



EDGE BU CSE DIGITAL SKILLS TRAINING

Project on Telemedicine Management System

Submitted to:

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Telemedicine Management System(TMS)

1.Designing (Entity Relationship) ER Diagram

Steps of Drawing ERD:

STEP-1: Identify the Entities Required:

- I. **Patients:** Stores basic information for each patient.
- II. **Doctors:** Contains details of doctors available on the platform, including specialties and availability.
- III. **Appointments:** Manages appointments, connecting patients with doctors for virtual or in-person consultations.
- IV. **Consultations:** Stores detailed records of consultations, including diagnosis and prescribed treatments.
- V. **Prescriptions:** Contains medication details prescribed during consultations.
- VI. **Medical Records:** A record of all medical history details, such as previous diagnoses, surgeries, allergies, etc.
- VII. **Billing:** Manages billing information, tracking charges for consultations and other services.
- VIII. **Insurance:** Manages patient insurance information, including coverage limits and expiry.
- IX. **Video Sessions:** Stores information on virtual sessions, including session links and timestamps.
- X. **System Users:** Basic table for storing login credentials and user roles
- XI. **Notifications:** Tracks notifications sent to users, such as appointment reminders.
- XII. **Teletherapy Sessions:** Manages teletherapy sessions for mental health support.

STEP-2: Identify the Attributes and Primary key for each Entity:

- **Patients:** patient_id (PK), name, dob, gender, contact_info, address
- **Doctors:** doctor_id (PK), name, specialization, license_no, contact_info, availability_schedule
- **Appointments:** appointment_id (PK), patient_id (FK), doctor_id (FK), appointment_date, status, consultation_type
- **Consultations:** consultation_id (PK), appointment_id (FK), prescription, follow_up_date
- **Prescriptions:** prescription_id (PK), consultation_id (FK), medication_name, dosage, frequency, duration
- **Medical Records:** record_id (PK), patient_id (FK), record_date, description, type
- **Billing:** billing_id (PK), appointment_id (FK), amount, payment_status, payment_date, payment_method
- **Insurance:** insurance_id (PK), patient_id (FK), provider_name, policy_number, coverage_details, expiry_date
- **Video Sessions:** session_id (PK), appointment_id (FK), session_link, duration, timestamp
- **System Users:** user_id (PK), username, password_hash, role, associated_doctor_id (FK)
- **Notifications:** notification_id (PK), user_id (FK), message, timestamp, status
- **Teletherapy Sessions:** teletherapy_id (PK), patient_id (FK), therapist_id (FK), session_date, session_notes

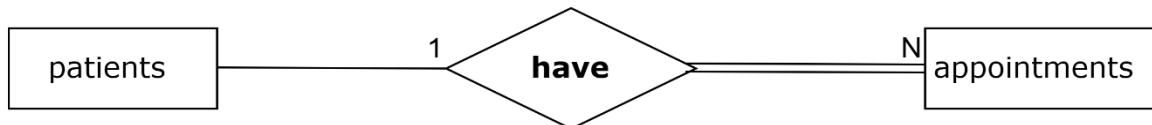
STEP-3: Identify the Relationship needed:

- Patients **have** Appointments: One-to-Many
- Appointments **involves** Doctors: Many-to-One
- Appointments **corresponds** to Video Sessions: One-to-One
- Appointments **associated_with** Billing: One-to-One
- Doctors **conduct** Consultations: One-to-Many
- Doctors **issue** Prescriptions: One-to-Many
- Patients **have** Consultations: One-to-Many
- Consultations **result_in** Prescriptions: One-to-Many
- Patients **receive** Prescriptions: One-to-Many
- Patients **have** Billing: One-to-Many
- Billing **covered_by** Insurance: Many-to-One

- Patients **attend** Teletherapy Sessions: One-to-Many
- Users **receive** Notifications: One-to-Many
- Patients **have** Medical Records: One-to-Many

🚦 STEP-4: Identify the Cardinality Ratio and Participation:

- Patients- **have**- Appointments: One-to-Many



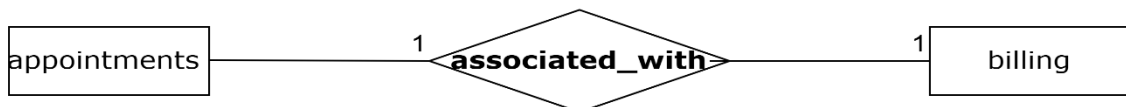
- Appointments- **involves** -Doctors: Many-to-One



- Appointments -**corresponds_to**- Video Sessions: One-to-One



- Appointments- **associated_with**- Billing: One-to-One



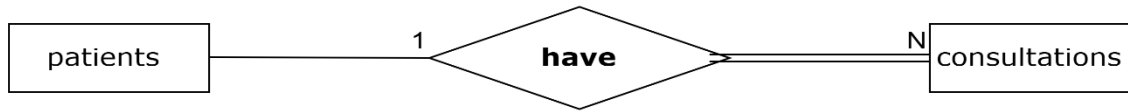
- Doctors- **conduct**- Consultations: One-to-Many



- Doctors- **issue** -Prescriptions: One-to-Many



- Patients- **have** -Consultations: One-to-Many



- Consultations- **result_in**- Prescriptions: One-to-Many



- Patients- **receive**- Prescriptions: One-to-Many



- Patients **-have** -Billing: One-to-Many



- Billing **-covered_by**- Insurance: Many-to-One



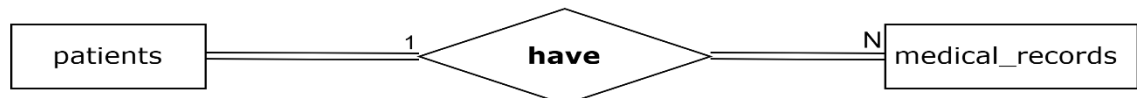
- Patients **-attend**- Teletherapy Sessions: One-to-Many

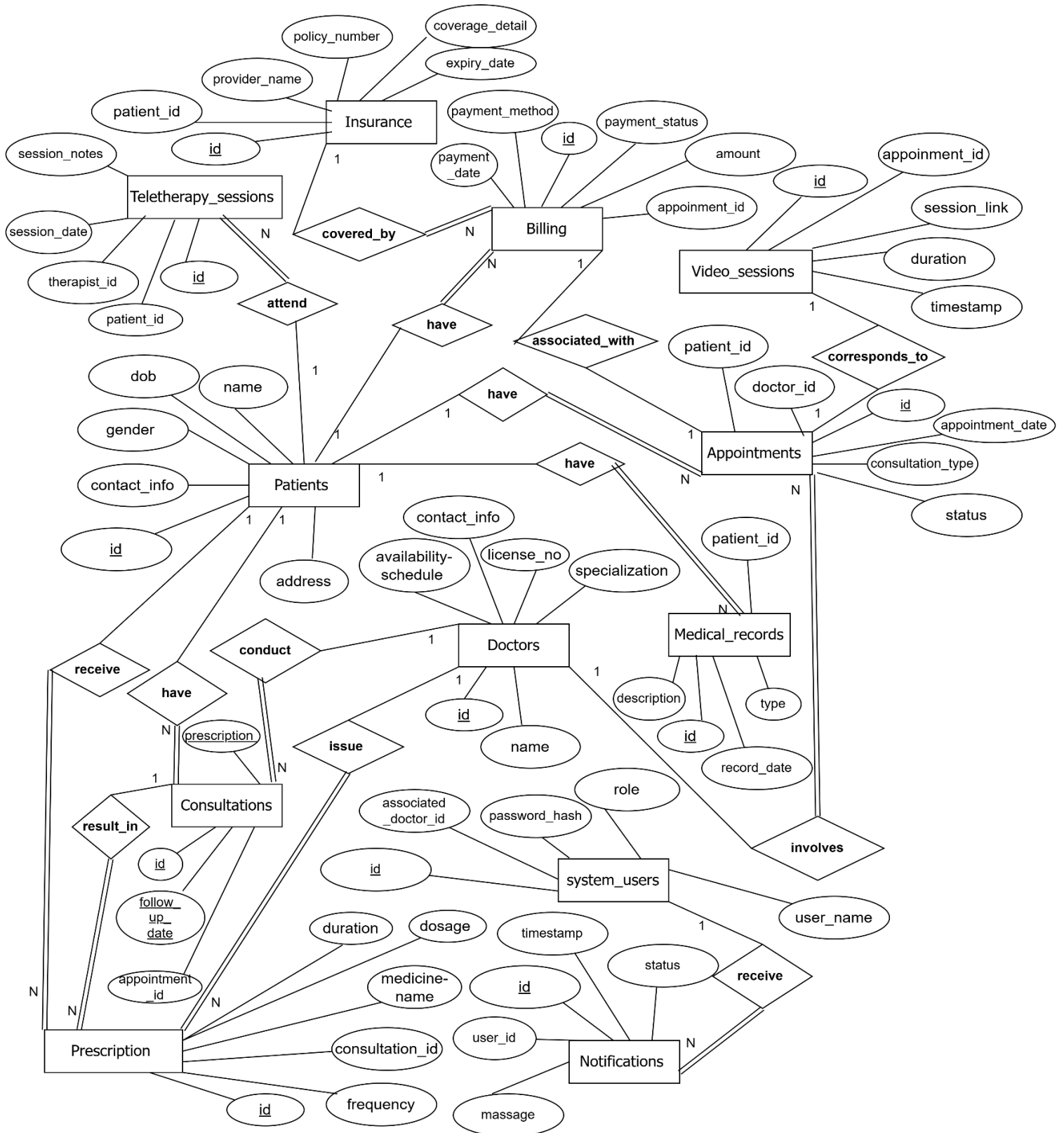


- Users **-receive**- Notifications: One-to-Many



- Patients **-have**- Medical Records: One-to-Many





2. Reduction to database schema:

- **Patients:** patient_id (PK), name, dob, gender, contact_info, address
- **Doctors:** doctor_id (PK), name, specialization, license_no, contact_info, availability_schedule
- **Appointments:** appointment_id (PK), patient_id (FK), doctor_id (FK), appointment_date, status, consultation_type
- **Consultations:** consultation_id (PK), appointment_id (FK), prescription, follow_up_date
- **Prescriptions:** prescription_id (PK), consultation_id (FK), medication_name, dosage, frequency, duration
- **Medical Records:** record_id (PK), patient_id (FK), record_date, description, type
- **Billing:** billing_id (PK), appointment_id (FK), amount, payment_status, payment_date, payment_method
- **Insurance:** insurance_id (PK), patient_id (FK), provider_name, policy_number, coverage_details, expiry_date
- **Video Sessions:** session_id (PK), appointment_id (FK), session_link, duration, timestamp
- **System Users:** user_id (PK), username, password_hash, role, associated_doctor_id (FK)
- **Notifications:** notification_id (PK), user_id (FK), message, timestamp, status
- **Teletherapy Sessions:** teletherapy_id (PK), patient_id (FK), therapist_id (FK), session_date, session_notes

3.Implementing the database in MySQL:

All tables with sample data:













Patients: patient_id (PK), name, dob, gender, contact_info, address

<div><div><div>←</div><div>T</div><div>→</div></div><div></div></div>				id	name	dob	gender	contact_info	address
<div><div><div></div></div><div><div><div></div></div><div><div></div></div></div><div><div>Edit</div><div>Copy</div><div>Delete</div></div></div>	1	Fahmida	2001-11-24	Female	01716909950	Barishal			
<div><div><div></div></div><div><div><div></div></div><div><div></div></div></div><div><div>Edit</div><div>Copy</div><div>Delete</div></div></div>	2	Md.Rakibullah	1988-09-09	Male	01673829453	Rajshahi			
<div><div><div></div></div><div><div><div></div></div><div><div></div></div></div><div><div>Edit</div><div>Copy</div><div>Delete</div></div></div>	3	Misses Rahima	1880-04-12	Female	01954344542	Chittagong			
<div><div><div></div></div><div><div><div></div></div><div><div></div></div></div><div><div>Edit</div><div>Copy</div><div>Delete</div></div></div>	4	Halima	2001-12-26	Female	01567890987	Khulna			

Doctors: doctor_id (PK), name, specialization, license_no, contact_info, availability_schedule

				id	name	specialization	license_no	contact_info	availability_schedule
<input type="checkbox"/>	 Edit	 Copy	 Delete	1	Dr.Md.Sahadutullah	Neurosurgeon	nrs-081123	+05267321	Mon-Fri, 9:00-12:00
<input type="checkbox"/>	 Edit	 Copy	 Delete	2	Dr. Garcian	Dermatology	drm-34546	+8823455	Mon-Fri, 6:00-9:00
<input type="checkbox"/>	 Edit	 Copy	 Delete	3	Dr. Zhirul Alam	cardiology	card-87423917	+80022822	sun-wed,3.00-9.00
<input type="checkbox"/>	 Edit	 Copy	 Delete	4	Dr.Nilima Chowdhury	psychiatrist	phyc345356	+8801221213	Tuesday, 9:00-9:00

Appointments: appointment_id (PK), patient_id (FK), doctor_id (FK), appointment_date, status, consultation_type

<div>←T→</div>				id	patient_id	doctor_id	appointment_date	status	consultation_type
<input type="checkbox"/>	 Edit	 Copy	 Delete	1	1	1	2024-11-01	available	telemedicine
<input type="checkbox"/>	 Edit	 Copy	 Delete	2	2	2	2024-12-03	on leave	phone consultation
<input type="checkbox"/>	 Edit	 Copy	 Delete	3	3	3	2024-12-10	Rescheduled	In-person
<input type="checkbox"/>	 Edit	 Copy	 Delete	4	4	4	2024-09-04	available	telemedicine

Consultations: consultation_id (PK), appointment_id (FK), prescription, follow_up_date

<div><div><div>←</div><div>T</div><div>→</div></div><div></div></div>				id	appointment_id	prescription	follow_up_date
<div><div><div></div></div></div>	<div><div><div></div></div><div>Edit</div></div>	<div><div><div></div></div><div>Copy</div></div>	<div><div><div></div></div><div>Delete</div></div>	1	1	Cyclobenzaprine	2024-12-28
<div><div><div></div></div></div>	<div><div><div></div></div><div>Edit</div></div>	<div><div><div></div></div><div>Copy</div></div>	<div><div><div></div></div><div>Delete</div></div>	2	2		0000-00-00
<div><div><div></div></div></div>	<div><div><div></div></div><div>Edit</div></div>	<div><div><div></div></div><div>Copy</div></div>	<div><div><div></div></div><div>Delete</div></div>	3	3		0000-00-00
<div><div><div></div></div></div>	<div><div><div></div></div><div>Edit</div></div>	<div><div><div></div></div><div>Copy</div></div>	<div><div><div></div></div><div>Delete</div></div>	4	2		0000-00-00

Prescriptions: prescription_id (PK), consultation_id (FK), medication_name, dosage, frequency, duration

				id	consultation_id	medication_name	dosage	frequency	duration			
<input type="checkbox"/>		Edit		Copy		Delete	111	1	Cyclobenzaprine	5 mg	three times a day	2 to 3 weeks
<input type="checkbox"/>		Edit		Copy		Delete	222	2	NULL	NULL	NULL	NULL
<input type="checkbox"/>		Edit		Copy		Delete	333	4	Serotonin-Norepinephrine Reuptake Inhibitors	10 mg	one time a day	1 month

Medical Records: record_id (PK), patient_id (FK), record_date, description, type

<div>← T →</div>			id	patient_id	record_date	description	type	
<input type="checkbox"/>	<div><div><div></div></div><div>Edit</div></div>	<div><div><div></div></div><div>Copy</div></div>	<div><div><div></div></div><div>Delete</div></div>	123	1	2023-09-09	No prior neurological issues	NULL
<input type="checkbox"/>	<div><div><div></div></div><div>Edit</div></div>	<div><div><div></div></div><div>Copy</div></div>	<div><div><div></div></div><div>Delete</div></div>	124	2	2023-08-12	History of eczema	Contact Dermatitis
<input type="checkbox"/>	<div><div><div></div></div><div>Edit</div></div>	<div><div><div></div></div><div>Copy</div></div>	<div><div><div></div></div><div>Delete</div></div>	125	3	2022-04-03	no problrm in heart	

Billing: billing_id (PK), appointment_id (FK), amount, payment_status, payment_date, payment_method

<div>← T →</div>					id	appointment_id	amount	payment_status	payment_date	payment_method		
<input type="checkbox"/>		Edit		Copy		Delete	1	1	600.00	paid	2024-11-05	Mobile banking
<input type="checkbox"/>		Edit		Copy		Delete	2	2	700.00	unpaid	0000-00-00	
<input type="checkbox"/>		Edit		Copy		Delete	3	3	0.00		0000-00-00	












Insurance: insurance_id (PK), patient_id (FK), provider_name, policy_number, coverage_details, expiry_date

<div>⏪ ⏴ ⏵ ⏩</div>													id	patient_id	provider_name	policy_number	coverage_details	expiry_date
<input type="checkbox"/>		Edit		Copy		Delete	1001	1	United Health care	POL1234567890	Covers 80% of services after deductible; no referr	2032-09-01						
<input type="checkbox"/>		Edit		Copy		Delete	1002	2	Good Life Insurance	edef432523	Covers urgent care and hospital services; no out-o	2030-01-01						
<input type="checkbox"/>		Edit		Copy		Delete	1003	3	Better Health Inc.	bttr235466	Covers 90% of services; requires referrals	2034-05-01						












Video Sessions: session_id (PK), appointment_id (FK), session_link, duration, timestamp

				id	appointment_id	session_link	duration	timestamp			
<input type="checkbox"/>		Edit		Copy		Delete	1	1	www.zoom32435.com	00:00:45	2024-11-01 01:07:09
<input type="checkbox"/>		Edit		Copy		Delete	2	3	www.google_meet674123767/.com	00:00:30	2024-11-01 01:07:09
<input type="checkbox"/>		Edit		Copy		Delete	3	4	www.google_meet//jeuh900//.com	00:00:01	2024-11-01 01:38:59

System Users: user_id (PK), username, password_hash, role, associated_doctor_id (FK)

			id	username	password_hash	role	associated_doctor_id
<input type="checkbox"/>		Edit		Copy		Delete	1 mahirull.iuu 213446@# assistant 1
<input type="checkbox"/>		Edit		Copy		Delete	2 shithy.aktr 124rsdfert nurse 2
<input type="checkbox"/>		Edit		Copy		Delete	3 nilimaaa.chdhryy erw45346y doctor 4

Notifications: notification_id (PK), user_id (FK), message, timestamp, status

			id	user_id	message	timestamp	status
<input type="checkbox"/>		Edit		Copy		Delete	666 3 Reminder: You have an appointment scheduled with a 2024-11-01 01:47:02 available
<input type="checkbox"/>		Edit		Copy		Delete	777 2 You have received a new message from Dr. Please ch 2024-11-01 01:44:51 NULL
<input type="checkbox"/>		Edit		Copy		Delete	999 1 NULL 2024-11-01 01:01:54 NULL

Teletherapy Sessions: teletherapy_id (PK), patient_id (FK), therapist_id (FK), session_date, session_notes

			id	patient_id	therapist_id	session_date	session_notes
<input type="checkbox"/>		Edit		Copy		Delete	100 2 4 2024-08-04 The increase in panic attacks
<input type="checkbox"/>		Edit		Copy		Delete	555 1 4 2024-08-03 Discussed the importance of pr

THANK YOU

