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Software Requirement Analysis

Personalized Medical Records

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Personalized medical records

Functional Requirements:

1- **User Registration and Authentication**:

- Users should be able to create accounts and log in securely to access their medical records.
- Authentication methods like email verification and password encryption should be implemented for security.

2- **Medical Profile Creation:**

- Users should be able to create comprehensive medical profiles including personal details, medical history, and insurance information.

3-**Data Input and Management:**

- Users should be able to input various types of medical data such as prescriptions, medications taken, doctors visited, diagnostic reports (X-rays, CT scans, MRIs), blood pressure readings, hospital/clinic visits, and blood test results.

4-**Provide Tips and Warnings:**

- Health-Care Providers should be able to send tips and recommendation to patients to improve their health records
- The app should provide warnings and send alerts based on the user's health condition, medication interactions and abnormal health readings.

5- **Reminder and Notification System:**

- The app should have a reminder system for medication schedules, doctor appointments, and follow-ups.
- Users should receive notifications for upcoming appointments, prescription refills, and health check-ups.

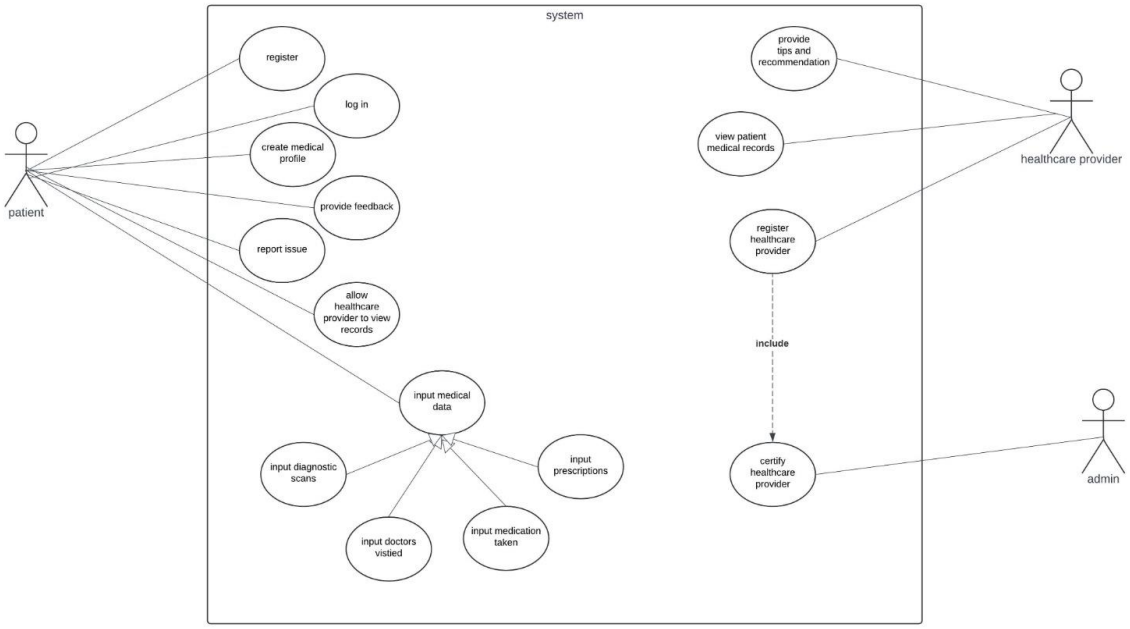
6- **Feedback and Support:**

- Users should have the option to provide feedback and report issues within the app.
- Customer support channels such as in-app chat or email should be available for assistance and inquiries.

Non-functional Requirements:

Requirement	Description
Performance	• The app should respond immediately to user interactions to ensure good user experience. • That can be accomplished by storing frequently accessed data for quicker retrieval **(Caching mechanism)**. • Response time for any common actions in the app should be 1 second
Robustness	• The app should be reliable and minimizes downtime by remain functioning under disturbances to ensure data integrity using back-up power supplies like UPS. • Exception handling: Handle unexpected errors to prevent system crashes. • Downtime of the system should not be more than 10 hours per year.
Usability	• The app should be smooth and easy to use for all the users of the system. • Create easy, user-friendly interfaces. • The number of steps to do any functionality in the app should not exceed 3 steps.
Scalability	• The app should be able to support the growing number of users, but at the same time maintain the app performance. • Adding more servers to handle the increasing load. • The app should be able to handle 500,000 users in parallel.
Compatibility	• The app should be compatible with multiple operating systems and devices, like mobile phones, PCs, tablets, web browsers. This will also improve the app usability and accessibility. • Using open-source libraries and Frameworks. • The app will be tested on all the platforms: iOS, macOS, Android, Windows, to ensure the performance and functionalities consistency.
Data recovery	• The app should do data backups regularly to be able to recover the data to prevent data loss. • Replicate data to a second server for faster recovery. • The app should do daily backups with a recovery point objective (RPO) of less than 24 hours.

Use Case Model



User Stories:

1- As a patient I want to create a medical profile on the medical records system so that I can be able to add my personal details , medical history and access all the system functionalities.

Acceptance Criteria :

• I want to be able to access and modify my medical profile at any time

• System allows me to upload any medical documents

• My personal and medical information should be securely stored.

2- As a patient, I want to input different types of medical data so that I can keep track of my health history and manage my healthcare more effectively.

Acceptance Criteria:

- I can enter medical data such as prescriptions, medications, doctor visits, diagnostic reports, blood pressure readings, hospital visits, and blood test results.
- I can provide details such as date, time, and notes for each entry.
- The system securely stores the data for future reference.
- I can easily access and review my medical data whenever I want.

3-As a health care provider want to be able to be sent daily reports and tips about my medical health records so that I can be able to improve their health condition and monitor medical changes

Acceptance Criteria :

- I can access medical records for patients.
- I can upload reports and tips
- I edit patients' medical records.

4-As a user, I want to be able to securely create an account and log in to access my medical records, so that I can maintain the privacy and security of my personal health information

Acceptance Criteria:

- Users can securely create accounts by providing email addresses and strong passwords.
- Email verification is required for account activation.
- Passwords are encrypted to ensure security.
- Users receive email verification links to confirm their email addresses.
- After successful registration, users can log in using their email and password.
- A secure password reset process is available in case of forgotten passwords.
- Upon logging in, users can access their personalized medical records dashboard to manage their health information securely.

5-As a user, I want to have the ability to provide feedback, report issues, and seek assistance within the app, so that I can easily communicate my concerns and receive support when needed.

Acceptance Criteria:

- The app includes a dedicated section for users to provide feedback and report issues.
- Accessing the feedback and issue reporting feature is straightforward from the app's main menu or settings.
- Users can easily submit feedback or report issues with an intuitive interface, including options to attach relevant information.
- Upon submission, users receive confirmation messages acknowledging their feedback or issue reports.

6-As a health care provider want to be able to be set medication reminders for patients so that I can be able to improve their health condition and monitor medical changes

Acceptance Criteria :

- I can access medical records for patients.
- I can set reminders for patients' medications
- I edit patients' medical records.

Use Case Tables:

Table 1:

Use Case Name:	Report Issue
Actors:	Patient
Purpose:	The patient reports an issue that he encountered in the system
Overview:	A patient requests the report an issue and then chooses the issue type (Technical, Usability, etc.). When submitted, the system sends the report to the system admins.
Type:	Essential
Pre-conditions:	The patient should be registered in the system
Post-conditions:	The issue report is sent to a system admin.
Special requirements:	The admins must receive the issue report within 1 minute.
flow of events	
ACTOR ACTION	**SYSTEM RESPONSE**
1. The patient chooses the Report Issue tab	2. The system outputs a pop-up screen for the user to write in.
	3. Provides a drop-down list for the user to choose the issue.
4. Chooses the issue type and writes an extra description if necessary.	
5. The patient submits the report.	6. The system saves the report and sends it to the admin responsible for user reports.
Alternate flow of events	
Step 4: If the user's issue is not in the drop-down list, the system provides a text field for the user to write his own issue.	

Table 2:

Use Case Name:	Register
Actors:	Patient
Purpose:	To allow patients to create an account in the app to access and manage their medical records.
Overview:	This use case describes the process by which a patient register for a new account on the Personalized Medical Records app.
Type:	Essential
Pre-conditions:	None
Post-conditions:	User has registered an account in the app
Special requirments:	None

flow of events	
ACTOR ACTION	**SYSTEM RESPONSE**
1. Patient opens the Personalized Medical Records app.	
2. Patient selects the "Register" option.	
	3. System presents the registration form, prompting the patient to enter required information.
4. Patient fills out the registration form with personal details (e.g., name, email, date of birth).	
5.Patient creates a username and password for their account.	
6. Patient submits the registration form.	
	7.System validates the information provided by the patient.
	8. System creates a new account for the patient.
	9. System notifies the patient that the registration was successful and prompts them to log in.

Alternate flow of events

Line 7: a. If the email provided by the patient is already associated with an existing account. Return to step 3

b. If the chosen username is already taken. return to step 3

c. If any required information is missing or invalid. Return to step 3

Line 8: a. If there is an error during account creation (e.g., database failure). Return to step 3

Table 3:

Use Case Name:	Medical Profile Creation
Actors:	Patient
Purpose:	Create a medical profile on the medical records system.
Overview:	Allows patients to add personal details, medical history, and access system functionalities.
Type:	Functional
Pre-conditions:	User must log in.
Post-conditions:	Medical profile is created and can be accessed at any time.
Special requirements:	Data must be securely stored.
flow of events	
ACTOR ACTION	**SYSTEM RESPONSE**
1. User logs in to the system	
	2. Displays the dashboard.
3. User selects "Create Medical Profile"	
	4. Displays the medical profile creation form
5.User enters personal and medical information	
	6. Allows user to upload medical documents and save the profile.
Alternate flow of events	
1. User decides to cancel profile creation	
	2. The system cancels the profile creation process and returns the user to the dashboard without saving any changes

Table 4 :

Use Case Name:	**Provide Tips and Warnings**
Actors:	Patient, Health-Care Providers
Purpose:	Provide User with feedback , tips and warnings
Overview:	This use case enables health-Care Providers to send tips and recommendation to patients to improve their health records and provide warnings and send alerts based on the user's health condition, medication interactions and abnormal health readings.
Type:	essential
Pre-conditions:	The patient must have an active medical account with medical records.
Post-conditions:	User receives relevant health tips that could potentially improve their health records
Special requirements:	

flow of events	
ACTOR ACTION	**SYSTEM RESPONSE**
1.Health-Care Providers request access for patient's medical records	
	2.System provides access for patient's medical records
3.Health-Care Providers analyses data	
5.Generate Report and medical tips and set medication reminders	
	5.The system sends report and tips to the patient.
Alternate flow of events	

Table 5:

Use Case Name:	Input Medical Data
Actors:	Patient
Purpose:	To allow users to input various types of medical data into the application
Overview:	This use case enables users to add different types of medical information such as prescriptions, medications taken, doctors visited, diagnostic reports (X-rays, CT scans, MRIs), blood pressure readings, hospital/clinic visits, and blood test results into the app.
Type:	essential
Pre-conditions:	The user must be logged into the application.
Post-conditions:	The entered medical data is saved and associated with the user's profile
Special requirements:	Data input forms must be intuitive and easy to use.

flow of events	
ACTOR ACTION	**SYSTEM RESPONSE**
1.User selects the option to input medical data.	
	2.System prompts the user to choose the type of medical data they want to input
3.User fills in the required information in the input form	
	4.System validates the entered data for completeness and correctness
5.User submits the input form	
	6.System saves the entered medical data and confirms successful submission
7.User exits the input medical data feature	
	8.System returns the user to the main menu or the previous screen

Alternate flow of events
If the user cancels the input process at any step: The system cancels the input operation and returns the user to the main menu or the previous screen without saving any entered data.

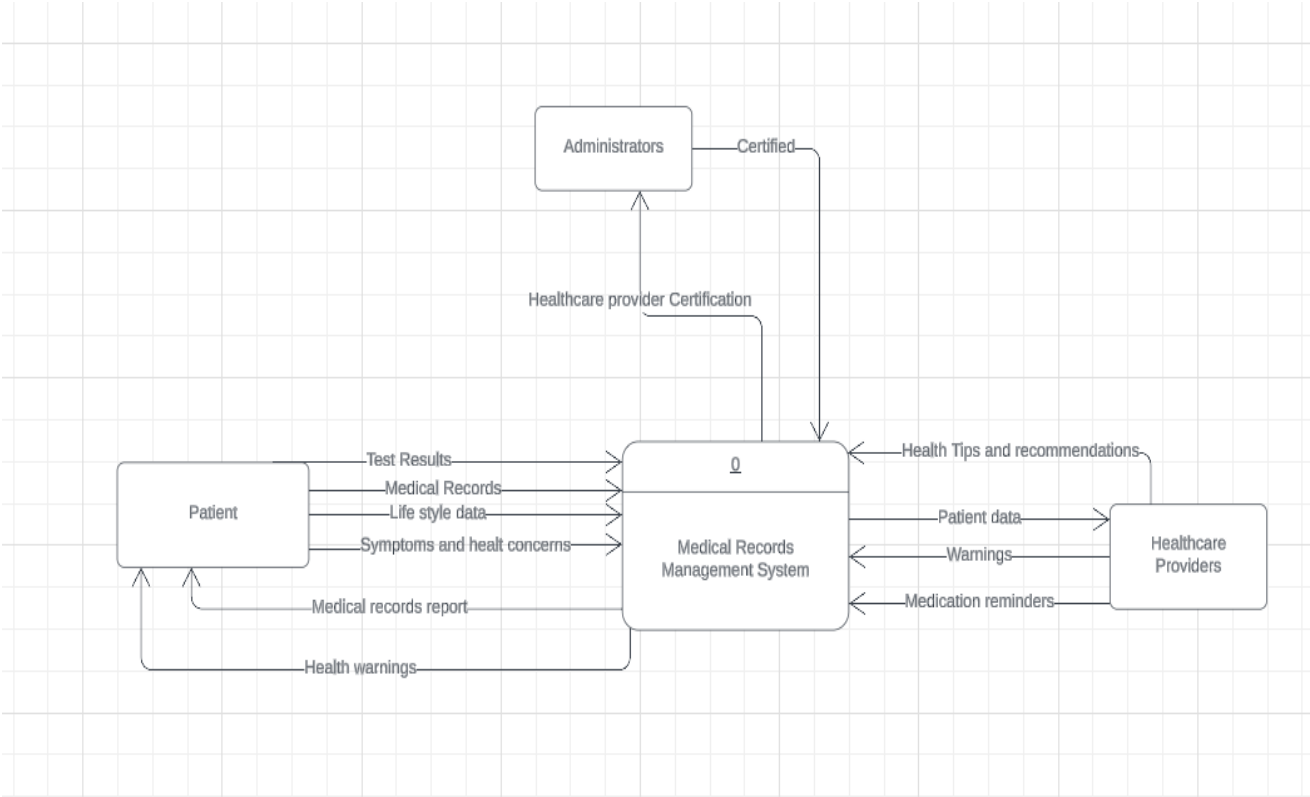
Table 6:

Use Case Name:	Provide feedback
Actors:	User
Purpose:	To allow users to communicate concerns and receive support
Overview:	Users can provide feedback and seek assistance within the app to communicate their concerns and receive support when needed
Type:	Primary
Pre-conditions:	User must have access to the app
Post-conditions:	Feedback or issue report is submitted; Assistance is provided if requested
Special requirments:	None

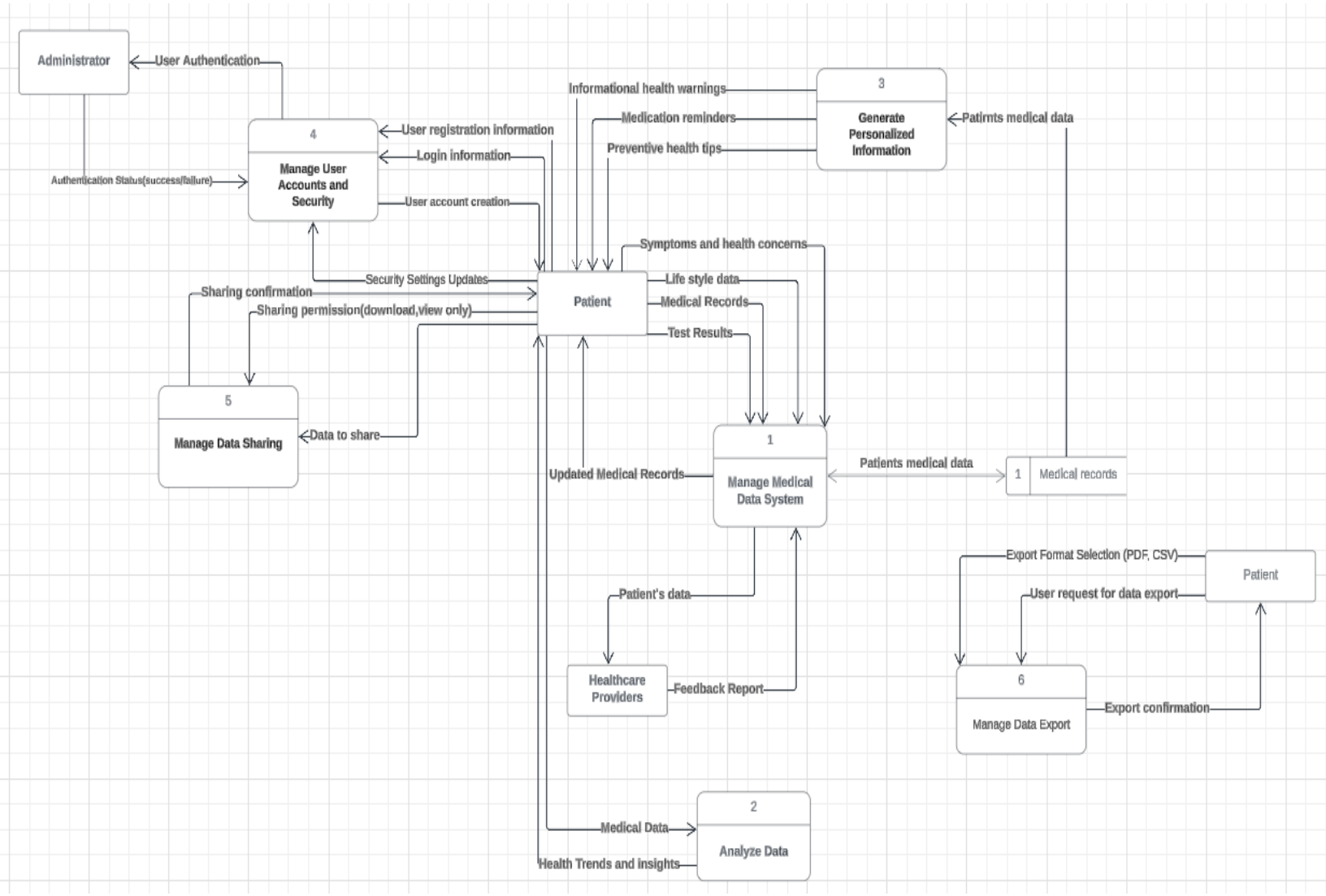
flow of events	
ACTOR ACTION	**SYSTEM RESPONSE**
1- User selects “provide feedback” from the menu	
2- User writes their feedback.	
3- User selects "Seek Assistance"	
	4- The system displays all the assistance method of the support team
5- User chooses the most suitable method.	
6- User contacts the support team.	

Alternate flow of events
1-If the user cancels the feedback/assistance request the system redirects to the home page. 2-If the user encounters an error while submitting feedback the system redirects to the home page. 3-Support team is unavailable, system prompts the user to enter the details of the issue, then the system sends it to the support team to contact the user when available.

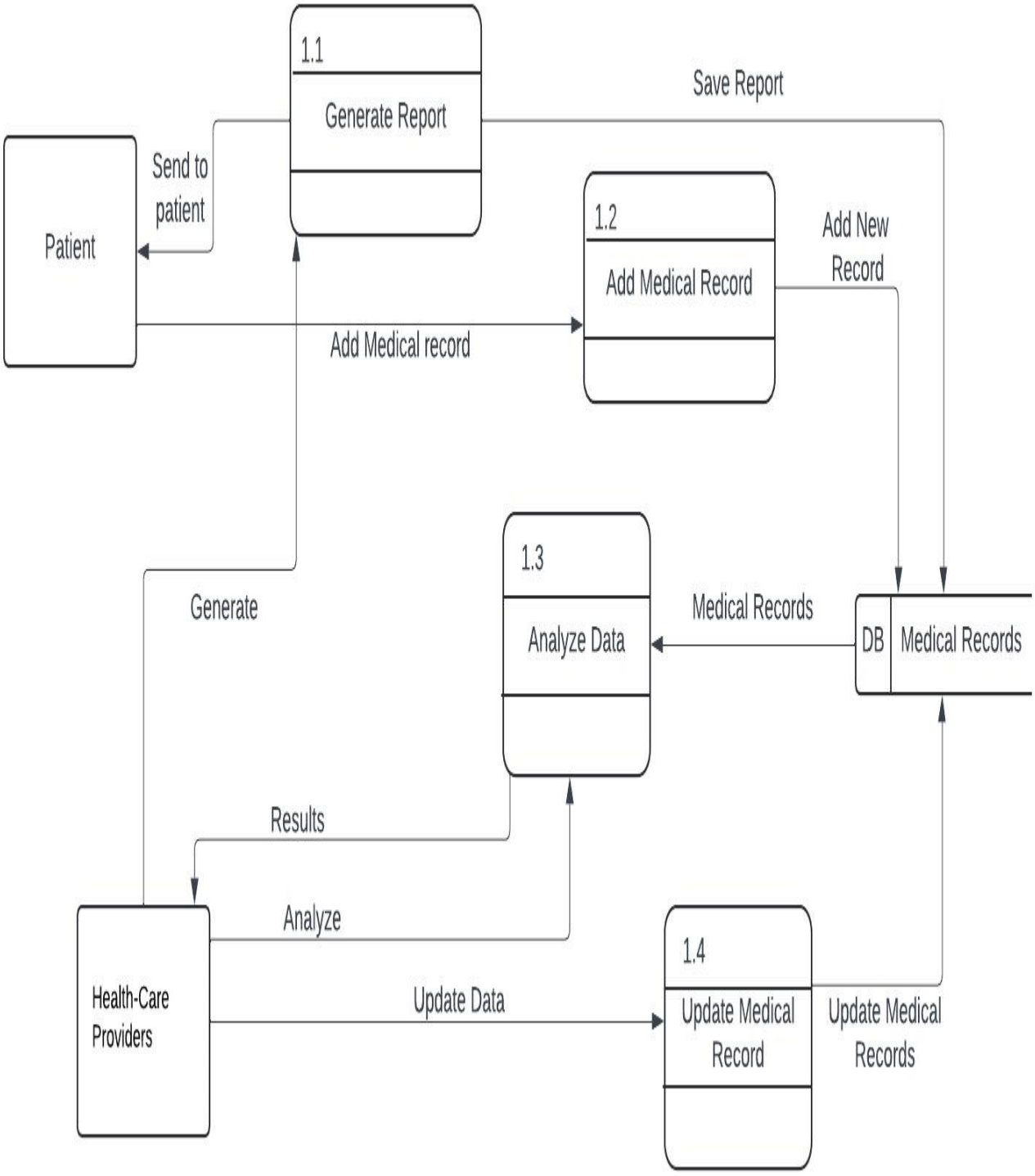
DFD Level-0 (Context diagram):

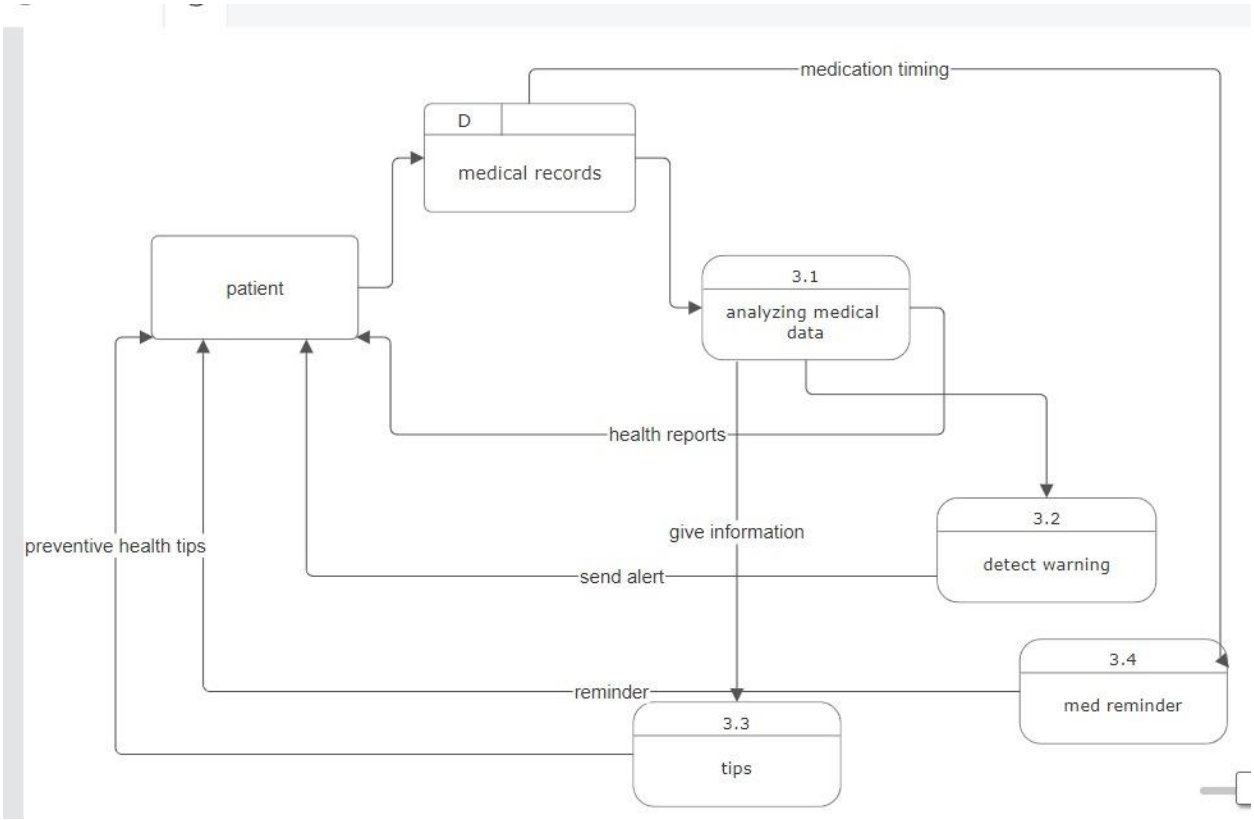


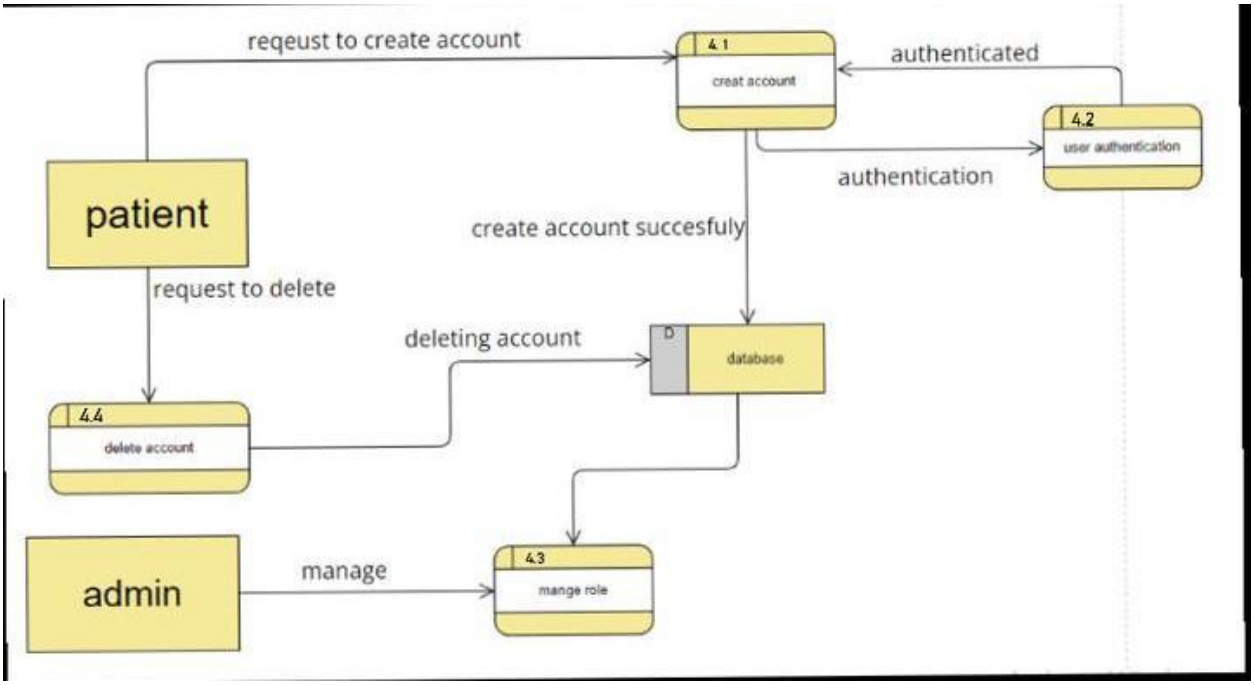
DFD Level-1:


Administrator
User Authentication
Authentication Status(success/failure)
4
Manage User Accounts and Security
User registration information
Login information
User account creation
Informational health warnings
Medication reminders
Preventive health tips
3
Generate Personalized Information
Patirnts medical data
Symptoms and health concerns
Security Settings Updates
Sharing confirmation
Sharing permission(download,view only)
Patient
Life style data
Medical Records
Test Results
5
Manage Data Sharing
Data to share
1
Manage Medical Data System
Updated Medical Records
Patients medical data
1
Medical records
Export Format Selection (PDF, CSV)
Patient
User request for data export
Patient's data
Healthcare Providers
Feedback Report
6
Manage Data Export
Export confirmation
2
Analyze Data
Medical Data
Health Trends and insights

DFD Level-2:


1.1
Generate Report
Save Report
Send to patient
Patient
1.2
Add Medical Record
Add New Record
Add Medical record
1.3
Analyze Data
Medical Records
DB
Medical Records
Generate
Results
Analyze
Health-Care Providers
1.4
Update Medical Record
Update Data
Update Medical Records


medication timing
D
medical records
patient
3.1
analyzing medical data
health reports
give information
3.2
detect warning
preventive health tips
send alert
3.4
med reminder
reminder
3.3
tips


reqeust to create account
4.1
creat account
authenticated
4.2
user authentication
authentication
patient
create account succesfuly
request to delete
deleting account
D
database
4.4
delete account
admin
manage
4.3
mange role

Name	Task
Husam Abozide	* Non-functional requirements * Use-case table ‘1’ * DFD level-0 (Context diagram) * DFD level-1 * Part of Use-case model * Document review
Amr Mostafa	* Functional requirements * Use-case table ’6’ * User story ‘3’ * DFD level-2 (1) * Document review and edit
Nadeen Nasser	* Use-case model * Use-case table ‘2’ * Document review and editing * User story ‘5’
Fady Milad	* Use-case table ‘3’ * User story ‘2’ * DFD level-2 (3) * Document review and edit
Mohammad Sobhy	* Use-case table ‘4’ * User story ‘4’ * DFD level-2 (3)
Youssef Mahmoud	* Use-case table ‘5’ * User story ‘1’ * DFD level-2 (2) * Document review and edit