UTM

UNIVERSITI TEKNOLOGI MALAYSIA

SECD 2523 - DATABASE

SEMESTER I, SESSION 2023/2024

Phase 2: Database Conceptual Design

E-Clinic System

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Section 08

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1. Introduction

This phase 2 document will focus on the development of the logical design of the E-Clinic system. In this phase, the proposed solutions described in phase 1 will be defined using Data Flow Diagram and Entity Relationship Diagram following a proposed business rule.

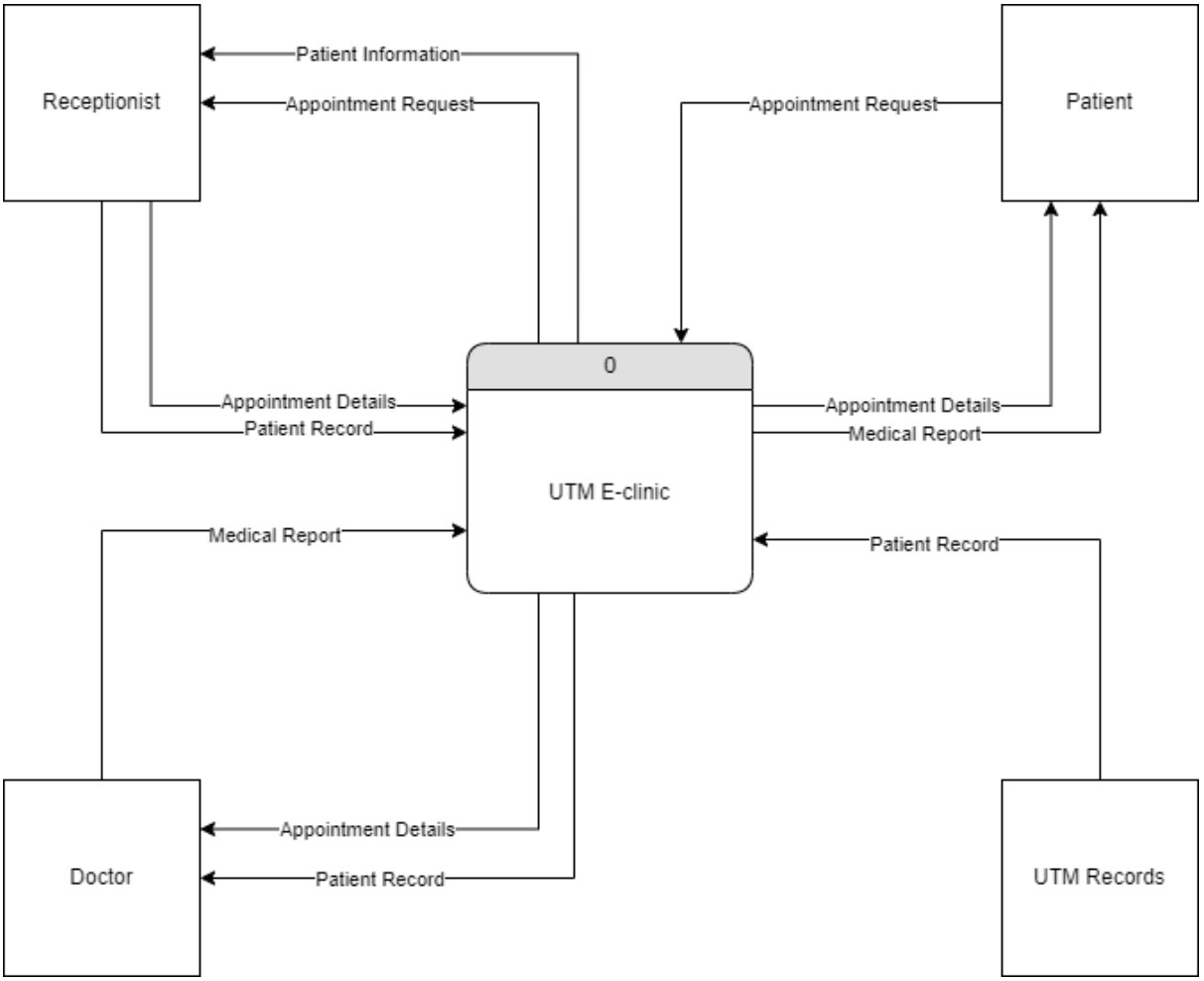
The Data Flow Diagram will be used to track which data from which actors that will flow through the system. The DFD will visualize the data from and to the external entities and the system itself. This includes primary data flow described in Context Diagram which will be expanded in the level 0 DFD where data from external entities will interact with the main system, that will be expanded into DFD level 1 where interactions with each subsystem will be defined in detail.

After making the DFD, the business rule will be defined in order to make the ERD. The business rule in this document will include business policies and constraints. After the business rule, the Entity Relationship Diagram to show the interaction of entity and system. The ERD is followed by an Enhanced ERD where the entities and its relation will be defined further.

At the end of the document, the entity and data that has been defined in the ERD will be listed in a Data Dictionary which will give the specifications such as data type, constraints, data length. This data dictionary will be used during the physical implementation.

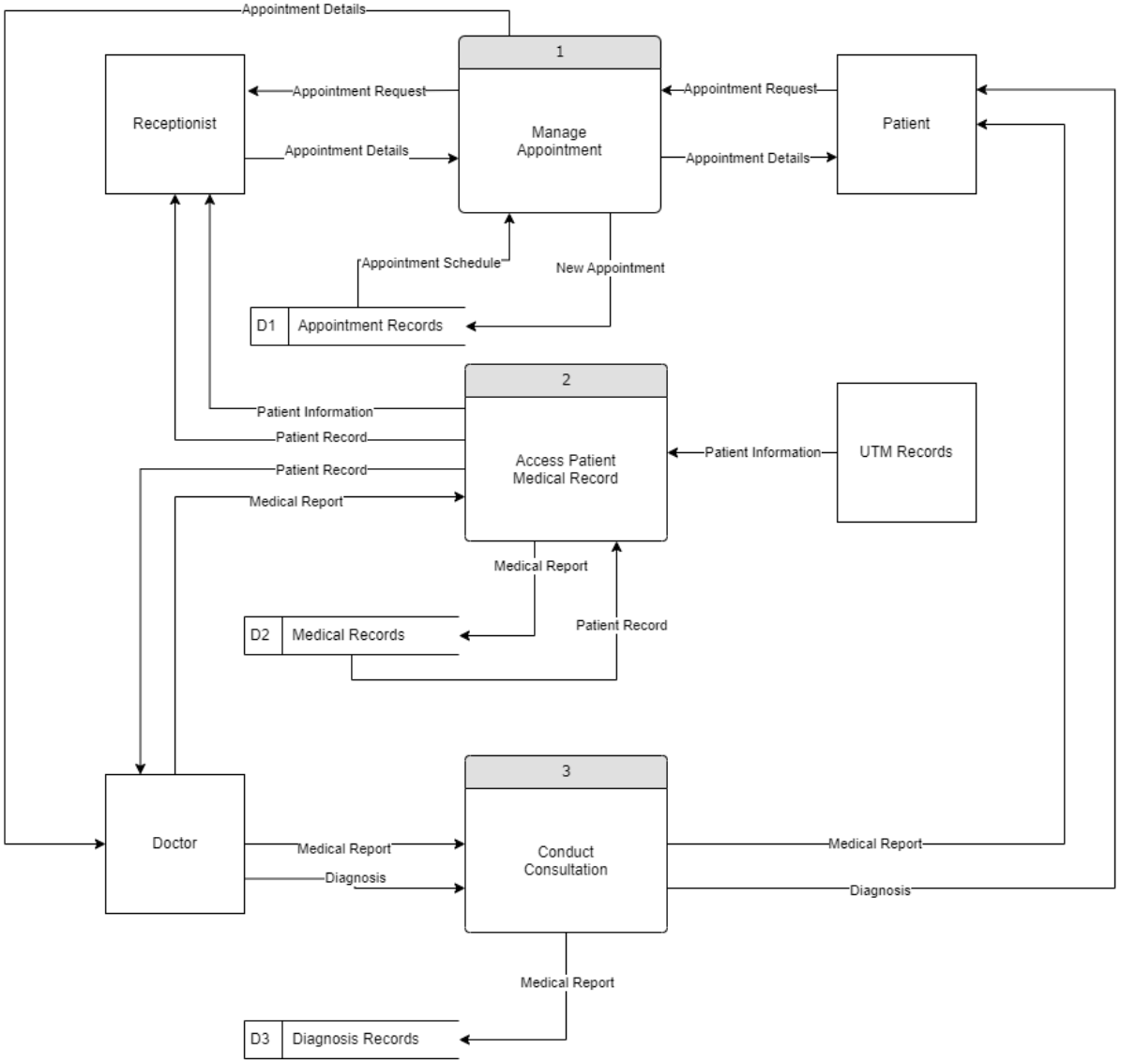
2. DFD

2.1. Context Diagram



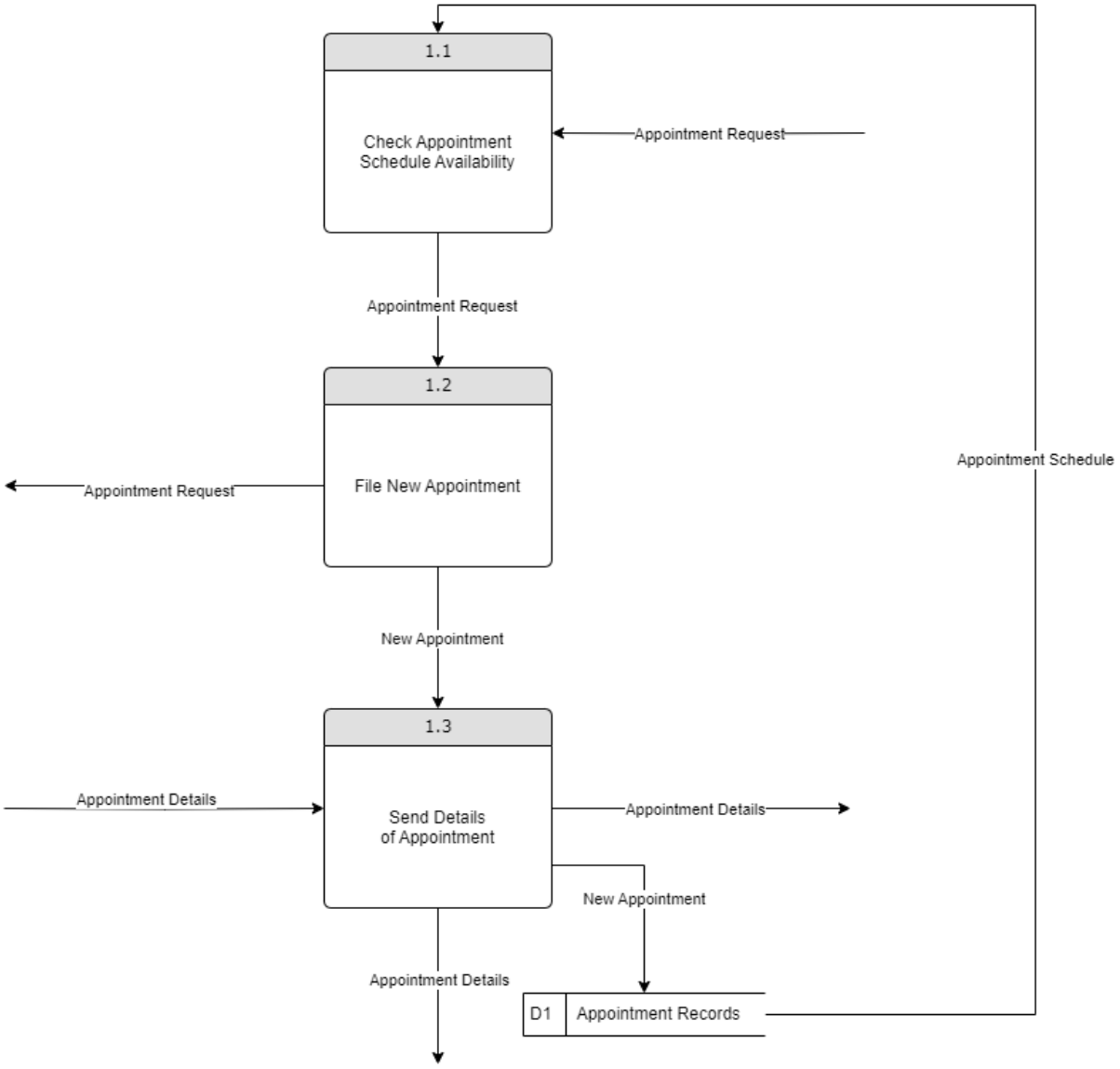
Actor: Doctor, Patient/Student , Pharmacist, Receptionist

2.2. Diagram Level 0

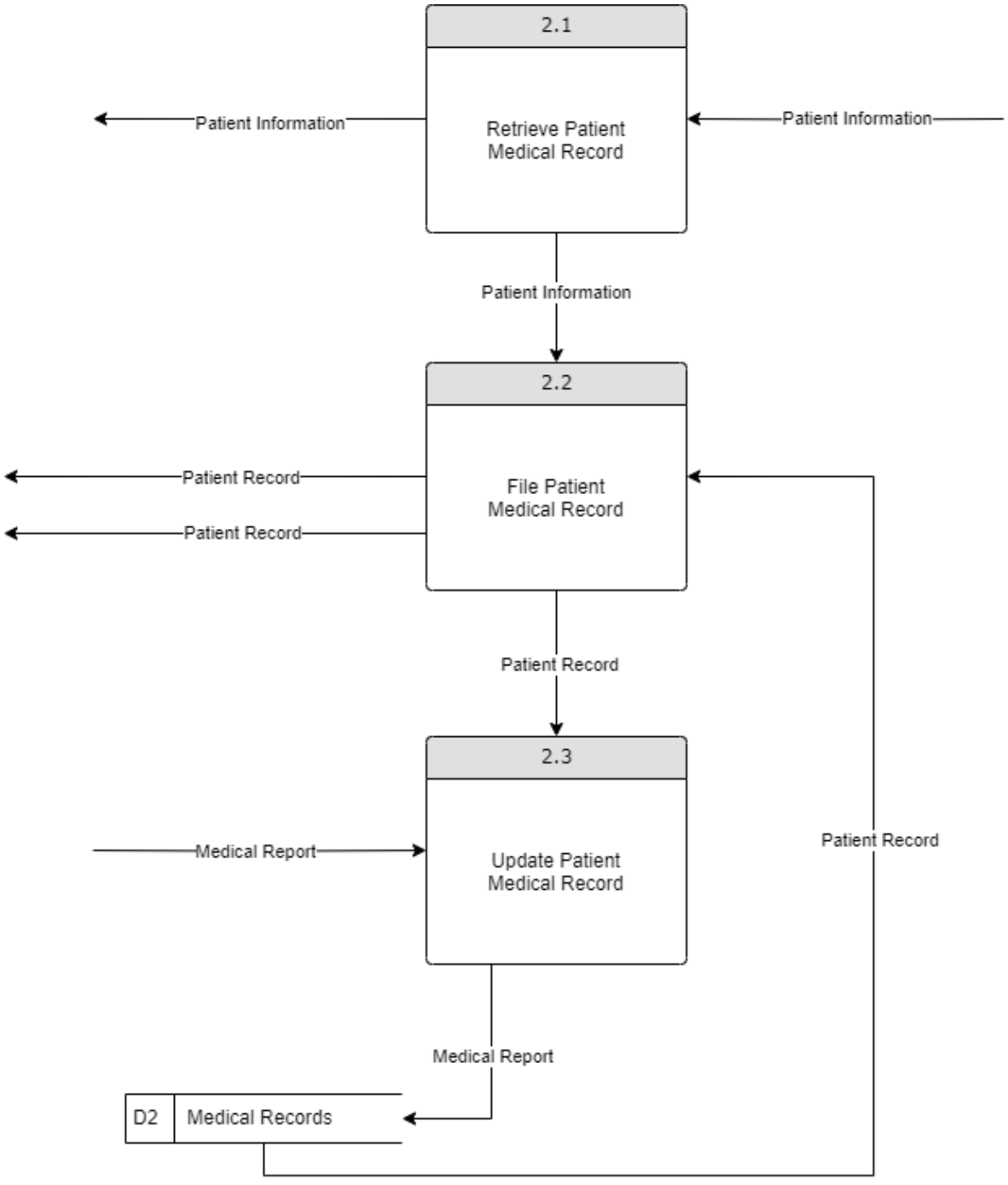


2.3. Diagram Level 1

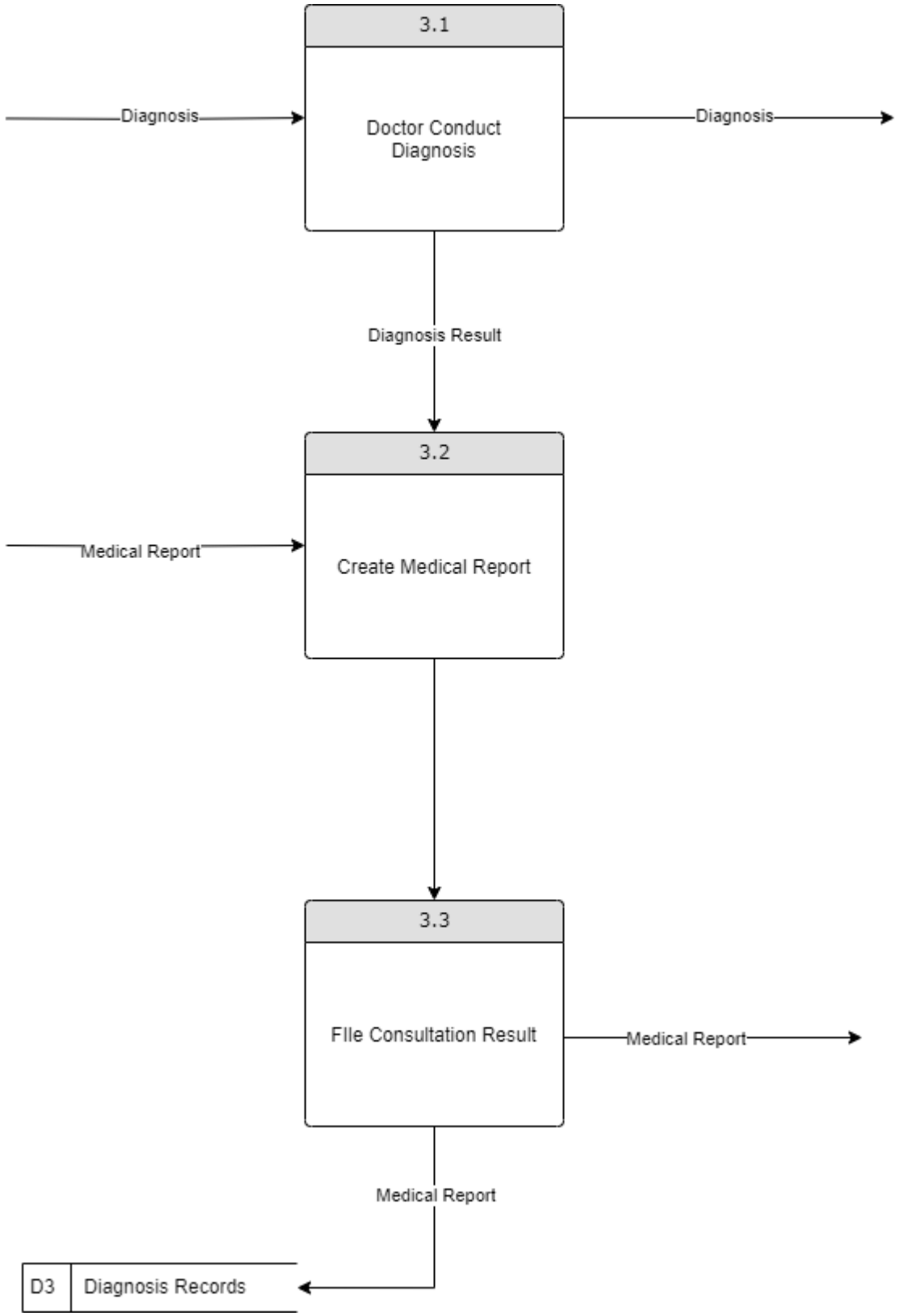
2.3.1. Manage Appointment



2.3.2. Access Patient Medical Record

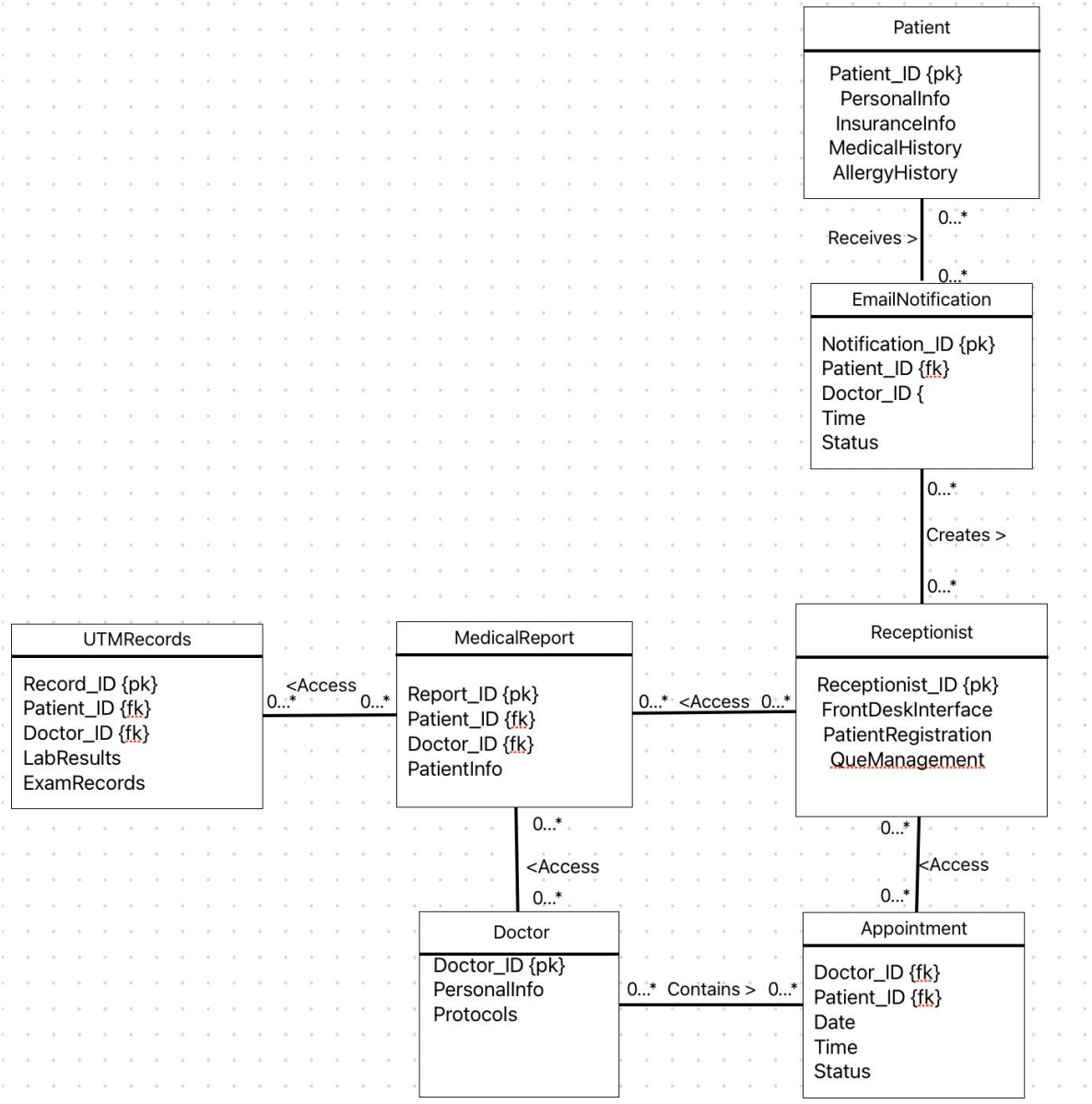


2.3.3. Conduct Consultation

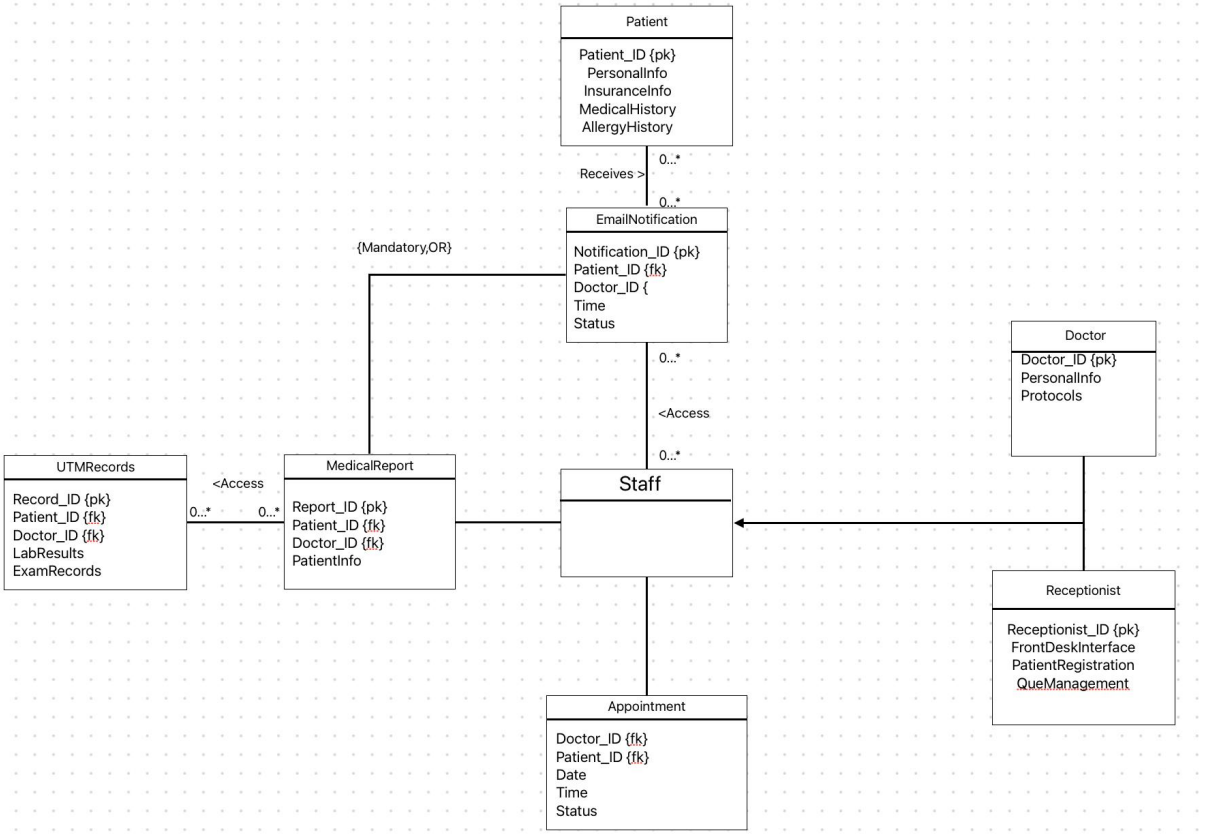


3. Database conceptual design

3.1. Conceptual ERD



3.2. Enhanced ERD (EERD)



4. Data dictionary

Our data dictionary provides a clear guide to the elements within your database. It details each table's attributes, including their data types, lengths, and specifications, helping users understand and manage the database efficiently

Entites	Attributes	Description	Data type	length	Null allowed?	Mult value
Patient	Patient ID	Unique identifierfro each patient	integer	10	No	No
	personalInfo	Full informationof for each patient	Varchar	30	Yes	Yes
	insuaranceinfo	Full breakdown of policy and term	Varchar	30	Yes	Yes
	medicalHistory	Encompass complete full health deatails	Varchar	30	Yes	Yes
	AllergyHistory	Listing allergens	varchar	30	Yes	Yes
EmailNotification	Notification_ID (PK)	Unique identifier for each notification	Interger	10	No	No
	Patient_ID	Identification for the patient receiving the notification	Varchar	10	No	No
	Doctor_ID	Identification for the doctor associated with the notification	Varchar	30	Yes	No
	Time	Timestamp indicating when the notification was sent	DATA	30	No	No
	Status	Indicates the current status of the notification	varchar	30	No	No
Receptionist	Receptionist_ID (PK)	Unique identifier for each receptionist	Integer	10	No	No
	FrontDeskInterface	Capability or access level for the front desk interface	Varchar	30	Yes	No
	PatientRegistration	Capability or access level for patient registration tasks	Varchar	30	Yes	No
	QueueManagement	Capability or access level for managing queues or appointments	varchar	30	Yes	no

MedicalReport	Report_ID (PK)	Unique identifier for each medical report	Integer	10	No	No
	Patient_ID (FK)	Foreign key linking to the specific patient associated with the report	Integer	10	No	No
	Doctor_ID (FFK)	Foreign key linking to the specific doctor associated with the report	Integer	10	No	No
	PatientInfo	Field storing additional patient information related to the report	Varchar	30	Yes	No
UTMRecords	Record_ID (PK)	Unique identifier for each UTM record	Integer	10	No	No
	Patient_ID (FK)	Foreign key linking to the specific patient associated with the record	Varchar	30	No	No
	Doctor_ID (TK)	A technical key (TK) for the doctor associated with the record	Varchar	30	Yes	No
	LabResults	Field to store laboratory test results	Varchar	30	Yes	No
	ExamRecords	Field to store additional examination records or details	Varchar	30	Yes	No
Appointment	Doctor_ID (K)	Unique identifier for the doctor associated with the appointment	Integer	10	No	No
	Patient_ID (UKR)	Unique key reference for the patient associated with the appointment	Varchar	30	Yes	No
	Date	Date of the scheduled appointment	Varchar	30	Yes	No
	Time	Time of the scheduled appointment	Varchar	30	Yes	No
	Status	Indicates the current status of the appointment	varchar	30	Yes	No

Doctor	Doctor_ID (PK)	Unique identifier for each doctor	Integer	10	No	No
	Personalinfo	Field storing personal information about the doctor	Varchar	30	Yes	No
	Protocols	Field storing specific protocols or guidelines associated with the doctor's practice	varchar	30	yes	No

5. Summary

This document outlines the logical design of an E-Clinic system, focusing on data flow, entity relationships, and data specifications. The design aims to streamline patient care and improve treatment efficiency.

Key Design Components:

1. Data Flow Diagrams (DFDs):

- Level 0 DFD: Shows the main system processes and data flows, including appointment requests, patient information management, and medical consultations.
- Level 1 DFD: Provides further detail on specific processes, such as managing appointments and generating medical reports.

2. Entity-Relationship Diagram (ERD):

- Illustrates the relationships between key entities: Patients, Doctors, Medical Records, UTM Records, Appointments, etc.
- Shows how data is organized and connected within the system.

3. Data Dictionary:

- Defines the attributes, data types, and constraints for each entity.
- Ensures data consistency and accuracy throughout the system.

Key Business Rules:

- Patient information accuracy: Patients can update their personal information.

- Doctor access to data: Doctors can access relevant patient records for diagnosis and treatment.
- Efficient patient registration: The system facilitates quick and accurate patient registration and appointment scheduling.
- Comprehensive medical reports: Medical reports contain all necessary information for effective diagnosis.
- Flexible scheduling: Appointments can be adjusted by both doctors and patients for efficient care delivery.
- Automated notifications: Patients receive email notifications about appointments and diagnostic updates.

Benefits of the Design:

- Improved patient experience through easier information management and convenient communication.
- Streamlined workflow for doctors with faster access to accurate data and flexible scheduling tools.
- Enhanced treatment efficiency through automation and organized data processes.

Remaining Considerations:

- Data type discrepancies: Address the inconsistencies in Patient_ID data type across different entities.
- Relationship clarification: Explicitly define the relationships between entities (e.g., one-to-many, many-to-many) for better understanding.

Overall, this design provides a solid foundation for an E-Clinic system that prioritizes patient care and treatment efficiency. Addressing the remaining considerations will further refine the design and ensure optimal functionality.