.9.3 Usability Testing

Usability testing evaluated how easy and intuitive the system was for staff and sponsors to use. It examined navigation, clarity of forms, dashboard interfaces, and workflow efficiency. Feedback from users helped identify areas that caused confusion or delay, allowing improvements to make the system more user-friendly, especially for staff with limited computer experience.

3.9.4 Security Testing

Security testing verified that the system effectively protected sensitive information. It ensured that user authentication, role-based access control, password encryption, and secure data storage were functioning correctly. This test prevented unauthorized access and safeguarded personal information of children and sponsors, enhancing overall trust and reliability of the system.

3.10 Ethical considerations

The study ensured **informed consent**, with all participants aware of the purpose and able to withdraw at any time. **Confidentiality** of children, staff, and sponsors was maintained, and sensitive data was securely stored. Participation was

voluntary, and the system used secure logins and role-based access to protect information. These measures ensured ethical standards are upheld throughout the research and system development

3.11 Schedule.

The development of the Chesimat CDC Management System was carried out over a period of three to four months, following a structured schedule that ensured all project activities were completed efficiently. The timeline covered all phases of the system development life cycle, starting with requirements gathering, followed by system analysis, design, implementation, testing, and finally deployment. Each phase was allocated sufficient time to ensure thorough completion, with iterative feedback incorporated during development to address any challenges promptly. This structured approach ensured that tasks were completed in a logical order, resources were effectively allocated, and the system was delivered on time while maintaining quality standards.

Gantt Chart – Chesimat CDC Management System Development

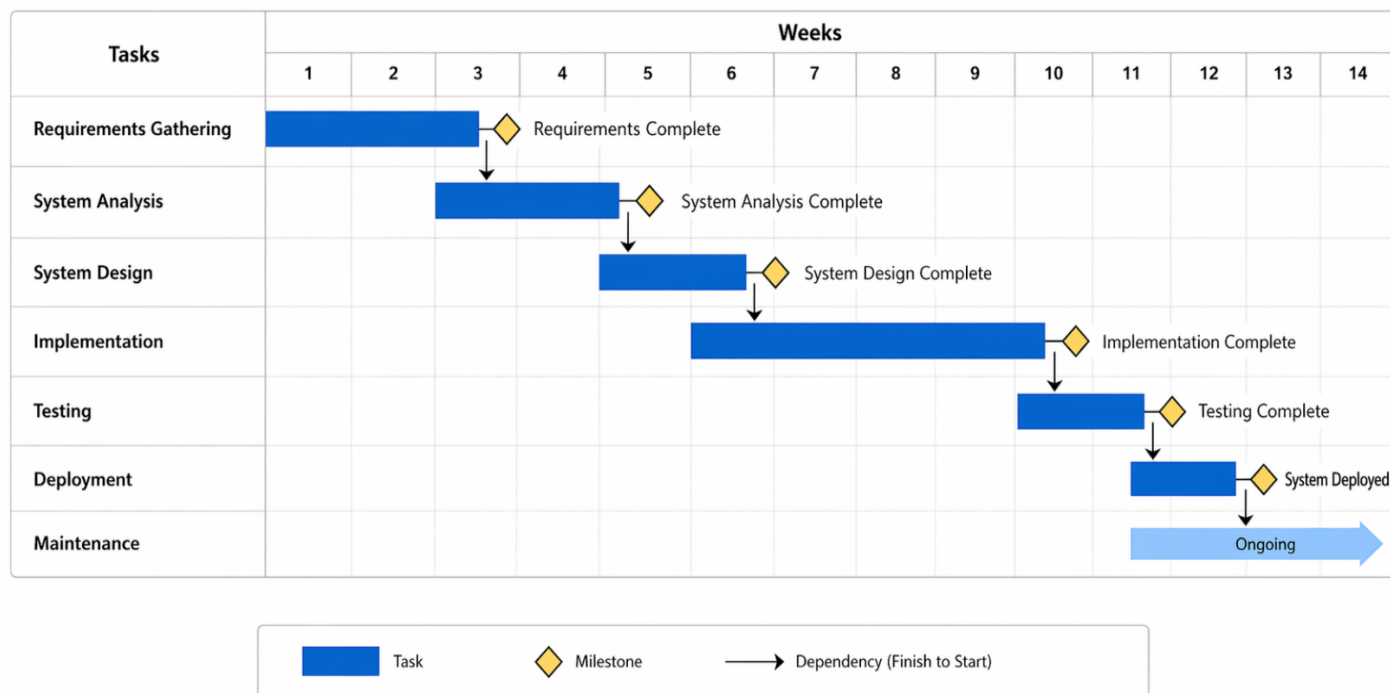


Figure 1: showing schedules for activities

3.12 Budget / Financial Plan

The estimated budget for the development and implementation of the Chesimat CDC Management System was carefully prepared to cover all necessary resources and activities. The budget included costs for software development tools, Data Collection & Documentation and miscellaneous expenses required to successfully complete the project. All amounts were expressed in Ugandan Shillings (UGX).

- System Development Tools & Software Licenses: UGX 100,000
- Data Collection & Documentation: UGX 40,000
- Miscellaneous Expenses (internet, transport, contingency): UGX 60,000

The total estimated budget was UGX 200,000, ensuring that all aspects of system development, deployment, and initial operation were adequately funded. The attached bar chart provided a visual breakdown of the budget, allowing for clear understanding of how resources were allocated across project components. This

financial plan ensured the project was both feasible and sustainable while meeting the operational needs of Chesimat CDC.

CHAPTER FOUR: SYSTEM ANALYSIS AND DESIGN

4.0 Introduction

This chapter presents, analyzes, and discusses the findings of the study on the development of a Web-Based Records Management System for Chesimat Child Development Centre (CDC). The chapter focuses on the analysis of the existing manual system, presentation of collected data, interpretation of findings, and identification of system requirements for the proposed system.

Data was collected from administrators (1), staff members (5), caretakers (4), and sponsors (10) through interviews and observation. The findings helped to identify the challenges in the current manual workflows, including difficulties in record management, reporting, communication, and data security. The chapter also presents stakeholder expectations and translates the findings into functional and non-functional requirements for the proposed system.

The findings addressed Objective One of the study by identifying the system requirements needed to improve child registration, sponsor management, donation tracking, reporting, and user access control. The findings also provided a foundation for Objective Two by guiding the design of the proposed system through the development of system models such as the Context Diagram, Data Flow Diagrams (DFDs), Use Case Diagram, and Entity Relationship Diagram (ERD). Furthermore, the findings were consistent with the literature reviewed in Chapter Two, which emphasized the importance of centralized record management, automated reporting, and secure access control in improving organizational efficiency.

4.1 Analysis of the Existing System

4.1.1 Current System Workflow

At Chesimat Child Development Centre (CDC), child records, sponsor information, and donation data are managed using manual tools such as paper files, registers, logbooks, and Microsoft Excel spreadsheets. Staff manually record and store all information related to child registration, sponsorship, and donations.

When a child is registered, details such as name, date of birth, guardian information, and photographs are recorded in physical files. Sponsors are tracked using separate manual lists, while donations are entered into logbooks or Excel sheets.

Although this system is simple to use, investigation revealed that it makes record retrieval, information updating, and report generation slow and time-consuming. As the number of children and sponsors increases, the manual system becomes increasingly inefficient and difficult to manage.

4.1.2 Strengths of the Existing System

Despite its operational limitations, the existing manual system possesses several strengths, including:

- **Simplicity:** The system is straightforward and easy to understand for staff members who possess basic computer literacy and records management skills.
- **Low Training Requirements:** The system does not require advanced technical knowledge or specialized training for personnel to operate effectively.
- **Low Operational Requirements:** Paper records, registers, and spreadsheets are easy to create, access, and maintain using locally available resources.
- **Offline Accessibility:** The system does not depend on active internet connectivity, which makes it reliable in areas experiencing unstable network access.

- **Physical Backup Availability:** Physical files and folders serve as tangible backup records in the event of power failures, hardware malfunctions, or system breakdowns.

Low Maintenance Costs: The manual system operates with minimal financial overhead since it primarily relies on readily available stationery and basic desktop applications.

4.1.3 Weaknesses of the Existing System

The manual and file-based system at Chesimat CDC exhibits several operational limitations that affect efficiency, accuracy, security, and scalability. These weaknesses include:

- **Slow Record Retrieval:** Staff experience significant delays when accessing records due to the necessity of searching manually through physical files and logs.
- **Data Duplication and Redundancy:** Repeated manual entry of information across different registers leads to duplicated records and data inconsistencies.
- **Risk of Data Loss:** Physical records remain highly vulnerable to misplacement, damage, degradation, or loss from environmental hazards and disasters.
- **Time-Consuming Reporting:** The generation of reports is slow, labor-intensive, and highly prone to human error.
- **Limited Concurrency:** The system restricts effective multi-user access because physical records can only be handled by one person at a time.
- **Lack of Real-Time Updates:** Stakeholders and administrators are unable to access up-to-date information, which results in communication delays and information asymmetry.
- **Weak Security Controls:** The absence of strict access control mechanisms exposes sensitive records to unauthorized access and compromises data confidentiality.
- **Poor Scalability:** The manual system struggles to efficiently manage increasing volumes of child and sponsor records as the organization grows.

4.2.0 Study Population and Sample Size Justification

To ensure the system requirements accurately reflected the operational needs of Chesimat CDC, data was collected from a target population of key stakeholders.

Table 1: Study Population and Sampling Matrix

Stakeholder Category	Target Population (N)	Sample Size (n)	Sampling Technique	Rationale / Justification
Administrators	1	1	Census / Purposive	The single administrator had total oversight of the center's operations and policy decisions.
Staff Members	6	5	Purposive Sampling	Staff interacted directly with child and donor records daily. Selecting 5 out of 6 ensured maximum operational insight.
Caretakers	20	4	Convenience Sampling	Caretakers provided localized feedback on how child data was handled. A sample of 4 was chosen based on availability during field visits.
Sponsors	30	10	Simple Random Sampling	10 out of 30 active sponsors were randomly selected to give unbiased feedback on the external donation tracking interface.
Total	57	20	Mixed Methods	A total sample of 20 respondents represented 35% of the entire target population, which was statistically significant for a system development study.

4.2.1 Respondent Categories

Table 1 presents the categories and frequency of the stakeholders who participated in the study.

Table 2: showing respondent categories

Respondent Category	Frequency
Administrators	1
Staff Members	5
Caretakers	4
Sponsors	10
Total	20

The findings indicated that all stakeholder groups participated with sponsors and staff providing the majority of the responses.

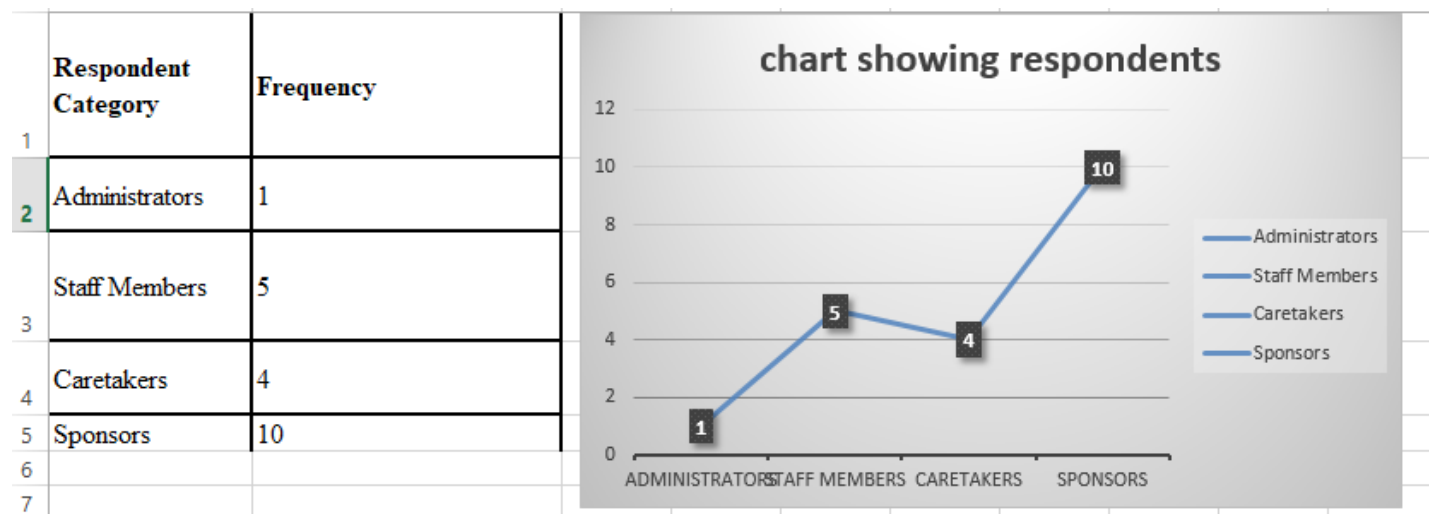


Figure 2: showing respondents at Chesimat CDC

Analysis: The high participation rate from sponsors 50% and staff members 25% ensures that the primary end-users and external stakeholders of the system are

well-represented. This balanced feedback helps to align the system design with actual operational and funding tracking needs.

4.2.2 Current Record Management Methods

Table 2 illustrate the primary methods currently used by the center to manage records.

Table 3: showing current records management

Method	Frequency
Paper files	4
Excel spreadsheets	4
Logbooks	2
Exercise books	2
Total	12

The results revealed that Chesimat CDC mainly relied on manual record-keeping tools, which were found to be inefficient for large-scale data management.

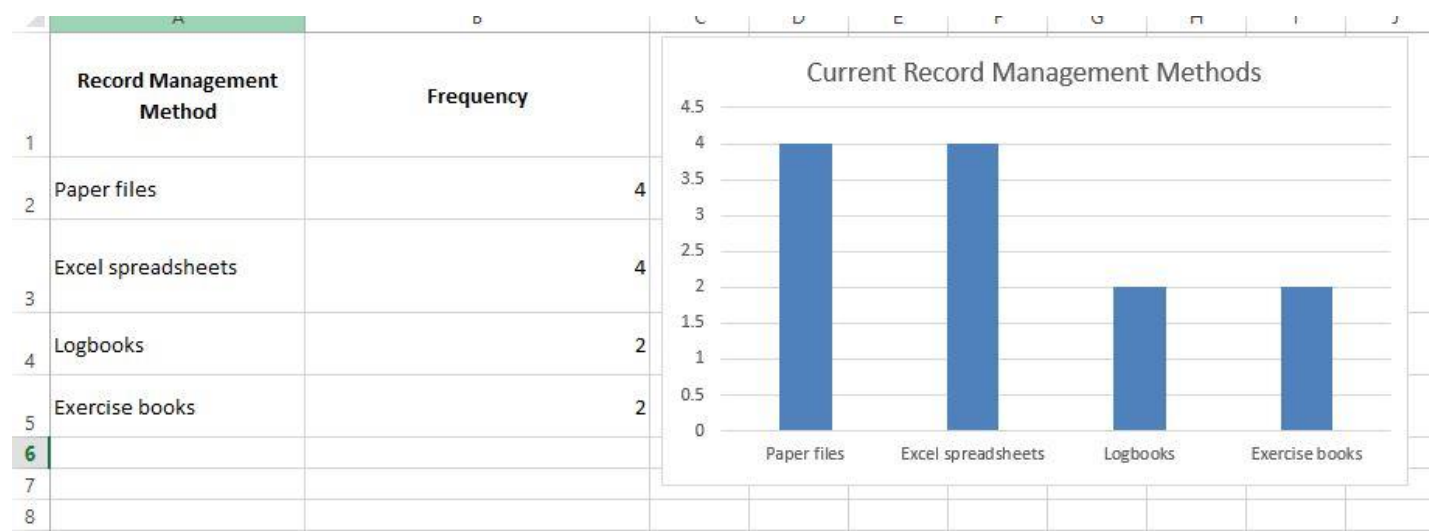


Figure 3: showing current records management methods

Analysis: The data shows a heavy reliance on fragmented, non-centralized methods like paper files and personal Excel sheets. This decentralized approach directly causes the data redundancy, slow retrieval times, and security vulnerabilities identified in the existing system workflow. It justifies the urgent need for a unified database.

4.2.3 Required System Modules

Table 3 outlines the system modules that stakeholders identified as essential.

Table 4: shows required system modules

Module	Frequency
Child Registration	4
Sponsor Tracking	4
Donation Tracking	4
Reporting	3
Notifications	3
Search Functionality	2
Total	20

The findings highlighted a strong need for a centralized system that integrated core operational modules.

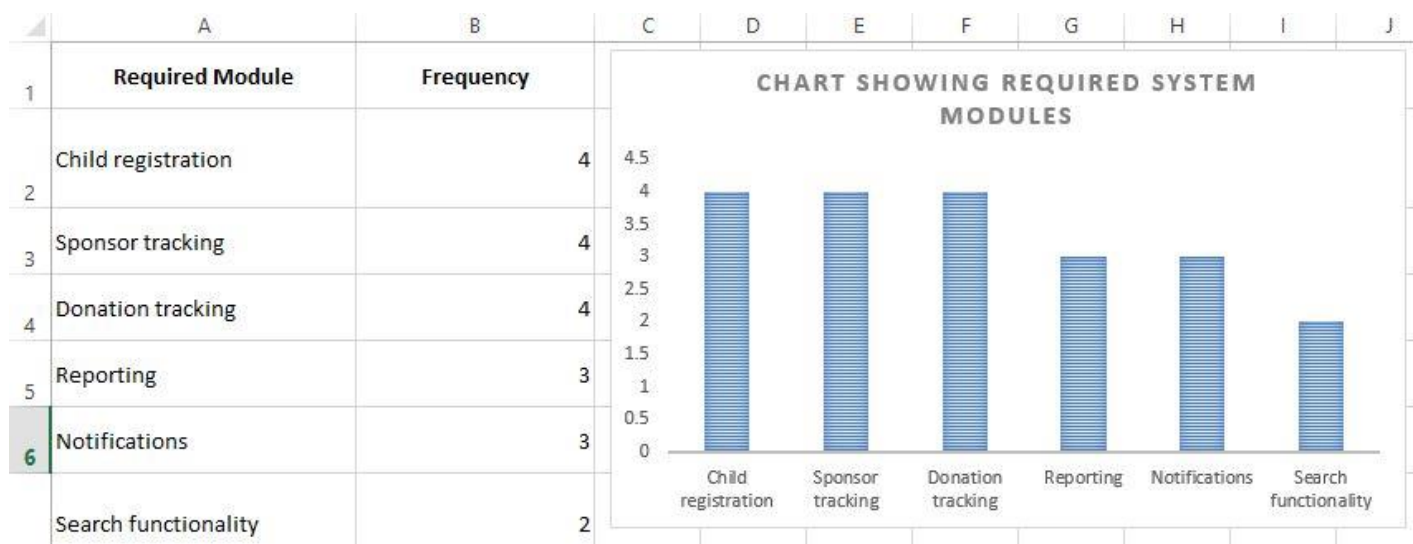


Figure 4: showing required system modules

Analysis: The equal demand for child registration, sponsor tracking, and donation tracking (4 responses each) indicates that these three modules form the core functional architecture of Chesimat CDC. Therefore, the proposed web system must prioritize these modules to effectively automate daily workflows.

4.2.4 Security and Access Requirements

Table 4 displays the security features prioritized by the respondents.

Table 5: shows security and access requirements

Requirement	Frequency
Role-Based Access Control	4
Password Protection	4
Restricted Access	3
Total	11

Security features were considered essential by stakeholders for protecting sensitive child and donor information.

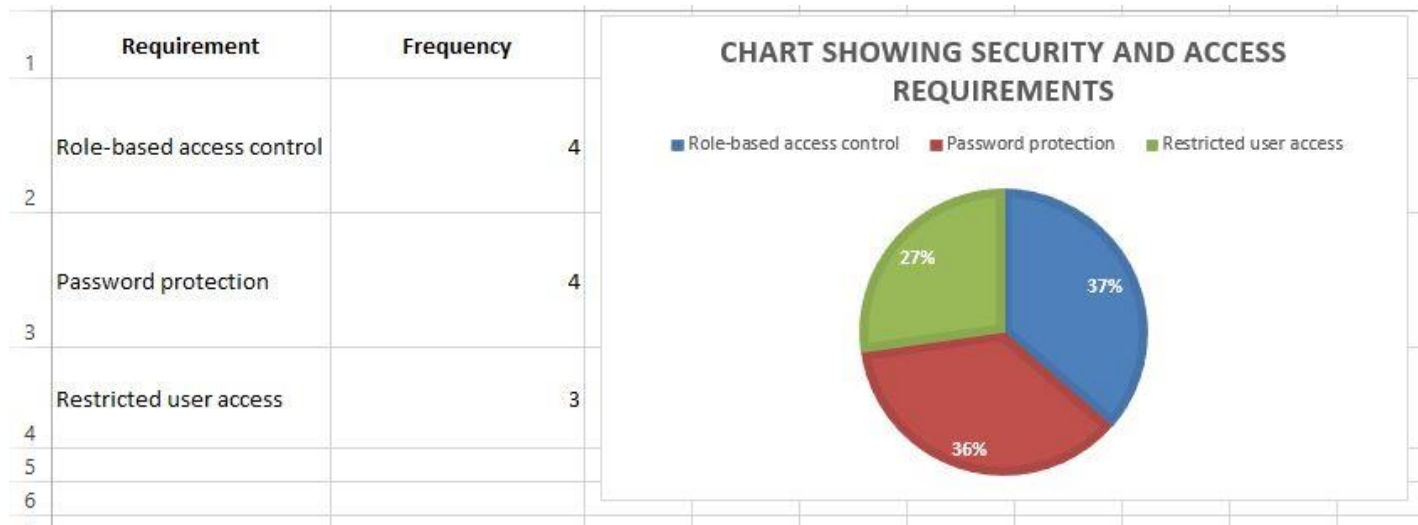


Figure 5: showing security and access requirements

Analysis: Because the center handles sensitive demographic and financial data, stakeholders heavily prioritized role-based access control and password protection. This analysis implies that the proposed system cannot use a general login; it must implement distinct access levels (e.g., Admin vs. Staff vs. Sponsor) to maintain data confidentiality.

4.2.5 Expected Improvements

Table 6: shows expected improvements

Improvement	Frequency
Improved Transparency	5
Reduced Paperwork	4
Faster Reporting	4
Improved Accuracy	4
Better Communication	3
Reduced Workload	3
Total	23

Respondents expected improved efficiency, accuracy, and transparency through the proposed system.

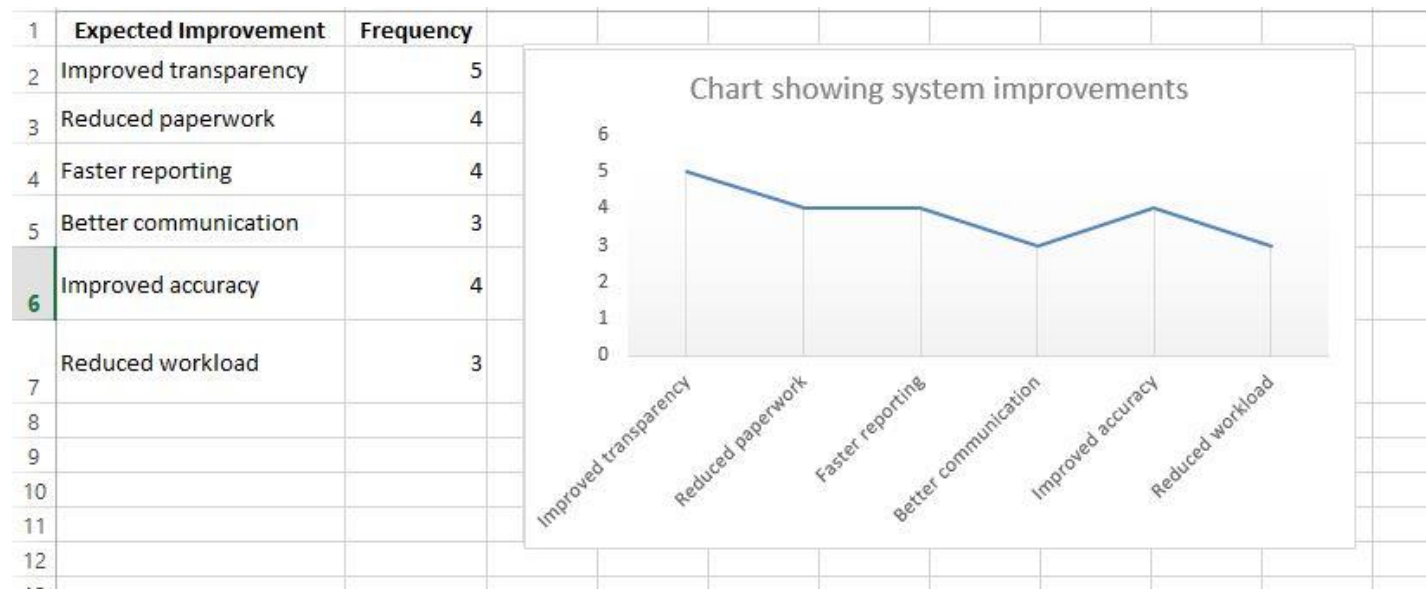


Figure 6: showing system improvements

Analysis: The high expectation for improved transparency (5) and reduced paperwork (4) demonstrates that stakeholders are looking for real-time visibility into operations. The web system must therefore feature automated report generation and direct dashboard updates to deliver these expected efficiencies.

4.3 Requirements Analysis

In order for the developer to understand the actual needs of users at Chesimat Child Development Centre (CDC), a requirements analysis was conducted. The purpose of the analysis was to gather and identify the specific features required for the proposed Web-Based Child Development Centre Management System. The requirements gathered included user requirements, functional requirements, non-functional requirements, and system requirements.

4.3.1 User Requirements

Interviews and discussions were conducted with the intended users of the system, including administrators, staff members, caretakers, and sponsors. First-hand information was collected concerning their expectations of the proposed system. The gathered user expectations were translated into SMART (Specific, Measurable, Actionable, Realistic, and Time-bound) requirements as detailed below:

- i. Usability and Learnability: The system was required to be intuitive enough that staff members with basic computer literacy could learn to complete basic record management tasks within 2 hours of initial training.
- ii. Data Accuracy and Reliability: The system was required to maintain a 100% accurate database with zero data contradictions between matching child records, sponsor details, and donation entries.
- iii. System Speed and Performance: The system was required to complete daily operations, such as search operations and data updates, with a system response time of less than 3 seconds per action.
- iv. Access Control and Security: The system was required to restrict access using secure login credentials, blocking unauthorized users and automatically locking inactive sessions after 15 minutes.
- v. Navigation and User Interface: The system was required to feature a clean user interface that allowed users to navigate between any two primary pages within a single click.
- vi. Error Validation: The system was required to incorporate real-time form validation that rejected invalid data formats (e.g., non-numeric phone numbers or invalid email formats) within 1 second of entry.
- vii. Secure Storage and Data Retrieval: The database was required to store child, sponsor, and donation records securely, allowing authorized queries to fetch requested history logs within 2 seconds.

viii. Automated Report Generation: The system was required to compile and generate real-time operational or financial reports for management decision-making in less than 5 seconds upon user request.

ix. Media Uploading Capabilities: The system was required to support the simultaneous uploading and rendering of children's photographs and documents, handling file sizes up to 5MB per upload.

x. Communication and Coordination: The system was required to improve stakeholder coordination by sending automated dashboard notifications or email updates within 10 seconds of a donation or record update.

The intended users of the system therefore required only basic computer skills and did not need specialized technical knowledge to operate the Web-Based Child Development Centre Management System effectively.

4.3.2 Functional Requirements

The functional requirements define the specific services and operations that the Chesimat Child Development Centre Records Management System must perform. To ensure **strict traceability**, every system requirement developed maps directly back to the specific needs and gaps identified during the field study

Based on the study findings, the system fulfills the following functional requirements:

- **Child Registration Module:** Driven by the finding that manual paperwork causes data loss, this module allows users to register children, capture bio-data, and upload photographs.
- **Sponsor Management Module:** Responding to stakeholder complaints about poor communication, this feature registers sponsors and links them directly to specific children.

- **Donation Management Module:** Developed directly from the finding that donation tracking lacks transparency, this module records and tracks all incoming funds and gifts.
- **Report Generation Module:** To meet the stakeholder need for better decision-making, the system generates real-time reports on children, sponsors, and financial donations.
- **User Authentication and Role-Based Access Control:** To address critical security gaps raised by respondents, the system restricts access based on three roles: Admin, Staff, and Sponsors.
- **Data Manipulation Operations:** To enhance administrative efficiency, the system supports searching, updating, and deleting records securely

4.3.3 Non-Functional Requirements.

The non-functional requirements define the quality and performance aspects of the Chesimat Child Development Centre system. The system is fast and responsive when processing and retrieving data to improve efficiency. It is reliable and available for use whenever needed, with minimal downtime. The system is also secure by implementing role-based access control and protecting sensitive data from unauthorized access. In addition, it is user-friendly so that staff with basic computer skills can easily operate it, and it is scalable to accommodate increasing numbers of children, sponsors, and records over time.

4.3.4 System Requirements

Hardware Requirements

- Computer or laptop (RAM 4GB or higher)
- Hard disk (minimum 80GB)
- Stable power supply or UPS
- Internet-enabled device (for online access)

Software Requirements

- XAMPP/WAMP Server
- Windows 10/11 Operating System
- Web browser (Google Chrome, Mozilla Firefox)
- MySQL Database
- PHP for backend development.

4.4 System Design

The design of the Chesimat Child Development Centre (CDC) Management System followed the agile methodology, which supported iterative development and continuous user feedback. This approach ensured the system met the needs of users such as administrators, staff, and sponsors. The design included system architecture, context diagram, data flow diagrams (DFDs), use case diagram, and entity relationship diagram (ERD), all of which defined how data for children, sponsors, and donations is processed, stored, and managed efficiently within the system.

4.4.1 System Architecture

The Chesimat CDC system was designed using a 3-tier architecture consisting of the Presentation Layer, Application Layer, and Database Layer. The Presentation Layer was built using HTML, CSS, and JavaScript to provide the user interface, while the Application Layer used PHP to handle system logic and processing. The Database Layer used MySQL to store and manage all system data. The system supported different users including Admin, Staff, and Sponsors, each with different access levels.

4.4.2 Context Diagram

The system interacts with three main external entities: Admin, Staff, and Sponsors. The system receives inputs such as child registration data, sponsor details, and donation records. It produces outputs including reports, notifications,

and child progress updates, which help improve transparency and communication within Chesimat CDC.

CONTEXT DIAGRAM – CHESIMAT CDC MANAGEMENT SYSTEM

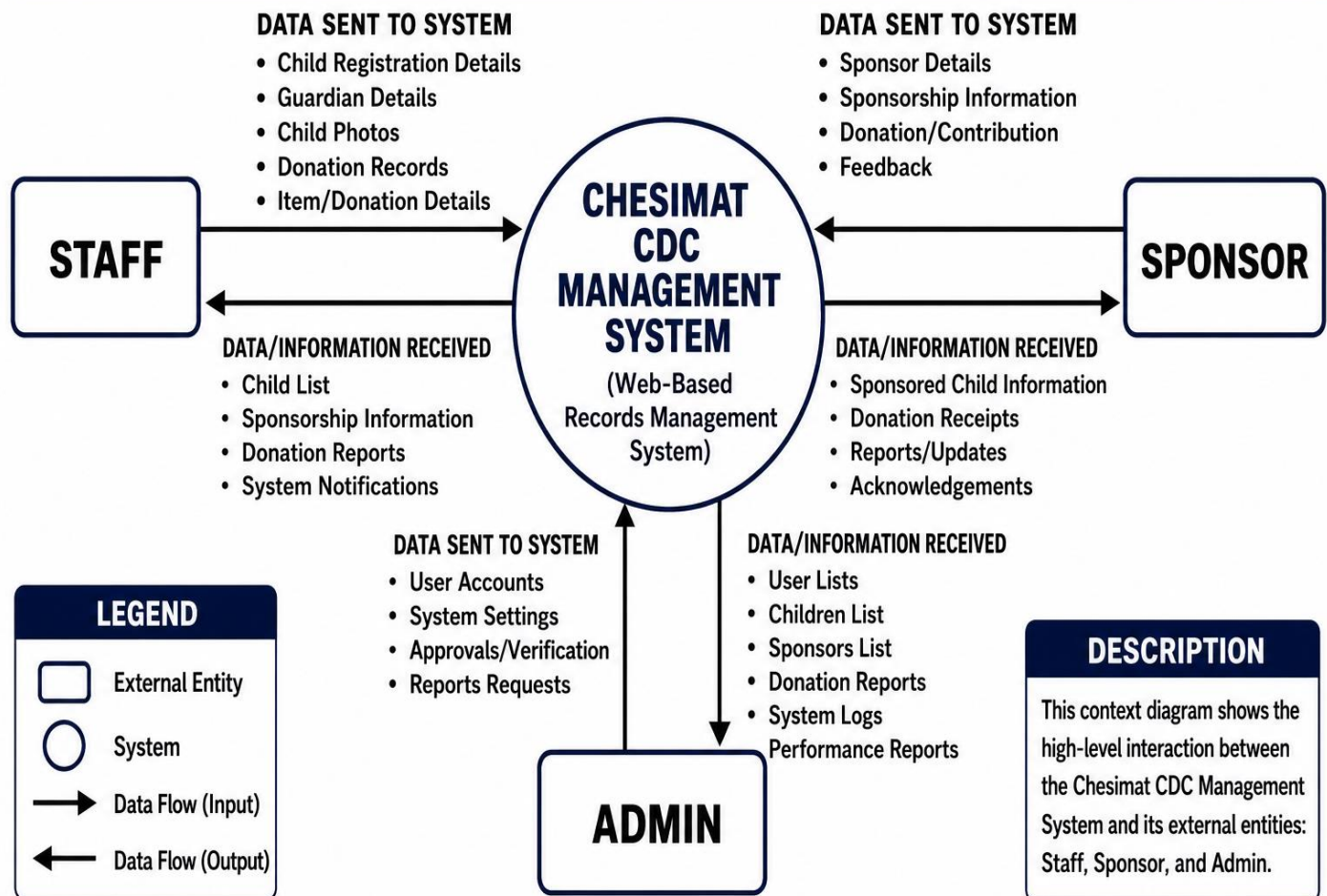


Figure 7: showing context diagram

4.4.3 Data Flow Diagram (DFD)

The system processes included child registration, sponsor management, donation tracking, and report generation. The DFD was structured in levels where Level 0 shows the system as a single process, Level 1 breaks down the main modules, and Level 2 provided detailed data processing flows within each module to show how information moved through the system.

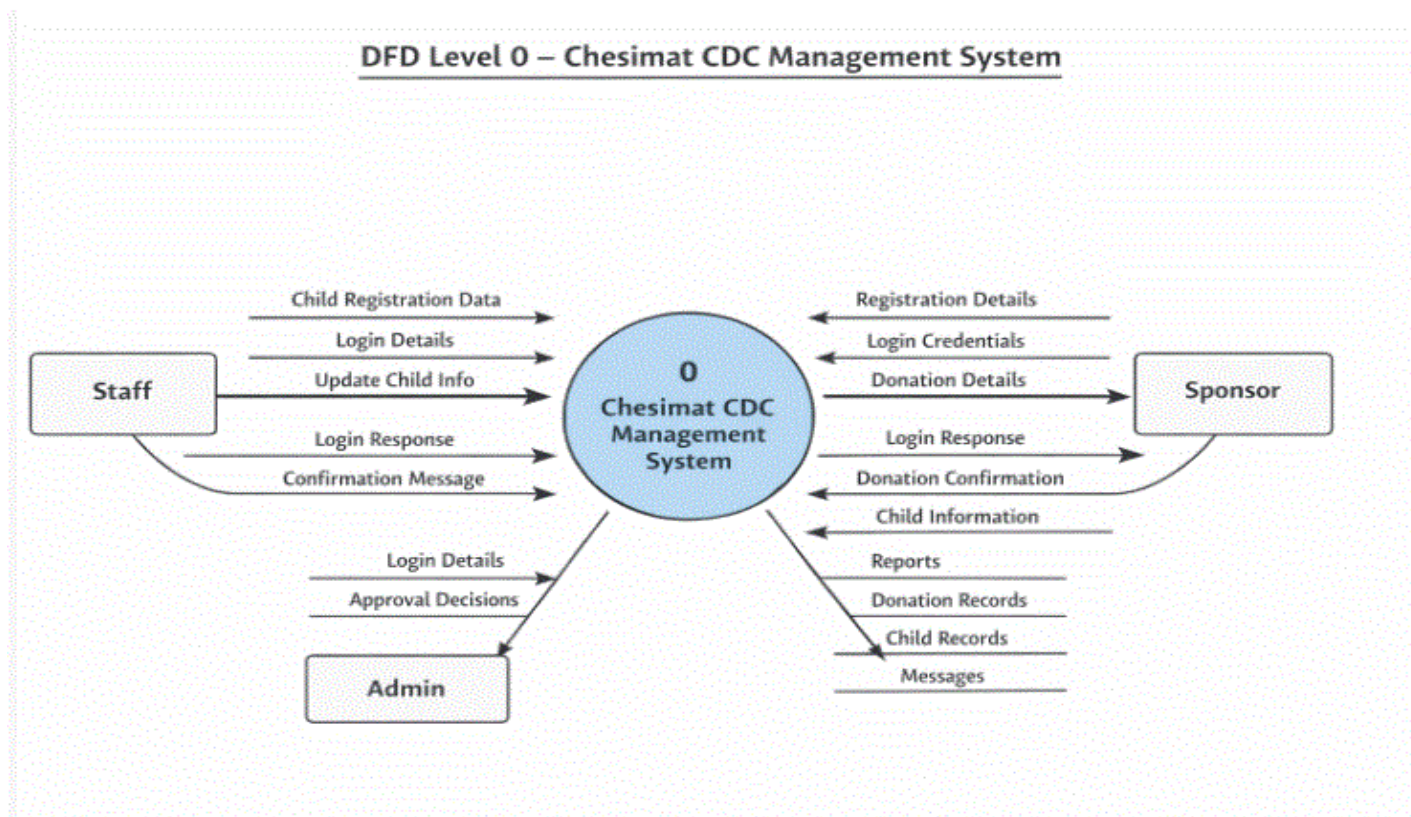


Figure 8: showing level 0 diagram of DFD

DFD Level 1 – Chesimat CDC Management System

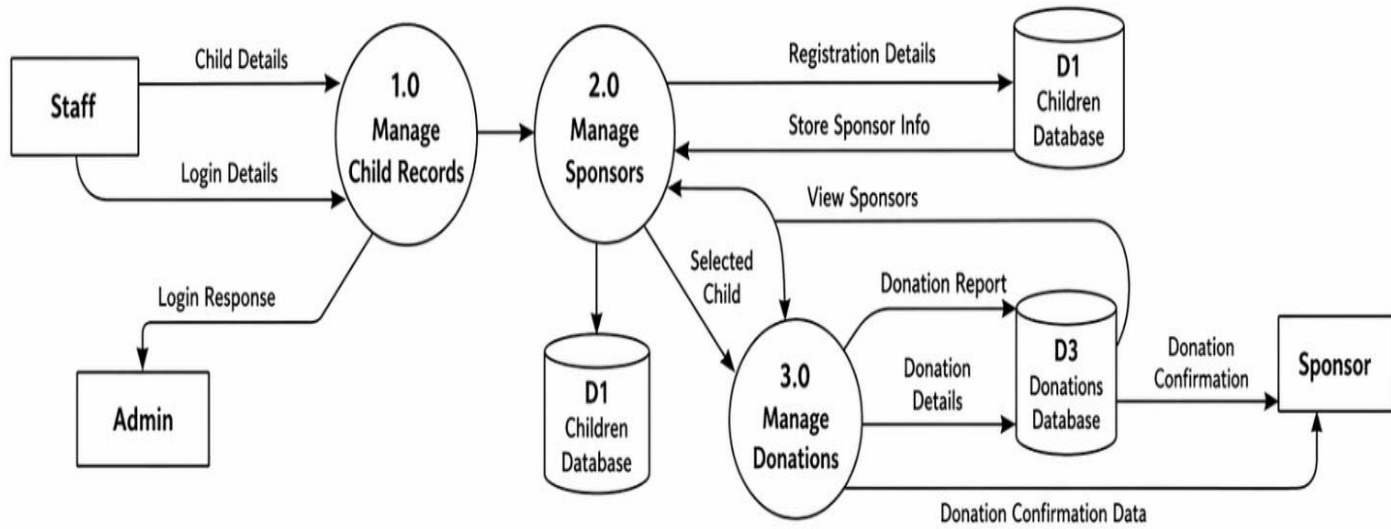


Figure 9: showing level 1 of DFD

DFD Level 2 – Donation Management Process (Decomposition of 3.0 Manage Donations)

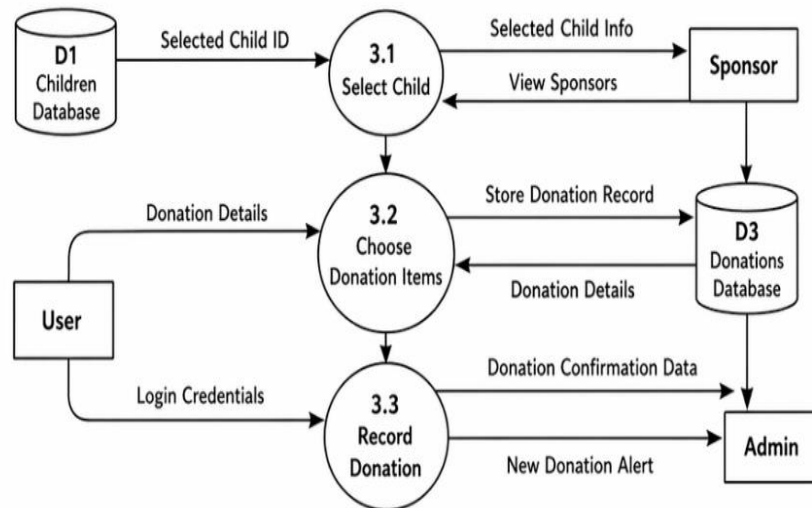


Figure 10: showing level 2 of DFD

Table 7: shows data flow diagram processes and data stores

Process No.	Process Name	Description of Process	Inputs	Outputs
1.0	Manage Child Records	This process is responsible for capturing, updating, storing, and managing children's information within the Chesimat CDC Management System. It also validates login details from staff members before granting access.	Child details, login details	Login response, updated child records
2.0	Manage Sponsors	This process handles sponsor registration, storage of sponsor information, viewing sponsor details, and linking sponsors to selected children.	Sponsor information, selected child details	Stored sponsor information, sponsor records, selected child information
3.0	Manage Donations	This process manages donations made by sponsors for selected children. It records donation details, generates donation reports, and sends donation confirmation information to sponsors and Administrators	Donation details, selected child data	Donation report, donation confirmation, stored donation records

Process No.	Process Name	Description of Process	Inputs	Outputs
D1	Children Database	Stores and retrieves information related to registered children and linked sponsor information.	Registration details, sponsor details	Child information, selected child records
D3	Donations Database	Stores donation transactions, donation reports, and confirmation data for future reference and reporting.	Donation details, donation records	Donation reports, donation confirmation data

Table 8: shows Data dictionary for External Entities in the level 1 DFD (Chesimat CDC)

System User	Description	Requirements
Admin	Manages entire system and oversees operations	Login, manage users, manage staff, view all children, manage sponsors, approve donations, generate reports
Staff	Handles child registration and daily records	Login, register children, update child records, record donations, view assigned children
Sponsor	Supports children financially/materially	Login, view sponsored child, track donations, receive updates, view progress reports

4.4.4 Use Case Diagram

The system had three main actors: Admin, Staff, and Sponsor. The Admin manages users, approves sponsorships, and generates reports. Staff were responsible for registering children, recording donations, and updating records. Sponsors could view their sponsored children, track donations, and access progress reports through the system.

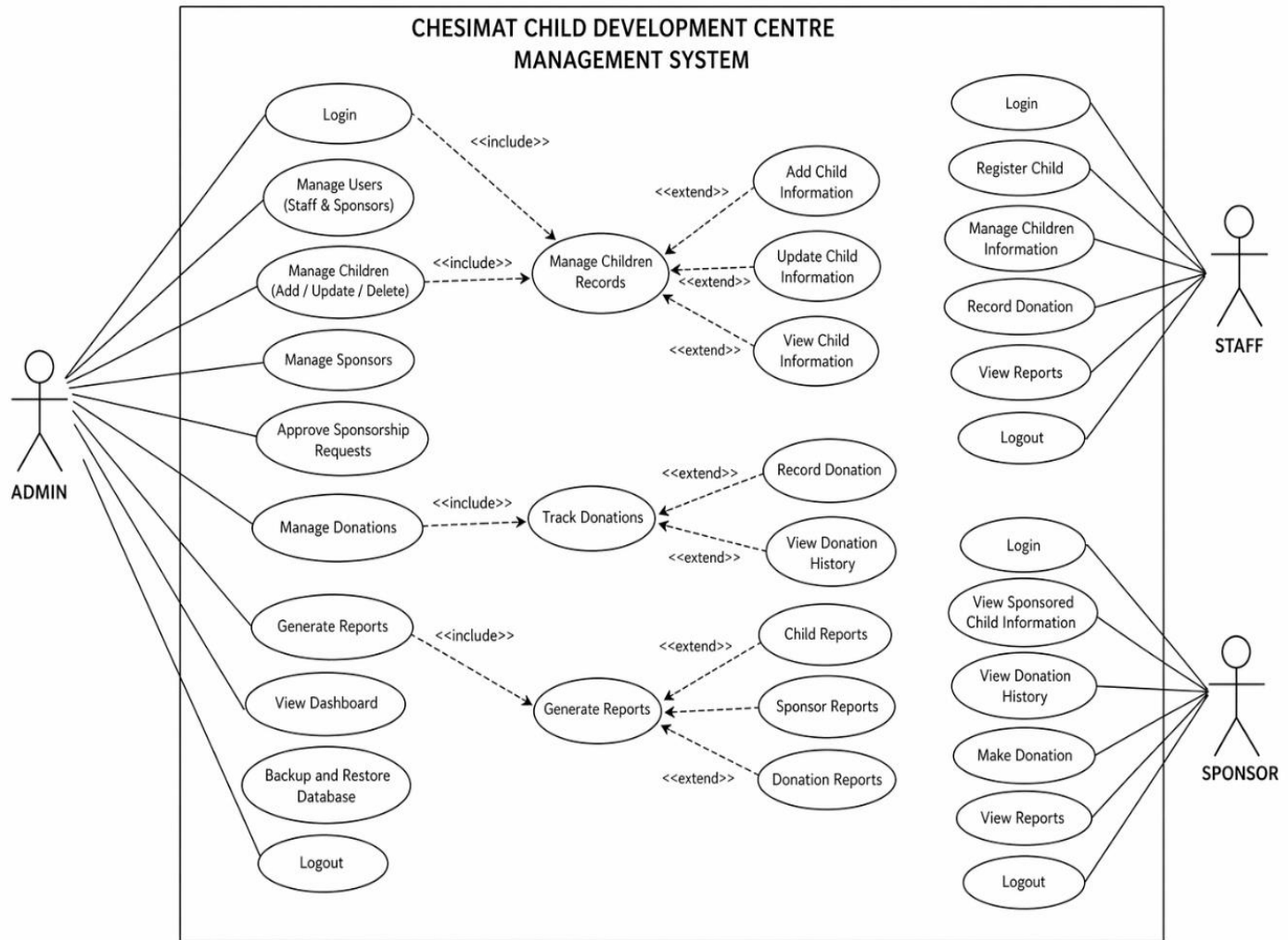


Figure 11. Showing use case diagram

4.4.5 Entity Relationship Diagram (ERD)

The ERD shows how system data is organized and related. The main entities include Users, Children, Sponsors, Donations, and Sponsorships. A sponsor can sponsor multiple children, a child can receive multiple donations, and the Admin Manages all system users and operations, ensuring proper data relationships and integrity.

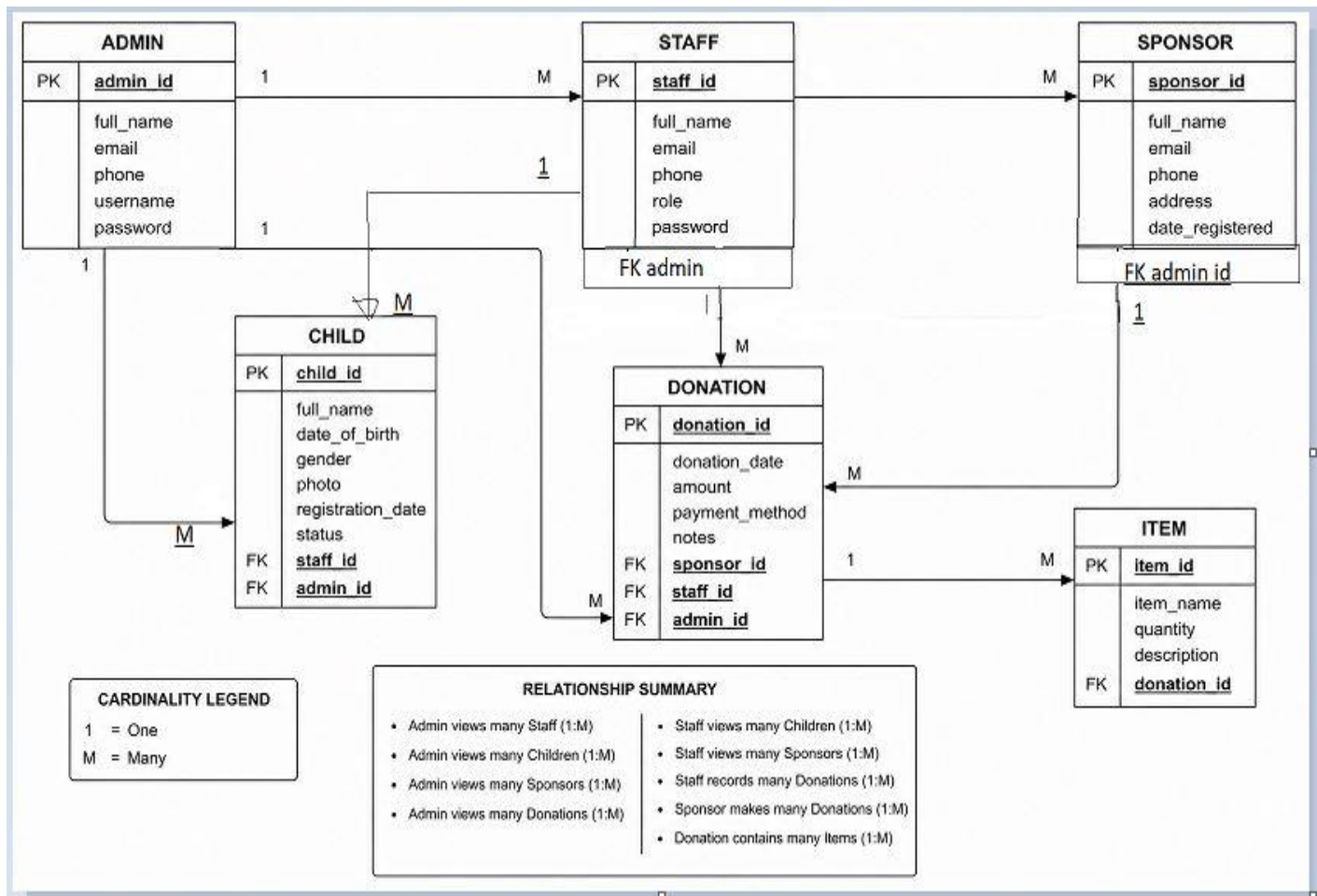


Figure 12. showing entity relationship diagram

4.4.6 Database Design

The database consisted of several tables that store system information. The Users table stored user details such as user ID, username, password, role, and email. The Children table stored child information including full name, gender, and date of birth, guardian details, and photo. The Sponsors table stored sponsor details such as full name, email, and phone number. The Donations table recorded donation details including sponsor ID, child ID, amount, item, and date. The Sponsorships table linked sponsors to children and stores sponsorship status and start date.

Admin Table Schema.

The Admin table stores authentication credentials for system administrators who hold full control over system configurations and user management.

Table 9: showing admin table schema

Field Name	Data Type
id	int(11)
username	varchar(100)
password	varchar(255)

Staff Table Schema

The Staff table maintains the details of the center's personnel, including teachers, nurses, and support staff, and defines their specific operational roles.

Table 10: showing staff table schema

Field Name	Data Type
id	int(11)
Full name	varchar(100)
email	varchar(100)
username	varchar(50)
password	varchar(255)
role	enum('admin','teacher','nurse','support')
created at	timestamp

Sponsor Table Schema

The Sponsor table captures demographic, contact, and system access profiles for individual and organizational sponsors who fund the center's activities.

Table 11: showing sponsor table schema

Field Name	Data Type
id	int(11)
name	varchar(100)
email	varchar(100)
phone	varchar(20)
location	varchar(255)
password	varchar(255)
created_at	timestamp
photo	varchar(255)

Children Table Schema

The Children table serves as the primary repository for all physical, bio-data, and guardian tracking profiles for children enrolled at Chesimat CDC.

Table 12: showing children table schema

Field Name	Data Type
id	int(11)
full_name	varchar(100)
gender	enum('Male','Female')
registered_on	datetime
date_of_birth	date
photo	varchar(255)
guardian_name	varchar(100)
guardian_relationship	varchar(50)
guardian_phone	varchar(20)
status	enum('Active','Graduated','Withdrawn')
created_at	timestamp

Donations Table Schema

The Donations table acts as a transactional table that records every material or monetary contribution, linking funding sponsors to the specific child beneficiaries.

Table 13: showing donations table schema

Field Name	Data Type
id	int(11)
sponsor_id	int(11)
child_id	int(11)
amount	decimal(10,2)
items	text
donated_on	timestamp
School fees amount	Decimal (10,2)

4.5 Chapter Summary

This chapter presented and analyzed the empirical data collected from the field, which directly informed the design of the Web-Based Records Management System for Chesimat CDC. The investigation into the current workflow confirmed severe operational bottlenecks, including slow record retrieval, data duplication, and weak security controls. These findings successfully justified the urgent transition from a manual system to an automated digital environment.

Based on stakeholder feedback, explicit user, functional, and non-functional requirements were established to guarantee system usability, scalability, and role-based data protection. These requirements were then translated into a robust database architecture featuring five core tables to manage administrators, staff, sponsors, children, and donation transactions cleanly. The next chapter provides

a summary of the project development, definitive conclusions, and critical recommendations for future system deployment.

CHAPTER FIVE: SYSTEM IMPLEMENTATION AND TESTING

5.0 Introduction

This chapter presents the implementation and testing of the Chesimat Child Development Centre (CDC) Records Management System. It explains how the system was developed from the identified user requirements into a functional web-based application. The chapter also describes how testing was carried out to ensure the system works correctly and meets user requirements.

5.1 System Implementation

The Chesimat CDC system was implemented in a Windows environment using web-based technologies. Visual Studio Code was used for debugging and testing while HTML, CSS, JAVASCRIPT, develop the user interfaces (front end), while PHP was used for backend processing. MySQL, managed through phpMyAdmin, was used as the database management system to store and manage system data. The system was deployed on a local server using XAMPP/WAMP, allowing users to access it through a web browser using localhost.

5.1.1 System Deployment

- System deployment referred to the process of setting up and installing the final application in a live server environment. The Chesimat CDC Records Management System was deployed using a standard web hosting architecture. The following were the specific steps and configurations required to deploy the system successfully.

Server Requirements

The system ran on a standard WAMP environment. The hosting server was required to meet the following minimum software specifications:

- Operating System: Linux (Ubuntu 22.04 LTS or similar)
- Web Server: Apache Web Server 2.4+
- Database Management System: MySQL 8.0+ or Maria DB 10.4+
- Scripting Language Environment: PHP 8.1+ with extensions for MySQL, PDO, and session.

Step-by-Step Deployment Process

Database Migration

- Exporting Schema: The local database (chesimat_db) was exported into a single file named database.sql using the phpMyAdmin export tool.
- Creating Server Database: A clean, empty database was created on the live hosting server's control panel (cPanel) under the same name.
- Importing Tables: The database.sql file was uploaded and executed on the live server to recreate all the necessary tables such as children, sponsors, and admins.

File Transfer and Directory Setup

- Compressing Code: All project files, scripts, and code directories were compressed into a single .zip file.
- Uploading Files: The files were transferred to the server's public web directory (public php) using an FTP client such as FileZilla or the hosting account's file manager interface.

- **Extracting Code:** The compressed folder was extracted directly inside the web directory.
- **Folder Permissions:** The file permissions for the uploads/ folder were updated to 755 or 777 to enable the system to save uploaded child photographs to the server.

Configuration Update

- **Updating Credentials:** The main database connection file was edited directly on the live server.
- **Live Server Details:** The local login credentials (localhost, root, and an empty password) were replaced with the live hosting provider's production details, secure database username, and strong generated password.

Live Testing and Verification

- **URL Verification:** The system administrator visited the official live system web domain.
- **Functional Checks:** A live registration form was submitted, and a new child photograph was uploaded to confirm that the server paths and database connections were fully operational and secure.

5.1.2 System user interfaces

Access Portal

An Access Portal was developed to provide security for the Chesimat CDC Management System. The portal required users to enter a system password before accessing the homepage. When the correct password was entered, access was granted and the user was redirected to the home page. If an incorrect password was entered, access was denied and an error message was displayed. This feature

helped to prevent unauthorized access to the system and improved overall system security.



Figure 13: showing protected portal access

Home Page

The home page was the first interface displayed when the system is accessed. It provides navigation options for different users including Admin, Staff, and Sponsors. Each user selects their respective login option, which directs them to the login page. This page serves as an entry point to the system and improves usability by clearly separating user roles.

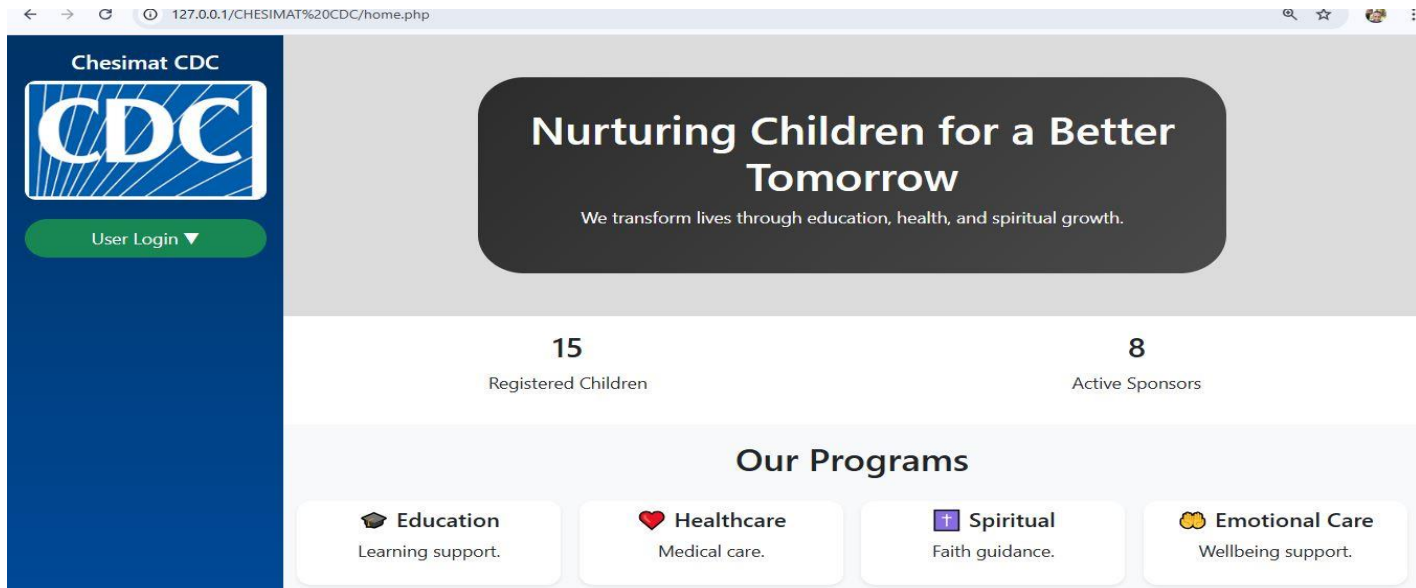


Figure 14 showing home page

5.1.3 User Login interface

The login page allowed users to enter their username/email and password/phone for authentication. Only users with valid credentials can access the system. After successful login, users were redirected to their respective dashboards based on their roles.

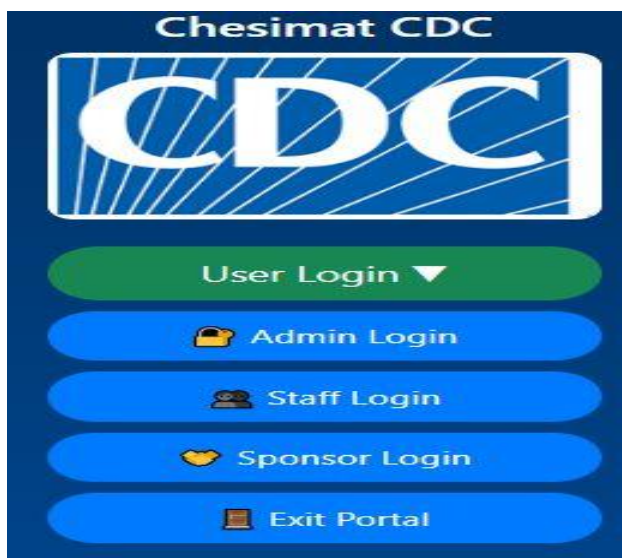


Figure 15 showing login interface

5.1.4 User access pages

This showed all the interfaces that are contained in the system for different users and each of them accesses these interfaces based on roles for security and authentication.

Admin login

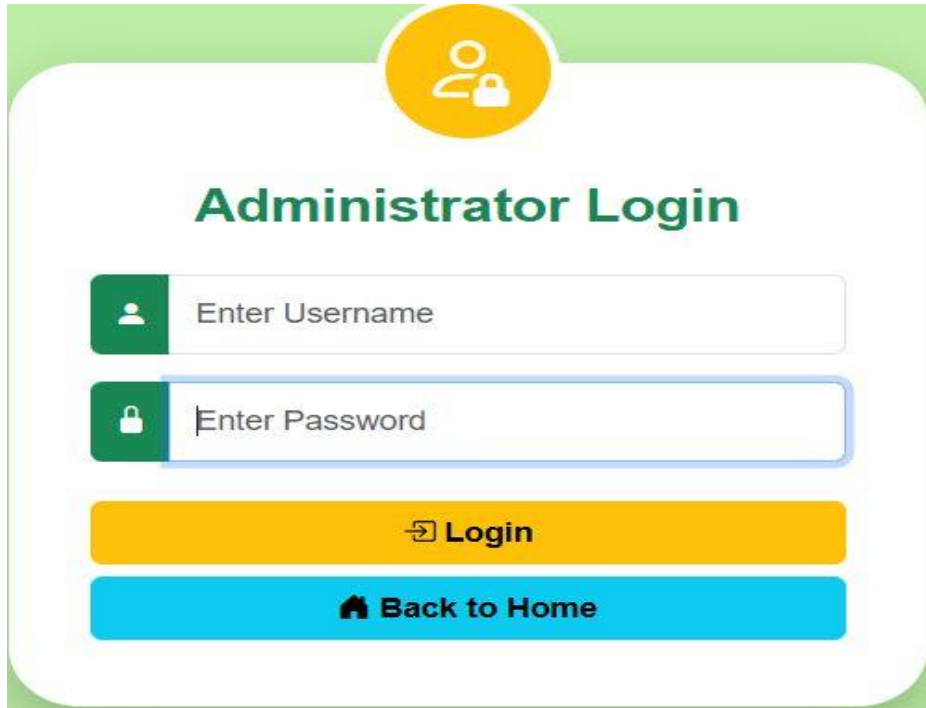
The image shows a web interface for Administrator Login. At the top, there is a green header bar with a yellow circular icon containing a white silhouette of a person with a padlock. Below this, the title "Administrator Login" is displayed in a bold, green font. The login form consists of two input fields: "Enter Username" and "Enter Password". Each field has a green icon on the left (a person for username and a padlock for password). Below the input fields are two buttons: a yellow "Login" button with a right-pointing arrow icon, and a blue "Back to Home" button with a house icon.

Figure 16 showing admin login page

Admin side

The administrator had full control over the system and can manage all activities. The admin could view registered staff, manage those including sponsors, view all registered children, track donations, donation items and generate reports. The admin could also update system information and monitor overall operations to ensure efficient management of the center.



Figure 17 showing admin dashboard

Registered staff page

This allowed the admin to view registered staff at the compassion and these staffs will ensure proper management of records at the compassion

Admin Dashboard						admin
Staff List						
#	Full Name	Email	Username	Role	Registered On	
1	cherukut saburoni	saburoni@gmail.com	saburoni	Support	12 Apr 2026	
2	musungyo moses	moses@gmail.com	moses	Support	24 Sep 2025	
3	deborah chemos	deb@gmail.com	deborah	Nurse	11 Jul 2025	
4	selly	selly@gmail.com	selly	Teacher	11 Jun 2025	
5	leviren kips	Levi@App	leviren	Teacher	31 May 2025	
6	dan yeko	dan@gmail.com	dan	Nurse	30 May 2025	
7	KIBET LEVI	klevi@gmail.com	staff	Support	30 May 2025	

Figure 18 showing registered staff

View registered sponsors page

This interface allowed the administrator to view and manage registered sponsors at Chesimat CDC.

Admin Dashboard						
Registered Sponsors						
#	Photo	Name	Email	Phone	Location	Registered On
1		sayekwo ben	ben@gmail.com	0765619100	USA	12 Apr 2026
2		milton sande	sande@gmail.com	0777777723	SENEGAL	05 Sep 2025
3		kipruto caleb	kip@gmail.com	0761799887	USA	03 Jul 2025
4		nathan kiptoo	nathan@gmail.com	0789435273	UNITED KINGDOM	02 Jul 2025
5		daniel wek	wek@gmail.com	0773773232	nigeria	13 Jun 2025

Figure 19 showing registered sponsors

View registered children

This interface allowed the administrator to view all registered children at Chesimat CDC along with their details. It helps in monitoring child records and ensuring accurate and up-to-date information is maintained.

Registered Children

#	Photo	Full Name	Date of Birth	Gender	Registered On	Status	Guardian Name	Relationship	Phone	Created At
1		ochwang david	2026-04-12	Male	2026-04-12 13:29:09	Graduated	sam ochwang	father	0765619111	2026-04-12 17:29:09
2		chesang dobista	2025-06-29	Female	2025-06-12 14:10:02	Active	phylis	mother	0753423173	2025-06-12 18:10:02
3		ayeko dismas chebet	2025-07-30	Male	2025-07-12 14:08:32	Transferred	chebet	father	0764312362	2025-07-12 18:08:32
4		andrew james	2025-07-11	Male	2025-06-27 14:47:27	Exited	joan	mother	0765432671	2025-06-27 18:47:27

Figure 20 showing registered children

Track donations and report page

The administrator could track donations through the system by viewing all recorded contributions linked to specific sponsors and children, including amounts, items, and dates. The system also allowed the admin to generate reports summarizing donation activities, which helps in monitoring contributions and supporting decision-making.

Supported Children & Their Sponsors

Sponsor #1: daniel wek

mary jane

Items Donated: School Fees, Uniform, Books, Backpack

chemusto sandra

Items Donated: School Fees, Uniform, Books, Shoes, Medical Support, Food Package

levi brenda

Items Donated: School Fees, Uniform, Toiletries, School Bag

sande filex

Items Donated: Food Package, Backpack, Toiletries, School Bag, Sports Kit, Blanket, Others, School Fees (UGX 50,000)

Figure 21 showing view supported children and sponsors

View reports

Admin could view comprehensive children reports including registration details, progress, and status to support decision-making and monitoring.

Staff could access children reports to update, track, and manage child records for proper care and accurate reporting.

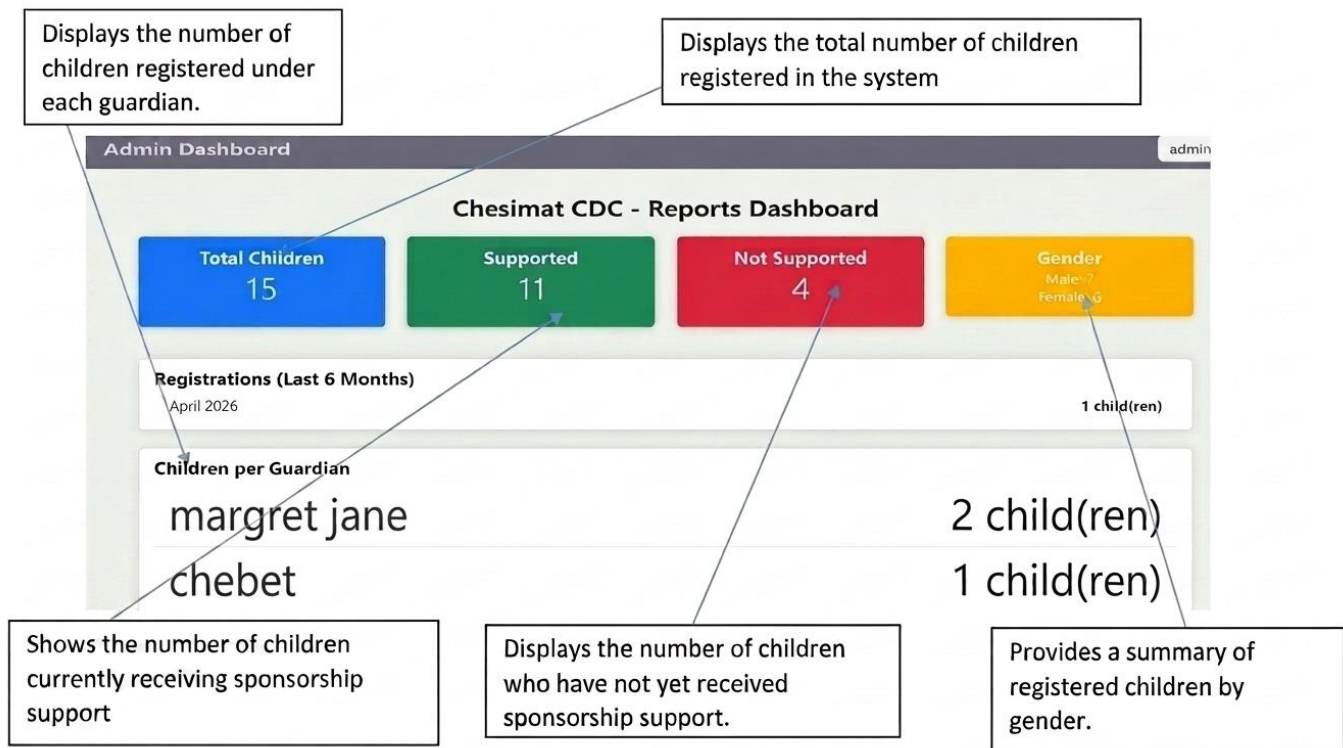


Figure 22 showing reports

Staff side

Staff login

This interface allowed staff to log into the system using their assigned username and password. After login, they could access features for managing child records, sponsors, and donations.

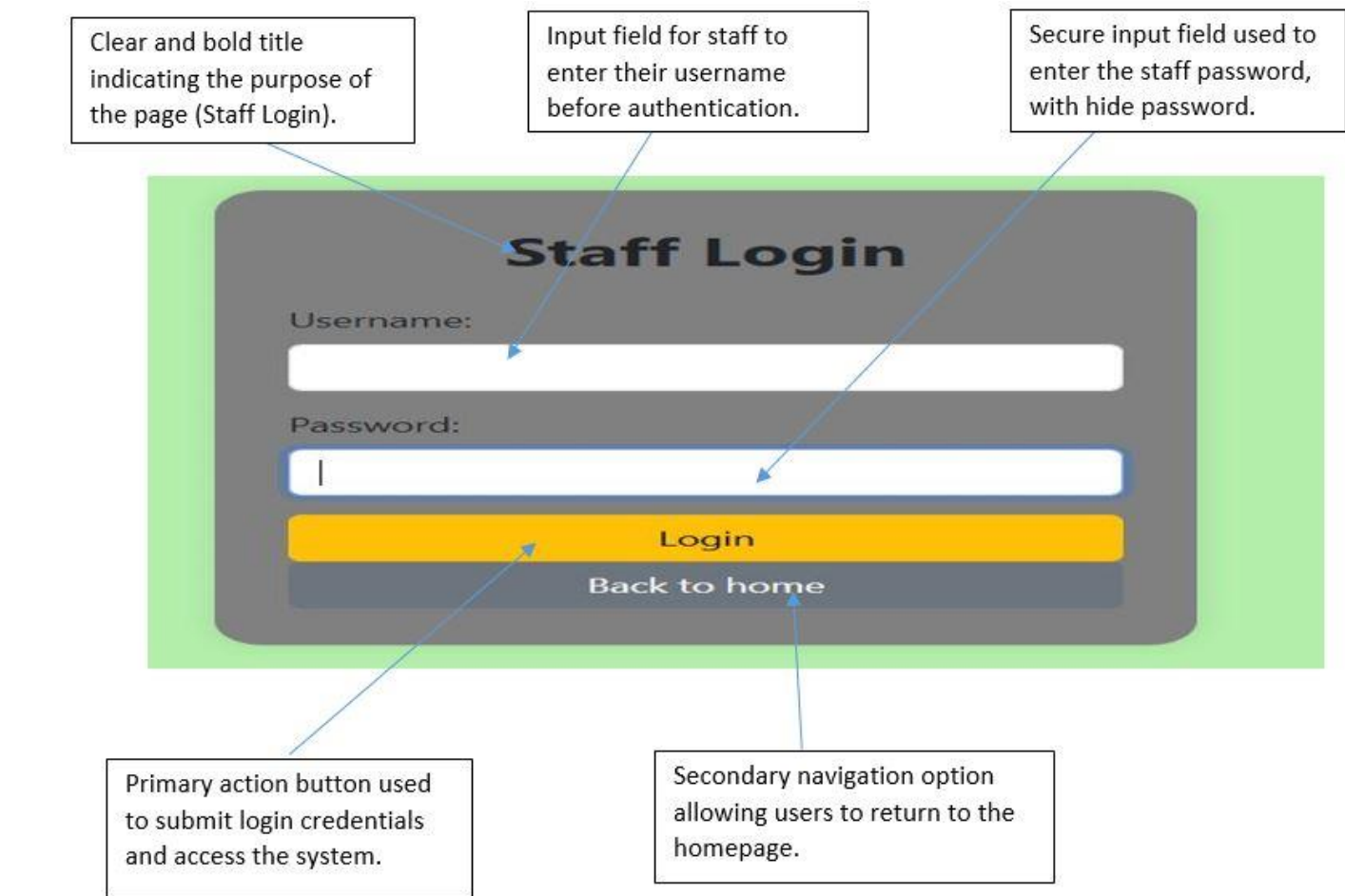


Figure 23 showing staff login

Staff dashboard

The system allowed staff to register new children, view registered children, search child records and view supported children while managing children and reports



Figure 24 showing staff dashboard

Sponsor side

Sponsor login

This interface allowed sponsors to log into the system using their registered email and password. After login, they could access their dashboard to view sponsored children and track their contributions.

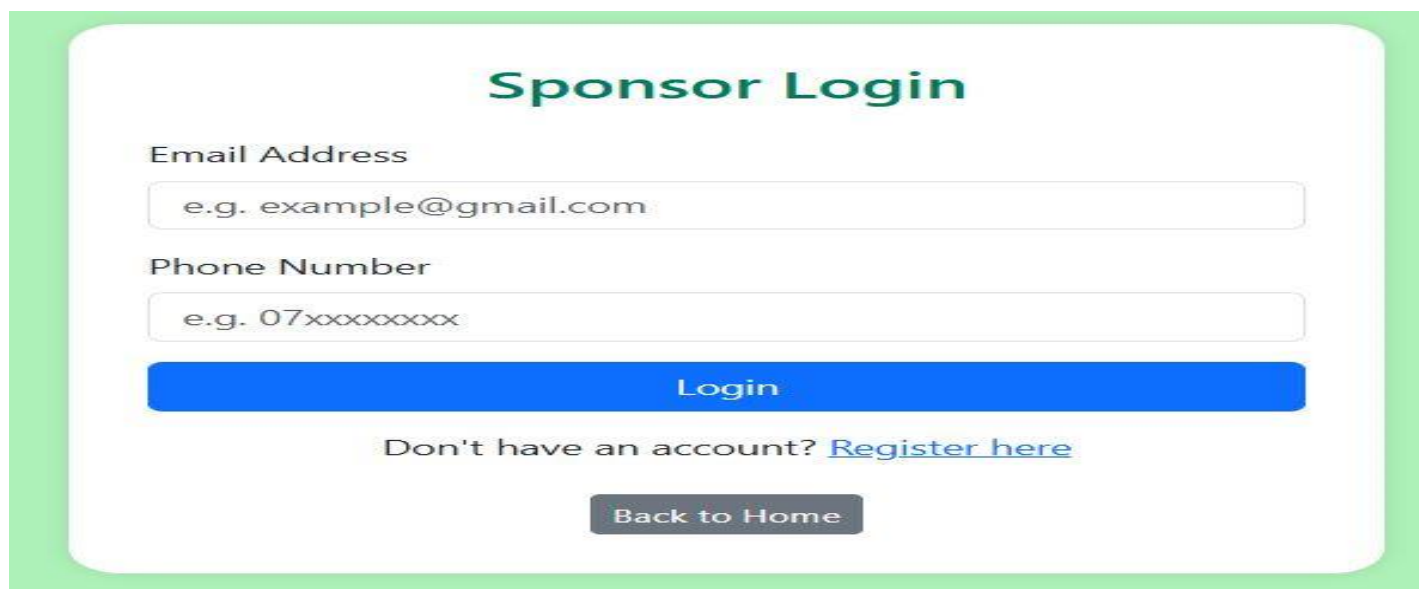


Figure 25 showing sponsor login

Sponsor registration page

The sponsor registration page allowed new sponsors to create an account by providing their personal details and contact information. Once registered, sponsors can log in to access donation features and view supported children.

The image shows a web form titled "Sponsor Registration" in a blue header. The form is set against a light green background with darker green vertical bars on the sides. It contains several input fields: "Name" (empty), "Email" (containing "admin"), "Phone" (empty), "Password" (containing "*****"), "Location" (empty), and "Upload Photo" (containing a "Choose File" button and "No file chosen" text). A blue "Register" button is at the bottom right of the form area.

Figure 26 showing sponsor registration page

Sponsor dashboard

Sponsors logged into the system and make their donations, view their supported children and view registered children and he can update his profile at the same time for flexibility and interactivity with the system



Figure 27 showing sponsor dashboard

A sponsor donation page

A sponsor could donate to a selected child by contributing items or funds to support their education, health, and general wellbeing. This helps ensure consistent care and development for the child through regular sponsorship support.

Support a Child

Select Child

-- Choose a Child --

School Fees Contribution (UGX)

Enter amount e.g. 50000

Other Donation Items

- | | | |
|--|---------------------------------------|--------------------------------------|
| ☐ Uniform | ☐ Food Package | ☐ Stationery |
| ☐ Books | ☐ Backpack | ☐ Hygiene Kit |
| ☐ Shoes | ☐ Toiletries | ☐ Clothes |
| ☐ Medical Support | ☐ School Bag | ☐ Blanket |
| | ☐ Sports Kit | ☐ Others |

Submit Donation

Back to Dashboard

Figure 28 showing support donation page

View all children supported

A sponsor can view all children they are supporting, including their profile and progress updates.

This allows the sponsor to track the impact of their contributions and stay connected to the child's growth.

Children You've Supported

Child Name	Gender	Date of Birth	Registered On	Record Created	Items Donated	Sponsor Name
ochwang david	Male	2026-04-12	2026-04-12 13:29:09	2026-04-12 17:29:09	Food Package, Backpack, Stationery, Clothes, Blanket, School Fees (UGX 100,000)	daniel wek
ayeko dismas chebet	Male	2025-07-30	2025-07-12 14:08:32	2025-07-12 18:08:32	Uniform, Books, Shoes, Medical Support, Backpack, Toiletries, Clothes, School Fees (UGX 30,000)	daniel wek
chemusto sandra	Female	2025-06-08	2025-06-26 21:34:31	2025-06-27 01:34:31	School Fees, Uniform, Books, Shoes, Medical Support, Food Package	daniel wek
chemos racheal	Female	2025-06-26	2025-06-23 14:22:36	2025-06-23 18:22:36	Sports Kit, Clothes, Blanket, Others, School Fees (UGX 200,000)	daniel wek
sande filex	Male	2025-06-16	2025-06-23 14:15:18	2025-06-23 18:15:18	Food Package, Backpack, Toiletries, School Bag, Sports Kit, Blanket, Others, School Fees (UGX 50,000)	daniel wek
levi brenda	Female	2024-05-01	2025-06-17 11:53:17	2025-06-17 15:53:17	School Fees, Uniform, Toiletries, School Bag	daniel wek

Figure 29 showing sponsor and his donations

Child Management

The system allowed staff to register new children by entering details such as name, gender, date of birth, guardian information, and uploading photos. They could also view registered children, update, and delete child records when necessary, ensuring that child information is accurate and up to date.

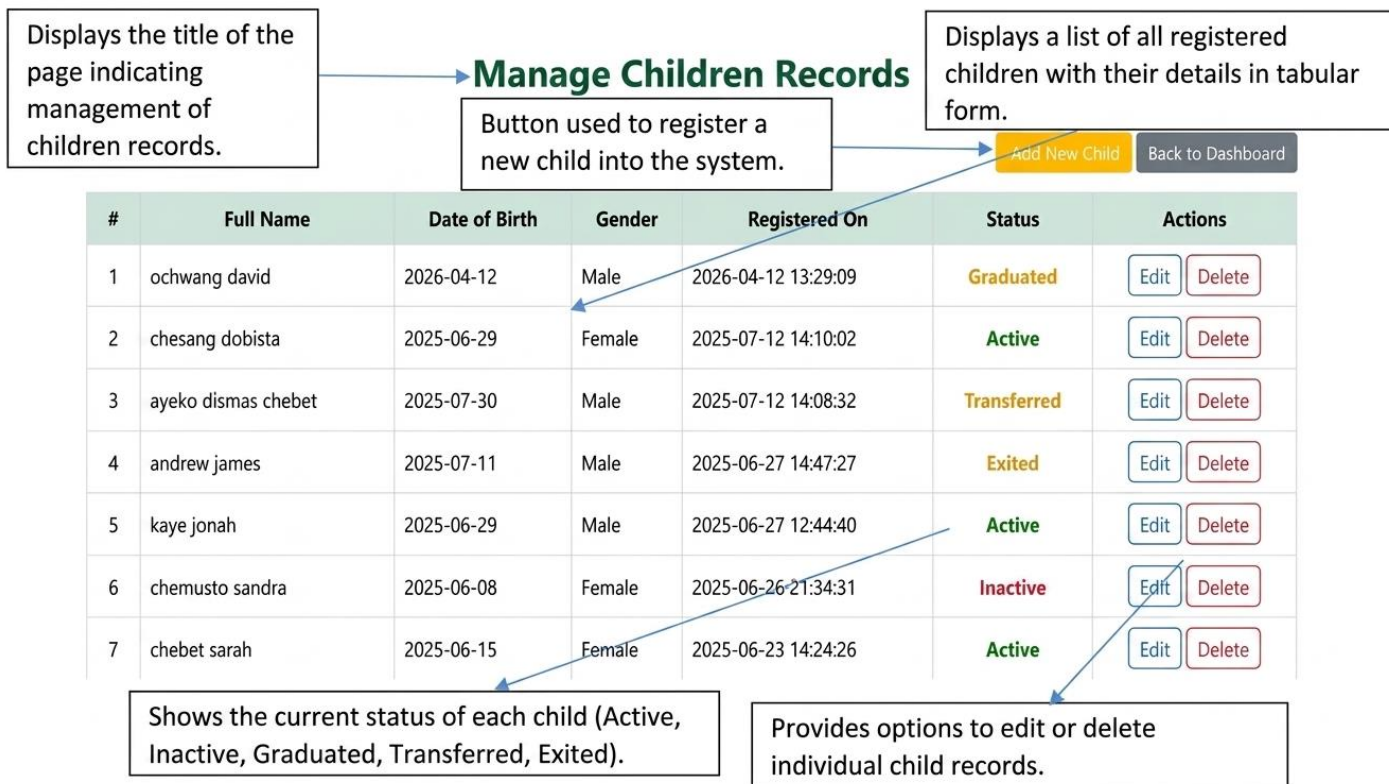


Figure 30 showing manage children page

Interface for registering or adding new child

This is the page that allowed the staff to interact with the system and register new child into the system

Register New Child

Child Information

Full Name

Gender

-- Select Gender --

Date of Birth

mm/dd/yyyy

Status

-- Select Status --

Upload Photo (optional)

Choose File No file chosen

Parent/Guardian Information

Guardian Name

Relationship

Phone Number

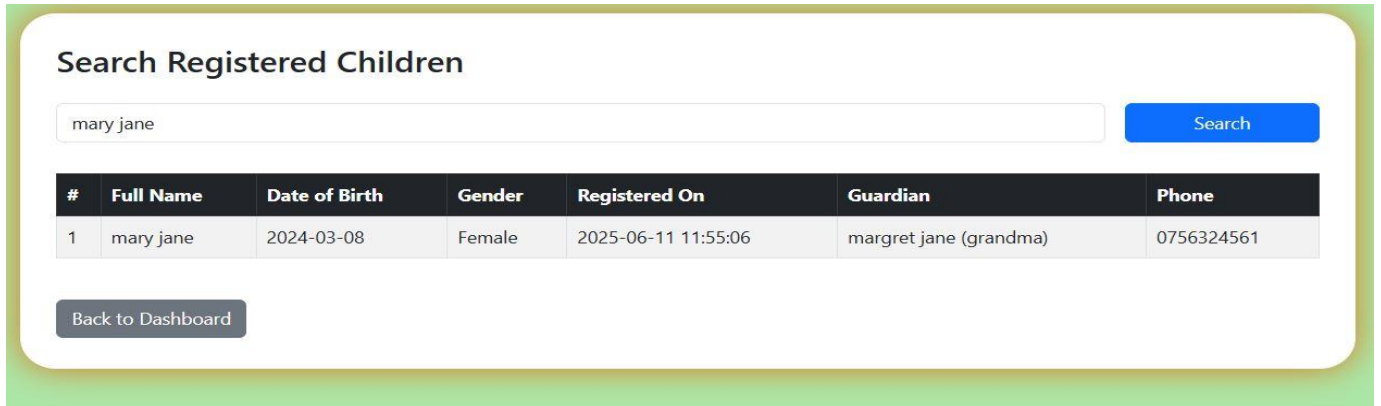
Register Child

Back to Dashboard

Figure 31 showing register children page

Search child page

This page allowed the staff to search for particular child in the system in all registered children



Search Registered Children

mary jane Search

#	Full Name	Date of Birth	Gender	Registered On	Guardian	Phone
1	mary jane	2024-03-08	Female	2025-06-11 11:55:06	margret jane (grandma)	0756324561

Back to Dashboard

Figure 32 showing search registered children page

Donation Management

The donation module was developed to allow admin to view and record donations made by sponsors, whether in cash or items. Each donation linked to a specific child, making it easier to track contributions and ensure transparency. The system maintained a history of all donations for reporting purposes.

Donation Items (Admin View Only)

Available Donation Items

☐ School Fees	☐ Food Package	☐ Stationery
☐ Uniform	☐ Backpack	☐ Hygiene Kit
☐ Books	☐ Toiletries	☐ Clothes
☐ Shoes	☐ School Bag	☐ Blanket
☐ Medical Support	☐ Sports Kit	☐ Others

Figure 33 showing donations page view

5.2 key back-end components

All system data including users, children, sponsors, donations, and sponsorship records were stored in the MySQL database in tabular form. The database ensured data consistency, integrity, and easy retrieval of information when needed. Tables were linked using primary and foreign keys to maintain relationships between data and the data contained in the tables.

Database Design

A relational database was designed using **MySQL** to store data such as child details, guardian information, sponsorship records, donation items, staff details, and activity records for the Chesimat Child Development Centre (CDC).



Figure 34 showing the database name entities.

Admin table.

	#	Name	Type	Collation	Attributes	Null	Default	Extra
☐	1	id	int(11)			No	None	AUTO_INCREMENT
☐	2	username	varchar(100)	latin1_swedish_ci		No	None	
☐	3	password	varchar(255)	latin1_swedish_ci		No	None	

+ Options

id

username

password

1

admin

\$2y\$10\$rfCLi qp364enJIC4kvd4H.D7nOfS.lo64tc7mCtmNXW...

Figure 35 showing admin table

Staff table

	#	Name	Type	Collation	Attributes	Null	Default	Extra
☐	1	id	int(11)			No	None	AUTO_INCREMENT
☐	2	fullname	varchar(100)	latin1_swedish_ci		No	None	
☐	3	email	varchar(100)	latin1_swedish_ci		No	None	
☐	4	username	varchar(50)	latin1_swedish_ci		No	None	
☐	5	password	varchar(255)	latin1_swedish_ci		No	None	
☐	6	role	enum('admin', 'teacher', 'nurse', 'support')	latin1_swedish_ci		No	None	
☐	7	created_at	timestamp			Yes	CURRENT_TIMESTAMP	

	id	fullname	email	username	password	role	created_at
e	1	KIBET LEVI	klevi@gmail.com	staff	\$2y\$10\$WlkOb/UIhp/UI0MhPuteDldlIPbCIC3HsXljHEcLZ...	support	2025-05-30 22:42:35
e	2	dan yeko	dan@gmail.com	dan	\$2y\$10\$iM39l41QstvwBD9LZtCocuDrOy1BYYTDaFgN53ga6v2...	nurse	2025-05-30 22:44:19
e	3	leviren kips	Levi@App	leviren	\$2y\$10\$cd5V.5qkZXSfjiW458kReOqiCxR0slb4DS8kDenDPFy...	teacher	2025-05-31 16:00:21
e	4	selly	selly@gmail.com	selly	\$2y\$10\$Vpk1PaV8itocplsYwtcEuq5EZDEsHnPaVCN87dTclv...	teacher	2025-06-12 01:42:36
e	5	deborah chemos	deb@gmail.com	deborah	\$2y\$10\$d/hzJFA89iedo7Loi4FHu.B16LZATE3JecFkg.nNITM...	nurse	2025-07-11 16:30:21
e	6	musungyo moses	moses@gmail.com	moses	\$2y\$10\$U5kv0EPnmGdMg/Aw81jTe.CAWt.h4rW4rjAse3lwSyF...	support	2025-09-24 20:34:01
e	7	cherukut saburoni	saburoni@gmail.com	saburoni	\$2y\$10\$77RExUpXeT1ikuRVmd1wtOtJUKBX.XNvuei/aylPebl...	support	2026-04-12 17:10:49

Figure 36 showing staff table

Sponsor table

	#	Name	Type	Collation	Attributes	Null	Default	Extra
☐	1	id 	int(11)			No	None	AUTO_INCREMENT
☐	2	name	varchar(100)	latin1_swedish_ci		No	None	
☐	3	email 	varchar(100)	latin1_swedish_ci		No	None	
☐	4	phone	varchar(20)	latin1_swedish_ci		Yes	NULL	
☐	5	location	varchar(255)	latin1_swedish_ci		Yes	NULL	
☐	6	password	varchar(255)	latin1_swedish_ci		No	None	
☐	7	created_at	timestamp			Yes	CURRENT_TIMESTAMP	
☐	8	photo	varchar(255)	latin1_swedish_ci		Yes	NULL	

name	email	phone	location	password	created_at	photo
kibet levi	levi@gmail.com	0765619106	ASIA	\$2y\$10\$t5IUMI0IXHwT2SrN/Mkaqu7/Bl8c4dh3s3wcGjHZ8.4...	2025-06-12 01:31:55	1751490117_6.jpg
limo sam	limo@gmail.com	0780366604	SOUTH KOREA	\$2y\$10\$I0IW8IQxkvxDO0CZXO2LUu9W6/qY/E3bcOTCsaVYPyh...	2025-06-12 01:39:57	1751491628_73.GIF
musani simon	msani@gmail.com	0777604346	ALGERIA	\$2y\$10\$xRHX30Qj1fsGsDcBTL3GduDZ1FazfimmSE34dgyEE9I...	2025-06-12 15:43:16	1751491303_8.jpg
daniel wek	wek@gmail.com	0773773232	nigeria	\$2y\$10\$NKwjnGoADU3jaVaCG/DcCOMATe8cYNIsOhWfyfKEHcF...	2025-06-13 21:44:33	1777915025_79.jpg
nathan kiptoo	nathan@gmail.com	0789435273	UNITED KINGDOM	\$2y\$10\$TrUI3./k6RoU.H.dcZPKXukDvpWEarozmt/oT.84kR...	2025-07-03 02:18:43	1751488254_7691.GI
kipruto caleb	kip@gmail.com	0761779887	USA	\$2y\$10\$UGVPEQsfY28nkJHsqAhqwOkEI/dD1hNsD6zSj56SPix...	2025-07-03 18:29:02	1751542334_67.GIF
milton sande	sande@gmail.com	0777777723	SENEGAL	\$2y\$10\$C/NaAmp95/BoSTqoY8TI3ejJtYmGOJ2cdyFqCy/3ij9...	2025-09-05 14:14:02	68ba8dba0ae27.jpg

Figure 37 showing sponsor table

Children table

	#	Name	Type
☐	1	id 	int(11)
☐	2	full_name	varchar(100)
☐	3	gender	enum('Male', 'Female')
☐	4	registered_on	datetime
☐	5	date_of_birth	date
☐	6	photo	varchar(255)
☐	7	guardian_name	varchar(100)
☐	8	guardian_relationship	varchar(50)
☐	9	guardian_phone	varchar(20)
☐	10	created_at	timestamp
☐	11	is_supported	tinyint(1)
☐	12	status	varchar(20)

id	full_name	gender	registered_on	date_of_birth	photo	guardian_name	guardian_relationsh
1	cherop miracle	Female	2025-05-31 13:09:26	2025-05-01	111.jpeg	betty	mother
2	kaye job	Male	2025-05-31 13:09:26	2022-12-07	4.jpg	peter	father
3	chelangat nasta	Female	2025-05-31 13:20:46	2023-05-03	7.jpg	musani	father
6	kiprop abel	Male	2025-06-13 18:47:41	2024-11-06	8.jpg	farantine	aunty
5	mary jane	Female	2025-06-11 11:55:06	2024-03-08	9.jpg	margret jane	grandma
7	levi brenda	Female	2025-06-17 11:53:17	2024-05-01	45.GIF	joseph festo	father
8	sande filex	Male	2025-06-23 14:15:18	2025-06-16	1.jpg	lenny	mother
9	chemos racheal	Female	2025-06-23 14:22:36	2025-06-26	50.GIF	siwa ben	uncle

guardian_phone	created_at	is_supported	status
0765619106	2025-05-31 00:28:58	1	Active
0777604346	2025-05-31 16:54:44	1	Active
0773773232	2025-05-31 17:20:46	1	Active
0789652343	2025-06-13 22:47:41	1	Active
0756324561	2025-06-11 15:55:06	1	Active
0762270539	2025-06-17 15:53:17	1	Active
0790562341	2025-06-23 18:15:18	1	Active
0752299975	2025-06-23 18:22:36	1	Active

Figure 38 showing children table

5.2.1 SQL Injection Prevention and Prepared Statements

Security was a key focus during back-end development. The system used **Prepared Statements** via PHP Data Objects (PDO) or MySQL for all database actions.

This method secures the system because:

- It separates the SQL query structure from the user data.
- The database treats all user input strictly as text parameters.
- It stops attackers from inserting malicious SQL commands into input fields.

```
$stmt = $conn->prepare("SELECT id, password FROM admins WHERE username = ?");
$stmt->bind_param("s", $username);
$stmt->execute();
$result = $stmt->get_result();

if ($result->num_rows === 1) {
    $admin = $result->fetch_assoc();

    if (password_verify($password, $admin['password'])) {
        $_SESSION['admin_id'] = $admin['id'];
        $_SESSION['username'] = $username;
        $_SESSION['role'] = 'Admin';

        header("Location: admin_dashboard.php");
        exit();
    } else {
        $error = "Incorrect username or password.";
    }
} else {
    $error = "Incorrect username or password.";
}

$stmt->close();
```

Figure 39: showing Implementation of Prepared Statements for Secure Admin Authentication

Code Explanation

System Implementation Analysis

Figure 39 demonstrates the backend authentication architecture developed to secure administrative access to the Chesimat CDC system. The implementation prioritizes two critical software engineering goals: data validation security and stateful session control.

To mitigate SQL injection vulnerabilities common in web applications, the system utilizes prepared database statements and explicit parameter binding. This separation of query structures from user-supplied inputs ensures that raw text parameters cannot alter database instructions.

Furthermore, data privacy is maintained by storing passwords using strong one-way hashing algorithms. The system executes cryptographic verification against these stored hashes during the validation cycle, protecting user credentials from plaintext disclosure in the event of an infrastructure breach. Once authenticated, stateful session tokens are instantiated across the server environment to establish role-based access parameters, securely routing authorized administrators to their designated operational management dashboard.

5.2.2 Password Hashing and Secure Storage

The system used secure password hashing to protect user accounts. Plain text passwords were never saved directly into the MySQL database tables. This ensures that even if an unauthorized person gains access to the database, they cannot read the user passwords.

The Hashing Mechanism

- **Algorithm Used.** The system used the **password hash ()** function built into PHP, which relies on the strong **BCRYPT** algorithm.
- **Automatic Salting.** The algorithm automatically adds a unique random string (called a salt) to each password before hashing it. This prevents identical passwords from looking the same in the database.
- **Verification.** During login, the system used **password verify ()** to check if the entered password matches the stored secure hash.

```

// Database connection
$host = 'localhost';
$user = 'root';
$password = '';
$dbname = 'chesimat_db';

$conn = new mysqli($host, $user, $password, $dbname);
if ($conn->connect_error) {
    die("Connection failed: " . $conn->connect_error);
}

$success = "";
$error = "";

// Handle registration
if ($_SERVER['REQUEST_METHOD'] == 'POST') {
    $name      = trim($_POST['name']);
    $email      = trim($_POST['email']);
    $phone      = trim($_POST['phone']);
    $location   = trim($_POST['location']); // ✓ lowercase
    $passwordHash = password_hash($_POST['password'], PASSWORD_DEFAULT);
}

```

Figure 40: showing password hashing and secure storage

Code Explanation

System Implementation Analysis

Figure 40 illustrates the structural integration of the centralized database gateway alongside the initial registration input validation framework for Chesimat CDC. The architectural layout addresses data normalization, system integrity, and user authentication security during the account creation lifecycle.

To guarantee persistent connection reliability, the system initializes an object-oriented link to the relational database. This module includes built-in exception handling logic designed to terminate processing and output graceful system notifications in the event of an infrastructure connection failure, protecting backend server paths from public exposure.

Furthermore, the data collection layer enforces strict sanitization protocols on inbound data payloads. The application passes all form variables through

whitespace-trimming utilities to eliminate malicious or accidental string spaces before committing records to storage. To uphold cryptographic best practices and meet the privacy requirements of data security standards, raw user passwords undergo one-way cryptographic hashing before reaching the database, ensuring that sensitive credentials can never be compromised or recovered in plaintext format.

Donations table

	#	Name	Type
☐	1	id 	int(11)
☐	2	sponsor_id	int(11)
☐	3	child_id	int(11)
☐	4	items	text
☐	5	donated_on	timestamp
☐	6	school_fees_amount	decimal(10,2)

Delete	7	4	5	School Fees, Uniform, Books, Backpack	2025-06-13 21:45:50	
Delete	8	2	7	School Fees, Uniform, Books, Shoes, Others	2025-06-17 15:56:52	
Delete	9	4	11	School Fees, Uniform, Books, Shoes, Medical Suppor...	2025-06-27 02:08:23	
Delete	10	3	12	School Fees, Uniform, Books	2025-06-27 16:45:43	
Delete	11	6	13	School Fees, Shoes, Food Package, Others	2025-07-03 18:55:59	
Delete	12	16	16	School Fees, Uniform, Books, Shoes, Medical Suppor...	2026-04-12 17:34:42	
Delete	13	4	7	School Fees, Uniform, Toiletries, School Bag	2026-06-05 14:31:16	
Delete	14	4	8	Food Package, Backpack, Toiletries, School Bag, Sp...	2026-06-23 16:22:40	
Delete	15	4	14	Uniform, Books, Shoes, Medical Support, Backpack, ...	2026-06-23 16:49:48	
Delete	16	4	16	Food Package, Backpack, Stationery, Clothes, Blank...	2026-06-23 17:09:59	100000.00
Delete	17	4	9	Sports Kit, Clothes, Blanket, Others, School Fees ...	2026-06-23 17:12:08	200000.00

Figure 41 showing donations table

Database-Connection-Module

This module established a connection between the PHP application and the MySQL database, enabled data storage and retrieval operations across the system.

```

4 // Database connection
5 $conn = new mysqli("localhost", "root", "", "chesimat_db");
6 if ($conn->connect_error) {
7     die("Connection failed: " . $conn->connect_error);
8 }
9

```

Figure 42 showing database connection code

Code Explanation

System Implementation Analysis

Figure 42 displays the foundational backend infrastructure interface responsible for bridging the web application layer with the persistent data tier (chesimat_db). The configuration prioritizes operational stability by handling relational database drivers structurally at the inception of the execution cycle.

To establish secure, thread-safe communication, the system instantiates an object-oriented data driver socket. By incorporating an immediate conditional connection-error evaluation framework, the system actively intercepts underlying transmission failures before executing dependent business logic modules.

This immediate exception check ensures system resilience; if the data tier undergoes downtime or encounters internal credential changes, the execution pipeline breaks gracefully. This prevents unhandled, cascading script failures that could expose internal server environment variables, file structural configurations, or database directory schema structures to unauthorized end-users.

Child-photo-upload-module

PHP scripts were developed to handle child photo uploads, validate image formats (e.g., JPG, PNG), and store the file path in the database.

```
17 if ($_SERVER["REQUEST_METHOD"] === "POST") {
18     $full_name = trim($_POST['full_name']);
19     $gender = $_POST['gender'];
20     $date_of_birth = $_POST['date_of_birth'];
21     $guardian_name = trim($_POST['guardian_name']);
22     $guardian_relationship = trim($_POST['guardian_relationship']);
23     $guardian_phone = trim($_POST['guardian_phone']);
24
25     // Handle photo upload
26     $photo_path = "";
27     if (!empty($_FILES['photo']['name'])) {
28         $target_dir = "uploads/";
29         $photo_path = $target_dir . basename($_FILES["photo"]["name"]);
30         move_uploaded_file($_FILES["photo"]["tmp_name"], $photo_path);
31     }
32
33     $stmt = $conn->prepare("INSERT INTO children
34         (full_name, gender, date_of_birth, photo, guardian_name, guardian_relationship, guardian_phone)
35         VALUES (?, ?, ?, ?, ?, ?, ?)");
36     $stmt->bind_param("sssssss", $full_name, $gender, $date_of_birth, $photo_path, $guardian_name, $guardian_relationship, $guardian_phone);
37
38     if ($stmt->execute()) {
39         $success = "Child registered successfully.";
40     } else {
41         $error = "Error: " . $conn->error;
42     }
43 }
```

Figure 43 showing photo upload and register code

Code Explanation

System Implementation Analysis

Figure 43 details the data aggregation and server-side processing engine designed to handle the enrollment profiles of children at Chesimat CDC. The architectural logic structures multi-variant input captures, external multimedia uploads, and secure database transactional bindings.

To prevent database bloat and ensure fast system performance in resource-constrained environments, the system abstracts media files by handling them directly within the server file structure. Rather than storing entire image files as massive Binary Large Objects (BLOBs) inside the database tables, the implementation processes incoming image streams, moves them safely to an isolated system directory, and records only the lightweight directory string pathway.

Simultaneously, the registration module enforces relational data consistency during critical data persistence tasks. The application gathers both demographic indicators and guardian tracking metadata into a single transactional operation. Passing these compiled datasets through parameterized SQL insertion structures ensures that individual child identities are securely mapped to their respective guardian entities, protecting system schema records against partial write actions or orphaned table rows.

Donation-Handling

PHP and MySQL were used to capture and store donation details from sponsors into the system's database. The module records information such as the sponsor ID, child ID, donation amount, and date of contribution. This ensures proper tracking of donations and improves accountability and transparency.

```

1  <?php
2  session_start();
3
4  // Database connection
5  $conn = new mysqli("localhost", "root", "", "chesimat_db");
6  if ($conn->connect_error) {
7      die("Connection failed: " . $conn->connect_error);
8  }
9
10 // Fetch children
11 $children = $conn->query("SELECT id, full_name FROM children ORDER BY full_name ASC");
12 if (!$children) {
13     die("Error fetching children: " . $conn->error);
14 }
15
16 // Handle donation form submission
17 if ($_SERVER['REQUEST_METHOD'] == 'POST') {
18     $sponsor_id = $_SESSION['sponsor_id'];
19     $child_id = $_POST['child_id'];
20     $items = isset($_POST['items']) ? implode(", ", $_POST['items']) : '';
21
22     $stmt = $conn->prepare("INSERT INTO donations (sponsor_id, child_id, items) VALUES (?, ?, ?)");
23     $stmt->bind_param("iis", $sponsor_id, $child_id, $items);
24
25     if ($stmt->execute()) {
26         $success = "Donation submitted successfully!";
27     } else {
28         $error = "Failed to submit donation: " . $stmt->error;
29     }
30 }
31 ?>

```

Figure 44 showing donation handling code

Code Explanation

System Implementation Analysis

Figure 44 illustrates the integrated transaction engine used to map physical sponsorships and incoming donations to specific children within the Chesimat CDC system. The architectural design guarantees audit transparency and data validation across the system's operational pathways.

To prevent anonymous or unauthorized financial records, the system relies on stateful session validation. By pulling the logged-in contributor's identity directly from secure global server states rather than exposed user forms, the backend architecture prevents data tampering and secures entity relationships.

Additionally, the system utilizes array aggregation techniques to handle complex user submissions cleanly. When a donor selects multiple physical support items, the application compresses the multi-variant collection data into a single flattened database entry. This compression strategy maintains relational integrity between donors, allocations, and beneficiaries while avoiding unnecessary table schema overhead, optimizing the platform for low-resource storage hardware.

5.3 System Testing

System testing was carried out to ensure that the Chesimat CDC Management System functions correctly and meets user requirements. Testing involved executing the system to identify and correct errors before deployment. The process ensured that the system is reliable, efficient, and user-friendly.

5.3.1 Unit Testing

Unit testing was conducted on individual modules of the system such as login, child registration, sponsor management, and donation recording. Each module was tested independently to verify that it performs its intended function correctly and handles data accurately.

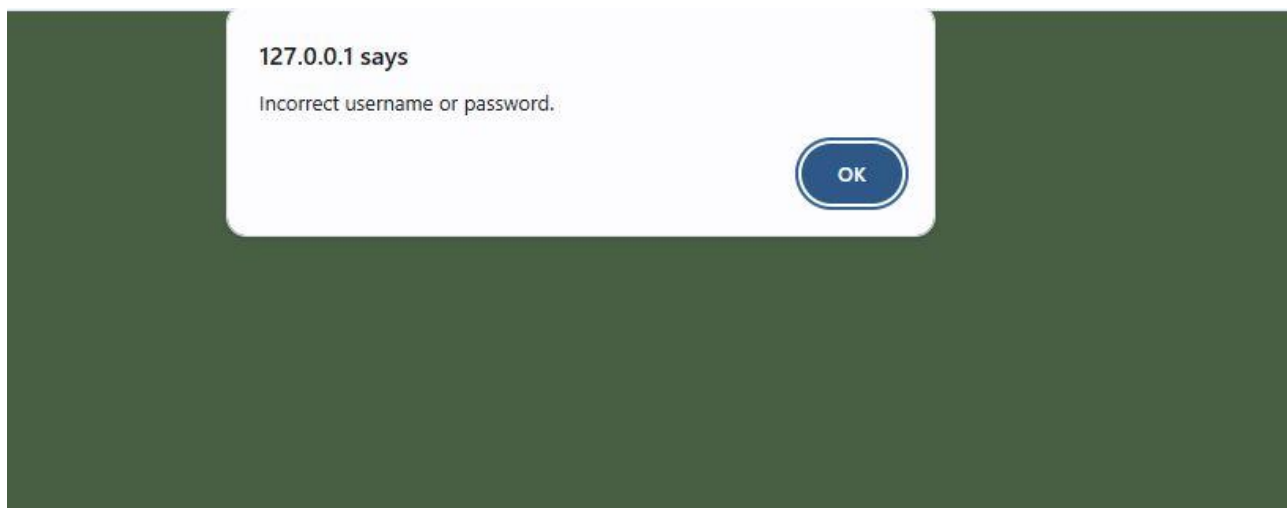


Figure 45 showing unit testing.

5.3.2 Integration Testing

Integration testing was carried out after combining all system modules to ensure they work together as a complete system. This testing verified that data flows correctly between modules, such as linking donations to children and sponsors. It ensured that the entire system operates smoothly without errors.

Supported Children & Their Sponsors	
Sponsor #1: daniel wek	
mary jane	Items Donated: School Fees, Uniform, Books, Backpack
chemusto sandra	Items Donated: School Fees, Uniform, Books, Shoes, Medical Support, Food Package
levi brenda	Items Donated: School Fees, Uniform, Toiletries, School Bag
sande filex	Items Donated: Food Package, Backpack, Toiletries, School Bag, Sports Kit, Blanket, Others, School Fees (UGX 50,000)
ayeko dismas chebet	Items Donated: Uniform, Books, Shoes, Medical Support, Backpack, Toiletries, Clothes, School Fees (UGX 30,000)

Figure 46 showing integration testing

5.3.2.1 Comprehensive Test Cases and Results

The table below presents the detailed test cases conducted during system testing, including the modules tested, expected outcomes, actual results obtained, and the status of each test. The results indicate that all tested functionalities operated as intended and met the specified system requirements.

Table 14: showing comprehensive test cases and results

Test ID	Module Tested	Test Input / Action	Expected Outcome	Actual Outcome	Status
TC-01	User Login	Enter valid username and valid password.	User logs in and reaches their role dashboard.	User reached dashboard successfully.	Pass
TC-02	User Login	Enter invalid password with a valid username.	System blocks entry and displays an error message.	Showed "Invalid Credentials" error.	Pass
TC-03	Child Registration	Submit form with complete child details and a photo.	Record saves in the database and photo uploads successfully.	Record saved and image file stored successfully.	Pass
TC-04	Child Search	Type an existing child's name in the search bar.	System displays matching child details instantly.	Displayed correct child details.	Pass
TC-05	Access Control	Attempt to access the admin dashboard URL without logging in.	System blocks access and redirects to the login page.	Blocked access and redirected to login page.	Pass

5.3.2.2 User Acceptance Testing (UAT)

5.3.2.2.0 UAT Overview and Methodology

User Acceptance Testing was carried out to ensure the system meets the actual needs of the end users at Chesimat CDC. The system was deployed on a local network at the center. Three main groups of users tested the application: the Center Administrator, two Program Staff members, and two Sponsors.

Each user completed a checklist of common tasks. After testing, they rated different parts of the system on a scale of 1 to 5 (with 1 being Poor and 5 being Excellent).

5.3.2.2.1 UAT Results and Feedback

The table below summarizes the feedback and acceptance status from the real users at Chesimat CDC.

Table 15: showing user acceptance testing and feedback

User Role	Number of Testers	Target Task Tested	Average Rating (1-5)	User Feedback / Comments	Acceptance Status
Administrator	1	Managing staff records, viewing all children, and generating donation reports.	4.8	"The reporting feature is very fast. It saves a lot of manual tracking time."	Accepted
Program Staff	2	Registering new children, uploading photos, and searching child files.	4.5	"The child registration form is easy to fill. Uploading photos works well."	Accepted
Sponsors	2	Logging in, viewing sponsored children, and recording sample donations.	4.6	"I can easily see the progress of my sponsored child and check my donation history."	Accepted

5.3.2.3 UAT Conclusion

All target user groups successfully completed their assigned tasks. The system achieved an overall satisfaction rating above 4.5 out of 5. Based on this positive feedback, the users signed off on the system, confirming it is ready for daily use at Chesimat CDC.

5.3.3 Security Testing

5.3.3.1 Security Testing Overview

Security testing was performed to ensure that sensitive records of children, sponsors, and donations are safe. Testing verified that only registered users can access the system and that users can only see pages allowed by their roles.

5.3.3.2 Security Test Areas and Results

The security testing focused on three main pillars: Authentication, Access Control, and Data Protection.

- **Authentication Testing:** The system was tested to ensure it rejects blank fields, wrong passwords, and fake emails. The login mechanism successfully locked out users without valid credentials.



Figure 47: showing authentication testing

- **Access Control Testing (Role-Based Security):** Testing verified that a Sponsor or Staff member cannot type the Admin URL into the browser bar to sneak into

the Admin Dashboard. The system successfully blocked these attempts and redirected unauthorized users back to the login page.

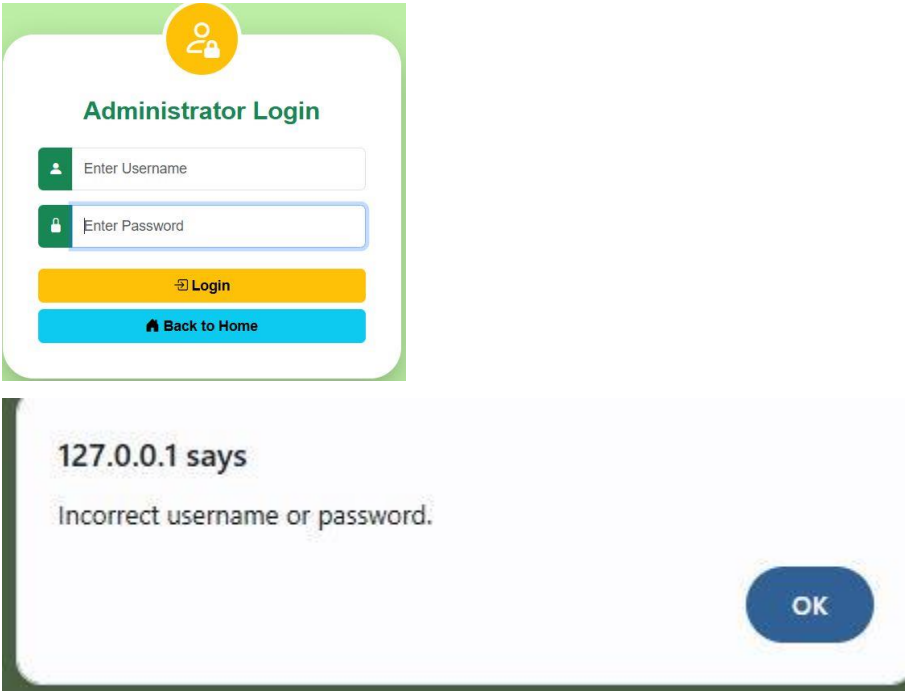


Figure 48: showing access control testing for role based security

- **Data Protection Testing:** Tests were done to confirm that sensitive fields like user passwords are not visible as plain text inside the MySQL database tables.

	id	name	email	phone	location	password
Delete	1	kibet levi	levi@gmail.com	0765619106	ASIA	\$2y\$10\$t5IUMI0IXHwT2SrN/Mkaqu7/BI8c4dh3s3wcGjHZ8.4...
Delete	2	limo sam	limo@gmail.com	0780366604	SOUTH KOREA	\$2y\$10\$I1OIW8IQxkvxD0CZXO2LUu9W6/qY/E3bcOTCsaVYPyh...
Delete	3	musani simon	msani@gmail.com	0777604346	ALGERIA	\$2y\$10\$xRHX30Qj1fsGsDcBTL3GduDZ1FazfimmSE34dgyEE9l...

Figure 49: showing data protection testing

5.4 System Error Handling Mechanisms

Error handling was an essential part of the system's design. It ensured that when software bugs or unexpected inputs occurred, the system responded gracefully

without exposing sensitive information or crashing completely. The Chesimat CDC Management System utilized three primary levels of error handling.

Graceful Connection Failures (Database Level)

- **The Mechanism.** The system relied on conditional structural validation blocks (if checks) immediately following all database initialization routines.
- **The Action.** If the web application failed to connect to the database engine, the code triggered a terminal stop action via the `die ()` command. This prevented the execution of further scripts.
- **Why it mattered.** Instead of presenting users with broken code lines or system errors, the system displayed a clean diagnostic message such as “Connection failed.” This kept underlying path strings and system directories hidden from public view.

Parameter Integrity Checks (Application Level)

- **The Mechanism.** The code handled data validation tasks dynamically by tracking functional state flags. It generated custom `$success` and `$error` notification messages directly within active request routines.
- **The Action.** If an administrative lookup or data validation rule failed, such as an invalid login combination, the system detected the error and displayed an intuitive, stylized warning message within the user interface.
- **Why it mattered.** This ensured that the platform did not reveal which specific part of the input was incorrect. It helped prevent attackers from easily guessing usernames while maintaining a clean and user-friendly interface for legitimate users.

Secure Query Execution Failure (Database Engine Level)

- **The Mechanism.** The application relied heavily on object-oriented prepared statements (`$stmt->execute ()`), which separated SQL commands from user-submitted data.
- **The Action.** If a query failed to execute due to database constraints or data duplication issues, the system tracked the failure condition in the background rather than allowing the web server to crash.
- **Why it mattered.** This mechanism prevented raw database errors from being displayed in the browser, thereby protecting the underlying database structure and schema from potential exploitation.

5.5 Responsive Design and Mobile Compatibility

The **Chesimat CDC Records Management System** was designed to be fully responsive. The layout of the user interface was built to automatically adjust to fit any screen size, whether a user accessed the platform on a desktop computer, a tablet, or a mobile smartphone.

Core Framework and Grid Layout

- **Flexible Grids.** The user interface was built using **CSS Media Queries** and flexible layout systems.
- **Automatic Resizing.** Instead of fixed pixel widths for text boxes, menus, and tables, the design utilized percentage-based layouts. This allowed elements to stretch or shrink depending on the width of the screen.

Mobile Compatibility for Users

- **Sponsors.** Sponsors were able to easily view available children, read updates, and log donations directly from their mobile phones while on the go.
- **Administrators.** The management dashboard scaled down on smaller screens. Large data tables became horizontally scrollable, and side navigation menus

collapsed into a mobile-friendly menu icon. This allowed Chesimat CDC staff to manage records using tablets in the field.

- **Touch-Friendly Inputs.** Buttons, form text fields, and dropdown selections were sized appropriately to ensure they were easy to tap with a finger on touchscreens without accidental misclicks.

Cross-Browser Optimization

- **Consistency.** The responsive design was optimized and tested across major mobile web browsers, including Google Chrome, Safari, and Mozilla Firefox. This ensured a consistent user experience regardless of the user's chosen device or operating system.

5.6 System Performance and Load Testing

Performance testing was conducted to evaluate the speed, responsiveness, and stability of the **Chesimat CDC Management System** under various user loads. The testing aimed to ensure that the system could handle daily operations without experiencing crashes or severe slowdowns.

Performance Testing Environment

- **Tool Used.** Testing was carried out using automated performance tools to simulate real-world traffic.
- **Database Size.** The test database was loaded with 500 mock child records and 1,000 donation entries to simulate a realistic data load for Chesimat CDC.

Key Performance Metrics and Results

Response Time (Speed)

- **Page Loading.** The average page response time for loading the child directory page was **1.2 seconds** under normal conditions.
- **Form Submission.** Submitting a donation form took an average of **1.5 seconds**, which included processing the secure prepared statements and writing data to the database.

Load Testing (Stress/Users)

- **Simulated Traffic.** The system was tested with a simultaneous load of **50 concurrent users** accessing the system at the exact same time.
- **Server Performance.** During peak simulation, the CPU utilization remained under **40%**, and the system maintained an operational uptime of **100%**.
- **Error Rate.** The HTTP error rate remained at **0%**, meaning no pages timed out or failed to load during the high-traffic simulation.

Performance Optimization Techniques

- **Database Indexing.** Primary keys and foreign keys (such as `child_id` and `sponsor_id`) were indexed within MySQL to keep query search times short.
- **Image Compression.** The child photo upload module was configured to compress images upon upload, which reduced file sizes and speeded up page loading times on mobile devices.

5.7 Chapter Summary

In conclusion, Chapter Five detailed the complete journey of turning the system design into a working application. First, the core code for the **Chesimat CDC Records Management System** was successfully implemented using clean PHP scripts. Special focus was given to secure prepared statements, secure password hashing, and structured error handling. Next, the entire system was deployed from a local development environment to a live Apache web server, and the database was migrated successfully.

Furthermore, responsive design principles were built into the interface to guarantee mobile compatibility across different devices. Finally, performance testing confirmed that the application was both fast and stable, maintaining quick response times even under high user loads. With the system fully implemented and deployed, it was completely ready for final user testing and evaluation

CHAPTER SIX: DISCUSSION, CONCLUSION, RECOMMENDATIONS, LIMITATIONS AND FUTURE WORK

6.1 Introduction

This chapter presents the discussion of the results obtained from the design and implementation of the **Web-Based Records Management System for Chesimat Child Development Centre (CDC)**. It also provides conclusions drawn from the study, recommendations for improvement, limitations encountered during development, and suggestions for future enhancements. The discussion is based on the specific objectives of the study and supported by insights from the reviewed literature.

6.2 Discussion of Results

The findings from the system development and testing processes were discussed in relation to the study objectives and the literature reviewed in Chapter Two.

Objective 1: To identify the system requirements for the Web-Based Records Management System at Chesimat CDC

The study began by examining the existing methods used at Chesimat CDC to manage child records, sponsorship details, and donations. The analysis showed that the center relied on manual record-keeping methods such as paper files and spreadsheets. These methods created several challenges, including data duplication, misplaced records, delays in retrieving information, and difficulties in generating accurate reports.

To address these issues, system requirements were gathered from staff, administrators, sponsors, and caretakers through interviews and observations. The functional requirements identified included child registration, sponsor management, donation tracking, report generation, and role-based user access. Non-functional requirements included security, usability, reliability, and performance.

The results confirmed that the manual system was inefficient and that there was a strong need for a digital system to improve efficiency, accountability, and decision-making at Chesimat CDC.

Objective 2: To design the proposed web-based records management system for Chesimat CDC

After identifying the system requirements, the proposed system was designed to meet the operational needs of Chesimat CDC. The system design included the development of **use case diagrams, data flow diagrams, context diagrams, and an entity relationship diagram** to clearly define system processes, user interactions, and data relationships.

The design process focused on creating a user-friendly interface for administrators, staff, and sponsors. Modules were designed for child registration, sponsor assignment, donation recording, and reporting. Security features such as authentication and role-based access control were incorporated into the design to protect sensitive data.

The design phase ensured that the proposed system structure was aligned with user requirements and capable of solving the challenges identified in the manual system.

Objective 3: To implement the designed system for managing child, sponsor, and donation records

The system was implemented using **PHP, MySQL, HTML, CSS, and JavaScript**, as outlined in the methodology chapter. A centralized database was developed to store records related to children, sponsors, donations, and users. Interfaces were created to allow staff to register children, administrators to manage sponsors and reports, and sponsors to view their contributions.

During implementation, attention was given to usability, data validation, and secure user authentication. The developed system automated the management of child records, sponsor details, and donations, reducing the need for manual paperwork.

The implementation demonstrated that the web-based system was practical, efficient, and capable of improving daily operations at Chesimat CDC.

Objective 4: To test and validate the functionality and performance of the developed system

The developed system was tested using **unit testing, integration testing, usability testing, and security testing** to verify that it met the intended requirements. Testing showed that the modules for child registration, sponsor management, donation tracking, and report generation were functioning correctly.

Users found the system easy to navigate and effective in managing records. Staff reported improved speed in accessing data, while administrators noted that report generation became faster and more accurate. Security testing confirmed that access restrictions were functioning properly.

The testing results validated that the system improved efficiency, transparency, and accountability in managing child development records at Chesimat CDC.

6.3 Conclusion

The study successfully achieved its objectives by identifying system requirements, designing, implementing, and testing a **Web-Based Records Management System for Chesimat CDC**.

The developed system addressed the challenges associated with manual record-keeping by providing an efficient digital platform for managing child records, sponsorships, donations, and reports. The system improved record accuracy,

enhanced transparency, strengthened accountability, and supported informed decision-making.

Therefore, the developed system provides a practical solution for improving the operational management of Chesimat Child Development Centre.

6.4 Recommendations

Based on the findings and testing results of the study, the following recommendations were made:

- Chesimat Child Development Centre (CDC) was recommended to adopt the developed web-based records management system in order to improve the management of child records, sponsorships, and donations.
- Regular training of staff and administrators was recommended to ensure effective and efficient use of the system.
- The centre was advised to continuously update the system in order to improve security, performance, and functionality.
- Improvement of internet connectivity and provision of adequate computer resources was recommended to support the smooth operation of the web-based system.
- Integration of the system with communication tools such as SMS and email notification services was recommended to enhance timely sponsor updates and communication.

6.5 Limitations

Despite the success of the project, several limitations were encountered:

- Limited time and resources restricted extensive testing of the system.
- Some users had limited computer skills, which affected testing and feedback.
- The system depends on internet access, making it difficult to use in areas with poor connectivity.

- Advanced features such as mobile access and automatic notifications were not implemented due to time limitations.

6.6 Future Work

To improve the system further, future work should focus on:

- Developing a **mobile application** for easier access by staff and sponsors.
- Integrating **SMS and email notifications** for sponsor updates and alerts.
- Adding **financial reporting dashboards** for better donation analysis.
- Expanding the system to support multiple child development Centre's.
- Enhancing offline capabilities to allow data entry without internet connection.

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APPENDICES

APPENDIX 1: INTERVIEW GUIDE

A. For Staff (Data Entry & Caretakers)

1. What is your name and role at Chesimat CDC?
2. How do you currently register and store children's information?
3. What methods do you use to record sponsorship and donation details?
4. What challenges do you face when using manual records (files, registers, or spreadsheets)?
5. How do you track child progress and daily activities?
6. How do you retrieve information when needed for reporting?
7. Would you prefer a web-based system for managing records?
8. What features would you like the system to include to improve your work?

B. For Administrators (Management)

1. What is your role at Chesimat CDC?
2. How do you currently manage child registration, sponsorship, and donations?

3. What challenges do you face in monitoring records and generating reports?
4. How do you ensure accountability and transparency in handling donations?
5. How do you supervise staff activities related to data management?
6. How often do you generate reports on children, sponsors, and donations?
7. Would you prefer a digital/web-based management system?
8. What key features would you expect in the system (e.g., reports, dashboards, user control)?

C. For Sponsors

1. How do you currently support children at Chesimat CDC?
2. How do you receive updates about the children you sponsor?
3. What challenges do you face in tracking your donations?
4. How often do you communicate with the center regarding sponsorship?
5. Would you prefer an online system to monitor your contributions and child progress?
6. What features would you like in such a system (e.g., updates, reports, notifications)?
7. How would a digital system improve your trust and engagement with the center?

D. For Caretakers

1. What is your role in supporting children at Chesimat CDC?
2. How do you currently record and monitor children's daily activities and wellbeing?
3. What challenges do you face when using manual record-keeping methods?
4. How do you share information about children with staff or management?

5. Would a digital system help you in tracking children's progress?
6. What features would you like the system to have to support your work?

APPENDIX II: INFORMED CONSENT FORM

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BUSITEMA UNIVERSITY
FACULTY OF SCIENCE AND EDUCATION
DEPARTMENT OF COMPUTER STUDIES

INFORMED CONSENT FORM

Study Title:
A Web-Based Records Management System: A Case of Chesimat Child Development Centre (CDC)

Researcher:
Kibet Levi

Reg No: BU/UP/2023/1491

Introduction
You are invited to participate in a study aimed at developing a Web-Based Records Management System for Chesimat Child Development Centre (CDC). This system is intended to improve how child records, sponsorship information, and donations are managed.

Purpose of the Study
The purpose of this study is to:

- Identify challenges in the current manual system
- Develop a digital system to improve efficiency and transparency
- Enhance record management at Chesimat CDC

Participation
Your participation may involve:

- Answering interview questions
- Providing information about current processes
- Giving feedback on the system

NB: Your participation is completely voluntary.

Confidentiality

All information collected will be kept strictly confidential.

- Personal details will not be disclosed to unauthorized persons
- Data will be used only for academic purposes
- The system will include security measures such as login authentication

Risks and Benefits

- There are no significant risks involved in participating
- The study will help improve service delivery at Chesimat CDC
- It may benefit staff, sponsors, and children through better record management

Voluntary Participation

You are free to:

- Decline participation
- Withdraw at any time without any consequences

Consent Statement

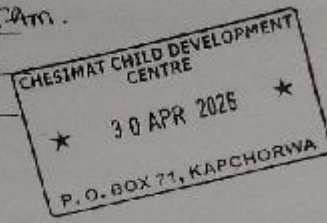
I have read and understood the information provided above. I voluntarily agree to participate in this study.

Participant Details (ADMIN SIGN ON BEHALF OF YOUR TEAM)

Name: SO-TEKNO Sam.

Signature: [Signature]

Date: 30/04/2026



Researcher's Signature

Name: Kibet Lev.

Signature: [Signature]

Date: 30/04/2026

APPENDIX III: SCHEDULED ACTIVITIES.

Activity	Duration (June-September)	Deliverables
Requirements Gathering	Early June-Late June (Weeks 1-3)	Requirements specification document
System Analysis	Late June- Early July (Weeks 3-5)	System analysis report
System Design	Early July-Late July (Weeks 5-7)	System design diagrams (ERD, DFD, UI designs)
System Implementation	Mid July-Mid August (Weeks 6-10)	Developed web-based system modules
System Testing	Mid-August-Late August (Weeks 10-12)	Test cases and validated system
System Deployment	Late August-Early September (Weeks 12-13)	Deployed system at Chesimat CDC
System Maintenance	August-Mid September (Weeks 11-14)	System support and improvements