



MEDICARE

System Design and Development Phase

TEAM MEMBERS:

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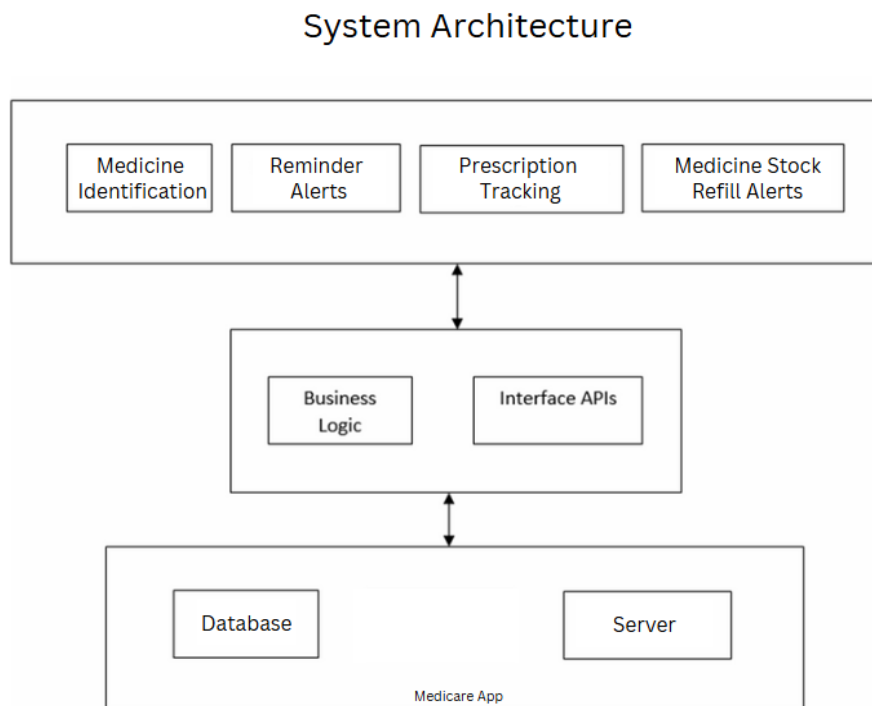
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1. System Architecture

1.1 System Perspective

After freezing the gathered requirements, the system designing is performed based on the analysis and feasibility study from previous development phases the following designs are accepted at a whole. These diagrams give a whole picture of the entire system that is being built.

1.2 Architecture



The above figure depicts a very high-level architecture of the system. The first level holds four different modules that provides set of functionalities to its user at the front. The middle layer which is the business layer makes an interface connection between the top and bottom layer in serving and processing the user request. The bottom most layer holds the backend database, webserver and drug repository that provides the required information to all the above layers.

2. Module Design

This system basically composed of four main high-level modules as mentioned below. Each of these modules in turn broke down into multiple sub modules.

a) Scanning and Identification Module

The Scanning and Identification module leverages advanced image recognition algorithms to analyze medicine packaging, pills, or barcodes using the device camera. It identifies the medicine and retrieves comprehensive information, including name, composition, uses, dosage, side effects, and manufacturer details, ensuring users receive accurate and quick access to essential medication data.

b) Prescription Management Module

The Prescription Management module enables users to upload digital copies of prescriptions through images or PDFs. Users can view and organize their prescriptions, track prescribed medication schedules, and maintain a history of medical records. This ensures better medication adherence and simplifies the management of prescriptions for ongoing treatments or consultations.

c) **Reminder and Alert Module**

The Reminder and Alert module help users stay on top of their medication regimen by enabling custom schedules with timely notifications. It provides alerts for upcoming doses, tracks medicine stock levels, and sends refill reminders when supplies are low, ensuring consistent and efficient medication management for better health outcomes.

d) **User Profile Module**

The User Profile module stores personalized user data, including medicine history, health preferences, and prescription records. It enables tailored recommendations, efficient tracking of past medications, and easy retrieval of health information, offering a customized experience to improve medication adherence and support individual health management goals.

e) **Admin Module**

The Admin Module handles backend operations, enabling administrators to manage drug databases, including adding, updating, or removing medicine information. It oversees app functionalities, user data management, and system performance, ensuring accurate information delivery, seamless user experience, and compliance with regulatory standards for efficient app operation.

These main modules are further composed of following sub modules.

i. **Login Module**

This module provides all access definitions to its users at various level.

ii. **Medicine Scanning**

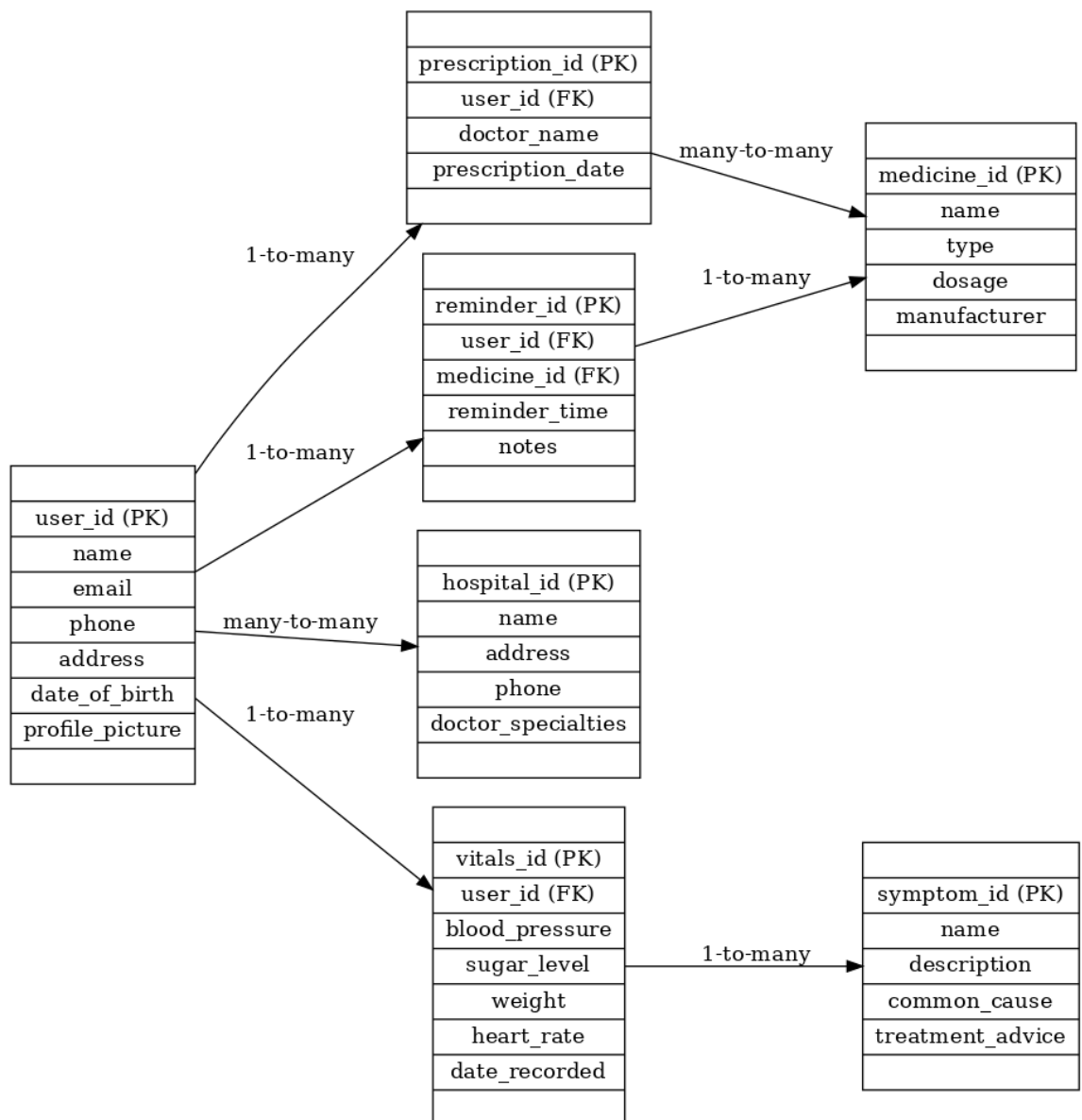
The module uses the device camera and image recognition to identify medicines, with a manual search option for added reliability.

iii. Stock Management Module

The inventory feature tracks medicine stock, sends low stock alerts, and provides refill suggestions via nearby pharmacies or online options.

3. Database Design

3.1 Tables and Relationship



3.2 Data Integrity and Constraints

Field	Data type	Length	Constraint
username	Varchar	16	FOREIGN KEY
password	Varchar	16	Not_Null

Table 3.1 Login

Field	Data type	Length	Constraint
Medicine_id	int	250	PRIMARY KEY
Medicine_Name	Varchar	50	Not_Null
Medicine_Imprint	Varchar	50	Not_Null
Description	Varchar	255	Default
Uses	Varchar	255	Default
Side_Effects	Varchar	255	Default
Counterfeit	Boolean	-	Default_FALSE
Image	image	10	Default

Table 3.2 Medicine Table

Field	Data type	Length	Constraint
Vitals_ID	Int	250	PRIMARY KEY
User_ID	Int	250	FOREIGN KEY
Height	Float	-	Default
Weight	Float	-	Default
Blood_Pressure	Varchar	255	Default
Sugar_Level	Varchar	255	Default
Heart_Rate	Int	12	Default

Table 3.3 – Health Vitals Table.

Field	Data Type	Length	Constraint
Reminder_ID	Int	250	PRIMARY KEY
User_ID	Int	250	FOREIGN KEY
Medicine_Name	Varchar	255	Not Null
Description	Varchar	255	Default
Day	Varchar	50	Default
Time	Time	-	Default

Table 3.4 – Reminders Table.

Field	Data Type	Length	Constraint
Hospital_ID	Int	250	PRIMARY KEY
Hospital_Name	Varchar	100	Not Null
Address	Varchar	255	Not Null
Specialists	Varchar	255	Default
Contact	Varchar	50	Default
Image	Varchar	255	Default

Table 3.5 – Hospitals Table.

Field	Data Type	Length	Constraint
Prescription_ID	Int	250	PRIMARY KEY
User_ID	Int	250	FOREIGN KEY
Title	Varchar	255	Not Null
Image	Varchar	255	Default
Date	Date	-	Not Null
Time	Time	-	Not Null

Table 3.6 – Prescriptions Table.

Field	Data Type	Length	Constraint
Symptom_ID	Int	250	PRIMARY KEY
Name	Varchar	100	Not Null
Description	Varchar	255	Default
Symptoms	Varchar	255	Default
To_Do	Varchar	255	Default

Table 3.7 – Symptom Checker Table.

Field	Data Type	Length	Constraint
Pharmacy_ID	Int	250	PRIMARY KEY
Name	Varchar	100	Not Null
Address	Varchar	255	Not Null
Contact_No	Varchar	50	Default
Time	Varchar	50	Default
Rating	Float	-	Default

Table 3.8 – Pharmacy Table.

3.4 Interface Design and Procedural Design

3.4.1 User Interface Design

Medicare app is being designed for the following healthcare users, which provides user specific interface feature to perform role-based tasks.

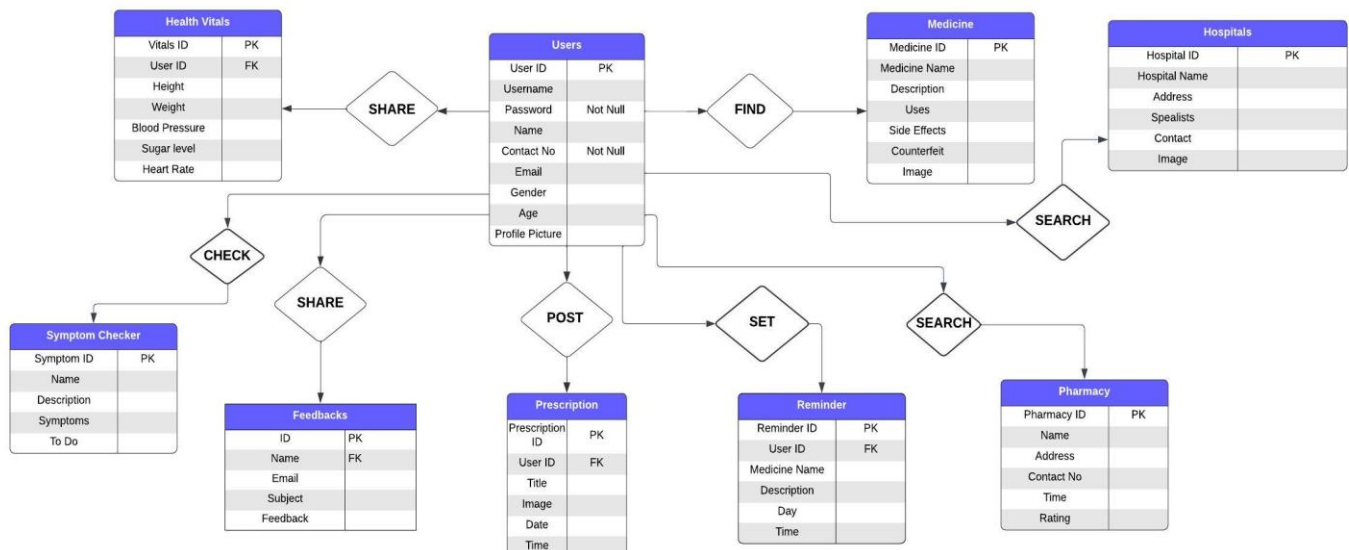
- a. **Elderly Users:** Older adults often struggle with managing medications due to memory decline, chronic illnesses, and complex regimens. Challenges like forgetting doses, vision impairments, or handling pills can affect adherence. Medicare’s reminders, health tracking, and easy-to-use design empower older

adults to manage medications independently, improving health outcomes and reducing stress.

- b. **Patients with Chronic Conditions:** Patients with chronic conditions like diabetes, hypertension, or heart disease often require strict adherence to medication schedules to manage their health effectively. Missing doses or inconsistent tracking can lead to complications. Medicare provides medication reminders, tracking features, and personalized health insights, ensuring these patients stay on track and improve their long-term health outcomes.
- c. **Caregivers:** Family members or professional caregivers responsible for managing the medication and health of others, such as elderly parents or patients with disabilities.
- d. **Pharmacists and Healthcare Providers:** Professionals who may recommend the app to their patients for medication adherence and prescription tracking.

3.5 Application Flow/Class Diagram

CLASS DIAGRAM



The above diagram shows the classes that makes up the system which interacts each other over its objects with relationship defined for each. Association links describes the relationship that each class possess with each other class and Cardinality tells what number of instances of objects are associated.