Phase 3: Data Modeling & Relationships

AI-Enabled Hospital & Pharmacy Management System

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Goal: To design the Salesforce data model with objects, fields, relationships, and layouts to represent the Hospital & Pharmacy Management System.

Tasks in Phase 3:

- Standard & Custom Objects

- Fields

- Record Types

- Page Layouts

- Compact Layouts

- Schema Builder

- Lookup vs Master-Detail vs Hierarchical Relationships

- Junction Objects

- External Objects

Standard & Custom Objects
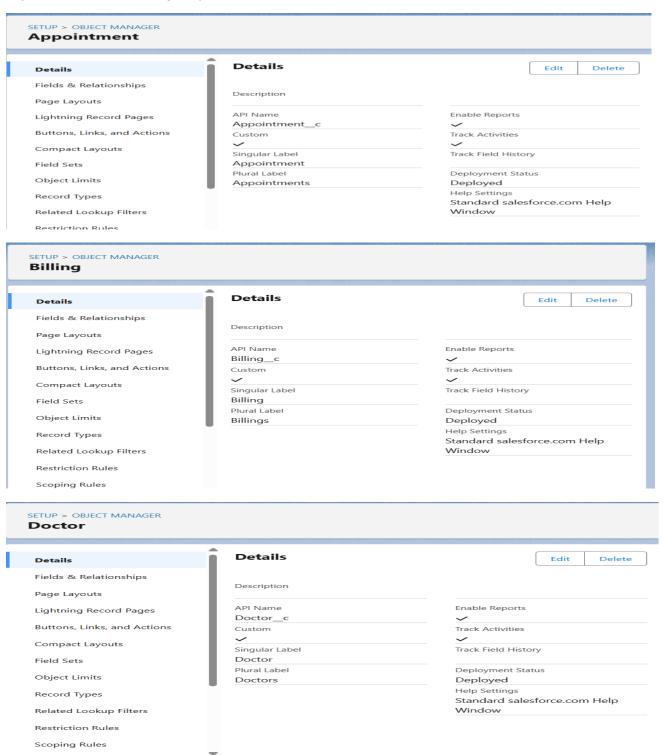
Standard Objects:

Using standard objects really helped me save time, since Salesforce already provides some useful built-in features. I didn't have to build everything from scratch and could instead focus on the hospital-specific parts of my system. For example, I used-

- **User** → Used to represent hospital staff such as Doctors, Nurses, and Pharmacists. This allowed me to assign profiles, roles, and permissions, ensuring proper access control in the system.
- **Contact** → Explored as a way to represent Patients if a portal or community setup is required. In my project, I primarily used a custom Patient object, but Contact remains important for real-world integration.
- **Activities (Tasks & Events)** → Leveraged Salesforce's built-in activities to log follow-ups or reminders related to Appointments, without creating a new object from scratch.

Custom Objects:

Created Custom Objects: Patient, Doctor, Appointment, Pharmacy Inventory, Medicine Order, Order Line Item (junction), Billing.

By creating these custom objects, I was able to model real hospital workflows such as patient visits, doctor schedules, medicine stock, and billing, while also ensuring that all objects are connected logically.

SETUP > OBJECT MANAGER
Appointment

Details	
Details	Edit / Delete

Description

API Name	Enable Reports
Appointment__c	✓
Custom	Track Activities
✓	✓
Singular Label	Track Field History
Appointment	
Plural Label	Deployment Status
Appointments	Deployed
	Help Settings
	Standard salesforce.com Help Window

Details
Fields & Relationships
Page Layouts
Lightning Record Pages
Buttons, Links, and Actions
Compact Layouts
Field Sets
Object Limits
Record Types
Related Lookup Filters
Restriction Rules

SETUP > OBJECT MANAGER
Billing

Details
Fields & Relationships
Page Layouts
Lightning Record Pages
Buttons, Links, and Actions
Compact Layouts
Field Sets
Object Limits
Record Types
Related Lookup Filters
Restriction Rules
Scoping Rules

Details   Edit   Delete

Description

API Name	Enable Reports
Billing__c	✓
Custom	Track Activities
✓	✓
Singular Label	Track Field History
Billing	
Plural Label	Deployment Status
Billings	Deployed
	Help Settings
	Standard salesforce.com Help Window

SETUP > OBJECT MANAGER
Doctor

Details
Fields & Relationships
Page Layouts
Lightning Record Pages
Buttons, Links, and Actions
Compact Layouts
Field Sets
Object Limits
Record Types
Related Lookup Filters
Restriction Rules
Scoping Rules

Details   Edit   Delete

Description

API Name	Enable Reports
Doctor__c	✓
Custom	Track Activities
✓	✓
Singular Label	Track Field History
Doctor	
Plural Label	Deployment Status
Doctors	Deployed
	Help Settings
	Standard salesforce.com Help Window

Patient

Details	
Details	**Edit** **Delete**

Description

API Name	Enable Reports
Patient__c	✓
Custom	Track Activities
✓	✓
Singular Label	Track Field History
Patient	
Plural Label	Deployment Status
Patients	Deployed
	Help Settings
	Standard salesforce.com Help Window

Sidebar (Patient):
- **Details**
- Fields & Relationships
- Page Layouts
- Lightning Record Pages
- Buttons, Links, and Actions
- Compact Layouts
- Field Sets
- Object Limits
- Record Types
- Related Lookup Filters
- Restriction Rules
- Scoping Rules

Pharmacy Inventory

Details	
Details	**Edit** **Delete**

Description

API Name	Enable Reports
Pharmacy_Inventory__c	✓
Custom	Track Activities
✓	✓
Singular Label	Track Field History
Pharmacy Inventory	
Plural Label	Deployment Status
Pharmacy Inventories	Deployed
	Help Settings
	Standard salesforce.com Help Window

Sidebar (Pharmacy Inventory):
- **Details**
- Fields & Relationships
- Page Layouts
- Lightning Record Pages
- Buttons, Links, and Actions
- Compact Layouts
- Field Sets
- Object Limits
- Record Types
- Related Lookup Filters
- Restriction Rules
- Scoping Rules

Medicine Order

Details	
Details	**Edit** **Delete**

Description

API Name	Enable Reports
Medicine_Order__c	✓
Custom	Track Activities
✓	✓
Singular Label	Track Field History
Medicine Order	
Plural Label	Deployment Status
Medicine Orders	Deployed
	Help Settings
	Standard salesforce.com Help Window

Sidebar (Medicine Order):
- **Details**
- Fields & Relationships
- Page Layouts
- Lightning Record Pages
- Buttons, Links, and Actions
- Compact Layouts
- Field Sets
- Object Limits
- Record Types
- Related Lookup Filters
- Restriction Rules
- Scoping Rules

Order Line Item

Details	
Details	Edit Delete

Fields & Relationships

Page Layouts

Lightning Record Pages

Buttons, Links, and Actions

Compact Layouts

Field Sets

Object Limits

Record Types

Related Lookup Filters

Restriction Rules

Scoping Rules

Description

API Name
Order_Line_Item__c

Custom
✓

Singular Label
Order Line Item

Plural Label
Order Line Items

Enable Reports
✓

Track Activities
✓

Track Field History

Deployment Status
Deployed

Help Settings
Standard salesforce.com Help
Window

Fields

Added relevant fields to each object:

Patients

- Patient Name (Text)

- Age (Number)

- Gender (Picklist: Male/Female/Other)

- Phone (Phone)

- Email (Email)

- Disease (Text Area)

Doctors

- Doctor Name (Text)

- Specialization (Picklist: Cardiology, Neurology, etc.)

- Phone (Phone)

- Email (Email)

Appointments

- Appointment Date (Date)

- Appointment Time (Time)

- Patient (Lookup → Patients)

- Doctor (Lookup → Doctors)

Pharmacy Inventory

- Medicine Name (Text)

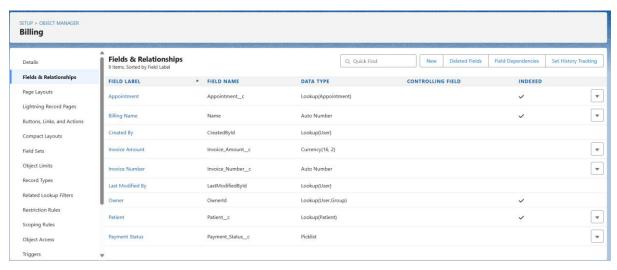- Stock Quantity (Number)

- Expiry Date (Date)

Billing

- Patient (Lookup → Patients)

- Amount (Currency)
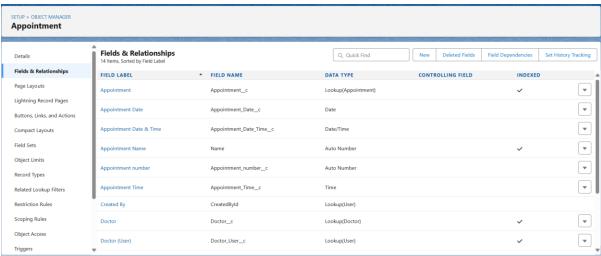
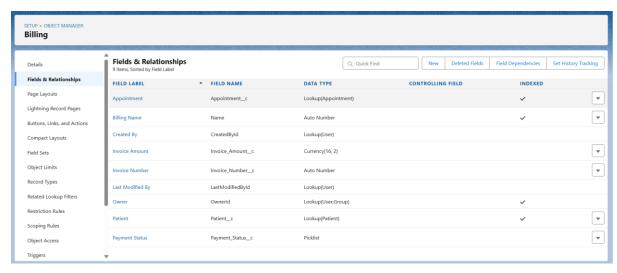- Payment Status (Picklist: Paid, Pending, Cancelled)

Medicine Orders

- Medicine (Lookup → Pharmacy Inventory)
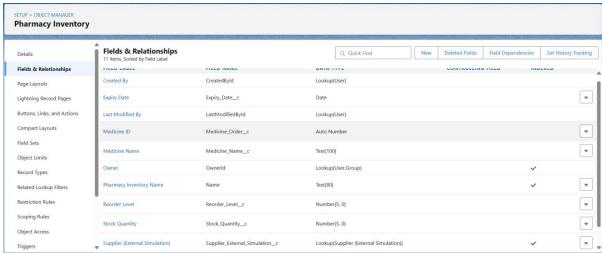
- Quantity Ordered (Number)

- Order Date (Date)

Created a formula field on Order Line Item: Line Total = Quantity × Price.

Added a roll-up summary on Medicine Order to calculate total order amount.

SETUP > OBJECT MANAGER
Billing

Fields & Relationships
9 Items, Sorted by Field Label

FIELD LABEL	FIELD NAME	DATA TYPE	CONTROLLING FIELD	INDEXED
Appointment	Appointment__c	Lookup(Appointment)		✓
Billing Name	Name	Auto Number		✓
Created By	CreatedById	Lookup(User)		
Invoice Amount	Invoice_Amount__c	Currency(16, 2)		
Invoice Number	Invoice_Number__c	Auto Number		
Last Modified By	LastModifiedById	Lookup(User)		
Owner	OwnerId	Lookup(User,Group)		✓
Patient	Patient__c	Lookup(Patient)		✓
Payment Status	Payment_Status__c	Picklist		

SETUP > OBJECT MANAGER
Appointment

Fields & Relationships
14 Items, Sorted by Field Label

FIELD LABEL	FIELD NAME	DATA TYPE	CONTROLLING FIELD	INDEXED
Appointment	Appointment__c	Lookup(Appointment)		✓
Appointment Date	Appointment_Date__c	Date		
Appointment Date & Time	Appointment_Date_Time__c	Date/Time		
Appointment Name	Name	Auto Number		✓
Appointment number	Appointment_number__c	Auto Number		
Appointment Time	Appointment_Time__c	Time		
Created By	CreatedById	Lookup(User)		
Doctor	Doctor__c	Lookup(Doctor)		✓
Doctor (User)	Doctor_User__c	Lookup(User)		✓

Billing

Fields & Relationships
9 Items, Sorted by Field Label

Quick Find | New | Deleted Fields | Field Dependencies | Set History Tracking

FIELD LABEL	FIELD NAME	DATA TYPE	CONTROLLING FIELD	INDEXED	
Appointment	Appointment__c	Lookup(Appointment)		✓	▼
Billing Name	Name	Auto Number		✓	▼
Created By	CreatedById	Lookup(User)			
Invoice Amount	Invoice_Amount__c	Currency(16, 2)			▼
Invoice Number	Invoice_Number__c	Auto Number			▼
Last Modified By	LastModifiedById	Lookup(User)			
Owner	OwnerId	Lookup(User,Group)		✓	
Patient	Patient__c	Lookup(Patient)		✓	▼
Payment Status	Payment_Status__c	Picklist			▼

Details
Fields & Relationships
Page Layouts
Lightning Record Pages
Buttons, Links, and Actions
Compact Layouts
Field Sets
Object Limits
Record Types
Related Lookup Filters
Restriction Rules
Scoping Rules
Object Access
Triggers

Pharmacy Inventory

Fields & Relationships
11 Items, Sorted by Field Label

Quick Find | New | Deleted Fields | Field Dependencies | Set History Tracking

FIELD LABEL	FIELD NAME	DATA TYPE	CONTROLLING FIELD	INDEXED	
Created By	CreatedById	Lookup(User)			
Expiry Date	Expiry_Date__c	Date			▼
Last Modified By	LastModifiedById	Lookup(User)			
Medicine ID	Medicine_Order__c	Auto Number			▼
Medicine Name	Medicine_Name__c	Text(100)			▼
Owner	OwnerId	Lookup(User,Group)		✓	
Pharmacy Inventory Name	Name	Text(80)		✓	▼
Reorder Level	Reorder_Level__c	Number(5, 0)			▼
Stock Quantity	Stock_Quantity__c	Number(5, 0)			▼
Supplier (External Simulation)	Supplier_External_Simulation__c	Lookup(Supplier (External Simulation))		✓	▼

Details
Fields & Relationships
Page Layouts
Lightning Record Pages
Buttons, Links, and Actions
Compact Layouts
Field Sets
Object Limits
Record Types
Related Lookup Filters
Restriction Rules
Scoping Rules
Object Access
Triggers

Doctor

Fields & Relationships
9 Items, Sorted by Field Label

Quick Find | New | Deleted Fields | Field Dependencies | Set History Tracking

FIELD LABEL	FIELD NAME	DATA TYPE	CONTROLLING FIELD	INDEXED	
Created By	CreatedById	Lookup(User)			
Doctor ID	Doctor_ID__c	Auto Number			▼
Doctor Name	Doctor_Name__c	Text(80)			▼
Doctor Name	Name	Text(80)		✓	▼
Email	Email__c	Email			▼
Last Modified By	LastModifiedById	Lookup(User)			
Owner	OwnerId	Lookup(User,Group)		✓	
Phone	Phone__c	Phone			▼
Specialization	Specialization__c	Picklist			▼

Details
Fields & Relationships
Page Layouts
Lightning Record Pages
Buttons, Links, and Actions
Compact Layouts
Field Sets
Object Limits
Record Types
Related Lookup Filters
Restriction Rules
Scoping Rules
Object Access
Triggers

Fields & Relationships 12 Items, Sorted by Field Label			Q Quick Find	New	Deleted Fields	Field Dependencies	Set History Tracking

FIELD LABEL	FIELD NAME	DATA TYPE	CONTROLLING FIELD	INDEXED	
Address	Address__c	Long Text Area(131072)			▼
Age	Age__c	Number(3, 0)			▼
Created By	CreatedById	Lookup(User)			
Disease / Primary Complaint	Disease_Primary_Complaint__c	Text Area(255)			▼
Email	Email__c	Email			▼
Gender	Gender__c	Picklist			▼
Last Modified By	LastModifiedById	Lookup(User)			
Owner	OwnerId	Lookup(User,Group)		✓	
Patient Name	Name	Auto Number		✓	▼
Patient names	Patient_names__c	Text(80)			▼

Fields & Relationships 8 Items, Sorted by Field Label			Q Quick Find	New	Deleted Fields	Field Dependencies	Set History Tracking

FIELD LABEL	FIELD NAME	DATA TYPE	CONTROLLING FIELD	INDEXED	
Created By	CreatedById	Lookup(User)			
Last Modified By	LastModifiedById	Lookup(User)			
Line Item Number	Name	Auto Number		✓	▼
Line Total	Line_Total__c	Formula (Currency)			▼
Medicine	Medicine__c	Master-Detail(Pharmacy Inventory)		✓	▼
Medicine Order	Medicine_Order__c	Master-Detail(Medicine Order)		✓	▼
Price	Price__c	Currency(18, 0)			▼
Quantity Ordered	Quantity_Ordered__c	Number(18, 0)			▼

Record Types

- Created record types for Appointments: OPD Appointment and Surgery Appointment.
- Created record types for Patient: Inpatient and Outpatient.
- Created record types for Billing: Consultation Bills vs Pharmacy Bills
- Created record types for Medicine Order: Online Orders (patient self-service) and In-Hospital Orders.

Usually don't need record types for Doctor and Pharmacy Inventory because:

- Doctor is just one category (with specialization already as a picklist).
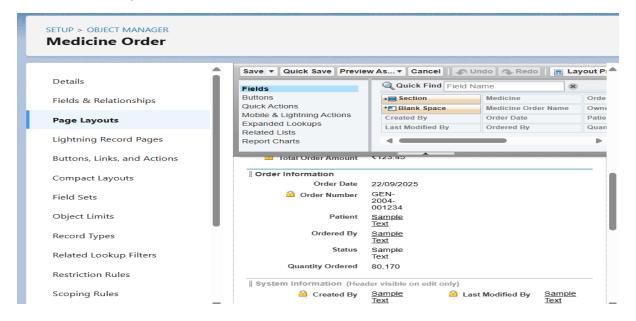- Inventory is already categorized by fields like Medicine Type.

Appointment

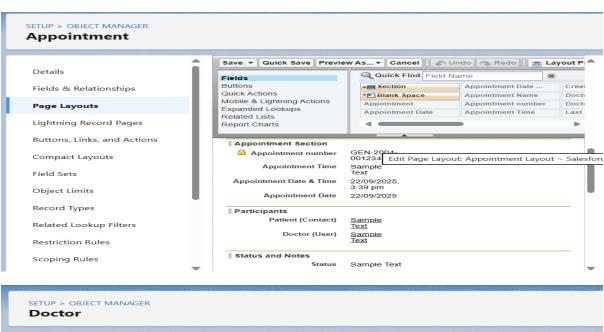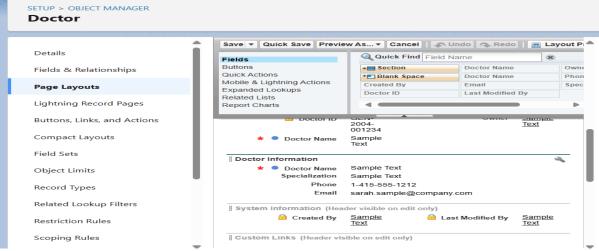|	Details

Details
Fields & Relationships
Page Layouts
Lightning Record Pages
Buttons, Links, and Actions
Compact Layouts
Field Sets
Object Limits
Record Types
Related Lookup Filters
Restriction Rules
Scoping Rules

Recor... [Quick Find]   New   Page Layout Assignment
2 Items, Sorted by Record Type Label

RECORD TYPE L... ▲	DESCRIPTION	ACTIVE	MODIFIED BY	
OPD Appointment	For regular OPD appointments.	✓	Mitali Mitali, 22/09/2025, 3:30 pm	▼
Surgery Appointment	For surgical appointments		Mitali Mitali, 22/09/2025, 3:31 pm	▼

Patient

Details
Fields & Relationships
Page Layouts
Lightning Record Pages
Buttons, Links, and Actions
Compact Layouts
Field Sets
Object Limits

Recor... [Quick Find]   New
2 Items, Sorted by Record Type Label

RECORD TYPE L... ▲	DESCRIPTION	ACTIV
Inpatient	admitted to hospital	✓
Outpatient	visiting for consultation	✓

Billing

Details
Fields & Relationships
Page Layouts
Lightning Record Pages
Buttons, Links, and Actions
Compact Layouts
Field Sets
Object Limits
Record Types
Related Lookup Filters

Recor... [Quick Find]   New   Page Layout Assignment
2 Items, Sorted by Record Type Label

RECORD TYPE L... ▲	DESCRIPTION	ACTIVE	MODIFIED BY	
Consultation Billing		✓	Mitali Mitali, 22/09/2025, 3:34 pm	▼
Pharmacy Billing			Mitali Mitali, 22/09/2025, 3:34 pm	▼

Page Layouts

What I Did?
I customized the page layouts for each object to make the record pages more organized and user-friendly. I divided fields into meaningful sections, such as Patient Information, Contact Details, and Medical Info for the Patient object, and Appointment Information, Participants, and Status & Notes for the Appointment object. I also added related lists, for example Appointments and Billing under Patient, Appointments under Doctor, Billing under Appointment, and Order Line Items under Pharmacy Inventory and Medicine Orders.

How It Helps?
By structuring the layouts in this way, doctors, pharmacists, and admins can quickly find the details they need without scrolling through cluttered pages. Related records are visible in one place, making it easier to view linked data like appointments, bills, and orders.
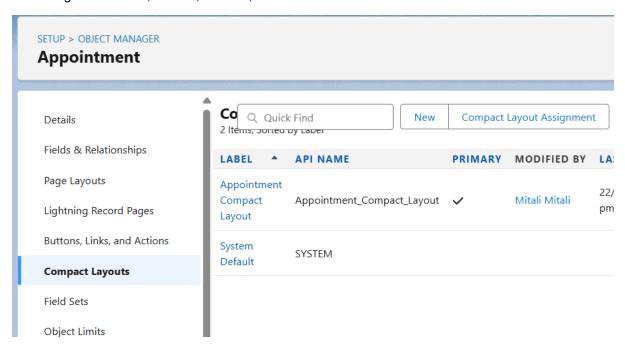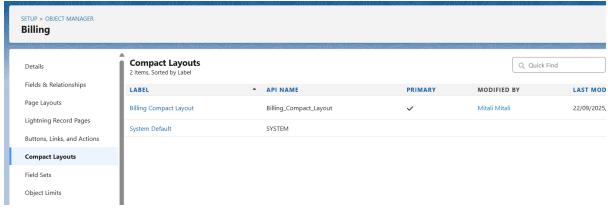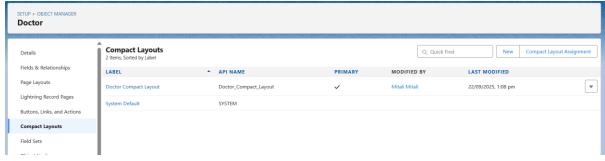
Appointment

Appointment

Details
Fields & Relationships
Page Layouts
Lightning Record Pages
Buttons, Links, and Actions
Compact Layouts
Field Sets
Object Limits
Record Types
Related Lookup Filters
Restriction Rules
Scoping Rules

Save ▾ | Quick Save | Preview As... ▾ | Cancel | ↶ Undo | ↷ Redo | 🔲 Layout P...

Fields
Buttons
Quick Actions
Mobile & Lightning Actions
Expanded Lookups
Related Lists
Report Charts

🔍 Quick Find Field Name ✖

◆ Section	Appointment Date ...	Creat
◆ 🔲 Blank Space	Appointment Name	Doct
Appointment	Appointment number	Doct
Appointment Date	Appointment Time	Last

◀ ▶

Edit Page Layout: Appointment Layout ~ Salesfor

‖ Appointment Section

🔒 Appointment number — GEN-2004-001234
Appointment Time — Sample Text
Appointment Date & Time — 22/09/2025, 3:39 pm
Appointment Date — 22/09/2025

‖ Participants

Patient (Contact) — Sample Text
Doctor (User) — Sample Text

‖ Status and Notes

Status — Sample Text

Doctor

Doctor

Details
Fields & Relationships
Page Layouts
Lightning Record Pages
Buttons, Links, and Actions
Compact Layouts
Field Sets
Object Limits
Record Types
Related Lookup Filters
Restriction Rules
Scoping Rules

Save ▾ | Quick Save | Preview As... ▾ | Cancel | ↶ Undo | ↷ Redo | 🔲 Layout P...

Fields
Buttons
Quick Actions
Mobile & Lightning Actions
Expanded Lookups
Related Lists
Report Charts

🔍 Quick Find Field Name ✖

◆ Section	Doctor Name	Owne
◆ 🔲 Blank Space	Doctor Name	Phon
Created By	Email	Spec
Doctor ID	Last Modified By	

◀ ▶

🔒 Doctor ID — GEN-2004-001234 — Owner — Sample Text
★ ● Doctor Name — Sample Text

‖ Doctor Information 🔧

★ ● Doctor Name — Sample Text
Specialization — Sample Text
Phone — 1-415-555-1212
Email — sarah.sample@company.com

‖ System Information (Header visible on edit only)

🔒 Created By — Sample Text   🔒 Last Modified By — Sample Text

‖ Custom Links (Header visible on edit only)

Pharmacy Inventory

Pharmacy Inventory

Details
Fields & Relationships
Page Layouts
Lightning Record Pages
Buttons, Links, and Actions
Compact Layouts
Field Sets
Object Limits
Record Types
Related Lookup Filters
Restriction Rules
Scoping Rules

Save ▾ | Quick Save | Preview As... ▾ | Cancel | ↶ Undo | ↷ Redo | 🔲 Layout P...

Fields
Buttons
Quick Actions
Mobile & Lightning Actions
Expanded Lookups
Related Lists
Report Charts

🔍 Quick Find Field Name ✖

◆ Section	Last Modified By	Phar
◆ 🔲 Blank Space	Medicine ID	Reor
Created By	Medicine Name	Stoc
Expiry Date	Owner	Supp

◀ ▶

Supplier (External Simulation) — Sample Text

‖ Medicine Information

🔒 Medicine ID — GEN-2004-001234
★ ● Medicine Name — Sample Text

‖ Stock & Pricing

Stock Quantity — 2,689
Unit Price — ₹123.45
★ ● Expiry Date — 22/09/2025

‖ System Information (Header visible on edit only)

🔒 Created By — Sample Text   🔒 Last Modified By — Sample Text
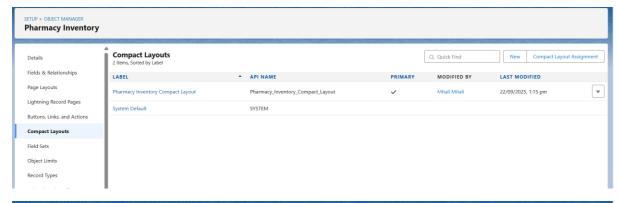
Compact Layouts

Selected important fields for highlights panel:
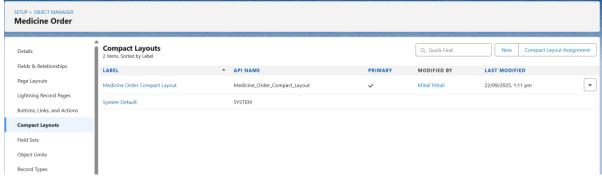
- o   Patient: Patient Name, Age, Gender, Phone.

- o   Doctor: Doctor Name, Specialization, Phone.

- o   Appointment: Appointment Date, Patient, Doctor, Status.

- o   Pharmacy Inventory: Medicine Name, Stock, Expiry Date.

- o   Medicine Order: Order Number, Patient, Status, Total Amount.

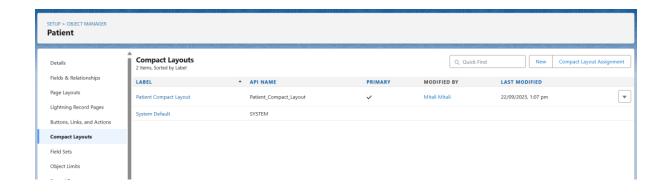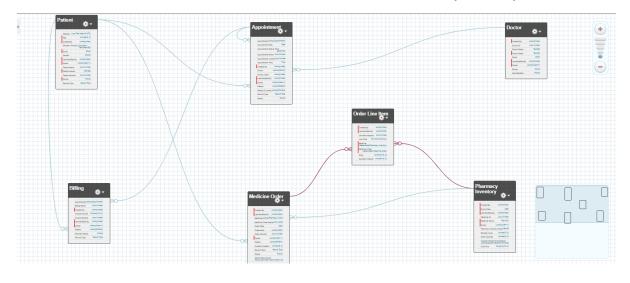- o   Billing: Bill Number, Patient, Amount, Status.

Compact Layouts
2 Items, Sorted by Label

LABEL		API NAME	PRIMARY	MODIFIED BY	LAST MOD
Billing Compact Layout	▲	Billing_Compact_Layout	✓	Mitali Mitali	22/09/2025,
System Default		SYSTEM			

Details
Fields & Relationships
Page Layouts
Lightning Record Pages
Buttons, Links, and Actions
Compact Layouts
Field Sets
Object Limits

Quick Find

Compact Layouts
2 Items, Sorted by Label

Quick Find | New | Compact Layout Assignment

LABEL		API NAME	PRIMARY	MODIFIED BY	LAST MODIFIED	
Doctor Compact Layout	▲	Doctor_Compact_Layout	✓	Mitali Mitali	22/09/2025, 1:08 pm	▼
System Default		SYSTEM				

Details
Fields & Relationships
Page Layouts
Lightning Record Pages
Buttons, Links, and Actions
Compact Layouts
Field Sets

Compact Layouts
2 Items, Sorted by Label

Quick Find | New | Compact Layout Assignment

LABEL		API NAME	PRIMARY	MODIFIED BY	LAST MODIFIED	
Pharmacy Inventory Compact Layout	▲	Pharmacy_Inventory_Compact_Layout	✓	Mitali Mitali	22/09/2025, 1:15 pm	▼
System Default		SYSTEM				

Details
Fields & Relationships
Page Layouts
Lightning Record Pages
Buttons, Links, and Actions
Compact Layouts
Field Sets
Object Limits
Record Types

Compact Layouts
2 Items, Sorted by Label

Quick Find | New | Compact Layout Assignment

LABEL		API NAME	PRIMARY	MODIFIED BY	LAST MODIFIED	
Medicine Order Compact Layout	▲	Medicine_Order_Compact_Layout	✓	Mitali Mitali	22/09/2025, 1:11 pm	▼
System Default		SYSTEM				

Details
Fields & Relationships
Page Layouts
Lightning Record Pages
Buttons, Links, and Actions
Compact Layouts
Field Sets
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Schema Builder

What I Did:

- Used Schema Builder to visualize the data model.
- Showed relationships like:
  - Patient ↔ Appointment ↔ Doctor.
  - Patient ↔ Billing.
  - Patient ↔ Medicine Order ↔ Order Line Item ↔ Pharmacy Inventory.

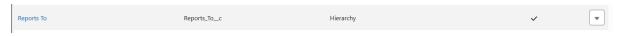## Lookup vs Master-Detail vs Hierarchical Relationships

What I Did:

- Lookup: Appointment → Patient, Appointment → Doctor, Billing → Patient.

- Master-Detail: Order Line Item → Medicine Order, Order Line Item → Pharmacy Inventory.

Medicine	Medicine__c	Master-Detail(Pharmacy Inventory)	✓	▼
Medicine Order	Medicine_Order__c	Master-Detail(Medicine Order)	✓	▼

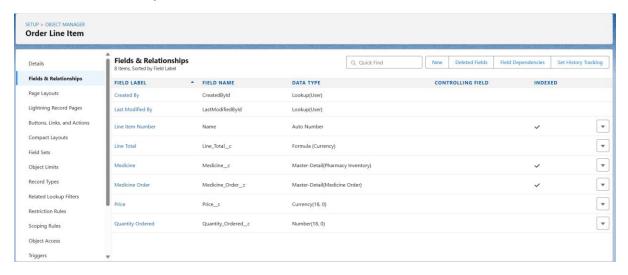- Hierarchical: Created a Reports To field on User to show reporting (e.g., Doctor reporting to Admin).

Reports To	Reports_To__c	Hierarchy	✓	▼

Junction Objects

What I Did:

- Created Order Line Item with two Master-Detail fields (to Medicine Order and Pharmacy Inventory).

Medicine	Medicine__c	Master-Detail(Pharmacy Inventory)	✓	▼
Medicine Order	Medicine_Order__c	Master-Detail(Medicine Order)	✓	▼

- Added fields for Quantity, Price, Line Total.

SETUP > OBJECT MANAGER
Order Line Item

	Fields & Relationships			
Details	8 Items, Sorted by Field Label			
Fields & Relationships				
Page Layouts		Quick Find	New	Deleted Fields	Field Dependencies	Set History Tracking
Lightning Record Pages	FIELD LABEL ▲	FIELD NAME	DATA TYPE	CONTROLLING FIELD	INDEXED
Buttons, Links, and Actions	Created By	CreatedById	Lookup(User)		
Compact Layouts	Last Modified By	LastModifiedById	Lookup(User)		
Field Sets	Line Item Number	Name	Auto Number		✓	▼
Object Limits	Line Total	Line_Total__c	Formula (Currency)			▼
Record Types	Medicine	Medicine__c	Master-Detail(Pharmacy Inventory)		✓	▼
Related Lookup Filters	Medicine Order	Medicine_Order__c	Master-Detail(Medicine Order)		✓	▼
Restriction Rules	Price	Price__c	Currency(18, 0)			▼
Scoping Rules	Quantity Ordered	Quantity_Ordered__c	Number(18, 0)			▼
Object Access					
Triggers					

- Roll-up summary on Medicine Order to calculate total.

Total Order Amount	Total_Order_Amount__c	Roll-Up Summary (SUM Order Line Item)	▼

External Objects

What I Did:

- Attempted to sync external OData source for Suppliers.

- Due to Developer Org limits, created a simulated Supplier object to demonstrate the concept.

- Linked Pharmacy Inventory → Supplier (simulation).

Conclusion

In Phase 3, I completed data modeling and relationships. I defined objects, fields, record types, page and compact layouts, and visualized them with Schema Builder. I implemented lookups, master-detail, and hierarchical relationships, designed a junction object, and simulated external object integration. These steps made the data model complete, flexible, and ready for automation and reporting in the next phase.