

ERD Problem Description for AI-Powered Medical Web Platform

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Introduction:

This document describes the **Entity-Relationship Diagram (ERD)** for an AI-powered medical web application. The platform facilitates interactions between doctors, patients, and hospital administrators, leveraging AI to analyze medical radiation images.

Key Entities and Attributes:

Patient:

- Stores patient & medical information, and appointments.
- Attributes include:
 - FullName,
 - gender
 - PatientId(PK)
 - phone number
 - Email,
 - Password
 - List Of Appointments
 - image
 - birthDate,
 - address,
 - emergency contact name,
 - emergency contact number,
 - occupation,

- Medical History
 - **Actions:**
 - sign up
 - login
 - book Appointments
 - show Appointments
 - Receive notifications via email/SMS about their appointments and analysis results.
 - cancel Appointments
 - Give Feedback
 - Pay for appointment (stripe)
 - Show Patient History \Rightarrow {date, Doctor Name, Results, Work place name}
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Doctor:

- Attributes include:
 - FullName
 - gender{enum},
 - *DoctorID (PK)*
 - phone number [multi value]
 - Email,
 - Password (hashed)
 - image,
 - address,
 - birthDate,
 - MedicalLicenseNumber

- Specialization
- work place{hospital or private clinic - Enum},
- identificationNumber,

Actions:

1. sign up
 2. login
 3. show patients appointments
 4. provide appointments
 5. upload image to model
 6. send results to patients {sms, email, patient history}
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HospitalAdmin:

Attributes:

- FullName
- gender{enum},
- *HospitalAdminID (PK)*
- phone number [multi value]
- Email,
- Password (hashed)
- image,
- birthDate,
- address,
- MedicalLicenseNumber

- Specialization
- identificationNumber,

Actions:

1. View customer feedback.
 2. View Doctors work.
 3. Respond to feedback.
 4. Manage Doctors.
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Appointment:

Attributes:

1. AppointmentID {PK},
 2. description,
 3. Date
 4. Status (e.g., Confirmed, Cancelled)
 5. Location,
 6. CreatedAt
 7. Cost
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MedicalImage: Stores the medical radiation images uploaded for analysis.

Attributes:

1. *ImageID (PK)*

2. ImagePath
 3. UploadDate
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AIAnalysis:

Contains the outputs from the AI model, including explainable elements like heatmaps and diagnosis insights.

Attributes:

1. AnalysisID (PK)
 2. Diagnosis (text)
 3. ConfidenceScore
 4. HeatmapData (could be a URL or base64 string)
 5. ExplanationDetails
 6. AnalysisDate
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Feedback: Captures feedback submitted by patients regarding their experience.

Attributes:

1. *FeedbackID* (PK)
2. Message
3. Rating (optional)
4. SubmittedAt

5. ResponseMessage

6. RespondedAt

Notification: Records the alerts sent to users regarding appointment statuses, analysis results, or feedback responses.

Attributes:

1. *NotificationID (PK)*
 2. Type (Email or SMS)
 3. Message
 4. Date
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Relationships

- **Patient and Appointment:** One Patient can have multiple Appointments; each Appointment is linked to one Patient.
- **Doctor and Appointment:** One Doctor can have multiple Appointments; each Appointment is linked to one Doctor.
- **Patient and Medical Image:** One Patient can upload multiple Medical Images.
- **Doctor and Medical Image:** Each Medical Image is associated with the Doctor who requested the analysis.

- **Medical Image and AI Analysis:** One Medical Image leads to one AI Analysis output, representing the model's interpretation.
 - **User and Notification:** Any User (Doctor, Patient, or Hospital Admin) can receive multiple Notifications.
 - **Patient and Feedback:** A Patient can submit multiple Feedback entries.
 - **Feedback and Feedback Response:** One Feedback entry can have one or more Feedback Responses from Hospital Admins.
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