(PHASE 1)

PROPOSED On	1st April 2025
WASS SOW	Dr Lina Paul
Version : controlled	GIT LAB | GIT
PROJECT Name	**EMR**
Team Member Front end engineer Process Engineer Documentation **Managed By**	
Database	Postrage | SQL Or MYSQL
API	JSON REST API
TESTING	ZIRA
SMS Gateway	NIMBUS
Email Gateway	Outlook
Payment Gateway	Phonepay | razorpay
SERVER & DPLOYMENT	Hetzener | AWS
TESTING	Manual & Automated
Encryption	

🧩 1. Project Objective:

The goal is to design a **collaborative, scalable, and secure EMR (Electronic Medical Records)** system that helps **doctors, patients, and clinic staff** manage their daily operations—from storing patient data and prescriptions to managing medicine inventory and handling reception tasks—all in one platform.

👥 2. Target Users:

- Doctors (General & Specialists)

- Clinic Receptionists & Nurses

- Patients

- Pharmacists / Medicine Store Managers

- Admin (Clinic Owners)

🧱 3. Core Modules & Features:

👨‍⚕️ A. Patient Records Management

- Add new patient with name, contact, age, gender, etc.

- Record medical history: allergies, past diseases, surgery records

- Upload & store diagnostic reports

- View treatment history in timeline format

💊 B. Prescription Management

- Create prescriptions with auto-fill from previous visits

- Prescribe from medicine database

- Option to save prescription templates

- Print & download prescriptions (PDF)

🏥 C. Clinic & Case Management

- Manage multiple doctors and specializations

- Assign cases to doctors

- Update case status (New, Ongoing, Closed)

- Notes section for doctor remarks

- Access to full patient history while viewing a case

📄 D. Medicine Database & Inventory

- Centralized list of all medicines

- Medicine categories (Antibiotics, Painkillers, etc.)

- Track stock, expiry, usage frequency

- Alert for low stock or expiring items

- Batch & vendor tracking

👨‍💼 E. Staff & Role Management

- Add users (Admin, Doctor, Receptionist, Pharmacist)

- Assign role-based permissions

- Control access to patient records & medicine inventory

● Track user activity (logins, updates)

📅 **F. Today's Case & Appointments**

● List of today's scheduled appointments

● Real-time patient check-in status

● Alerts for pending or emergency cases

● Quick access to patient profile during consultation

💬 **G. Reception Dashboard**

● Add new appointments

● Manage patient queue

● View current waiting, in-consultation, and completed cases

● Collect patient info and route to doctors

🖨️ **H. Print & Export Features**

- Print prescriptions

- Export patient data to Excel or PDF

- Print case summaries and billing

📊 I. Reporting & Analytics

- Daily, weekly, monthly case count

- Doctor performance analytics

- Medicine usage trends

- Patient revisit frequency

🧪 4. Tech Stack Recommendation:

Layer	Technologies
Frontend	React.js or Angular
Backend	Node.js (Express) or Java Spring Boot
Database	PostgreSQL or MongoDB

Authenticatio n	JWT (JSON Web Tokens) + Role-based access
Storage	AWS S3 / Firebase for report uploads
Hosting	AWS EC2 / Vercel / DigitalOcean
Security	HIPAA-compliant design, data encryption, audit logs

5. Team Collaboration Model:

Role	Responsibilities
Project Manager	Task planning, sprint reviews, timelines
UI/UX Designer	Wireframes, prototypes, design system
Frontend Developer	Build doctor/patient/staff dashboards
Backend Developer	APIs, database models, logic, role management
DevOps Engineer	CI/CD, deployment, backups, monitoring
QA Tester	Functional, load, and security testing

🛡️ 6. Compliance & Security:

- **Data Encryption**: All sensitive data encrypted at rest and in transit.

- **Access Logs**: Track who accessed what and when.

- **Regular Backups**: Automatic daily backups of patient records and prescriptions.

- **HIPAA Guidelines**: System built to meet medical data protection norms.

📈 7. Future Add-Ons (Phase 2):

- Patient Mobile App (for appointment booking & viewing prescriptions)

- Video Consultation Module

- Billing & Payment Gateway Integration

- SMS/Email Notifications

- AI Health Assistant or Chatbot

🧱 Module-Wise Breakdown of SmartClinic EMR System

1. Patient Management Module

Manage everything related to patient information, visit history, and medical records.

- ◆ **Sub-Modules:**

  - ● **Patient Registration**

    - ○ Add new patient with personal details (name, age, contact, gender)

    - ○ Upload documents (Aadhar, reports, insurance if applicable)

  - ● **Patient Profile**

    - ○ View full history (visits, prescriptions, diagnostics)

    - ○ Quick access to past diseases or allergies

  - ● **Medical History**

    - ○ Add/edit illness history, surgeries, allergies

    - ○ Attach reports (PDFs/images)

  - ● **Visit Timeline**

○ Chronological view of visits and treatments

○ Notes for each session

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2. Prescription Management Module

Generate, manage, and print prescriptions.

◆ **Sub-Modules:**

● **Prescription Creator**

○ Auto-fill fields (patient, medicine)

○ Dropdown of medicine database

○ Dosage, frequency, duration entry

● **Print Prescription**

○ Branded PDF print with doctor name & signature

○ Download and email options

● **Previous Prescriptions**

○ Access patient's prescription history

- Clone old prescriptions

- **Prescription Templates**

  - Save custom templates for quick use

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3. Clinic Management Module

Manage internal clinic operations and configurations.

- ◆ **Sub-Modules:**

  - **Clinic Setup**

    - Add multiple departments/specializations

    - Set opening hours and holidays

  - **Doctor Management**

    - Add/remove doctors

    - Assign cases or specializations

  - **Room & Resource Allocation**

    - Manage available rooms, equipment, and resources

4. Case Management Module

Handle patient cases with proper documentation.

- ◆ **Sub-Modules:**

  - ● **Create New Case**

    - ○ Select patient, assign doctor

    - ○ Capture symptoms, diagnosis, tests advised

  - ● **Case History**

    - ○ View all past cases

    - ○ Search by doctor/date/status

  - ● **Case Status Tracking**

    - ○ Update status (New, In Consultation, Treated, Closed)

5. Medicine & Inventory Module

Centralized management of medicine data and inventory.

- ◆ **Sub-Modules:**

- **Medicine Master Database**

  - Add/edit medicines with name, composition, brand

  - Categorization by type

- **Stock Management**

  - Add stock entries (with batch no., vendor, expiry)

  - Alerts for low stock or near-expiry

- **Medicine Usage Tracking**

  - Track how many times a medicine is prescribed

  - Usage analytics for ordering

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6. Staff & Role Management Module

Control access, roles, and track user activity.

- ◆ **Sub-Modules:**

- **User Role Definition**

  - Roles: Admin, Doctor, Receptionist, Nurse, Pharmacist

- ○ Define access per role (read/write/print/delete)

- **User Management**

  - ○ Add, edit, or deactivate users

  - ○ Assign working hours

- **Activity Logs**

  - ○ Track login times, edits, deletions

  - ○ View audit history

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7. Reception & Appointment Module

Interface for front desk operations and appointment scheduling.

- ◆ **Sub-Modules:**

- ● **Appointment Booking**

  - ○ Walk-in or scheduled appointments

  - ○ Slot-wise doctor availability

- ● **Patient Check-in/Check-out**

○ Mark arrivals, consultation starts, and exits

● **Queue Management**

○ Live queue of waiting, in-consultation, and completed cases

● **Today's Case Overview**

○ Doctor-specific and clinic-wide dashboard

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8. Reports & Print Module

Enable export and print of patient and clinic data.

◆ **Sub-Modules:**

● **Prescription Reports**

○ Filtered by patient, date, doctor

● **Patient Visit Summary**

○ Generate visit history report

● **Export Options**

○ Excel, PDF formats

○ Secure report sharing

9. Dashboard & Analytics Module

High-level overview and insights for admin and doctors.

◆ **Sub-Modules:**

● **Admin Dashboard**

○ Total patients, daily cases, active doctors, alerts

● **Doctor Dashboard**

○ Today's cases, upcoming appointments, history quick links

● **Analytics**

○ Monthly patient count

○ Frequent diagnoses & most prescribed medicines

○ Staff productivity

10. Security & Compliance Module

Data safety and access regulation.

◆ **Sub-Modules:**

- **Login & Session Control**

  ○ JWT-based authentication

  ○ Auto-logout after inactivity

- **Role-Based Access Control (RBAC)**

  ○ Restrict screens and data by role

- **Data Encryption**

  ○ AES encryption for stored data

  ○ SSL for data in transit

- **Audit Trail**

  ○ Who accessed what and when

- **Backup & Recovery**

  ○ Daily backup schedule

  ○ One-click recovery system

✅ Optional (Phase 2 Expansion Ideas)

- **Patient Mobile App**

  ○ Book appointments, view reports & prescriptions

- **Online Consultation Module**

  ○ Video/audio consults with appointment flow

- **Billing & Payments**

  ○ Invoicing, receipt generation, online payments

- **Email/SMS Notifications**

  ○ Reminders for appointments or medicine refills

SmartClinic EMR – Modules, Sub-Modules, and Operations Table

Module	Sub-Module	Operations / Features
1. Patient Management	Patient Registration	Add patient, Upload ID proofs, Enter contact info, Add age/gender/date of birth
	Patient Profile	View profile, Edit details, Upload profile picture, View documents

	Medical History	Add/edit illnesses, surgeries, allergies, Attach diagnostics/reports
	Visit Timeline	Chronological view, Session notes, Quick access to past visits
2. Prescription Management	Prescription Creator	Add medicine, dosage, frequency, Auto-suggest from DB, Save template
	Print Prescription	Download PDF, Add header/footer, Branded format
	Previous Prescriptions	Search/view by date, Clone past prescriptions
	Prescription Templates	Save template, Load template, Manage templates
3. Clinic Management	Clinic Setup	Add/edit clinic info, Add departments, Define working hours
	Doctor Management	Add/edit doctors, Assign departments, Doctor profile

	Resource Allocation	Assign rooms, Link devices/equipment, Availability status
4. Case Management	New Case Entry	Assign patient, Symptoms, Diagnosis, Lab tests
	Case Status Tracking	Update status, Assign/reassign doctor, Timeline view
	Case History	Search/filter by patient, doctor, date
5. Medicine & Inventory	Medicine Database	Add/edit medicine, Category, Brand, Dosage details
	Stock Management	Add stock, Track quantity, Expiry alert, Batch/vendor info
	Usage Tracking	Frequency of prescription, Top-used medicine reports
6. Staff & Role Management	Role Definition	Define permissions per role, Assign roles

	User Management	Add staff, Activate/deactivate accounts, Assign schedules
	Activity Logs	View user logs, Track edits/deletes, Login history
7. Reception & Appointment	Appointment Booking	Add new appointment, Choose time/doctor, Walk-in vs Scheduled
	Check-in/Check-out	Mark entry/exit time, Room allotment
	Queue Management	Live patient queue, Priority flags, Waiting time alerts
	Today's Case Overview	View all cases for the day, Filter by doctor/status
8. Reports & Printing	Prescription Report	Generate filtered report (by date/doctor), PDF/Excel export
	Visit Summary	Create visit report for patient, Export as PDF

	Export Options	Export full data (admin only), Secure download
9. Dashboard & Analytics	Admin Dashboard	Stats: total cases, top doctors, appointment load
	Doctor Dashboard	View upcoming cases, Alerts/reminders, Quick history access
	Reports & Graphs	Disease frequency chart, Medicine usage trend, Patient revisit ratio
10. Security & Compliance	Authentication	Login/logout, Token expiration, 2FA support (optional)
	RBAC	Restrict data by role, Hide unauthorized views
	Encryption	AES encryption at rest, SSL for data in motion
	Audit Trail	Who accessed/modified what, Log export

	Backup & Restore	Daily backup scheduler, Restore from version history