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# **Phase 3: Design Document**

**For**

## **MediCare Pro**

# **Complete Clinic Management Solution**

**by**

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## 1. Introduction

### 1.1 Purpose of the Document

The purpose of this Design Document is to describe how the system will be structured and implemented. It provides the architectural design, module design and UI specifications required for developers and stakeholders.

This document ensures that all team members share a common understanding before coding begins.

### 1.2 Scope of the Design Phase

The design phase covers the following aspects of MediCare Pro:

- System architecture (monolithic)
- Module breakdown and responsibilities
- MVC pattern mapping
- Class design and interactions
- Detailed sequence descriptions
- UI/UX wireframe references
- Data design

### 1.3 Intended Audience

- Developers: To guide implementation.
- Testers: To understand system behavior and interaction flow.
- Project Managers: To track design completeness.
- Stakeholders & Clinic Staff: To understand system structure.

### 1.4 Overview of Contents

This document includes:

- System overview and design goals
- Architecture and technology stack
- Detailed MVC-based design

- UML-based system modeling
- UI/UX outline
- Data schema and dictionary
- Final summary of decisions made

## 2. System Overview

### 2.1 Brief Description of the System

The System is a web-based clinic management platform supporting doctors and administrators. It digitizes patient records, manages appointments, processes financial transactions, stores medical images, and provides analytics.

The system centralizes clinic operations under a secure, role-based interface, allowing multi-clinic management and real-time reporting.

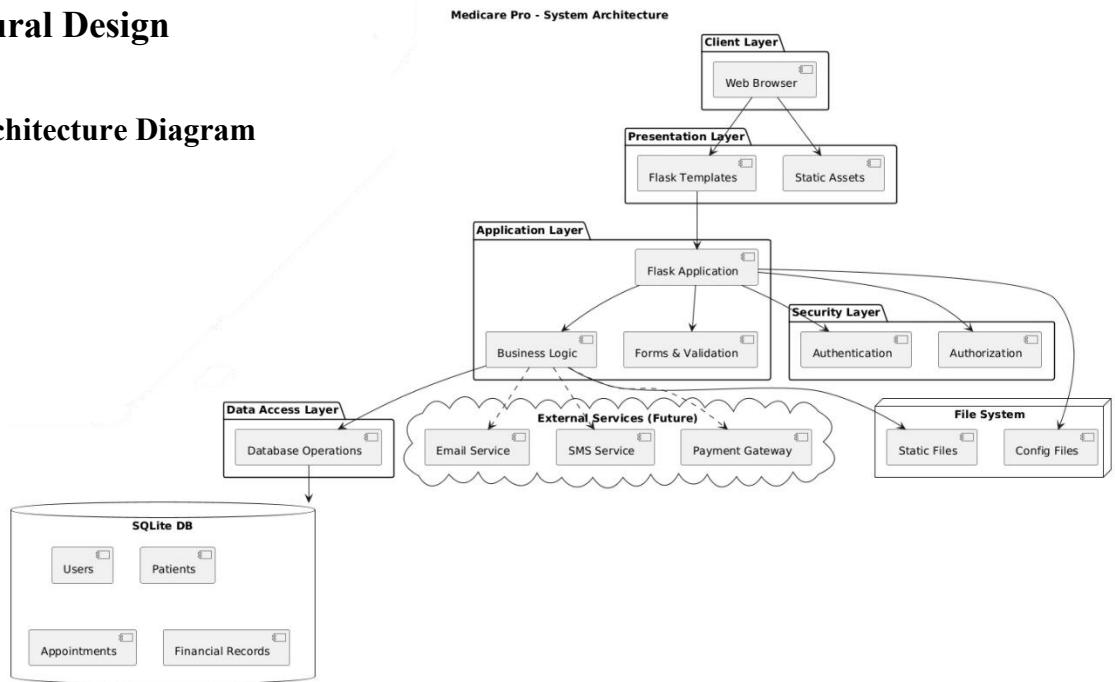
### 2.2 Key Design Goals and Constraints

#### *Design Goals*

- **Scalability:** Support multiple clinics and increasing patient loads.
- **Modularity:** Clear separation of features and components.
- **Security:** Encrypted medical data and role-based access.
- **Usability:** Intuitive dashboards for non-technical users.
- **Reliability:** Consistent uptime and robust data storage.

## 3. Architectural Design

### 3.1 System Architecture Diagram



### 3.2 Discussion of Architectural Style and Components

#### Architectural Style:

All components (authentication, patient management, appointments, finance, images, reporting) run as part of a single backend application.

#### Main Components

- **Presentation Layer (View):** HTML/CSS, Flask templates.
- **Application Logic Layer (Controller):** Flask routes, controllers for each module.
- **Data Layer (Model):** SQLite database, ORM models.

### 3.3 Technology Stack and Tools

Category	Technology
Backend	Python + Flask
Frontend	HTML, CSS, JS
Database	SQLite
API	REST (JSON-based)
Authentication	JWT
Hosting	Linux (Ubuntu Server)
Tools	Draw.io (diagrams), GitHub, VS Code

## 4. Detailed Design

### 4.1 Model–View–Controller (MVC) Design Pattern

#### 4.1.1 Description of MVC Pattern

MVC divides the system into:

- **Model:** Data structures, database tables, business logic
- **View:** User interface pages
- **Controller:** Handles inputs, routes, and interactions between Model and View

Reasons for choosing MVC:

- Clean separation of logic
- Easy maintainability
- Supports multi-role interfaces

- Prevents mixing of UI and business logic

#### 4.1.2 Responsibilities of Model, View, and Controller

##### Model Responsibilities

- Represent system data using ORM classes
- Enforce data constraints
- Provide logic (search, update, validate data)
- Handle relational mappings (patient → records, clinic → doctors, etc.)

##### View Responsibilities

- Display dashboards, forms, tables
- Provide user interaction elements (inputs, buttons)
- Show dynamic data returned by controllers

##### Controller Responsibilities

- Route requests
  - Validate input
  - Call model functions
  - Prepare data and send to views
  - Manage session state and permissions
- 

#### 4.1.3 Interaction Between Components

Example flow (Manage Patient Record):

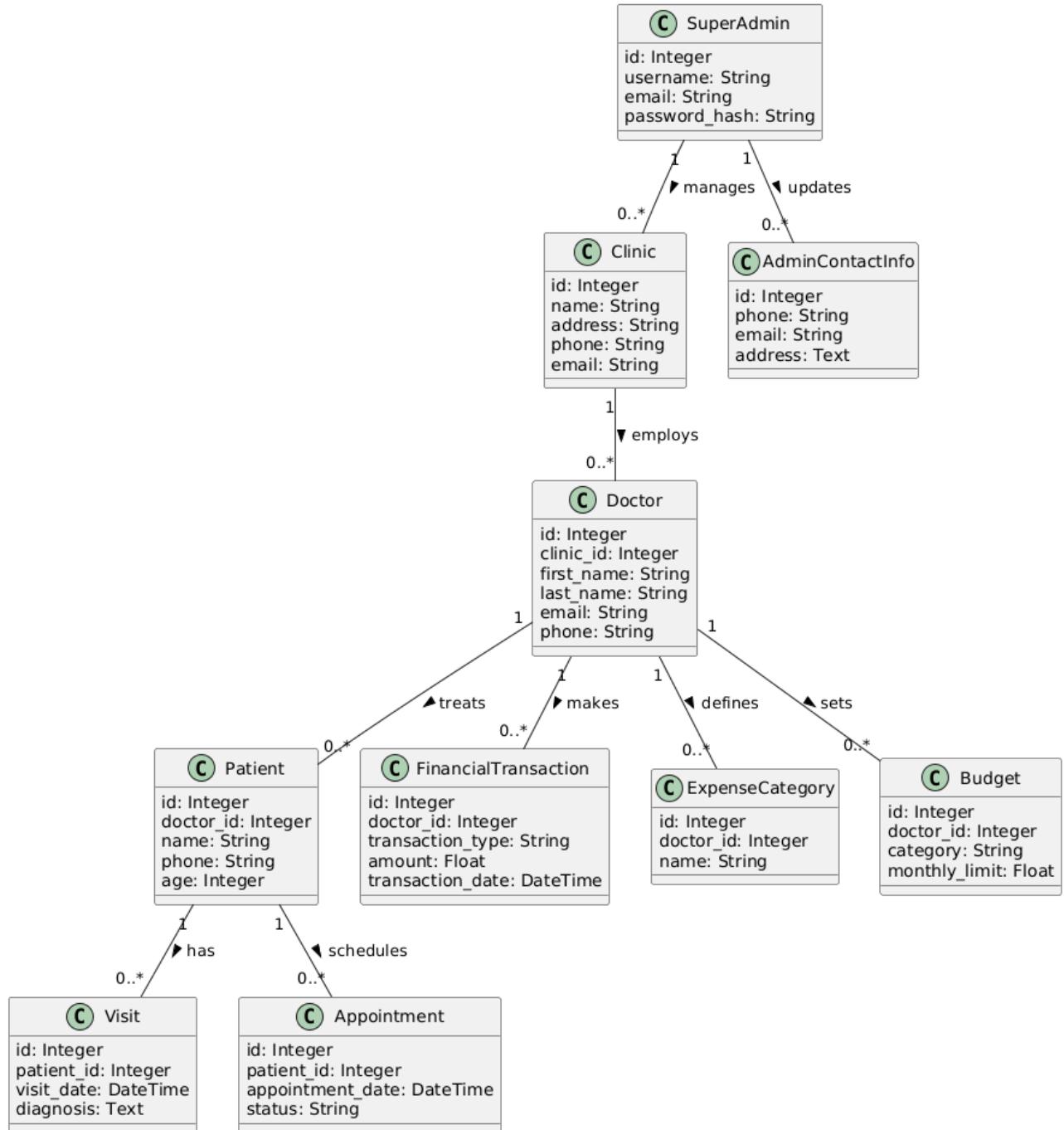
1. User clicks “View Patient”
2. Controller receives request
3. Controller fetches patient data from Model
4. Controller sends data to View
5. View displays patient record
6. User submits changes

7. Controller validates and updates Model

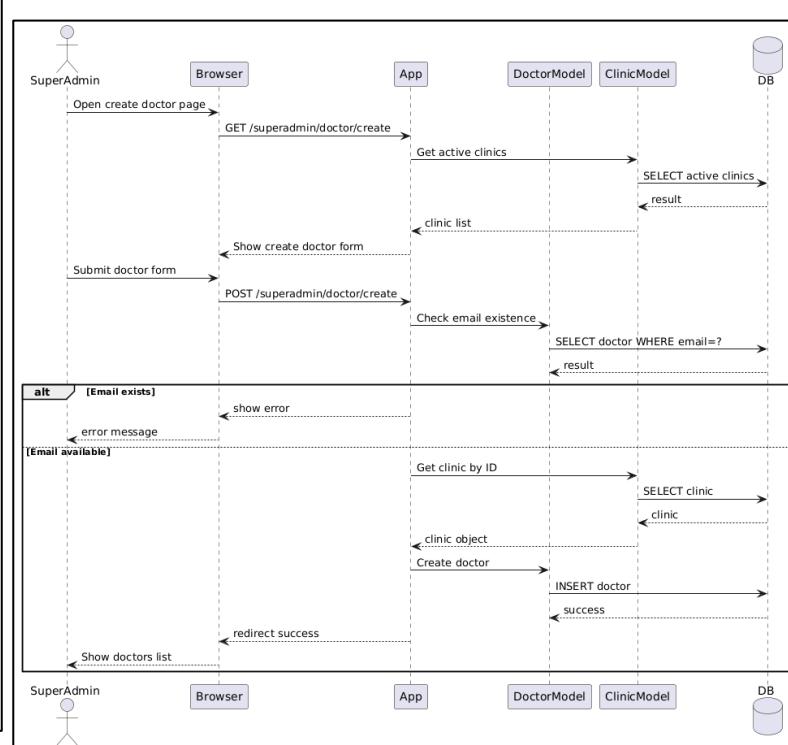
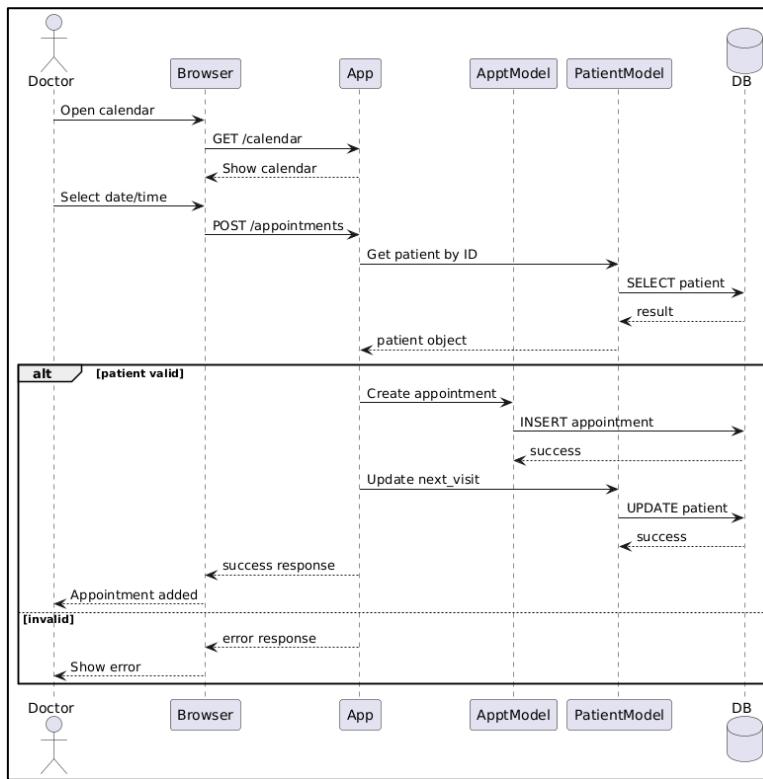
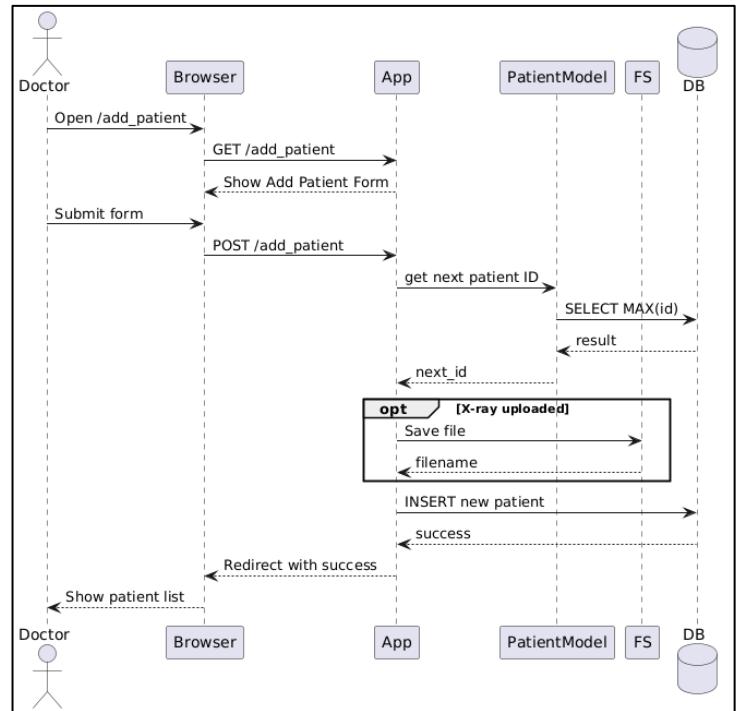
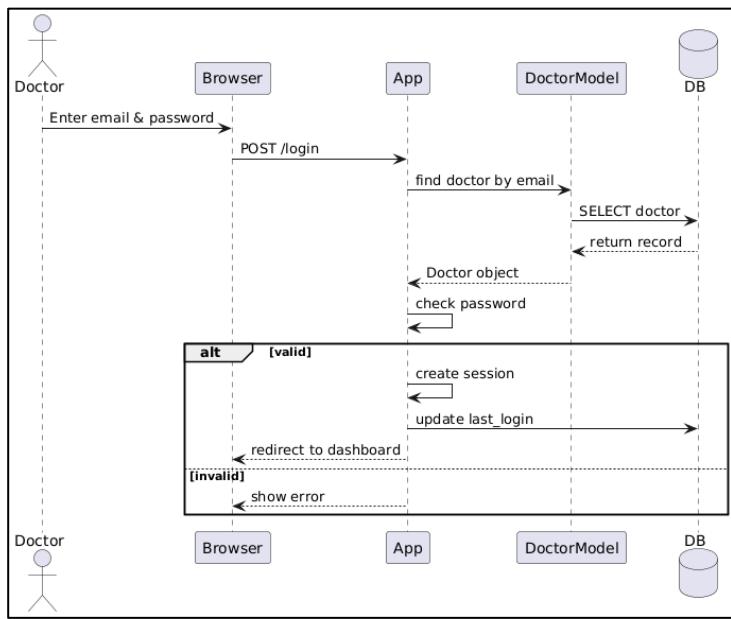
## 4.2 UML Diagrams

### 4.2.2 Class Diagram

**Medicare Pro - Class Diagram**

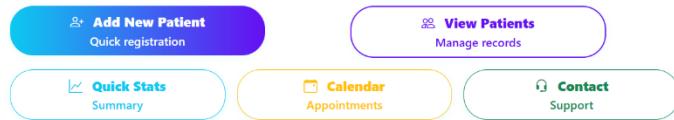
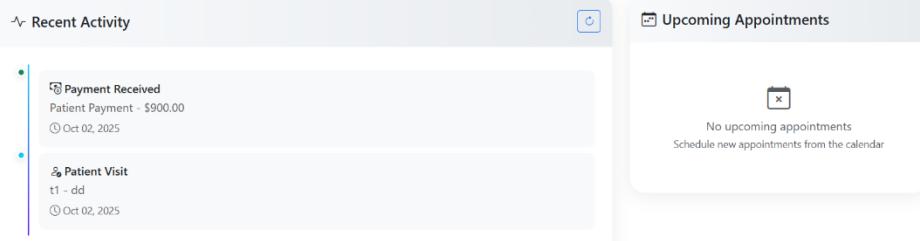
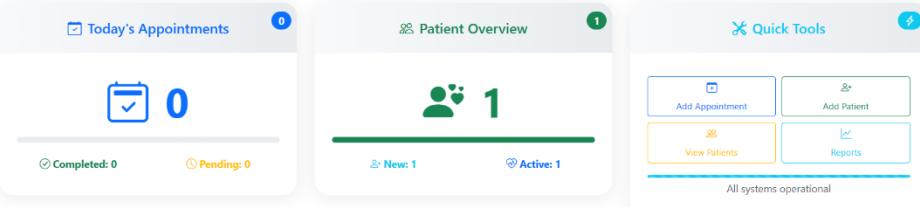
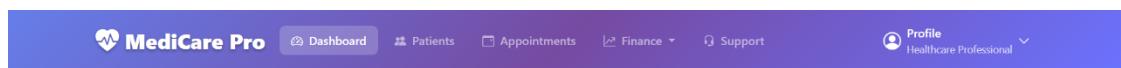
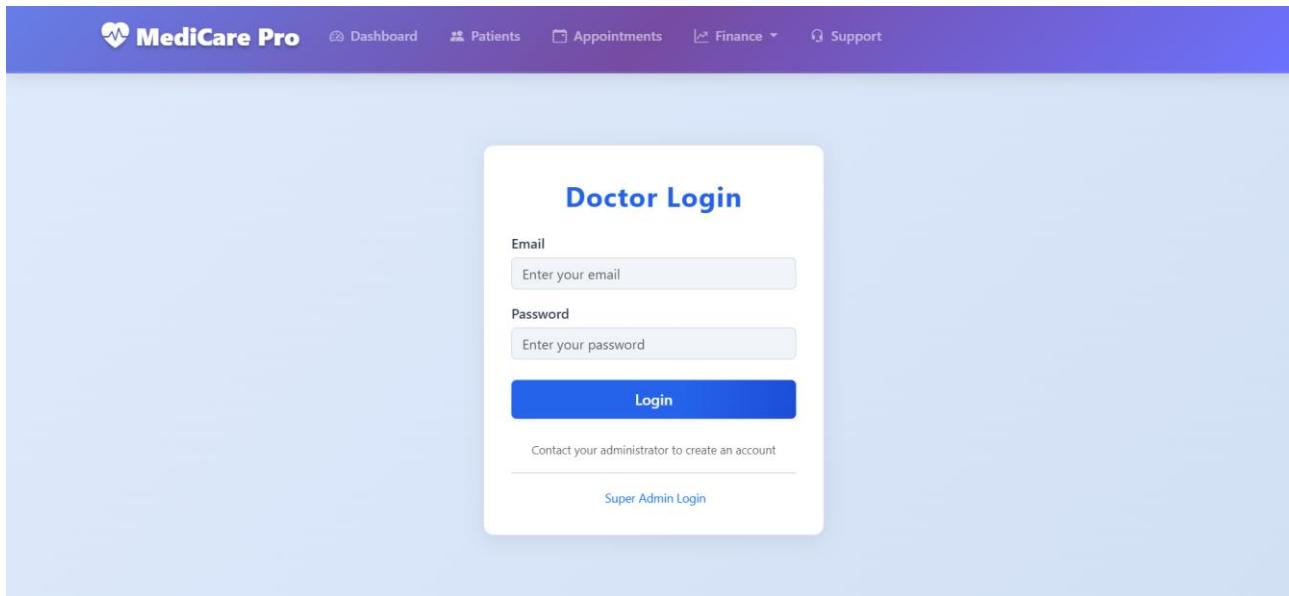


### 4.2.3 Sequence Diagrams



## 4.3 UI/UX Design

### 4.3.1 Wireframes / Mockups



The screenshot shows the MediCare Pro interface. At the top, there's a navigation bar with links for Dashboard, Patients (which is the active tab), Appointments, Finance, and Support. A user profile for 'Dr. Ahmed Healthcare Professional' is also at the top right. Below the navigation is a search bar and a table titled 'All Patients' with one row of data. The footer contains a summary of the platform, social media links, and quick access links.

**All Patients**

#	ID	Name	Phone	Age	Actions
1	t1	123	11		<a href="#">View</a> <a href="#">Delete</a>

**MediCare Pro**

Your Complete Healthcare Management Solution  
Empowering healthcare professionals with cutting-edge technology to deliver exceptional patient care. Streamline appointments, manage patient records, and optimize your practice efficiency with our comprehensive, secure, and user-friendly platform designed specifically for modern medical practices.

**Contact & Support**

- Address: Egypt
- Phone: +20 123 456 7890
- Email: admin@clinic.com

**Quick Access**

- Dashboard
- Patient Records
- Appointments
- Financial Reports
- Get Support
- Privacy Policy
- Terms of Service
- Help Center

All Systems Operational

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The screenshot shows a modal window titled 'Contact Information' with the sub-instruction 'Get in touch with our administrative team'. It lists four contact methods: Email Address (admin@clinic.com), Phone Number (+20 123 456 7890), WhatsApp (+20 123 456 7890), and Office Address (Egypt). The background of the main page is visible, showing the same navigation and footer as the previous screenshot.

**Contact Information**

Get in touch with our administrative team

**Email Address**  
admin@clinic.com

**Phone Number**  
+20 123 456 7890

**WhatsApp**  
+20 123 456 7890

**Office Address**  
Egypt

The screenshot shows the footer section of the MediCare Pro interface, which is identical to the one in the first screenshot. It includes the MediCare Pro logo, a summary of the platform, social media links, and quick access links.

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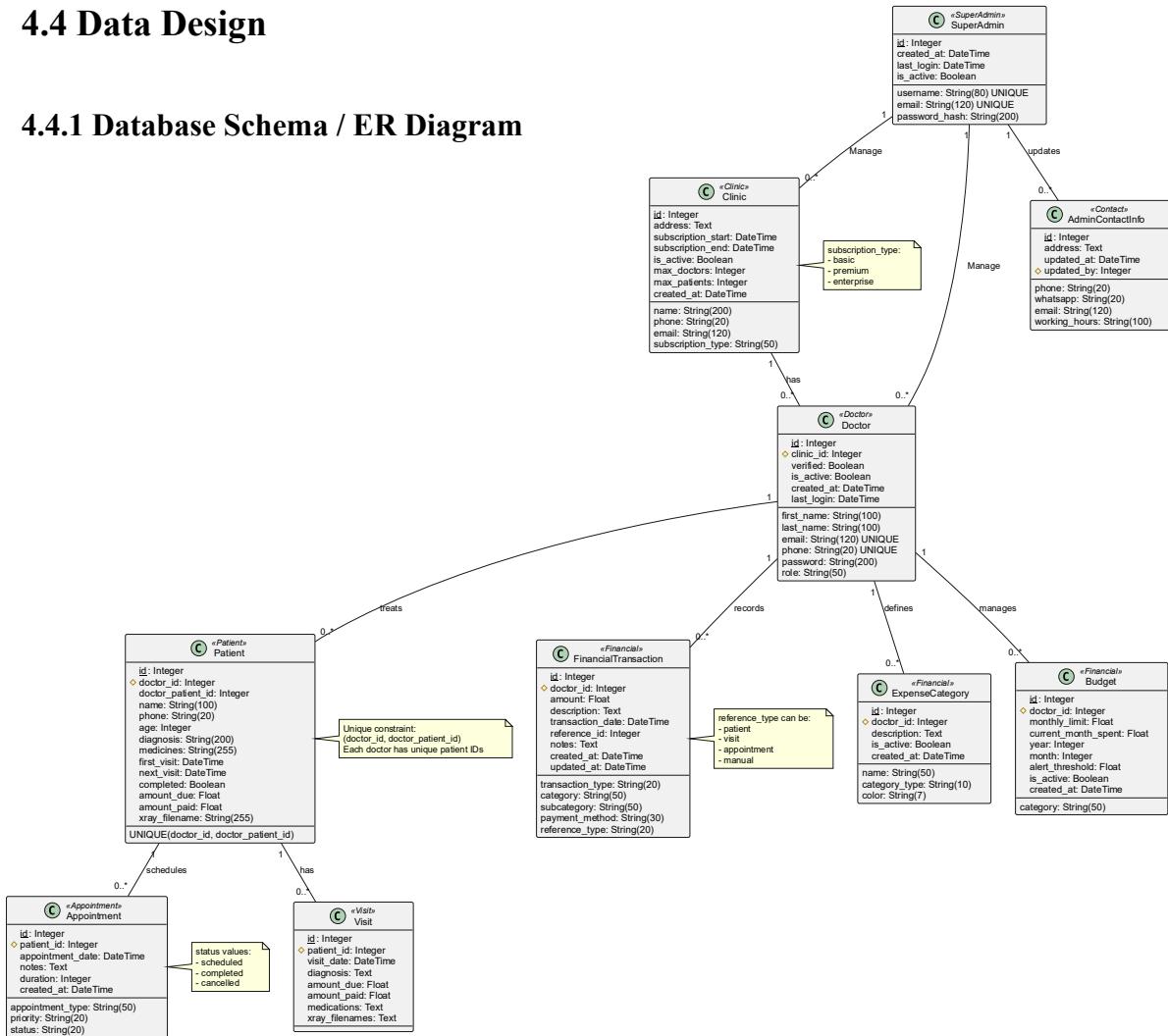
All Systems Operational

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The screenshot shows the Patient Dashboard for Dr. Ahmed. At the top, there are navigation links: Dashboard, Patients, Appointments, Finance, Support, and a user profile for Dr. Ahmed. The main area displays patient details (Phone: 123, Age: 11, Diagnosis: dd), visit history (First Visit: 2025-10-02 12:17 AM, Next Visit: N/A), and financial information (Amount Due: 1000.0 LE, Amount Paid: 900.0 LE, Total Remaining: 100.0 LE). Below this is an 'Edit Patient Info' button. The 'Visit History' section shows a visit on Thursday, 10/02/2025 at 12:17 AM, with medications MM, due 1000.0 LE, paid 900.0 LE, and remaining 100.0 LE. It includes buttons for 'Edit Visit' and 'Delete Visit'. At the bottom right are 'New Appointment' and '+ Add Visit' buttons.

## 4.4 Data Design

### 4.4.1 Database Schema / ER Diagram



## **5. Conclusion**

### **5.1 Summary of Design Phase**

This Design Document defines how the MediCare Pro system will be implemented using Flask. It provides:

- Architectural breakdown
- Technology stack
- Class and sequence descriptions
- UI/UX outline
- database structure