UNIVERSITY OF DAR ES SALAAM

COLLEGE OF INFORMATION AND COMMUNICATION TECHNOLOGIES (COICT)

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

FINAL YEAR PROJECT END REPORT (2022/ 2023): IS 335/CS 449

PROJECT TITLE: MATERNAL AND CHILD HEALTH MANAGEMENT SYSTEM

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DECLARATION

I hereby declare that this report and the work described in it is my own work, with any contributions from others expressly acknowledged and cited. I declare that the work in this report was carried out in accordance with Regulations of University of Dar-es-Salaam and has not been presented to any other University for examination either in Tanzania or overseas. Any views expressed in the report are those of the author and in no way represent those of University of Dar-es-Salaam.

This report may proceed for submissions of assessment for the Award of BSc in Computer Science at the University of Dar-es-Salaam.

Supervisor's signature: .....

Date: …….....

ABSTRACT

This project report is about A Web based system for MATERNAL AND CHILD HEALTH which is under ICARE from DHIS2 in UNIVERSITY OF DAR ES SALAAM. Maternal and Child Health (MCH) refers to the range of services that aim to improve the health and well-being of mothers and their children. This includes services related to pregnancy, childbirth, and postpartum care, as well nutrition. Where Maternal Health Services (MHS) include antenatal care, delivery care and postnatal care play a crucial role in preventing maternal health problems. And child health services are the medical services that are provided by the medical health professionals to the children. This system also addresses social and economic factors that can impact maternal and child health, such as lack of education and limited access to healthcare.

This report also explains in detail how the problem was broken down using the agile methodology that involves constant collaboration with stakeholders and continuous improvement at every stage. Once the work begins, teams cycle through a process of planning, executing, and evaluating.

ACKNOWLEDGEMENT

Foremost, I thank God for enabling me to keep progressing with this project and making me Healthy. I would also like to extend my sincere gratitude to thank every single person who has helped me and is still contributing to make this project possible.

My special thanks and acknowledgement goes to my supervisor DR. HONEST KIMARO who has helped make this project possible. His Guidance and advice has carried us through the stages of preparing for this project.

I must also thank my friends for the immense support and help during this project. And lastly, I give my warmest thanks and appreciation to my teammates for their contribution, efforts and sacrifices that made this project successful.

TABLE OF CONTENT

LIST OF SYMBOLS AND ABBREVIATIONS

MCH - Maternal and Child Health

WHO- World Health Organization

EMR- Electronic Medical Record

EHR- Electronic Health Record

EPS- Electronic Prescribing System

COICT- College of Information and Communication Technology

FYP- Final Year Project

ANC- Ante-natal Care

PNC- Postnatal Care

RCH- Reproductive and child Health

L & D- Labor and delivery

QI- Quality Improvement

LIST OF FIGURE

LIST OF TABLES

CHAPTER ONE

1.1 INTRODUCTION

Maternal and child health (MCH) refers to the health and well-being of the women during pregnancy, childbirth, and the postpartum period, as well as the health of their children. This includes areas such as maternal and infant nutrition, prenatal and postnatal care, family planning and prevention and treatment of infection diseases. Aim is to improve the health and survival of mothers and children. Maternal and child health services may be provided by a variety of healthcare professionals, including obstetricians, midwives, pediatricians, and nurses, among others. The healthcare sector also includes organizations and agencies that work to improve maternal and child health on a larger scale, such as through public health initiatives and research into the causes and prevention of health problems affecting mothers and children.

BACKGROUND

According to WHO, maternal death in Tanzania is at a ratio of 578 per 100,000 which represents 18% of women's death at the age of 15 to 49. The main causes of maternal and child death are lack of access to health care, inadequate maternal and child health services, malnutrition, and lack of education and also clinical practices. Due to the mentioned existing problems, it has been clearly shown that there is a great need of finding an immediate solution to the existing challenge to ensure that there is a better quality of maternal and newborn care services.

1.2 PROBLEM STATEMENT

The main challenges facing Maternal and child HealthCare centers in Tanzania is due to manual paperwork and documents in clinic setting in which information or data are stored manual in physical clinic cards for each respective patient in which accounts less privacy, insecurity, poor data integrity and incorrect document and files circulation, Limited data analysis, Inaccuracy data etc. Thus maintaining paperwork has become so ineffective and inefficient resulting in a tedious and time consuming process, and delay For health care providers to make follow up for patients specifically maternal and child on their clinic visits. This has led to an increased maternal and child mortality rate in Tanzania.

1.3 OBJECTIVES

1.3.0 Main Objectives

To develop a computerized clinical form for pregnant women and under five children that will help clinical staff to enter a clinical record for pregnant women and under five children.

1.3.1 Specific Objectives

The specific objectives include:

i. To perform requirement gathering from HealthCare practitioners such as doctors and nurses and also pregnant or expecting women.

ii. To develop system requirements and design a computerized clinical form that will help clinical staff to record clinical details for infants and also expecting mothers in order to get the necessary health treatment at the right time.

iii. To implement and test the web application to users who are clinical staff, and get the necessary feedback.

1.4 SIGNIFICANCE OF THE PROJECT

Some of the significance in which health systems can support maternal and child health include:

i. Better monitoring and evaluation: computerized clinical form allowing health providers to monitor the health status of mother and the under-five child more effectively.

ii. Improved communication: computerized clinical form can be shared easily and securely between different health care providers, allowing for better coordination and continuity of care.

iii. Increased productivity; Faster, reliable, and more efficient documents and files retrieval can improve health care providers efficiency and patients satisfaction.

iv. Easier Document Retrieval; since searching for and retrieving documents is currently very time-consuming, the project will help in solving the problem and save time that is currently wasted. Depending on the implemented solution, searching and retrieving documents, and files will be done by only searching a keyword or phrase in a computer based system. The system will allow access to a document remotely. As long as there is an internet connection, documents can be accessed anywhere at any time.

1.5 PROJECT SCOPE AND LIMITATION

1.5.1 Project Scope

The project scope aims at computerizing the clinic card for both maternal and child for health care providers to capture important information on their clinic visits. My scope is about developing and designing a Child clinic card, which has the following components.

- Child registry form
- list of children registered
- Child immunization records
- vitamins records
- child growth development

1.5.2 Limitation

The limitations of such a project might include:

i. Budget constraints: The project may be limited by the availability of funding or other resources, which could impact the scope and scale of the project.

ii. Time constraints: The project may be limited by the available time to complete it, which could impact the scope and scale of the project.
iii. Technological constraints: The project may be limited by the availability of technology or the ability to integrate with existing systems, which could impact the functionality of the HMIS.
iv. Legal or regulatory constraints: The project may be subject to legal or regulatory constraints, which could impact the scope and scale of the project.
v. Organizational constraints: The project may be limited by the resources or capabilities of the organization implementing the HMIS, which could impact the scope and scale of the project.
vi. User adoption: The success of the HMIS may be limited by the willingness or ability of users to adopt and use the system, which could impact the overall effectiveness of the project.

1.6 ORGANIZATION OF REPORT

The report is organized into three chapters.

CHAPTER ONE: This chapter is introducing the system by providing the background, motivation, objectives, significance, scope, limitation of the project.

CHAPTER TWO: This chapter is all about the literature review and other related works. It also shows the gaps in the present systems or approaches.

CHAPTER THREE: This chapter covers the methodology to be used for the system, justifications of the used methodology and the phases to be followed.

CHAPTER FOUR: This chapter covers the system analysis and design of the system including the reference. The simulation of the system is produced in this chapter to show the progress of the work where it is reached.

CHAPTER SIX: This chapter covers the system implementation.

CHAPTER TWO
LITERATURE REVIEW

2.0 INTRODUCTION

This chapter describes some of the related work, literature of the concepts in relation to the project, A literature review for maternal and child health services would involve a comprehensive review of research and other literature on the topic.

2.1 RELATED WORKS

There are some of the systems which have been designed and implemented to perform similar Functions to the one to be developed in this project and some are related inventory systems which Aim of tracking medical equipment in other sectors, the only difference is on the functionalities and the organizations using them.

2.2.1 THE METRO HEALTH SYSTEM.

The Metro Health System in the United States of America was the first safety-net health care system in the US to implement the Epic EHR, starting in its ambulatory clinics in 1999 and fully deployed enterprise-wide by 2009. As a pioneer in the innovative use of HIT, Metro Health views their EHR as a critical component of administrative, clinical, operational, and quality activities. Using their modules and components of the HIT they use. One of their biggest components is the Vaccine Outreach. It was implemented to identify adolescents who had not taken at least one vaccination, increase vaccination uptake and improve the patient engagement by having automated message reminders such as through postcards, texts and phone calls to help patients get or complete their vaccination hence ensuring a defined increase in the adult vaccinations within their system.

2.2.2 MAMA NA MWANA

Data source: UNICEF through Rapidpro.io website.

The Mama na Mwana (Mother & Child) is an mHealth initiative with the objective to substantially contribute to a reduction in maternal, neonatal and postnatal mortality in Tanzania, Using mobile surveys to systematically and consistently gather feedback on the quality of care experienced by service recipients (prospective and new mothers), the initiative aims to provide evidence that will inform quality improvement for RMNCH services. The findings present a quantitative measure of overall quality of services over an array of indicators covering administrative and clinical areas

recommended practice. The initiative was piloted in September 2016 in Mbarali, Mbeya Region and scale up began in April 2017, targeting the whole of Mbeya, Songwe and Njombe Regions. Currently, data is collected using RapidPro surveys administered over Short Message Service (SMS) with plans to extend it to Interactive Voice Response (IVR). The surveys are scheduled to coincide with the four visit model of the national focused antenatal care guidelines, and two postnatal visits. After each visit, mothers are asked whether or not they received interventions according to the recommended practice, and their overall satisfaction with the service. Rapid Pro campaigns are used to handle the scheduling and trigger the appropriate round of questioning an enrollee receives. Responses to these questions are directly or indirectly an array of indicators, monitoring service availability, quality perceptions and barriers to uptake. A project dashboard periodically fetches survey responses, sans personally identifying information, aggregates the collected data and supports performing analyses such as pattern/trends identification. It supports dis aggregation (from regional down to facility level), grading facilities on each of the selected quality indicators, generating a periodic report that at an instant, provides a snapshot of recipients' experiences with care given at the facility. The report card is used to monitor progress and promote providers accountability for care they provide at facility level and higher. Towards the latter, the tool also incorporates an action tracker for tracking of remedial interventions taken at facility level and higher in response to service recipient's feedback.

To enroll expectant and new mothers into the program, two modes of enrolment are supported: Self and Assisted enrollment, both carried out over SMS. At least two health care workers from all health facilities offering RMNCH services in the target regions have been oriented on the program and trained on the modalities of assisted enrollment.

2.3 PROJECT GAP

The project gap between Mama na Mwana project and our project is that Mama na Mwana project was mainly based in developing the reminder system through SMS on reminding Mother over the important information for self-care during pregnancy period, but our project aims at digitalize and computerize the clinic cards for both maternal and under five child to aid health care providers to access important data and information and make constant follow up of maternal and child health during the attendance's period on the clinic.

CHAPTER THREE
METHODOLOGY

3.1 AGILE METHODOLOGY

The main development methodology used in the system is **Agile Methodology**. The Agile methodology is a way to manage a project by breaking it up into several phases. It involves constant collaboration with stakeholders and continuous improvement at every stage. Once the work begins, teams cycle through a process of planning, executing, and evaluating. This consistent focus on improvement and quality control is one of the core principles of Agile, and it helps to create superior products.

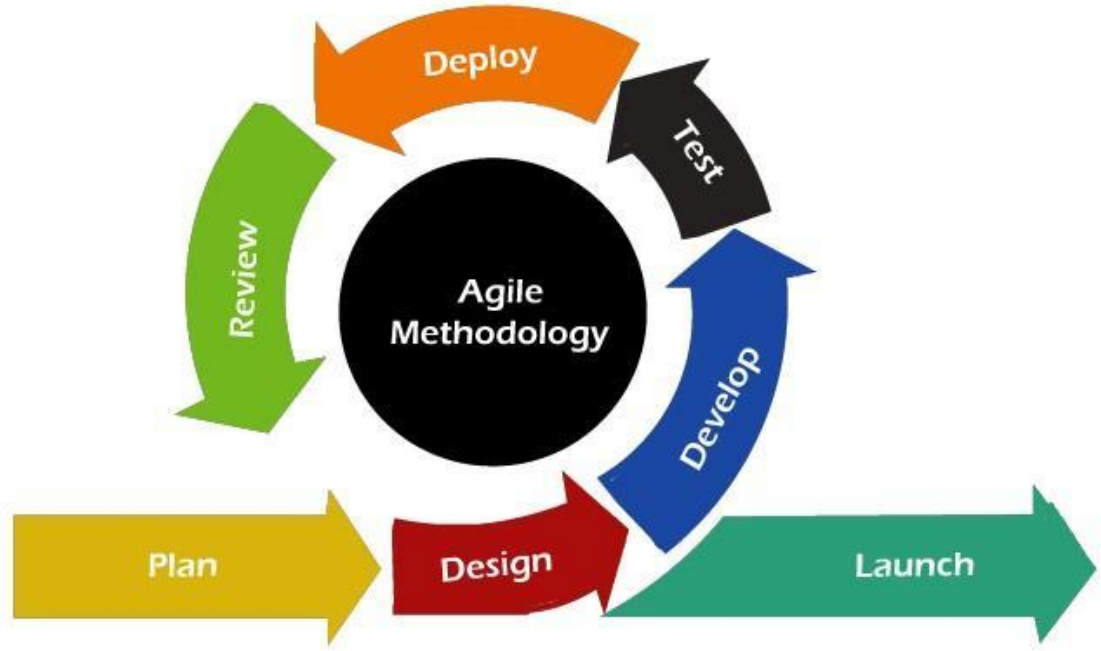


Figure 1: The Agile methodology model

WHY AGILE METHODOLOGY?

Some of the advantages and reasons for choosing agile methodology include the following.

i. With agile, teams can quickly adapt to requirements changes without negatively impacting release dates.

ii. Greater customer satisfaction the product owner actively participates in the sprints during the agile development and testing process. Their participation in this manner ultimately fosters a level of engagement that ensures their needs are being met.

iii. Better Stakeholder Engagement for Agile software development to be successful, it is important for the product owner to be engaged throughout the process. Unfortunately, that level of engagement doesn't happen in waterfall projects.

iv. Higher Quality Product Waterfall methodology can negatively impact the quality of the product. In a waterfall methodology, project phases may be so full of features that developers must rush to complete them and little time is left for testing. As a result, they may not have the time needed for proper mobile application testing.

CHAPTER FOUR
SYSTEM ANALYSIS AND DESIGN

The main objective of system analysis and design in projects is that it deals with planning the development of information systems through understanding and specifying in detail what a system should do and how the components of the system should be implemented and work together. It is also a process in which a new system is designed or an existing system is replaced by specifying its components or modules to meet particular specifications. This focuses on how to achieve the system's function. I will examine the framework I am implementing in this project after a brief significance of system analysis and design.

4.1 FUNCTIONAL REQUIREMENTS

The functional requirement is the description of the service that the software must offer. It describes the system's behavior as it applies to the functionality of the system. The following are the functional requirements that the system is expected to perform.

S/N	Functional description	Category
F1	**Management of users**	
1.1	The system should allow the users to register or subscribe to the icare system anonymously by sending a trigger word to the given code without any charges.	Evident
1.2	The system should allow the grouping of the registered users based on the similarity of their needs.	Evident
1.3	System should be able to capture the user's information to the database.	Hidden

Table 1: Table of management of user's functional requirements

S/N	Functional description	Category
F2	**Management of new born baby**	
2.1	The system should allow the users to register a new born child.	Evident
2.2	The system should allow users to assign vaccines to a new born child and under five children.	Evident
2.3	The system should allow users to assign vitamin A supplementation to a new born child.	Evident
2.4	The system should store all clinical information entered by user	hidden

Table 2: Table of management of new born baby

S/N	Functional description	Category
F2	**Management of development of child growth**	
2.1	The system should allow the user to check the growth of the child and record it.	Evident
2.2	The system should allow users to enter child weight for every month.	Evident
2.3	The system should store every detail of child development.	hidden

Table 3: Management Of development of child growth

S/N	Functional description	Category
F2	**Management of a child with special care**	
2.1	The system should allow the user to check the growth of the child and record it.	Evident
2.2	The system should allow users to enter child weight for every month.	Evident
2.3	The system should store every detail of child development.	hidden
2.4	The system should allow users to assign a doctor to a child with special care.	Evident

Table 4: Management Of children with special care

4.2 NON-FUNCTIONAL REQUIREMENTS

Non-functional requirements specify the quality attribute of a software/ system, which defines parameters that can be used rather than individual behaviors to judge the operation of a system. They can judge the software system based on Responsiveness, Usability, Security, Portability and other non-functional standards that are critical to the success of the software system.

S/N	NON FUNCTIONAL REQUIREMENTS
N1	The system will be provide no charges to the user providing responses (it is free of charge)
N2	The system will be user friendly by having a very simple User interface.
N3	The System should be able to interact with the existing systems.
N4	The System should be able to perform its functions fast, reliably, And accurately.
N5	The System should allow for modification and development to Accommodate the frequently changing requirements.

Table 5: Table of Non-functional requirements

4.3 USE CASE

A use case is a description of how a person who actually uses that process or system will accomplish a goal. It includes all system operations that are important to users, as well as models of system/actor (user) interaction objectives. In this project there are two important actors: Normal users (including clinical staff) and the Administrator.

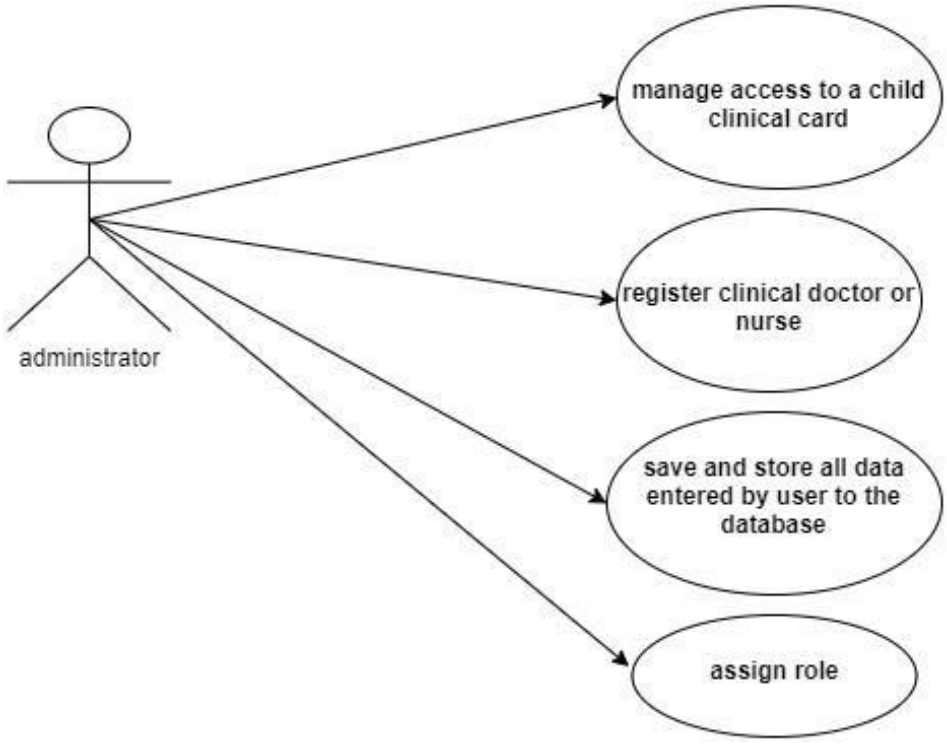


Figure 3; Administrator Use Case

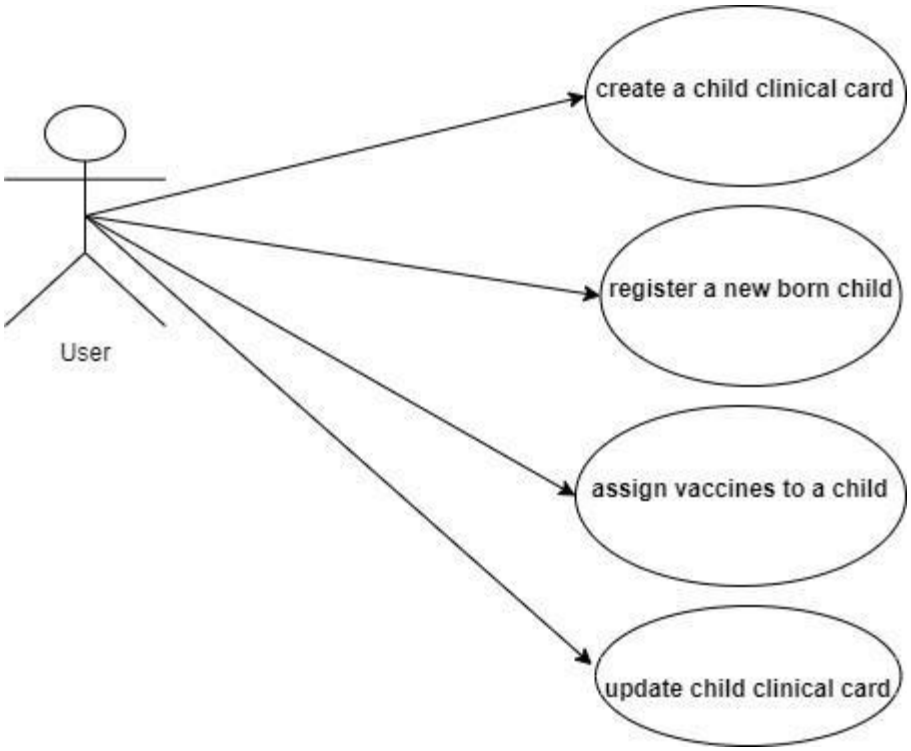


Figure 4: user use case

4.4 USE CASE DESCRIPTION

Use case number	**1**
Use case name	Register new born baby
Actor	user
Description	This is where a clinical doctor registers a new born baby to a clinical card.
Pre-condition	User must be logged in to the system
Post-condition	New born babies will be registered in the system.

Table 6: register new born baby use case description

Use case number	2
Use case name	Assign vaccine to a new born baby
Actor	user
Description	This is where a clinical doctor assigns vaccines to a new born baby by filling out a clinical card.
Pre-condition	Users must be logged in to the system and newborn babies must be registered.
Post-condition	Vaccine will be assigned to a new born baby.

Table 7: assign vaccine to a new born baby use case description

Use case number	3
Use case name	Register a special care child
Actor	user
Description	This is where a clinical doctor registers a child who needs special care in a clinical card.
Pre-condition	Users must be logged in to the system.
Post-condition	Children with special care will be registered in the system.

Table 8: register a special care child use case description

Use case number	4
Use case name	Development of child growth
Actor	user
Description	This is where a clinical doctor checks the growth of the child and fills the clinical card.
Pre-condition	Users must be logged in to the system.
Post-condition	The growth of the child will be filled in a child clinical card.

Table 9: development of child growth use case description

4.5 ENTITY RELATIONSHIP DIAGRAM (ERD)

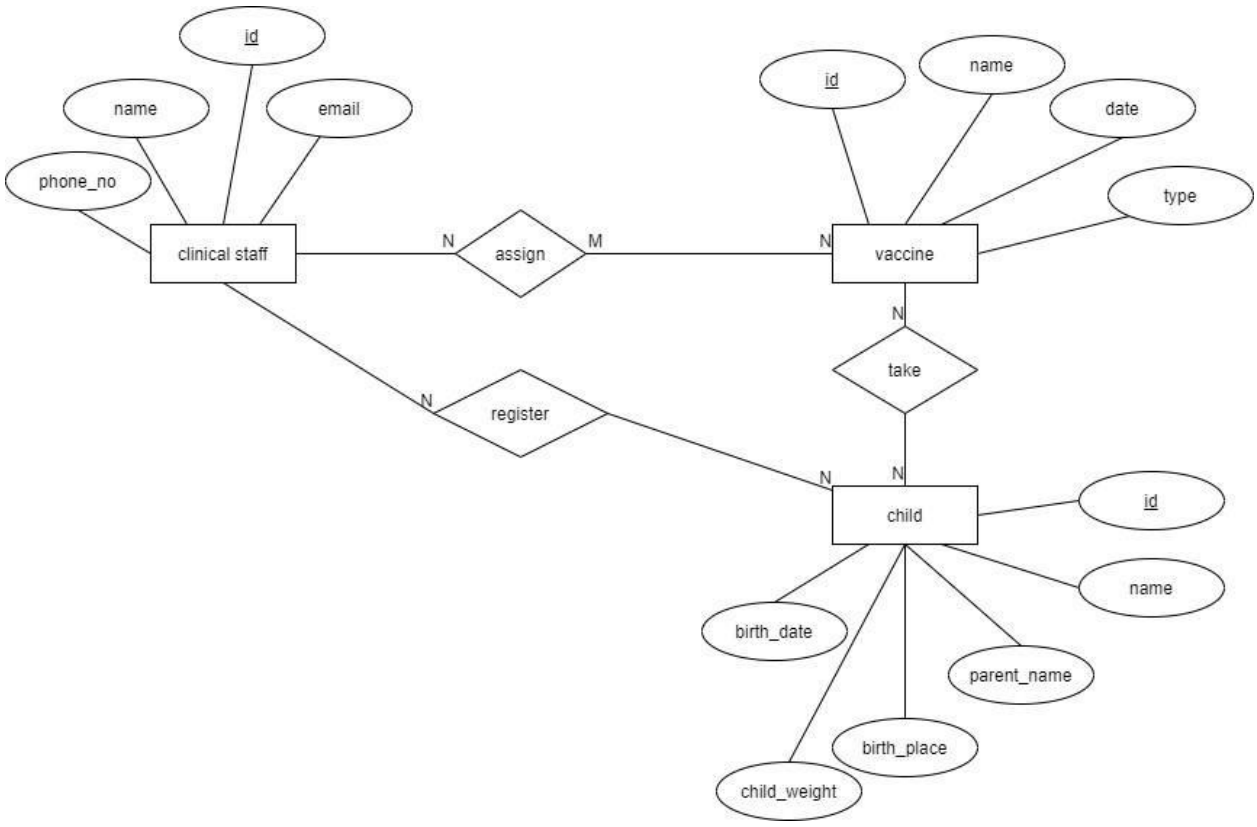


Figure 5: entity relationship diagram

4.6 SYSTEM ARCHITECTURE OF THE CHILD CLINICAL CARD

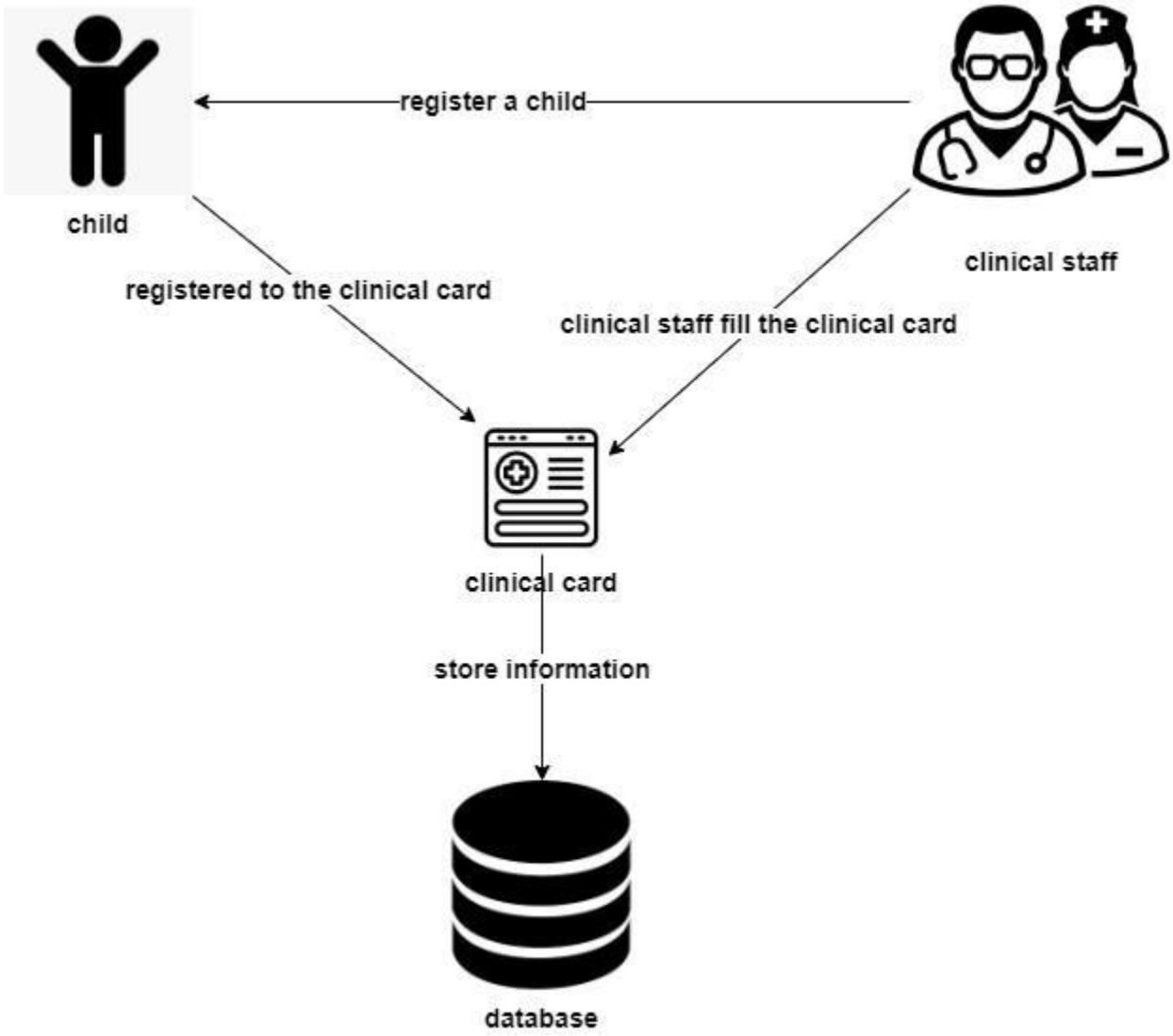


Figure 6: system architecture diagram

CHAPTER FIVE: IMPLEMENTATION

This chapter will clearly represent the implementation of the project taking into account of the Objectives, functional requirements and non-functional requirements.

5.1 TECHNOLOGY USED

The implementation of child clinical form is divided into two parts: The user interface implementation and back-end implementation the system that involves database design and database connection. The implementation of user interface first started by designing and developing using ANGULAR framework for the front end and BOOTSTRAP using code editor Visual Studio Code and the backend was implemented using SPRING BOOT and MYSQL database, and another tool used that have contributed to the implementation is GITHUB.

5.2 USER INTERFACE IMPLEMENTATION

The following is the user interface of Medical Supplies and Equipment Management System.

5.2.1 Child Registration Form

This interface shows registration of a newborn baby which involves two parts which are family identification and a birth record of a child, after a user registers a child can save the registration details.

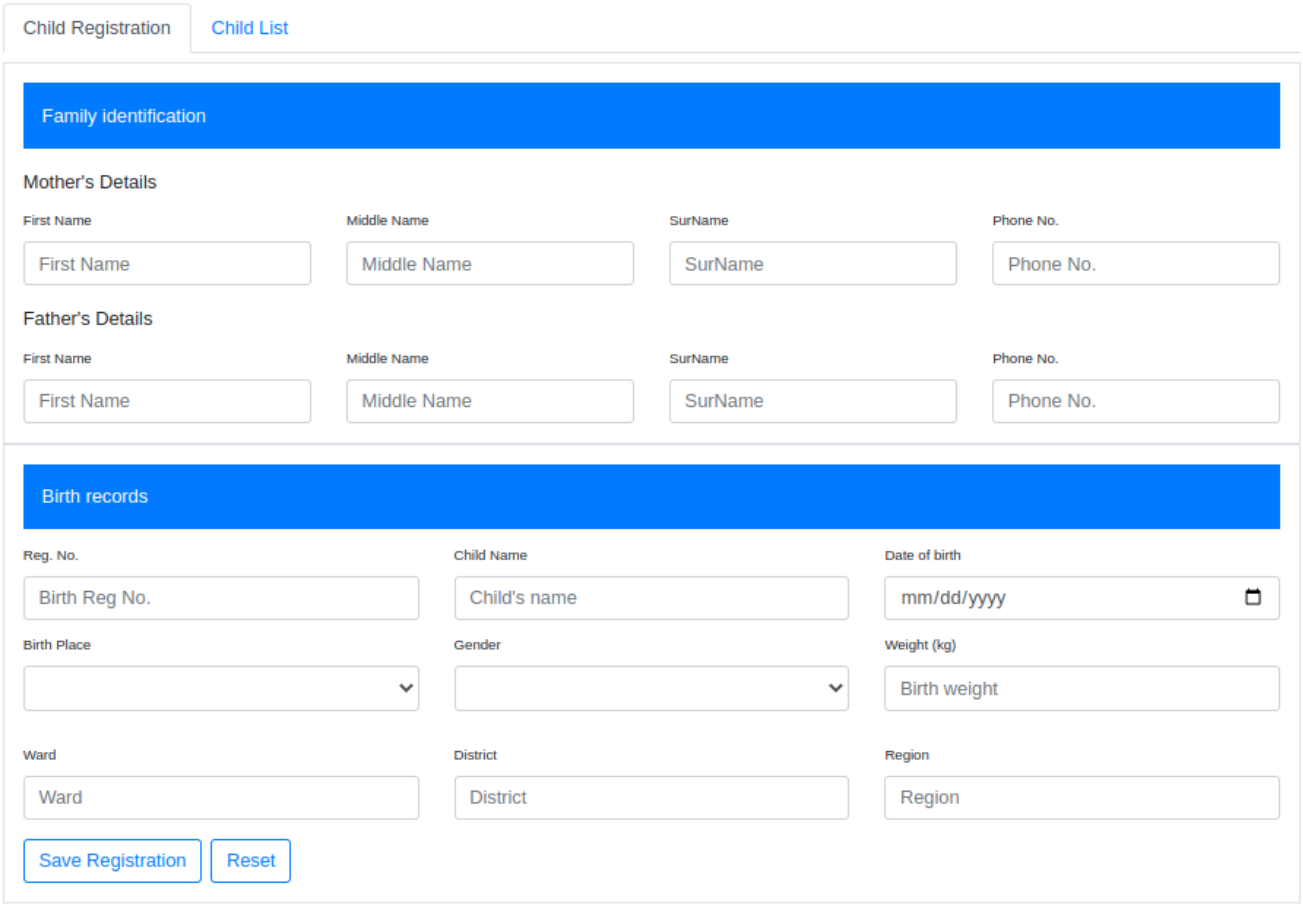


Figure 7: child registration form

5.2.2 Child list Interface

This interface shows the list of all the children registered by the user.

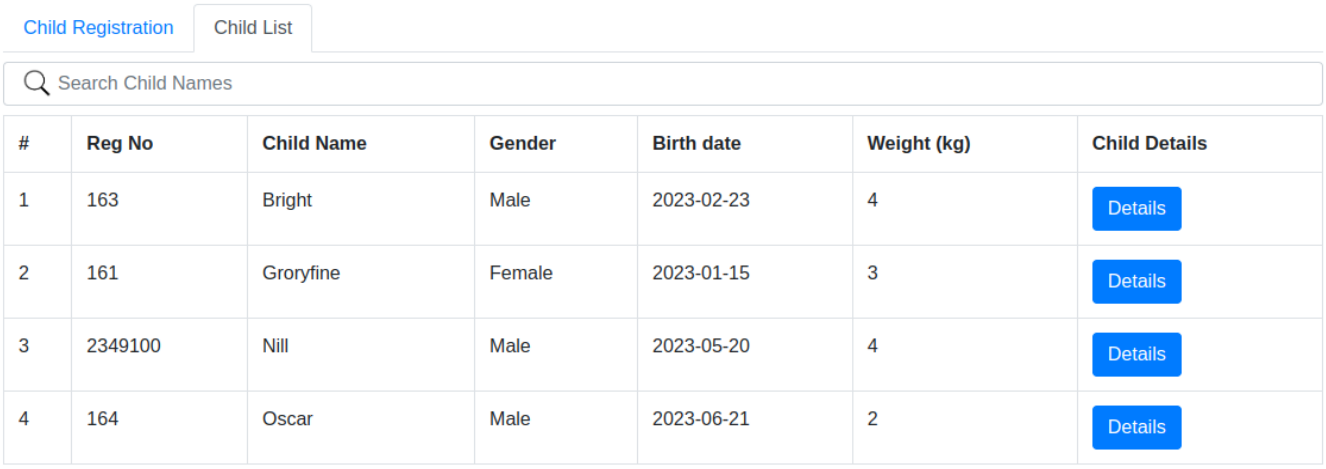


Figure 8: child list interface

5.2.3 Immunization Record Interface

This interface shows immunization records for a certain child where a user can assign a date of a vaccine for the week required, and also user can review data for the vaccines assigned.

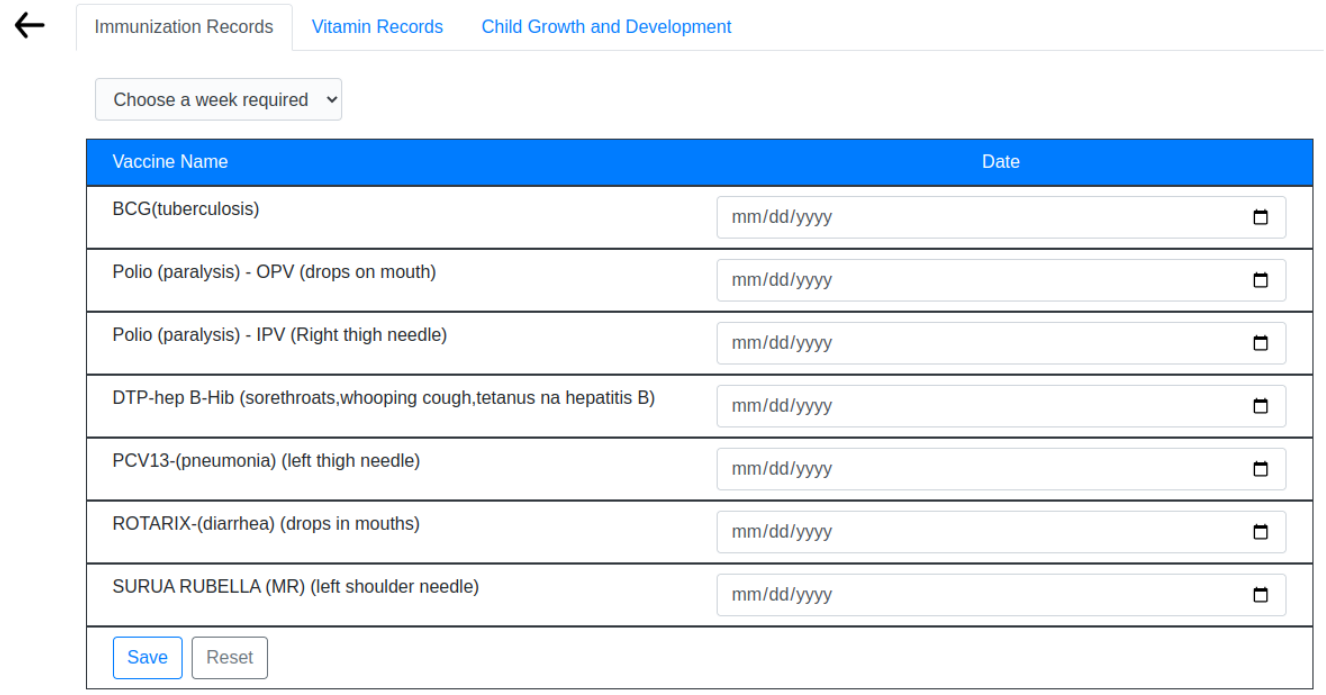


Figure 9: immunization form

Immunisation record data review

Vaccine Name	0 after birth	1 (week 6)	2 (week 10)	3 (week 14)
BCG(tuberculosis)	2023-06-14	checking for scar	checking for scar	checking for scar
Polio (paralysis) - OPV (drops on mouth)	2023-06-14	2023-11-14	2023-06-14	2023-06-14
Polio (paralysis) - OPV (Right thigh needle)				2023-06-14
DTP-hep B-Hib (sorethroats,whooping cough,tetanus na hepatitis B)		2023-11-14	2023-06-14	2023-06-14
PCV13-(pneumonia) (left thigh needle)		2023-11-14	2023-06-14	2023-06-14
ROTARIX-(diarrhea) (drops in mouths)		2023-11-14	2023-06-14	
SURUA RUBELLA (MR) (left shoulder needle)	2023-06-29		2023-12-14	

Figure 10: immunization record data review

5.2.4 Vitamins Record Interface

This interface shows vitamins records for a certain child where a user can put a tick to a check box by choosing a month required then save the data in database, then user can review data for vitamins and anthelmintic assigned in the table of vitamins data review table .

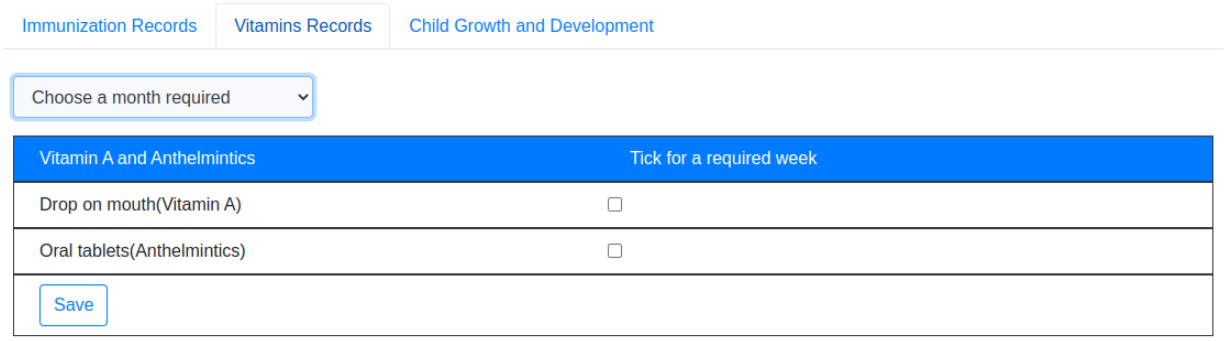


Figure 11: vitamin record form

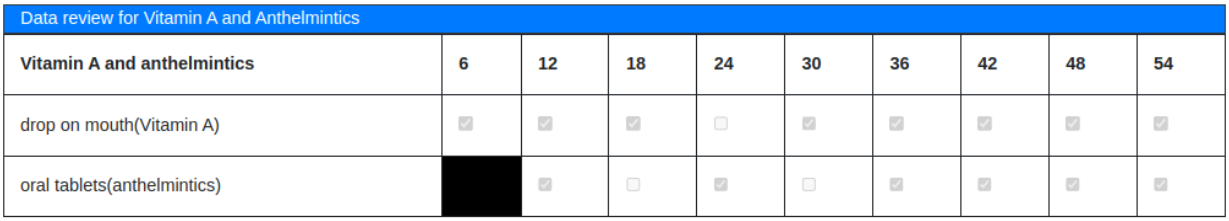


Figure 12: vitamin data review

5.2.4 Child Growth and Development Interface

This interface shows under five children visiting forms where a user can fill a date of a child visiting a clinic and weight of a child measured and the date of the next clinical visit, and also shows the data review for the child visiting form, also it shows the graph which shows the child growth and development for each visit.

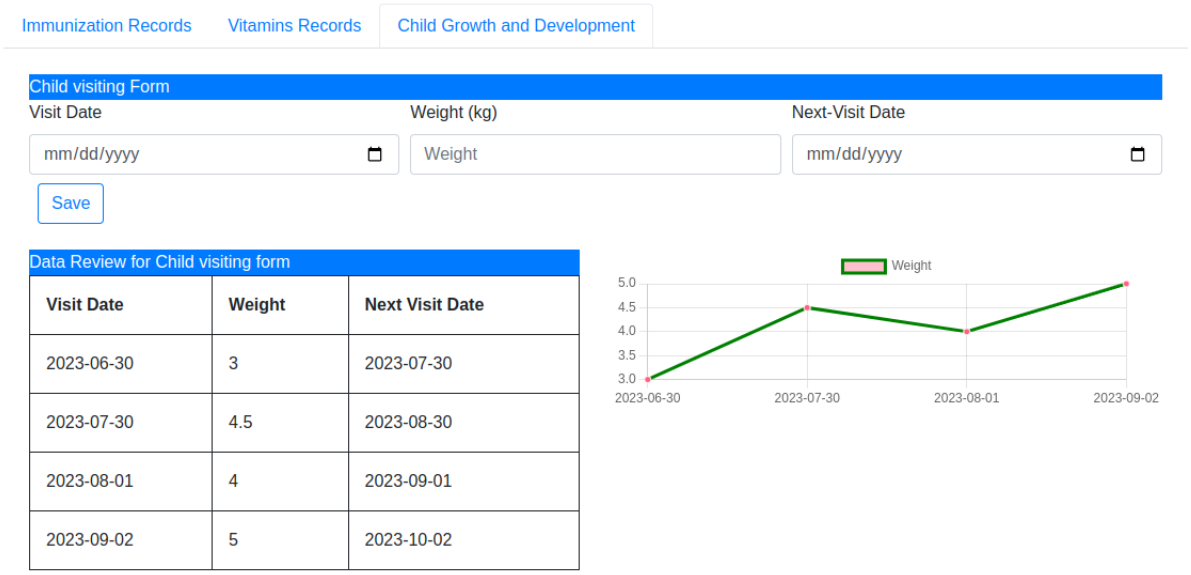
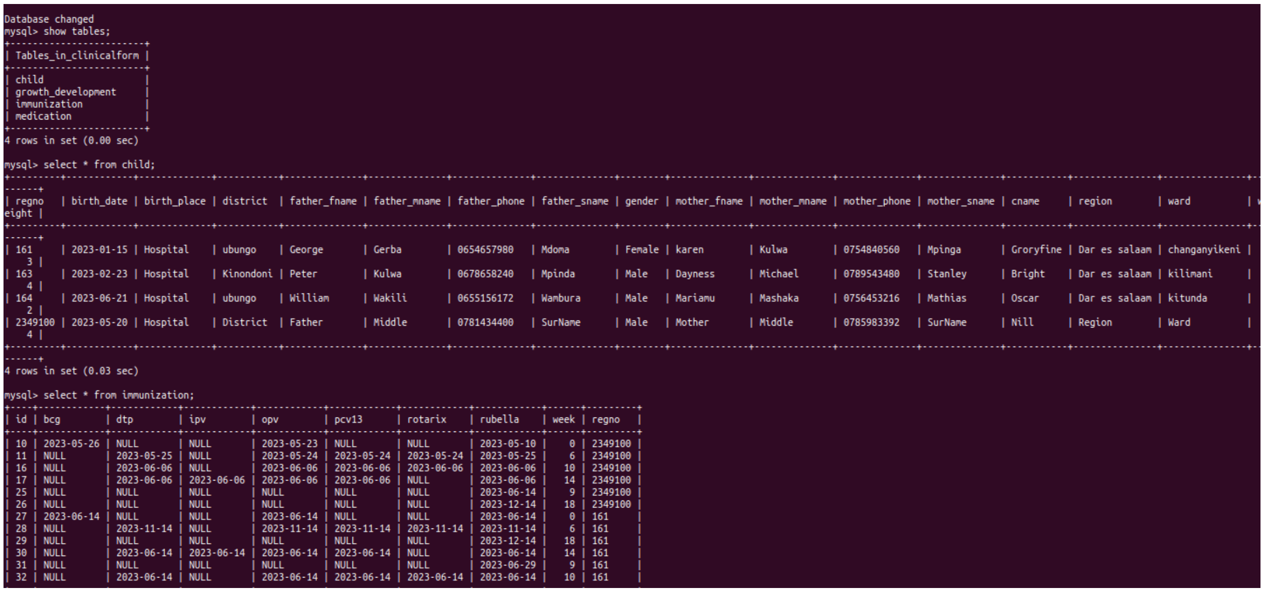


Figure 13: child growth and development interface

5.2 Database Implementation

Database used for implementation was MySQL database server through SPRING BOOT for creating and storing system information for the required information in the system. The following show tables of the system.



```
Database changed
mysql> show tables;
+------------------------+
| Tables_in_clinicalform |
+------------------------+
| child                  |
| growth_development     |
| immunization           |
| medication             |
+------------------------+
4 rows in set (0.00 sec)

mysql> select * from child;
| regno   | birth_date | birth_place | district  | father_fname | father_mname | father_phone | father_sname | gender | mother_fname | mother_mname | mother_phone | mother_sname | cname     | region        | ward          | w
eight |
| 161     | 2023-01-15 | Hospital    | ubungo    | George       | Gerba        | 0654657980   | Mdoma        | Female | karen        | Kulwa        | 0754840560   | Mpinga       | Groryfine | Dar es salaam | changanyikeni |
    3 |
| 163     | 2023-02-23 | Hospital    | Kinondoni | Peter        | Kulwa        | 0678658240   | Mpinda       | Male   | Dayness      | Michael      | 0789543480   | Stanley      | Bright    | Dar es salaam | kilimani      |
    4 |
| 164     | 2023-06-21 | Hospital    | ubungo    | William      | Wakili       | 0655156172   | Wambura      | Male   | Mariamu      | Mashaka      | 0756453216   | Mathias      | Oscar     | Dar es salaam | kitunda       |
    2 |
| 2349100 | 2023-05-20 | Hospital    | District  | Father       | Middle       | 0781434400   | SurName      | Male   | Mother       | Middle       | 0785983392   | SurName      | Nill      | Region        | Ward          |
    4 |
4 rows in set (0.03 sec)

mysql> select * from immunization;
+----+------------+------------+------------+------------+------------+------------+------------+------+---------+
| id | bcg        | dtp        | ipv        | opv        | pcv13      | rotarix    | rubella    | week | regno   |
+----+------------+------------+------------+------------+------------+------------+------------+------+---------+
| 10 | 2023-05-26 | NULL       | NULL       | 2023-05-23 | NULL       | NULL       | 2023-05-10 |    0 | 2349100 |
| 11 | NULL       | 2023-05-25 | NULL       | 2023-05-24 | 2023-05-24 | 2023-05-24 | 2023-05-25 |    6 | 2349100 |
| 16 | NULL       | 2023-06-06 | NULL       | 2023-06-06 | 2023-06-06 | 2023-06-06 | 2023-06-06 |   10 | 2349100 |
| 17 | NULL       | 2023-06-06 | 2023-06-06 | 2023-06-06 | 2023-06-06 | NULL       | 2023-06-06 |   14 | 2349100 |
| 25 | NULL       | NULL       | NULL       | NULL       | NULL       | NULL       | 2023-06-14 |    9 | 2349100 |
| 26 | NULL       | NULL       | NULL       | NULL       | NULL       | NULL       | 2023-12-14 |   18 | 2349100 |
| 27 | 2023-06-14 | NULL       | NULL       | 2023-06-14 | NULL       | NULL       | 2023-06-14 |    0 | 161     |
| 28 | NULL       | 2023-11-14 | NULL       | 2023-11-14 | 2023-11-14 | 2023-11-14 | 2023-11-14 |    6 | 161     |
| 29 | NULL       | NULL       | NULL       | NULL       | NULL       | NULL       | 2023-12-14 |   18 | 161     |
| 30 | NULL       | 2023-06-14 | 2023-06-14 | 2023-06-14 | 2023-06-14 | NULL       | 2023-06-14 |   14 | 161     |
| 31 | NULL       | NULL       | NULL       | NULL       | NULL       | NULL       | 2023-06-29 |    9 | 161     |
| 32 | NULL       | 2023-06-14 | NULL       | 2023-06-14 | 2023-06-14 | 2023-06-14 | 2023-06-14 |   10 | 161     |
```

Figure 14: database tables

CHAPTER 6: CONCLUSION AND RECOMMENDATION

6.1 Conclusion

The issue of provision of quality care is a major issue in Tanzania especially in rural areas. It is It is important that proper measures are considered. Clinical practice and maternal mothers are both associated with an increase or decrease in the newborn mortality rate. Therefore, rather than Placing blame in either way, our method attempts to increase clinical engagement between health's Staff and mothers in order to lessen the strain of the health staff while maintaining the focus on Delivering high-quality maternal care. The society at large needs to be educated on the issues relating to maternal and child health care. It is the responsibility of each member of the community to be a part of this great impact.

6.2 Recommendations

The research done during the processes of gathering requirements and implementation of this The project showed clearly that poor clinical practices and lack of proper health care provision contributes to the existence of the problem. From the health center which is: UDSM health center, it has shown that there are still a lot of challenges in RCH section in these facilities which results in poor healthcare to pregnant women and newborns. For instance, shortage of enough training, an unconducive environment including a limited number of attendants. Therefore, it is very important for the government and the legislators to make new policies and come up with ways to solve challenges that are propelling the existence of the problem.

The foreseen significance of this project will make a greater impact in the provision of quality services to pregnant mothers and newborns. Therefore, I do recommend that this project should be considered, completed and get support from the stakeholders.

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APPENDICES

A1: INTERVIEW QUESTIONS

MASWALI KUHUSU UTOAJI HUDUMA KWA MAMA MJAMZITO NA MTOTO

Muuguzi (Health Staff)

1. nini kifanyike ili kupunguza vifo vya watoto wachanga na chini ya miaka mitano na nini kiboreshwe?
2. Je ni uzembe wa mama au wauguzi wanaosababisha vifo vya watoto?
3. Huduma ya chanjo kwa watoto inatolewaje?
4. Kwa siku, unahudumia takribani watoto wangapi na unadhani kliniki yenu inauwezo wa kuwahudumia ipasavyo?
5. Serikali inatoa mchango gani katika kuboresha miundombinu ya utendaji kazi wenu?
6. Ni utaratibu gani unatumika kujua taarifa au historia za nyuma za mtoto wakati anapo hudhuria kliniki hadi pale anapoendelea kukua?
7. Ni Mifumo (systems) gani ambayo mnatumia katika utoaji wa huduma zenu?
8. Ni taarifa gani za muhimu za mtoto zinazohifadhiwa?
9. Mnatumia njia gani kutunza rekodi za kina mama na watoto wanapohudhuria kliniki? Je, njia hizo zinahitaji maboresho gani?
10. Ni changamoto gani unapitia katika utendaji wako wa kazi? Je,kuna changamoto ambazo zina sababishwa na watu unaowapa huduma?
11. Je, ni gharama zipi muhimu ambazo mama anaingia anapokuja kwaajili ya kliniki ya mtoto katika kituo chenu?

A2: WORK PLAN

S/N	TASK NAME	ACTIVITY	DATE	STATUS
1	review challenge documentation	Reviewing related works	Nov 2022	Done
2	Defining the problem and the existing sub problems.	Analyzing the possible causes and challenges contributing to the problem's existence.	Nov 2022	Done
3	Data collection	Preparing research questions for both questionnaires and Interviews.	Jan 2023	Done
4	Research	Conducting research at UDSM dispensary	March 2023	Done
5	Ideation and prototyping	Creating prototype for the ideated Solution.	April 2023	Done
6	Implementation	Web application child clinical card	May-July 2023	on progress
7	Piloting (testing)	Test the system to the users Nurses or clinical staffs	August 2023	not yet

Table 10: work plan table

A3: BUDGET

S/N	CATEGORY	PARTICULAR	COST
1	INTERNET	-Internet bundle -communication with team members	20000/=
2	TRANSPORT	public transport	10000/=
3	RESEARCH	-food -stationeries	40000/=
4	PILOTING	-training users -training materials	10000/=
		TOTAL	80000/=

Table 11: budget table