



Sillah Phase 3

CS340: Introduction to Databases Systems

Section: 1629

Instructor: Maram Alajlan

Prepared by:

Yara Albugami - 223410190

Rose Alrakan - 223410382

Shoug Alomran - 223410392

Raghad Abdulaziz - 222511358

Table of Contents

1. Relational Schema.....	3
2. Data Dictionary.....	5
USER.....	5
FAMILY_MEMBER.....	6
HEALTH_CONDITION.....	6
MEDICAL_HISTORY.....	6
RISK_ALERT.....	7
CLINIC.....	8
APPOINTMENT.....	8
AWARENESS_CONTENT.....	8
HEALTH_EVENT.....	9
3. Mapping from EER Model to Relational Model.....	9
4. Relational Diagram.....	10
5. Individual Contribution Description.....	10

1. Relational Schema

The conceptual EER model developed in Phase 2 has been transformed into a relational schema suitable for implementation in a relational database management system.

Each entity was mapped to a corresponding relation. One-to-many (1:N) relationships were implemented by placing foreign keys on the N-side of the relationship.

The resulting relational schema is defined as follows:

```
SQL
USER(
  user_id PRIMARY KEY,
  first_name,
  last_name,
  email UNIQUE,
  password_hash,
  phone_number,
  created_at
)

FAMILY_MEMBER(
  member_id PRIMARY KEY,
  user_id FOREIGN KEY REFERENCES USER(user_id),
  first_name,
  last_name,
  date_of_birth,
  relationship,
  contact_phone,
  medical_history,
  blood_type,
  gender,
  status
)

HEALTH_CONDITION(
  condition_id PRIMARY KEY,
  condition_name,
  category,
  description
)

MEDICAL_HISTORY(
  medical_history_id PRIMARY KEY,
  member_id FOREIGN KEY REFERENCES FAMILY_MEMBER(member_id),
```

```

    condition_id FOREIGN KEY REFERENCES HEALTH_CONDITION(condition_id),
    event_date,
    event_type,
    diagnosis,
    severity,
    symptoms,
    treatment,
    outcome
)

RISK_ALERT(
    alert_id PRIMARY KEY,
    member_id FOREIGN KEY REFERENCES FAMILY_MEMBER(member_id),
    alert_type,
    risk_level,
    priority,
    status,
    notes,
    description,
    created_date,
    resolved_date
)

CLINIC(
    clinic_id PRIMARY KEY,
    clinic_name,
    city,
    address,
    phone
)

APPOINTMENT(
    appointment_id PRIMARY KEY,
    user_id FOREIGN KEY REFERENCES USER(user_id),
    clinic_id FOREIGN KEY REFERENCES CLINIC(clinic_id),
    appointment_date,
    appointment_time,
    reason,
    status
)

AWARENESS_CONTENT(
    content_id PRIMARY KEY,
    title,
    topic,

```

```

        content_type,
        content_body,
        created_at
    )

HEALTH_EVENT(
    health_event_id PRIMARY KEY,
    member_id FOREIGN KEY REFERENCES FAMILY_MEMBER(member_id),
    event_date,
    severity,
    symptoms,
    condition_name,
    treatment,
    outcome,
    event_type,
    diagnosis,
    diagnosis_date,
    notes,
    onset_age,
    status
)

```

2. Data Dictionary

The data dictionary defines attribute types and constraints for each relation.

USER			
Attribute	Data Type	Description	Constraints
user_id	INT	Unique user identifier	Primary Key
first_name	VARCHAR(50)	User first name	NOT NULL
last_name	VARCHAR(50)	User last name	NOT NULL
email	VARCHAR(100)	User email address	UNIQUE, NOT NULL
password_hash	VARCHAR(255)	Encrypted password	NOT NULL
phone_number	VARCHAR(20)	Contact number	—
created_at	DATETIME	Account creation timestamp	NOT NULL

FAMILY_MEMBER			
Attribute	Data Type	Description	Constraints
member_id	INT	Unique family member identifier	Primary Key
user_id	INT	Owner of family member	NOT NULL, Foreign Key REFERENCES USER(user_id)
first_name	VARCHAR(50)	First name	NOT NULL
last_name	VARCHAR(50)	Last name	NOT NULL
date_of_birth	DATE	Date of birth	NOT NULL
relationship	VARCHAR(50)	Relationship to user	—
contact_phone	VARCHAR(20)	Contact number	—
medical_history	TEXT	General notes	—
blood_type	VARCHAR(5)	Blood type	—
gender	VARCHAR(10)	Gender	—
status	VARCHAR(30)	Overall condition	—

HEALTH_CONDITION			
Attribute	Data Type	Description	Constraints
condition_id	INT	Unique condition identifier	Primary Key
condition_name	VARCHAR(100)	Disease/condition name	NOT NULL
category	VARCHAR(50)	Condition category	—
description	TEXT	Condition description	—

MEDICAL_HISTORY			
Attribute	Data Type	Description	Constraints

MEDICAL_HISTORY			
medical_history_id	INT	Unique medical history record	Primary Key
member_id	INT	Related family member	Foreign Key
condition_id	INT	Related condition	Foreign Key
event_date	DATE	Date of diagnosis	NOT NULL
event_type	VARCHAR(50)	Type of medical event	—
diagnosis	TEXT	Diagnosis details	—
severity	VARCHAR(20)	Severity level	—
symptoms	TEXT	Reported symptoms	—
treatment	TEXT	Treatment information	—
outcome	TEXT	Treatment outcome	—

RISK_ALERT			
Attribute	Data Type	Description	Constraints
alert_id	INT	Unique alert identifier	Primary Key
member_id	INT	Related family member	Foreign Key
alert_type	VARCHAR(50)	Type of alert	—
risk_level	VARCHAR(20)	Risk level	—
priority	VARCHAR(20)	Alert priority	—
status	VARCHAR(20)	Alert status	—
notes	TEXT	Medical notes	—
description	TEXT	Alert explanation	—
created_date	DATETIME	Date generated	NOT NULL
resolved_date	DATETIME	Date resolved	—

CLINIC			
Attribute	Data Type	Description	Constraints
clinic_id	INT	Unique clinic identifier	Primary Key
clinic_name	VARCHAR(100)	Clinic name	NOT NULL
city	VARCHAR(50)	Clinic city	—
address	VARCHAR(150)	Clinic address	—
phone	VARCHAR(20)	Contact phone	—

APPOINTMENT			
Attribute	Data Type	Description	Constraints
appointment_id	INT	Unique appointment ID	Primary Key
user_id	INT	Scheduling user	Foreign Key
clinic_id	INT	Associated clinic	Foreign Key
appointment_date	DATE	Appointment date	NOT NULL
appointment_time	TIME	Appointment time	NOT NULL
reason	TEXT	Appointment reason	—
status	VARCHAR(20)	Appointment status	—

AWARENESS_CONTENT			
Attribute	Data Type	Description	Constraints
content_id	INT	Unique content ID	Primary Key
title	VARCHAR(150)	Content title	NOT NULL
topic	VARCHAR(100)	Health topic	—
content_type	VARCHAR(30)	Article / Video / Infographic	—
content_body	TEXT	Main content	—

AWARENESS_CONTENT			
created_at	DATETIME	Date created	NOT NULL

HEALTH_EVENT			
Attribute	Data Type	Description	Constraints
member_id	INT	Related family member ID	NOT NULL, Foreign Key REFERENCES FAMILY_MEMBER (member_id)
health_event_id	INT	Unique event ID	Primary Key
event_date	DATETIME	Event time	NOT NULL
severity	VARCHAR(20)	Severity level	—
symptoms	TEXT	Event symptoms	—
condition_name	VARCHAR(100)	Condition name	—
treatment	TEXT	Treatment	—
outcome	TEXT	Event result	—
event_type	VARCHAR(50)	Event category	—
diagnosis	TEXT	Overall findings	—
diagnosis_date	DATE	Date of diagnosis	—
notes	TEXT	Medical notes	—
onset_age	INT	Age during event	—
status	VARCHAR(30)	Event status	—

3. Mapping from EER Model to Relational Model

The logical schema was derived directly from the conceptual EER model developed in Phase 2.

Mapping decisions:

- Each strong entity was mapped to a separate relation.

- One-to-many (1:N) relationships were implemented using foreign keys on the N-side.
 - Example: FAMILY_MEMBER includes user_id referencing USER.
 - Example: MEDICAL_HISTORY includes member_id and condition_id as foreign keys.
- Independent entities (e.g., AWARENESS_CONTENT) were mapped to standalone tables.
- Primary keys uniquely identify each tuple within its respective relation.
- Referential integrity is preserved using foreign key constraints.

This relational structure preserves the integrity and relationships defined in the conceptual model while preparing the database for implementation in Phase 4.

4. Relational Diagram

The relational diagram includes:

- All relations listed above
- Primary keys clearly marked
- Foreign key relationships represented with directional arrows
- One-to-many relationships implemented via foreign key references

The diagram visually demonstrates the structural integrity and relationships of the relational schema.

5. Individual Contribution Description

Team Member	Contribution
Yara Albugami	Assisted in mapping User and Appointment entities into relational schema and defining key constraints.
Raghad Abdulaziz	Transformed FamilyMember and MedicalHistory into relational form and ensured foreign key consistency.
Shoug Alomran	Designed RiskAlert relational structure and verified mapping logic across modules.
Rose Alrakan	Developed HealthCondition, Clinic, and AwarenessContent relational definitions and reviewed overall schema consistency.