

Hospital Management System Architecture Document

Group 1

Overview

This document outlines the foundational architecture of the Hospital Management System (HMS) being developed by Group 1. It captures the agreed-upon entities, their attributes, data types, relationships, and the rationale behind each design decision. This serves as the basis for database table creation and API development.

1. GROUP1_PATIENT

A national database of registered patients, accessible by all hospitals unless otherwise restricted by the patient.

Attribute	Type	Description
patientId	UUID	Unique identifier for the patient
patientFirstName	VARCHAR	Patient's first name
patientLastName	VARCHAR	Patient's last name
patientOtherNames	VARCHAR	Middle or other names
patientDateOfBirth	DateTime	Date of birth
patientGender	VARCHAR	Gender
patientPhone	VARCHAR	Primary contact number
patientEmail	VARCHAR	Email address
patientAddress	VARCHAR	Residential address
patientCountry	VARCHAR	Country of residence
patientEmergencyContactName	VARCHAR	Name of emergency contact
patientEmergencyContactPhone	VARCHAR	Phone number of emergency contact

Attribute	Type	Description
patientBloodGroup	VARCHAR	Blood group
patientGenotype	VARCHAR	Genotype
patientRegisteredAt	UUID	Hospital where the patient first registered
patientAccessScope	VARCHAR	Either 'NATIONAL' or hospitalId for local access
patientCreatedAt	DateTime	Timestamp of creation
patientUpdatedAt	DateTime	Timestamp of last update

2. GROUP1_HOSPITAL

Contains core data about each hospital in the system.

Attribute	Type	Description
hospitalId	UUID	Unique hospital identifier
hospitalName	VARCHAR	Name of the hospital
hospitalAddress	VARCHAR	Physical address
hospitalCity	VARCHAR	City location
hospitalState	VARCHAR	State location
hospitalPhone	VARCHAR	Contact phone
hospitalEmail	VARCHAR	Email address
hospitalStatus	VARCHAR	Active/Inactive
hospitalCreatedAt	DateTime	Creation timestamp
hospitalUpdatedAt	DateTime	Last update timestamp

3. GROUP1_STAFF

Hospital staff (doctors, nurses, etc.). Belongs to one hospital.

Attribute	Type	Description
staffId	UUID	Unique identifier
staffFirstName	VARCHAR	First name
staffLastName	VARCHAR	Last name
staffOtherNames	VARCHAR	Other names
staffDateOfBirth	DateTime	Date of birth
staffGender	VARCHAR	Gender
staffPhone	VARCHAR	Contact phone
staffEmail	VARCHAR	Email address
staffAddress	VARCHAR	Residential address
staffRole	VARCHAR	Role in hospital (e.g., Doctor, Nurse)
staffDepartment	VARCHAR	Department or unit
staffHospitalId	UUID	FK to hospital
staffCreatedAt	DateTime	Timestamp of creation
staffUpdatedAt	DateTime	Last update timestamp

4. GROUP1_MEDICINE

Medicines available at each hospital. Each hospital manages its own stock.

Attribute	Type	Description
medicineId	UUID	Unique medicine identifier
medicineHospitalId	UUID	FK to hospital
medicineName	VARCHAR	Name of the medicine

Attribute	Type	Description
medicineDescription	VARCHAR	Optional description
medicineDosageForm	VARCHAR	e.g., Tablet, Syrup
medicineDosage	VARCHAR	e.g., 500mg
medicineExpiryDate	Date	Expiry date
medicineStockQty	INT	Quantity in stock (in blister packs)
medicineUnitPrice	Decimal	Price per blister pack
medicineReorderLevel	INT	Threshold for triggering restock
medicineCreatedAt	DateTime	Timestamp of creation
medicineUpdatedAt	DateTime	Last update timestamp

5. GROUP1_EQUIPMENT

Hospital-owned equipment with basic tracking.

Attribute	Type	Description
equipmentId	UUID	Unique ID
equipmentHospitalId	UUID	FK to hospital
equipmentName	VARCHAR	Name of the equipment
equipmentDescription	VARCHAR	Optional description
equipmentType	VARCHAR	E.g., Diagnostic, Surgical
equipmentPurchaseDate	Date	Purchase date
equipmentExpiryDate	Date	Optional
equipmentCondition	VARCHAR	Working, Needs Maintenance, etc.
equipmentCreatedAt	DateTime	Timestamp of creation

Attribute	Type	Description
equipmentUpdatedAt	DateTime	Last update timestamp

6. GROUP1_APPOINTMENT

Used when a patient books a scheduled time to see a specific staff member (typically a doctor or specialist).

Attribute	Type	Description
appointmentId	UUID	Unique identifier
appointmentPatientId	UUID	FK to patient
appointmentStaffId	UUID	FK to staff (the target professional)
appointmentHospitalId	UUID	FK to hospital
appointmentDateTime	DateTime	Scheduled appointment date and time
appointmentReason	VARCHAR	Purpose for the appointment
appointmentStatus	VARCHAR	PENDING, CONFIRMED, RESCHEDULED, CANCELLED, COMPLETED
appointmentCreatedAt	DateTime	When the appointment was first made
appointmentUpdatedAt	DateTime	Last modified timestamp

Note: Appointment rescheduling will update appointmentDateTime and appointmentStatus.

7. GROUP1_CHECKIN

Represents any in-person interaction with the hospital — whether emergency, walk-in, or appointment-based.

Attribute	Type	Description
CheckInId	UUID	Unique identifier
checkInPatientId	UUID	FK to patient

checkInHospitalId	UUID	FK to hospital
checkInAppointmentId	UUID	Optional FK to appointment if checkIn originated from a scheduled booking
checkInReason	VARCHAR	Reason for checkIn (headache, injury, routine checkup, etc.)
checkInDiagnosis	VARCHAR	Initial or updated diagnosis (can be filled in later)
checkInStatus	VARCHAR	ACTIVE, COMPLETED, CANCELLED, ABANDONED
checkInPatientNotes	TEXT	Clinical notes about patient condition or instructions
checkInCreatedAt	DateTime	Timestamp of checkIn creation
checkInUpdatedAt	DateTime	Timestamp of last update

Note: A CheckIn is logically tied to a single medical concern. Follow-up checkups tied to that concern remain part of the same CheckIn. A new issue (e.g., heart attack vs. headache) triggers a new CheckIn.

8. GROUP1_CHECKIN-STAFF

This is a join table that maps each CheckIn to the staff members involved in the patient's care. A CheckIn can involve multiple staff, and a staff member can participate in multiple CheckIns.

Attribute	Type	Description
CheckInStaffId	UUID	Unique ID for the CheckIn-staff relation
CheckInId	UUID	FK to CheckIn
staffId	UUID	FK to STAFF
CheckInStaffRole	VARCHAR	Role during the CheckIn (e.g., Assigned Nurse, Doctor)

Attribute	Type	Description
CheckInStaffCreate dAt	DateTime	Timestamp of assignment
CheckInStaffUpdate dAt	DateTime	Last update timestamp

9. GROUP1_PRESCRIPTION

This join table connects CheckIns and medications. Each prescription is linked to a single CheckIn and a single medication, and is written by a specific staff member.

Attribute	Type	Description
prescriptionId	UUID	Unique prescription identifier
prescriptionCheckInId	UUID	FK to CheckIn
prescriptionMedicineId	UUID	FK to MEDICINE
prescriptionPrescribedById	UUID	FK to STAFF (who prescribed it)
prescriptionDosage	VARCHAR	Dosage and instruction (e.g., "2 tablets twice daily")
prescriptionQuantity	INT	Quantity prescribed
prescriptionStatus	VARCHAR	ACTIVE, FULFILLED, CANCELLED
prescriptionNotes	TEXT	Optional additional remarks
prescriptionCreatedAt	DateTime	Timestamp of creation
prescriptionUpdatedAt	DateTime	Timestamp of last update

10. GROUP1_SALES

Represents the billing for all fulfilled prescriptions for a CheckIn. One sale object per CheckIn.

Attribute	Type	Description
saleId	UUID	Unique ID for the sale transaction
saleCheckInId	UUID	FK to CheckIn
saleHandledById	UUID	FK to STAFF (pharmacist or cashier)
saleTotal	Decimal	Total amount billed based on prescription quantities and unit price
saleCreatedAt	DateTime	Timestamp of sale
saleUpdatedAt	DateTime	Last update timestamp

This concludes the base entity structure for the Hospital Management System. The architecture is subject to refinement as features evolve or new requirements emerge.

Core CRUD APIs

Log - JB

1. Patient - F

- POST /patients – Register new patient
- GET /patients/{id} – View patient details
- PATCH /patients/{id} – Update patient info
- GET /patients – List all patients
- DELETE /patients/{id} – (Optional) Soft delete patient
- GET /patients/search?name=... – Search patients by name or phone

2. Hospital - JB

- GET /hospitals – List all hospitals
- GET /hospitals/{id} – View hospital details
- POST
- PATCH

3. Staff - V

- POST /staff – Add new staff
- GET /staff/{id} – View staff details
- PUT /staff/{id} – Update staff info
- GET /staff?hospitalId=... – List staff by hospital

4. Medicine - F

- POST /medicines – Add medicine to hospital store
- GET /medicines/{id} – View medicine info
- GET /medicines?hospitalId=... – List hospital medicines
- PATCH /medicines/{id}/add-stock – Increase stock quantity
- PUT /medicines/{id} – Update medicine info

5. Equipment - JB

- POST /equipment – Add equipment
- GET /equipment/{id} – View equipment
- GET /equipment?hospitalId=... – List all equipment for a hospital
- PUT /equipment/{id} – Update equipment info

CheckIn & Appointment APIs

6. Appointment - V

- POST /appointments – Book an appointment
- PATCH /appointments/{id}/reschedule – Change time
- DELETE /appointments/{id} – Cancel appointment
- GET /appointments?patientId=... – Get patient's appointments

7. CheckIn - F

- POST /CheckIns – Register new CheckIn (walk-in or from appointment)
- GET /CheckIns/{id} – View CheckIn info
- PATCH /CheckIns/{id} – Update diagnosis, status, notes
- GET /CheckIns?patientId=... – List CheckIns for a patient

Care Flow APIs

8. CheckIn-Staff Assignment - F

- POST /CheckIn-staff – Assign staff to CheckIn
- GET /CheckIn-staff?CheckInId=... – List staff for a CheckIn

9. Prescription - JB

- POST /prescriptions – Create prescription (staff input)
- GET /prescriptions?CheckInId=... – Get all prescriptions for a CheckIn
- PATCH /prescriptions/{id} – Update or cancel a prescription

10. Sales - F

- POST /sales – Create sale by passing CheckInId, auto-fetching unfulfilled prescriptions
- GET /sales/{id} – View sale
- GET /sales?CheckInId=... – Fetch sale for a CheckIn (if only one allowed)

Advanced or Custom APIs

Patient

- GET /patients/search?query=... – Search patients by name, phone, or email
- GET /patients/{id}/CheckIns – Fetch all CheckIns made by a patient
- GET /patients/{id}/appointments – Fetch appointment history
- GET /patients/{id}/prescriptions – Fetch all past prescriptions (via CheckIns)

Appointment

- PATCH /appointments/{id}/reschedule – Reschedule to a new date/time
- PATCH /appointments/{id}/cancel – Cancel the appointment
- GET /appointments/available-slots?staffId=...&date=... – Check staff availability (optional advanced feature)

CheckIn

- POST /CheckIns/from-appointment – Create CheckIn using appointmentID (auto-fill fields)
- GET /CheckIns/active?patientId=... – Get ongoing CheckIn(s) for a patient
- PATCH /CheckIns/{id}/update-diagnosis – Add/update diagnosis
- PATCH /CheckIns/{id}/add-note – Append clinical notes from staff (with timestamp & ID)

CheckIn-Staff

- POST /CheckIn-staff/bulk – Assign multiple staff to a CheckIn in one request
- GET /CheckIn-staff?staffId=... – See which CheckIns a staff member participated in

Prescription

- POST /prescriptions/bulk – Prescribe multiple medications in one request
- GET /prescriptions/active?CheckInId=... – Get unfulfilled prescriptions for a CheckIn
- PATCH /prescriptions/{id}/mark-fulfilled – Flag as fulfilled (used in backend sale logic)

Sale

- POST /sales/from-CheckIn – Create a sale based on active prescriptions for a CheckIn

- GET /sales/{id}/prescriptions – List prescriptions covered by this sale
- GET /sales/summary?hospitalId=...&dateRange=... – Generate daily/weekly sales reports

Medicine

- PATCH /medicines/{id}/add-stock – Add new quantity to stock
- GET /medicines/low-stock?hospitalId=... – List medicines below reorder level
- GET /medicines/search?name=... – Search medicine by name

Equipment

- GET /equipment/available?hospitalId=... – List all working equipment
- PATCH /equipment/{id}/mark-maintenance – Update condition to maintenance-needed

Utility or Maintenance APIs

- GET /dashboard/summary – Aggregate dashboard (CheckIns today, appointments scheduled, sales made, etc.)
- GET /hospitals/{id}/staff-roles – List roles available in a hospital (Doctor, Nurse, Lab Tech, etc.)
- GET /reports/patient-history?patientId=... – Full timeline of care

Authentication

Role-based Access Control (Authorization)