

Jimma University

Jimma Institute of Technology

Faculty of Computing and Informatics

Department of Software Engineering

**CBTP-PHASE II: - APPROPRIATE TECHNOLOGY AND
ACTION PLAN DEVELOPMENT**

**Title: - Web and Smart Card System for Infant
Immunization**

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The last but not the least we would like to thank our honorable teachers who give as their time to support us.

CHAPTER ONE

Project Overview

Introduction

As it is known many health center data records are kept manually. One of those records is immunization record for pregnant woman and infants. This card is used to record already given vaccines and appointment days for future vaccinations that infants and pregnant women must take. On most health centers this immunization records are just kept manually on cards. This is the same problem we have observed in Jimma Health Center located at Bosa Kitto kebele in the first phase of CBTP.

As we know the health sector should give better service for the society mainly for pregnant mothers and infant because they need special care and treatment. So we focus on how we can give better way of data recording for immunization record. Regarding with this we selected a web based smartcard system for immunization to both mothers and infants which can work offline and online. In this phase will present the design solution we have proposed for the problems we have found.

Statement of Problems

In the current system when a pregnant mother comes to follow up pregnancy check they are given an immunization card to follow up vaccination while they are pregnant and after giving birth. The pre-birth vaccination is given for the mother and the post birth vaccination is given for the infants until the infant get to age of 1 year. This immunization cards are filled manually. These manual card issues many problem due to different reasons.

Accessibility Problem:-When the mother loses her card and as well as when changing health center from one to another access for previous data becomes very difficult.

Data Loss:-these manual records could get lost for some reason .For example because of natural disaster like earthquake and lightening, and as well as man-made disasters like fire.

Time consuming: - Data record is manually and it is very time consuming when wanting to find a specific data. So giving service in short amount of time will be difficult.

Wastage of resources: -papers were wasted because of everything were written manually.

CHAPTER TWO

Objective

General Objective

The main objective is to design a web and smart card for immunization data record and management.

Specific Objective

These are the specific objective identified in order to implement the general objective

- Identifying the functional and non-functional requirement of the system.
- Identifying design tools.
- Identifying Methodology to be used.
- Identifying the action plan.
- Design use case and class diagram for the system.
- Identifying main components of the system.

SCOPE and Limitation

The scope of the system is designing web based smart card system for the mother and new born infant vaccination to record, update, retrieve and notify the mothers vaccination date.

Our system is limited only to record and manage mothers and infant vaccination profile which restrict the usability to the mothers and infant whose age is below one and this system designed only to record the immunization profile of both up to completes there vaccination. After completion of the vaccine both the mother and the infant data will be deactivated. This make shortens the scope/life time of the record.

Methodology

Our requirement gathering is mainly focused on observation and asking health professionals. And we have used object oriented approach to model the system, because this approach helps us to know every component needed and simplifies the implementation process. Using this approach, we have identified the class needed and the properties and behavior of those classes.

Tools used

We used different tools during our project

- **Edraw max:** to model the requirement in drawing the use cases and class component diagram.
- **Microsoft word:** to write the document.
- **Internet:** to collect information about immunization vaccines.

CHAPTER THREE

PROPOSED SOLUTION

Introduction

In this phase, we are going to solve the problems stated above in Jimma Health Center by designing smart card for infant vaccination. In this system, first the mother and infant should be registered by registrar filling the registration form online. The data inserted by the registrar stored in the database by using a unique identification number. A smart card is given to the mother which contain the data like identification number. The registrar and doctors can view the detailed information about Mother and Infant using smart card they retrieving the data from the data base and also contact the admin if he/she has any queries. In addition to this, it enables health center to request for the available vaccines. That means it allows online and real-time ordering. Finally this system also allow the users to access the system when internet connection lose by downloading the file and editing the data (store new information to the file) then restore the data in to database when internet connection available.

Main components of this system are the smart card and the website application. The smart card is essential part of this system, which hold basic information of the user and it can read and rewritten. When the mother come to health center the health professional read the card by using smartcard reader and rewrite the updated information. This part of the system will work on offline.

The website application will serve as a bridge between the smart card data and the central database. This part of the system is an online system which has the following main tasks; it will upload the newly updated information to the central database when there is internet connection, it also notify the mother when the vaccination date is coming closer.

Proposed Architecture

We selected the three tier architecture for our system. Which is organized in to three layers:-

1. Interface layer for users to interact to the system
2. Application layer for smart card reading and connect to database the server for data exchange.
3. Storage layer for storing data in to smart card and database.

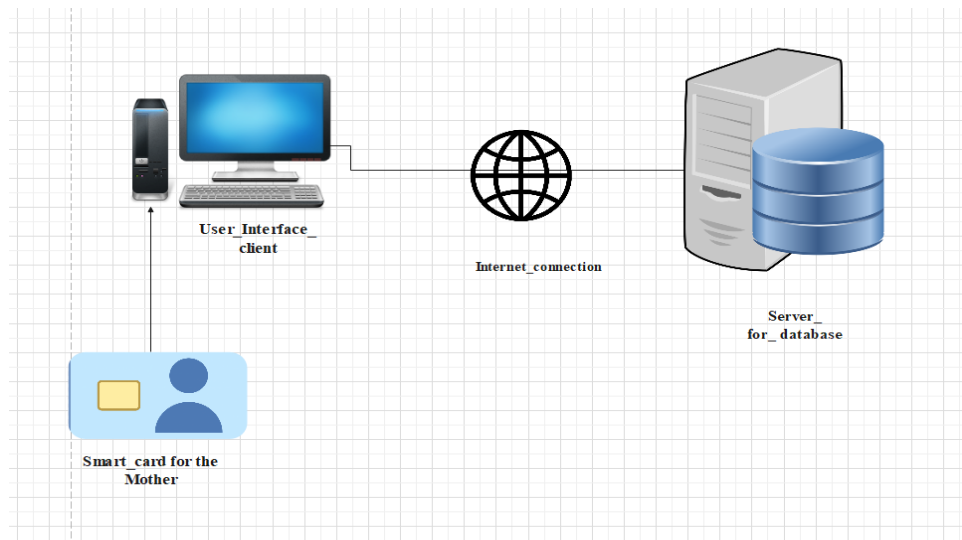


Fig 3.1 System architecture diagram

Participating Actors

1. Mother
2. Registrar
3. Health Professional
4. Admin

Functional Requirements

Functional requirement is defined as a function of a system or its component.

Mother

- ✓ The system notify the mother that her vaccination data.

Registrar

- ✓ The system allows a Registrar to log in.
- ✓ The system allows a Registrar to register new mother.
- ✓ Registrar can read mothers smart card using smart card reader.

Health professional

- ✓ The system allows health professional to log in.
- ✓ Health professional can read mothers smart card.
- ✓ Health professional can update the mothers and infant information on the smart card and
- ✓ Health professional can also upload the new updated data to central database using web.

Administrator

- ✓ The system allows Administrator to log in.
- ✓ The system allows Administrator to create users.
- ✓ The system allows Administrator to deactivate.
- ✓ The system allows Administrator to update user.
- ✓ The system allows Administrator to generate report.

Nonfunctional requirement

Non-functional requirements are that detail the constraints and quality standards that the system building should adhere to. We are finding out what these non-functional requirements should be by our experience. Also, we can use try and discover what non-functional requirements should be. Here are some areas that we should have in our non-functional requirements document:

Usability: - our system is more usable according to different perspectives.

From user perspective: - our system is easily to uses because the smart card can carry the information needed the user to get the service any health center by using that card only.

From task perspective: - our system operated by simple tasks. According to our system there is a reader in the health center so the health professional can easily retrieve the data he/she need by reading the smart card.

From environment perspective: - our system work both offline and online. The card can be read offline by using reader and updated then by using web the data is uploaded to the central database which this task performed in online.

From platform perspective: - our system uses simple technology to read the smart card and to update the data.

Accessibility: - our system is easily to access. Because it work both in offline and online user can access the system functionalities at any time in the presence of the smart card. So the user can get service at any health center.

Performance: - In the manual System, the cycle of retrieving and storing data is so bulky that it needs more time and energy. Our system fix this problem by storing and retrieving the data from the smart card faster. It can avoid wastage of energy, time and resource.

Use cases

1. Login
2. Register
3. View mother and infant information
4. Update mother and infant information
5. Read from the card
6. Rewrite in to card
7. Receive notification
8. Upload updated data
9. Update user

- ## 12. Generate report

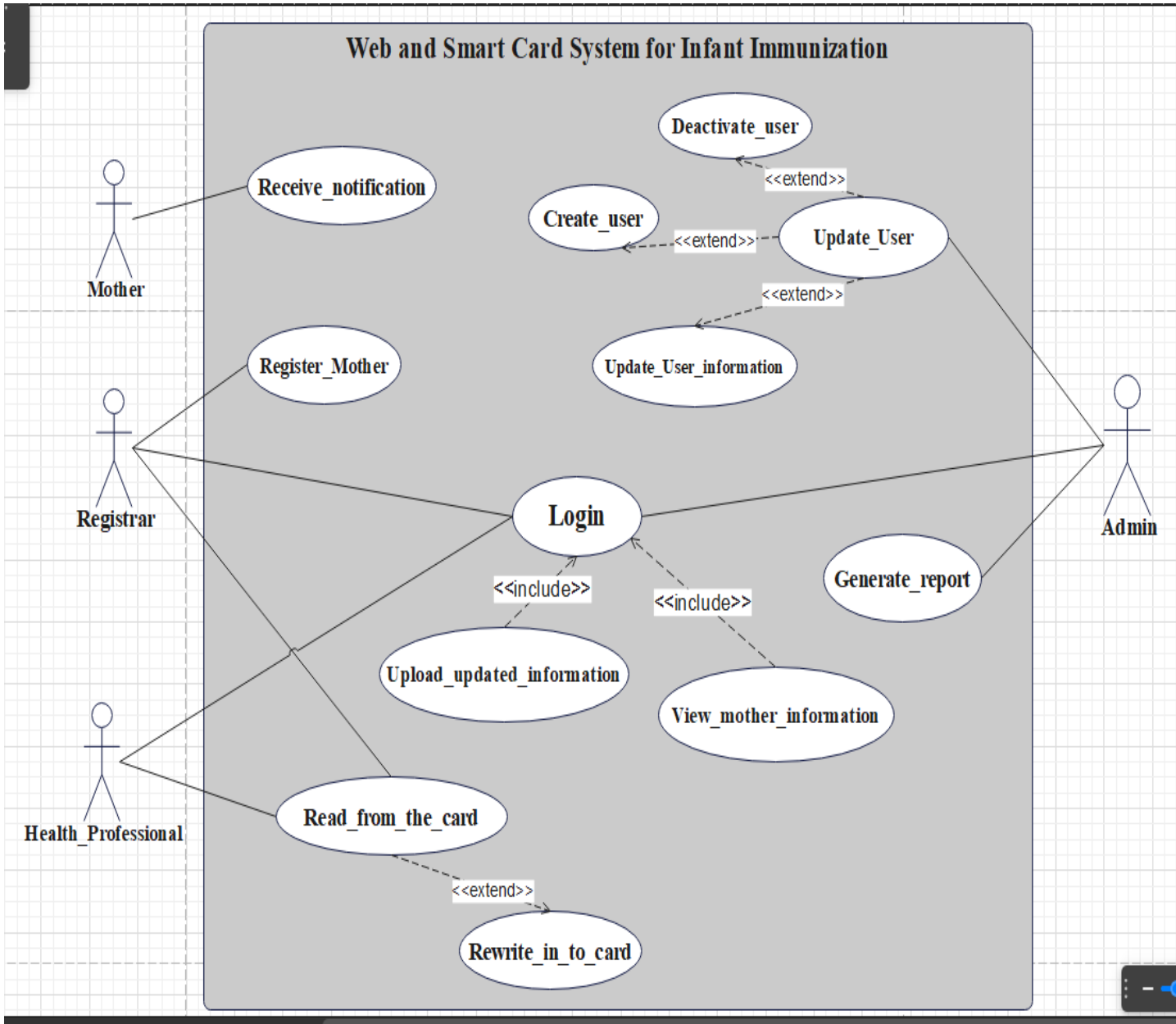


Fig 3.2 use case diagram

Class diagram

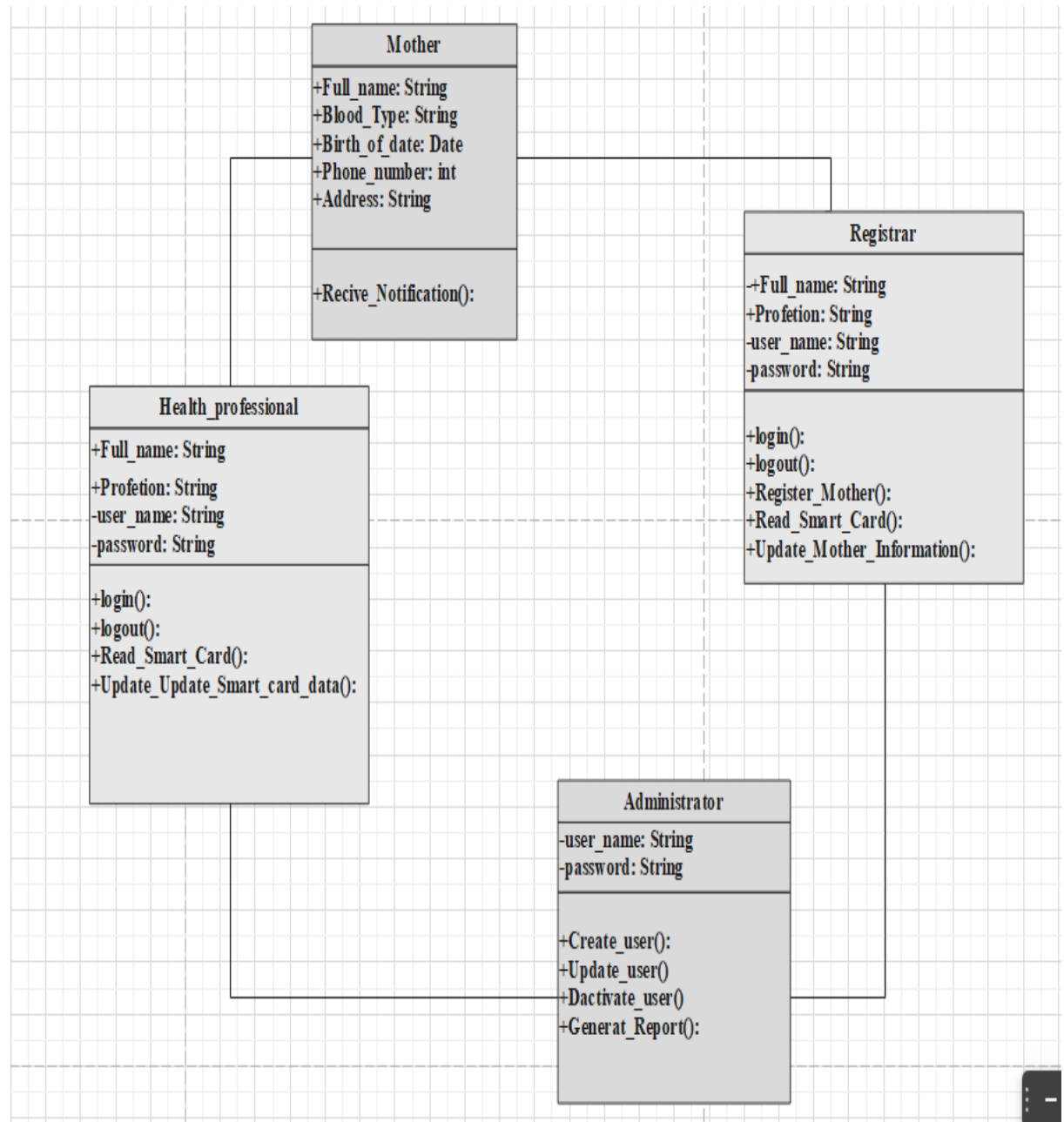


Fig 3.3 class diagram

Component Diagram

Component diagram describes the organization and wiring of the physical components in a system.

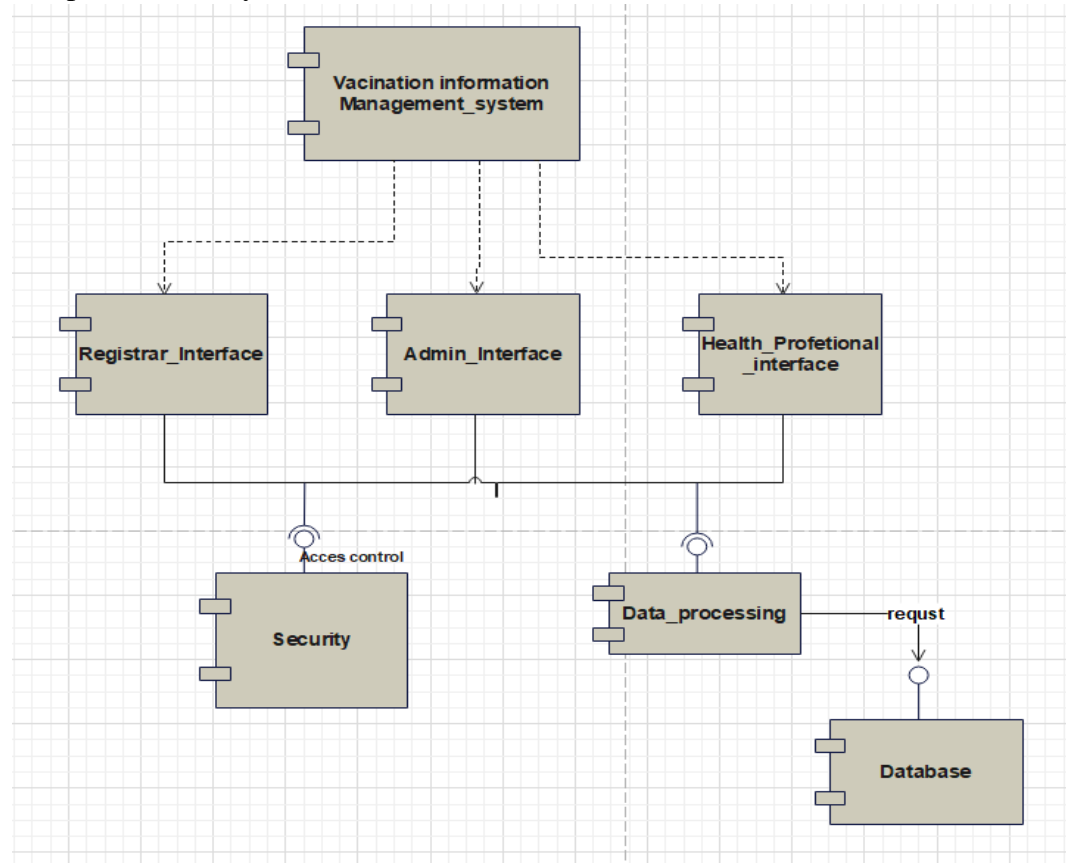


Fig 3.4 component diagram

Deployment diagram

This diagram depicts the static view of runtime configuration and hardware nodes and the software components that run on those nodes. And it shows the hardware for our system, the software that is installed on that hardware. The deployment diagram of our proposed system is shown as follows.

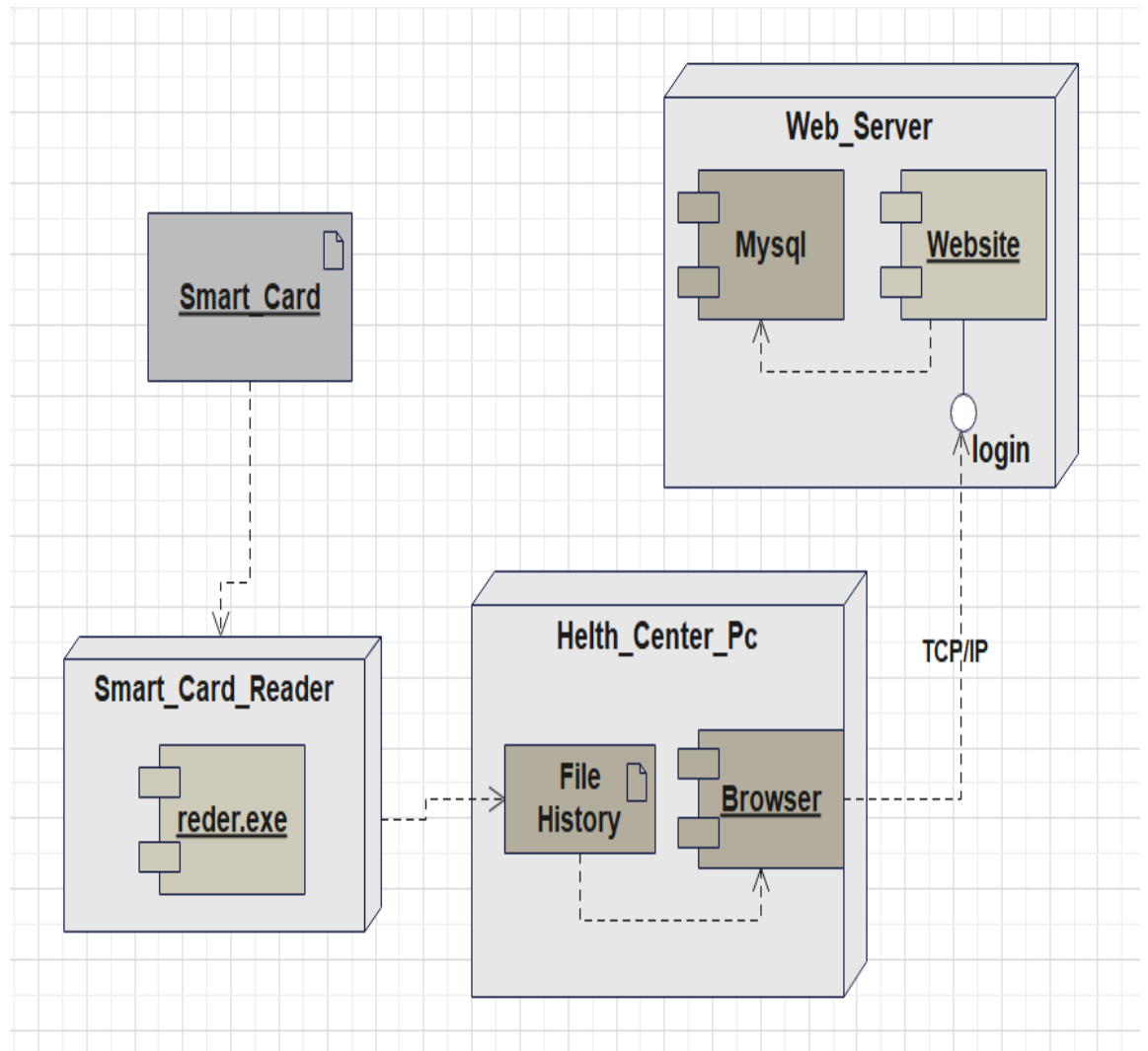


Fig 3.5 Deployment diagram

CHAPTER FOUR

ACTION PLAN

Action plan is the list of tasks or procedure we used to achieve our objective or goal. Action plans are useful, because they give us a framework for thinking about how we'll complete our project efficiently.

Accordingly, all of our group members used the following throughout our project.

Tasks: -are the actions we performed through our project.

- ✓ Analyzing the project overview
- ✓ Prepare objective and scope
- ✓ Functionalities and non-functionalities of our system
- ✓ Analyzing the proposed solution
- ✓ Designing our project by using UML diagram

Task	Resource	Time plane	Person
Analyzing the project overview	Paper, pen and Computer (Microsoft office word)	Jan, 22, 2022	All members
Prepare objective and scope	Paper, pen and Computer (Microsoft office word)	Feb, 02, 2022	All members
Functionalities and non-functionalities of our system	Paper, pen and Computer (Microsoft office word)	Jan 05, 2022	All members
Analyzing the proposed solution	Computer (Microsoft office word)	Jan 24, 2022	All members
Designing our project by using UML diagram	Computer (Edraw)	March 1, 2022	All members

Table 4.1 action plan

CHAPTER FIVE

FUTURE PHASE

In the phase three, we are aimed to solve the stated problems by implementing the proposed system by using different concepts of database, programing languages, html and css that we designed in the previous chapters of our document.