

HAWASSA UNIVERSITY



FACULTY OF INFORMATICS DEPARTMENT OF COMPUTER SCIENCE SOFTWARE ENGINEERING PROJECT TITLE : STUDENT CLINIC SYSTEM

GROUP 5

KALEAB TESHAYE	1801/14
NATHAN ABAYNEH	2403/14
GETAHUN DERJE	1463/14
EYOB HAILU	1249/14
VENUS HAILEMESKEL	3064/14

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Part 2 : System Design

3.1.System Architecture

System architecture, as used in software development, describes the overall organization of a software system, including its elements, relationships, and design principles. It describes how the various components—modules, layers, services, databases, and external interfaces—are arranged and coordinated. To guarantee the stability, maintainability, and flexibility of the system, system architecture follows to important design concepts like modularity, encapsulation, and scalability. It covers issues including performance, security, flexibility, and dependability with the goal of building a system that is capable of handling growing loads, recover back from errors, and defend off security threats. System design also takes deployment scenarios into account, which helps with decisions regarding how the system will be managed and distributed in various situations.

For a software project, the system architecture typically consists of several layers, each responsible for specific components and functionalities. Here are the common layers of a system architecture:

Presentation layer

The elements and interactions of the user interface are managed by this layer. It consists of elements like graphical user interfaces (GUIs). The presentation layer of a student clinic system would include user interfaces including login screens, patient profiles, forms, and so on.

Application Layer:

The application layer contains the core logic and functionality of the system. It processes requests from the presentation layer, performs business logic operations, and interacts with the data layer. In a student clinic system, the application layer would handle functionalities such as patient management, report generation , medical record management, etc.

Data Access Layer:

This layer manages the interaction between the application layer and the database. It handles tasks such as querying, updating, and managing data stored in the database. In a student clinic system, the data access layer would facilitate interactions with the database to retrieve patient records, store medical histories, etc.

Database Layer:

The database layer comprises the database management system (DBMS) and the actual database where the system's data is stored. It stores structured data in tables and provides mechanisms for data retrieval, manipulation, and storage. In a student clinic system, the database layer would store information such as patient medical histories , information about medications in the store etc.

Security Layer:

The security layer is responsible for ensuring the confidentiality, integrity, and availability of the system's data and resources. It includes mechanisms such as authentication, authorization and encryption to protect against unauthorized access, data breaches, and security threats. In a student clinic system, the security layer would implement measures to safeguard patient information, user accounts, and system resources.

3.2. Class Modeling

Class diagram is a static diagram. It represents the static view of an application. Class diagram is not only used for visualizing, describing, and documenting different aspects of a system but also for constructing executable code of the software application.

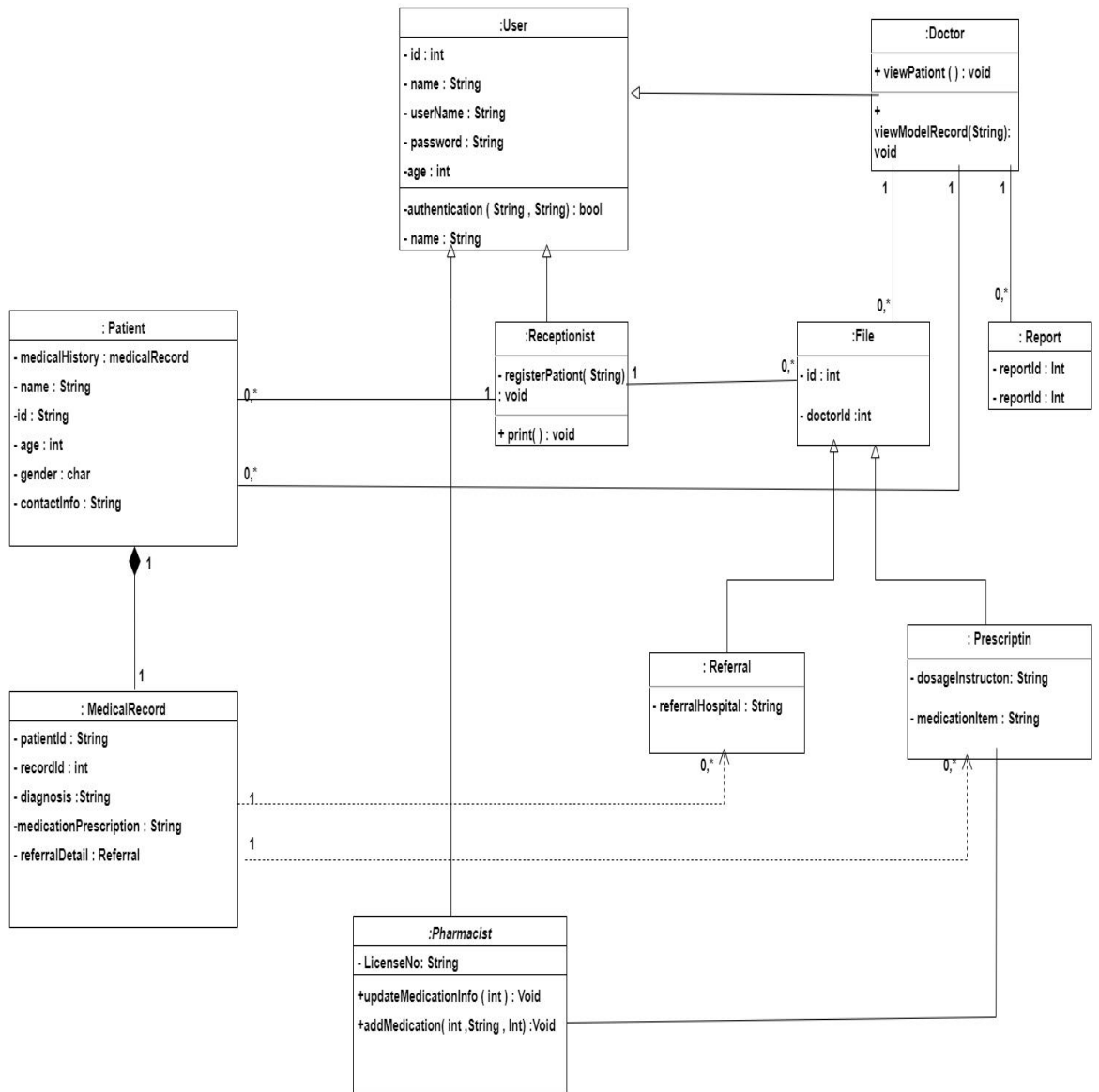
A class diagram establishes the characteristics and functions of a class together with the limitations placed upon the system. Since class diagrams are the only UML diagrams that can be directly transferred to object-oriented languages, they are frequently employed in the modeling of object-oriented systems.

A collection of classes, interfaces, associations, collaboration, and constraints are displayed in a class diagram.

List of the classes and interfaces for our project

- | | |
|----------------|----------------|
| ● User | Doctor |
| ● Pharmacist | Receptionist |
| ● Patient | Medical record |
| ● File | Referral |
| ● Prescription | Report |

- Doctor Pharmacist and receptionist implement the user interface
- A doctor can have multiple patients
- Patient has a medical record
- Referral and prescription implement file interface
- A doctor can generate zero or more reports
- A receptionist can print one or more files
- A receptionist can register one or more patients
- Medical record depends on referral and prescription



1.1. Deployment Diagram

Deployment diagrams are used to visualize the topology of the physical components of a system, where the software components are deployed.

Deployment diagrams are used to describe the static deployment view of a system.

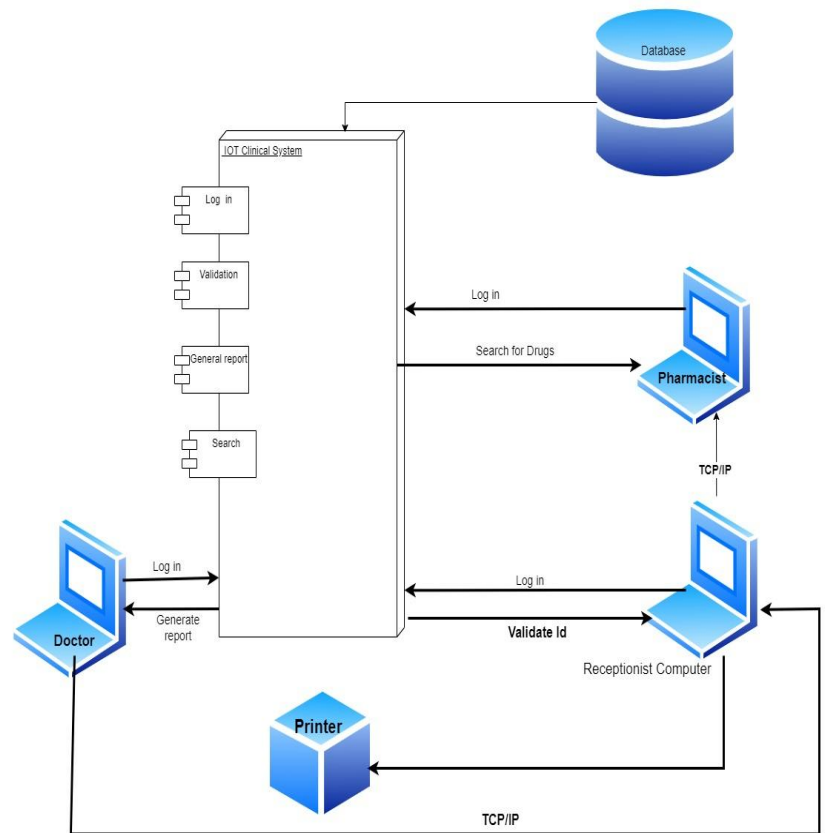
Deployment diagrams consist of nodes and their relationships.

The purpose of deployment diagrams can be described as –

- Visualize the hardware topology of a system.
- Describe the hardware components used to deploy software components.
- Describe the run time processing nodes.

Deployment diagrams are useful for system engineers. An efficient deployment diagram is very important as it controls the following parameters –

- Performance
- Scalability
- Maintainability
- Portability

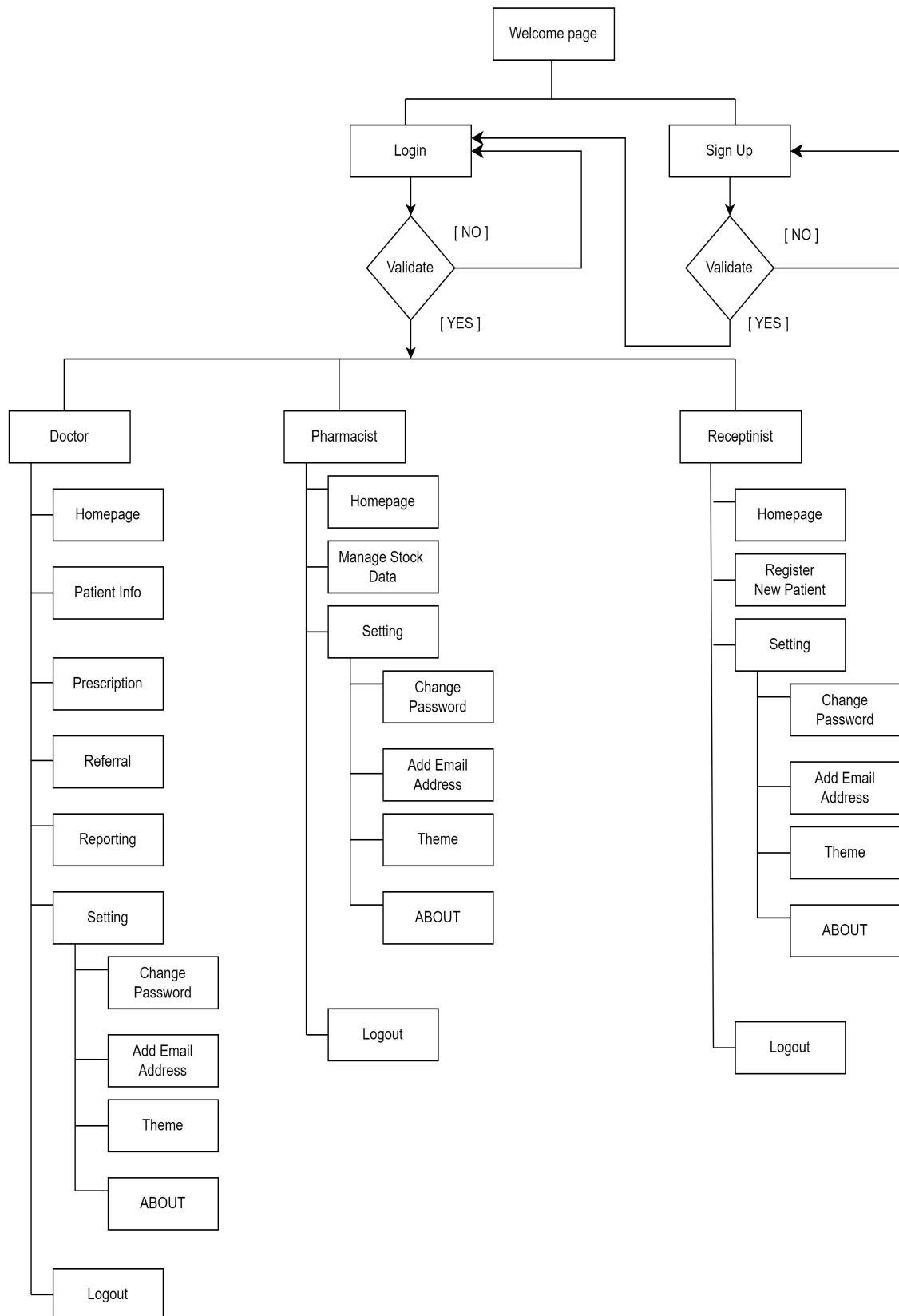


3.4. System User Interface

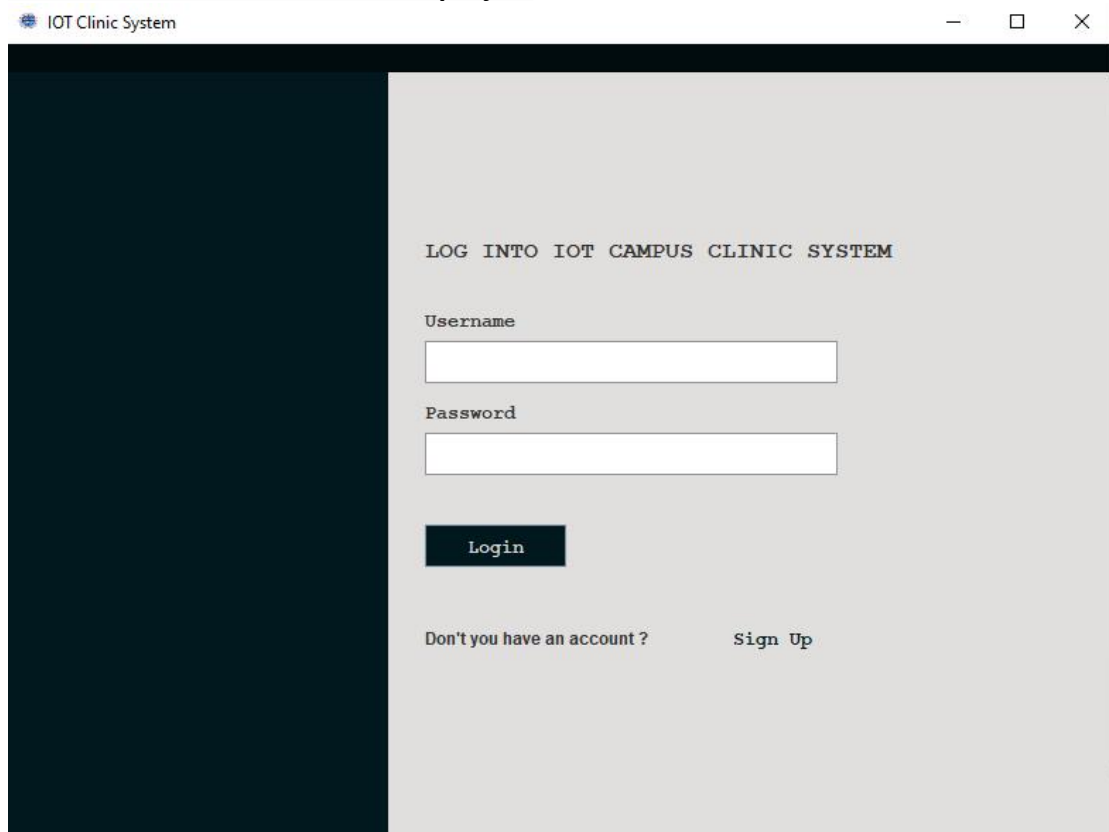
The system user interface refers to the part of the software that enables interaction between the user and the system. It encompasses all elements and features of the software that users interact with to input data, receive feedback, and perform tasks. The system user interface plays a crucial role in providing a means for users to interact with the software effectively

some key components that might be included in the system interface for a Patient Management System:

- Dashboard
- Reporting and Analytics
- Patient Registration
- Medical Records Management



Some screenshot of the GUI our project



IOT Clinic System

LOG INTO IOT CAMPUS CLINIC SYSTEM

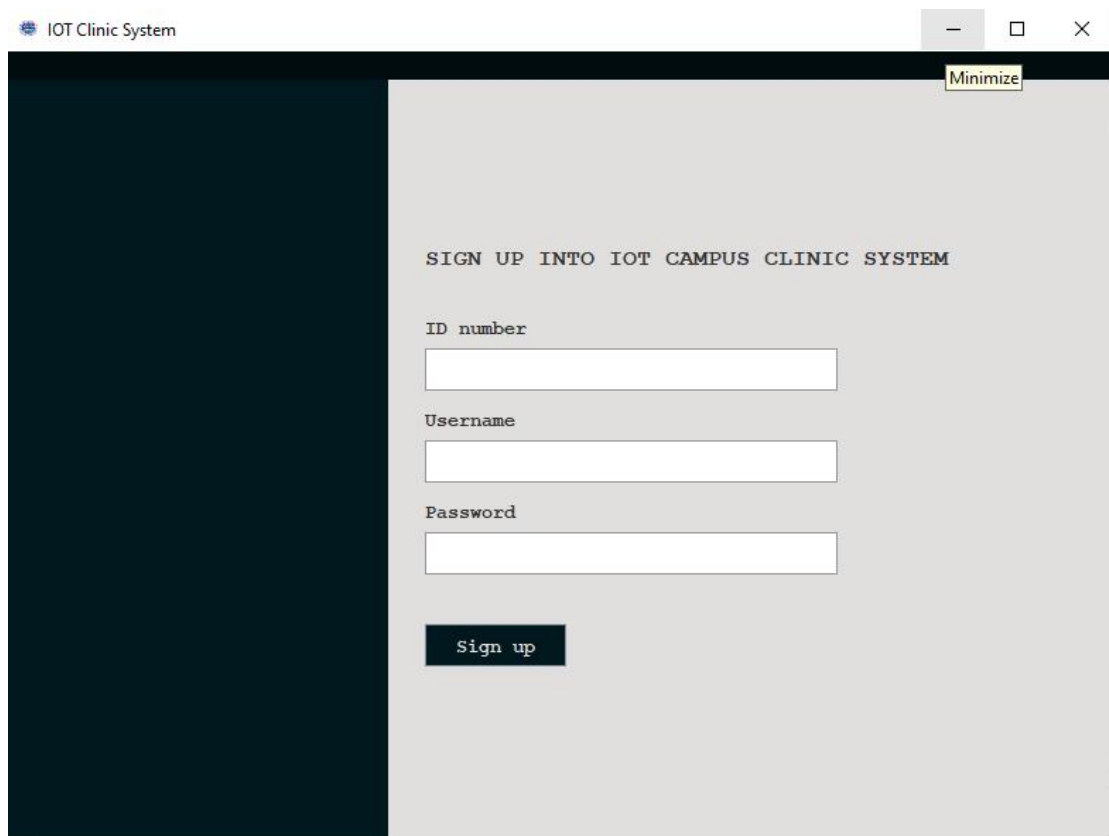
Username

Password

Login

Don't you have an account ? Sign Up

This screenshot shows the login interface of the IOT Clinic System. It features a dark blue sidebar on the left and a light gray main content area. The title 'LOG INTO IOT CAMPUS CLINIC SYSTEM' is centered at the top. Below it are two input fields for 'Username' and 'Password'. A dark blue 'Login' button is positioned below the password field. At the bottom, there is a link 'Don't you have an account ?' followed by a 'Sign Up' link.



IOT Clinic System

SIGN UP INTO IOT CAMPUS CLINIC SYSTEM


ID number

Username

Password

Sign up

This screenshot shows the sign-up interface of the IOT Clinic System. It features a dark blue sidebar on the left and a light gray main content area. The title 'SIGN UP INTO IOT CAMPUS CLINIC SYSTEM' is centered at the top. Below it are three input fields for 'ID number', 'Username', and 'Password'. A dark blue 'Sign up' button is positioned below the password field. A 'Minimize' button is visible in the top right corner of the window.


user

Home

Patient Info

Prescription

Referral

Reporting


Setting

Log out

Please enter medication type

Please enter Dosage instruction

Generate Prescription


user

Home

Patient Info

Prescription

Referral

Reporting

Setting

Log out

Account Management

Add Email Address

Change Password

General Settings

Dark Mode

About