Umm Al-Qura University
Faculty of Engineering and Computer Science

Software Documentation Project

Course code 1401003123

Sehaty App

Saudi Ministry of Companions

Team A

Abdeyah alamri 44007594
Rola alnashri 4412063

Supervisor:T.Mona Al-Aoufi

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0.1 Introduction

The ”My Health” app is a platform aimed at promoting public health and health awareness among individuals

0.1.1 Goals of the My Health App

• Providing Reliable Health Information: The app aims to deliver accurate information about health and disease prevention • Enhancing Health Awareness: By spreading awareness about healthy habits and the importance of regular check-ups • Facilitating Access to Health Services: By providing a centralized platform for accessing health information and services.

0.1.2 Problems the App Solves

• Lack of Health Information: It helps bridge the gap in available information about diseases and treatments • Difficulty in Accessing Health Services: It simplifies communication with healthcare providers and scheduling appointments. • Disorganization of Health Data: It offers a way to track personal health records, such as vaccinations and tests

0.1.3 Needs Addressed by the App

• Tracking Health Status: It allows users to monitor their health regularly • Access to Medical Consultations: It provides the option to consult doctors remotely. • Promoting a Healthy Lifestyle: It offers tips and guidance for improving lifestyle, such as nutrition and exercise

0.1.4 Here is a questionnaire to evaluate the My Health App

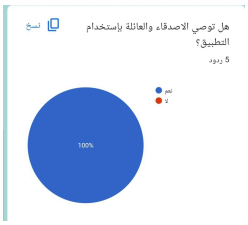

Figure 1: User opinion on using the Sehaty app

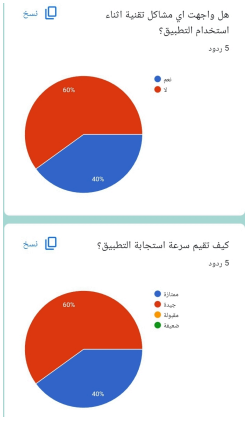

Figure 2: This image shows the measurement of your technical experience while using the Seha app.

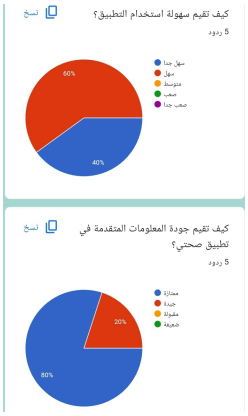

Figure 3: This image shows how easy it is to use the app.

0.1.5 Steps to use the application

• Download
• Open the Application
• Choose the Application language
• Enter ID and Password
• Verification code will be sent to you
• Enter the code in the app
• In case you forget your password
• Recover Password
• ID Number and Date of Birth
• A verification code will be sent to you
• New Password
• Confirm Password
• Start using the Application

0.1.6 Comparison between the ”my health” app and the ”amanah”app and ”My Chart”app

Table 1: A table showing the advantages and disadvantages of the My Chart application

Advantages	Disadvantages
Globally Available: Works with various hospitals and clinics using the ”Epic” health system, making it suitable for use in multiple countries.	Works Only with Specific Institutions: It can only be used with hospitals and clinics that rely on the ”Epic” system, making it unavailable to everyone.
Full Access to Medical Records: Provides access to the user’s complete medical records, including doctor notes, medication history, and past test results.	Geographical Limitations: Some features may be restricted in certain regions and can only be used in institutions that support it.
Direct Communication with Doctors: Offers the ability to message doctors directly and request telehealth consultations (when available).	Complexity in Account Setup: Some users may find it challenging to set up their account and link it to the correct hospitals or clinics, especially when switching between institutions.
Synchronization with Health Devices: Integrates with various health devices and other apps such as Apple Health and Google Fit to compile health data.	Privacy Concerns: Due to the sensitive nature of the medical information handled by the app, security and privacy are major concerns.

Sehhaty is designed for residents in Saudi Arabia, connecting users with government health services like appointment booking, COVID-19 testing, and vaccination records, with full Arabic support and integration with local government systems. MyChart is a global app, providing access to medical records and direct communication with doctors in supported hospitals, with features like family management and health monitoring through other devices and apps.

Table 2: A table showing the advantages and disadvantages of the Amanah application

Advantages	Disadvantages
Health Alerts: Focuses on monitoring health conditions and alerting users about high-risk areas for infectious diseases like COVID-19.	Limited Functionality: Mainly focused on tracking and alerts, without offering services like appointment booking or medical record viewing.
Preventive Notifications and Guidelines: Sends periodic alerts on preventive measures, areas to avoid, and health safety tips.	Lack of Integration with Health Systems: Does not integrate with hospitals or health centers, making it less comprehensive compared to ”Sehhaty.”
Providing Health Information: Offers access to the latest pandemic developments and official data from health authorities.	No Support for Health Account Management: Does not provide medical record display or general health monitoring for users.
Simple Interface: Features a straightforward user interface for tracking users’ health status.	Lack of Updates and Information: Some information may not be continuously updated, which can affect the accuracy of guidance and alerts.

The Sehaty app provides comprehensive information about overall health, including blood pressure and sugar measurements, while Amana focuses on chronic diseases. Additionally, Sehaty includes a feature for tracking vaccination schedules, which may not be available in Amana.

0.2 Analysis

0.2.1 Main functions

• Log in and manage the account: Create a new account: An easy .interface to create a new account using email or phone number .Log in: The ability to log in to existing accounts using credentials - Update personal information: An interface to update personal information such as name, .date of birth, and address .Recover password: The option to password in case you forget it via email or text messages Do you want to know the appointments: - Search for doctors or medical researchers • ability to search for variables and health centers to request on the site and specialty: Choose the appropriate time: An interface to easily book an appointment with a display of - .available times Receive notifications: Send notifications to confirm the reservation and reminders of - .upcoming appointments View medical login: - Access to a medical record: The ability to access a medical record • including medical reports: Medical history follow-up: Follow-up of health follow-up and personal medical history - Medication management: - Recording medication information: An interface for entering • information about prescribed medications: including doses and timing Setting reminders: Setting reminders to take medications at specified times and adhere to - .treatment The possibility of not registering the possibility of recording medications and notifications - .about medications and notifications about celebrities of expiration of medications

0.2.2 Functional requirements

• Log in: The possibility of creating a new account .Log in using data or phone number- Health data management: The possibility of providing and updating personal health • information such as: Medical history- Medications taken - Previous and subsequent appointments Do you want an appointment: - The possibility of doing so with variables and health • centers: Choosing the appropriate health center and the supervising doctor of the specialty and the - .available time • Health status follow-up: Health follow-up tools such as: - Blood pressure - Weight - Sugar level - Any other relevant health quality • Appointment and Medication Reminder: Reminder of upcoming medical appointments

0.2.3 Non-functional requirements

• Security: Protection of personal and health data: - Use .strong encryption (such as AES-256) to protect stored and transmitted data Apply HTTPS protocols and secure communication between the user and the server - Identity verification number: - Complete two-factor authentication (2FA) to enhance the - .security of access to invoices Use security questions or temporary writing as part of the verification • Reliability: Application availability: - The application must be available at 99.9Develop a response strategy for responding to failures - Real response reaction: - Provide a real response copy of the non-response information - .Backup storage in different geographical locations for the loss manager • Technical Support: Technical support on the watch: - Providing technical support on the .3.watch through multiple channels (phone, chat, email) Creating a comprehensive knowledge base containing articles and answers to frequently - .asked questions • Periodic updates: Implementing periodic updates that are final and always performing - Notifying users of new updates and explaining features in addition to • Explanation: Working in non-current network requirements: - Designing the application .4 .to be personally based on working in network specifications or not present Using caching techniques

(caching) Main reliance on the computer and the Internet - Dealing with power outage service: - Providing user interfaces free of users by continuing to use the application even when offline Completing data recording to automatically synchronize data when the connection is - Restored

0.3 Design

0.3.1 System Architecture

1. Main layers: A. Front-End Layer:This layer of the Indian language, deals with user interaction, and includes:User Interface (UI):Application design, buttons, and forms. Language support (Arabic and English) to achieve a smooth user experience. Using technologies such as *React Native* or *Flutter* (if the applications are multi-platform). User interaction:Receiving user requests (booking an appointment, displaying a registration, etc.). Verifying the inputs sent to the back-end layer.B. Service (Service Layer):* This German language is a cosette dish between the front-end and the back-end, in addition to: API Gateway: A central point for receiving all requests from the interface.alidating requests before sending them to the Latin language. Authentication and validation management. Business Logic Services: Units for serving different customers, such as requesting appointments, displaying medical records, and issuing reports. Managing communication with databases and services such as the ”Nafath” system Back-End Layer:This Canadian layer is about the logical implementation of comprehensive data operations, background: Application Discovery (Application Servers): Want to make requests from API Gateway. Implementing business logic (Business Logic) and generating effective responses. Using technologies such as *Node.js, **Java Spring Boot, or NET Database (Database Layer):* - Data management system for user data, medical records, appointments, and settings. Using relational databases such as PostgreSQL or MySQL Supporting non-relational data requirements such as MongoDB to record large medical records or unstructured data.Identity and Authentication Management System (Identity and Access Management):A system dedicated to user innovation and authentication, such as using OAuth2 and OpenID. ntegration with the ”Nafath” system to ensure secure login and two-factor authentication.D. Integration (Integration Layer): This advanced layer for application integration with external systems: ntegration with other government applications:inking with systems such as ”Tawakkalna” and ”Mawid” to share information and unify registration.Such as integration with the Ministry of Health system:Exchange data with the Ministry of Health systems (medical records and health centers) to obtain medical records, results, and reports.Integration with payment systems: Support for electronic payment systems (if there is a connection to some such as different types).E. Security (Security Layer):Encryption: Using SSL/TLS protocols to secure data transfer between components. Reading sensitive data in the database.Firewall: Monitoring a site from cyber attacks and hacking attempts.Application Detection System (IDS) and Management:Inactive monitoring and alerting any other users. 2. Flow (Data Flow):1.The user sends a request from the front-end:The user, for example, books an appointment or requests to view a medical report. 2.The request passes through the API gateway:His request for a specific service (such as the appointment request service) is verified. 3.The request is processed in the services (service layer): The central processing unit (such as the appointment request unit) checks the availability of appointments and prepares the appropriate response. 4.Interaction with databases or systems (Integration Layer):If external requests are needed to obtain data from the Ministry of Health or the database, queries are sent to search for profit. 5.Send result to front-end:* - After the request, the response is sent to the user via the front-end, such as getting clear content or displaying the request.3. Constraints used:Front End:React Native, Flutter, or Angular with HTML/CSS. API

management:Express.js or Spring Boot with RESTful APIs. Database:MySQL or PostgreSQL, with MongoDB support if unstructured data is needed.Authentication:OAuth2, OpenID, integration with Nafath platform.Cloud services (if supported):AWS, Azure, or Google Cloud for data control. 4. Additional features:Performance system (monitoring system):Monitor application performance through tools such as Prometheus or Grafana. Logging System:Logging all transactions through tools such as ELK Stack to analyze and identify needs.

0.3.2 Technical specifications

1.Main components of the system: A. Front-End: -Languages used: -HTML/CSS/JavaScript:To design web pages if there is a web version of the application. -React Native or Flutter: To develop mobile applications (iOS and Android). -TypeScript:To add powerful features in building and organizing code. -Technical specifications: -User interface that supports *Arabic and English -Responsive Design* to ensure compatibility with different screen sizes. -Use GraphQL or RESTful APIs to interact with back-end services. -Libraries and frameworks:* -Redux to manage state (State Management) in React Native. -Material UI or Ant Design to design visual components. -Localization Libraries to support changing the language in the application easily. B. Back-End: -Languages and Frameworks Used: -Node.js (Express Framework) or Spring Boot (if Java is the preferred choice). -NET Core if the system is based on Microsoft technologies. -Servers: -Nginx or Apache to manage and route user requests. -Load Balancers to distribute the load across multiple servers and ensure high availability. -Database: -PostgreSQL or MySQLas a relational database. -MongoDB to store medical records and unstructured data. -Database Technologies: -Entity Framework or Hibernate to manage database connectivity. -ACID Transactions suport for sensitive operations. -Database Sharding Replication* to increase data availability and performance. -dentity Management: -OAuth 2.0 and OpenID Connect to manage credentials and authenticate users. -Integration with Nafath platform to provide secure login. -Session Management using JWT (JSON Web Tokens) D.Security: -Encryption: -Encrypt communications using TLS/SSL (Transport Layer Security). -AES-256 to encrypt sensitive data in the database. -Access Control: -Use RBAC (Role-Based Access Control) to manage privileges. -Support MFA (Multi-Factor Authentication)to secure sensitive accounts. -Protection from attacks: -Firewall to protect servers from external attacks. -DDoS Protection using tools such as AWS Shield. -Web Application Firewall (WAF)to filter malicious requests H.Integration Services: -Integration with government systems: -Integration with Absher and Nafath to verify users' identity. -Integration with Ministry of Health to retrieve medical records and update patient status. -Linking with Tawakkalna and Mawid applications to share health information. -Integration with hospital systems: -Using HL7 (Health Level Seven)and FHIR (Fast Healthcare Interoperability Resources)to exchange health information in a unified manner. -Linking with Hospital Management Systems (HIS)to access medical data and reports. -Notification Systems: -Use Firebase Cloud Messaging (FCM) or Apple Push Notification Service (APNS)to send instant notifications to users. -Support SMS using services such as Twilio. Data Management: -Backup Management: -Create daily backups of databases using AWS RDS Backups. -Disaster Recovery to ensure the ability to recover data in an emergency. -Data Analytics: -Use tools such as Google BigQuery or AWS Redshift to analyze health data and generate reports. -Log Management: -Collect logs using tools such as ELK Stack (Elasticsearch, Logstash, Kibana) or plunk. -Monitor security events using SIEM (Security Information and Event Management). Performance Monitoring Services: -Performance Monitoring Tools: -Use Prometheus and Grafana to monitor server performance. -Use New Relic or Datadog to monitor system health and identify issues. -Error Handling: -Use tools like Sentry or Airbrake to track

and report errors. -System Testing: -load Testing using tools like *Apache JMeter*. -security Testing using OWASP ZAP.

0.3.3 Activity Diagram

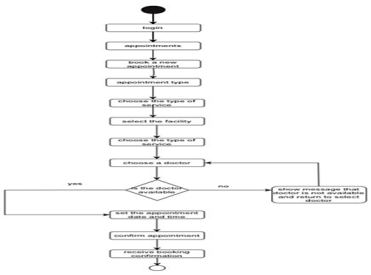

Figure 4: Activi Daycram to book an appointment from the Sehaty app

The Activity Diagram planning for booking an appointment from the Sehaty app includes the following steps: Log in to the app Appointments Book a new appointment Type of appointment you want to book Choose the type of service you want Choose the facility that suits you or the closest to you Choose the doctor you want If the doctor is not available, it will give me a message stating that the doctor is not available and to return to choosing another doctor If the doctor is available, it will open an interface for me to specify the date and time of the appointment Confirm the appointment I will receive a confirmation message for the booking The last thing is to exit the app

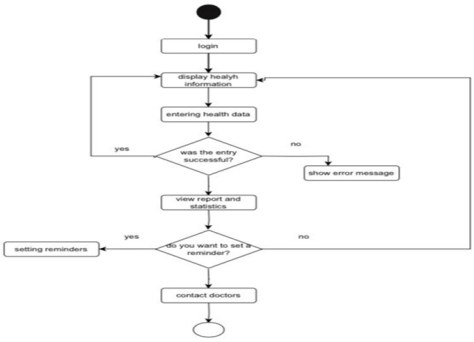

Figure 5: User opinion on using the Seha app

Activity Diagram for the Sehaty application may include the following steps: Log in to the application View health information Enter health data such as weight, blood pressure, etc. Condition: If the entered data is correct or not, if it is correct, it returns to displaying health information If it is not, it displays an error message View reports and statistics A message appears asking if you want to set reminders such as taking medication, if yes, it opens the report preparation interface If no, it returns to displaying health information Communicate with doctors or health advisors Exit the application or end the session

0.3.4 Interfaces used

1. Login / Registration Interface -Function: Enables users to create a new account or log in to their accounts. -Links: -New Registration: Leads to the user information entry interface. -Forgot Password: Links the user to the password recovery process. 2.Profile Interface -Function: View and update user information. -Links: -Update Data: A button to edit personal information. -Add Health Information: Leads to the medical history entry interface. 3. Health Services Interface -Function: Displays services such as booking appointments and consultations. -Links: -Book an Appointment: Directs the user to a list of available doctors. -Medical Consultation: Leads to a chat or video call interface. 4.Health Tracking Interface -Function: Tracks health indicators such as weight and blood pressure. -Links: -Add New Data: Opens an interface to enter new measurements. -View Charts: Directs the user to charts to track data. 5.Educational Content Interface -Function: Provides health information from articles and videos. - Links: -Specific Article or Video: Leads to a detailed interface for the content. -Share Content: A button to share information via social media 6.Support and Communication Interface -Function: Provides means of communication with the support team. -Links: -Live Chat: Opens a conversation interface with a support representative. -Discussion Forums: Directs the user to a discussion platform with other users. 7.Evaluation and Reviews Interface -Function: Enables users to evaluate services and doctors. -Links: -Add Rating: Opens an interface to submit a new rating. -View Ratings: Directs the user to a list of previous ratings. 8.Settings Interface -Function: Manages app settings and privacy. -Links: -Change Password: Opens an interface to update the password. -Privacy Settings: Allows the user to control their information. Interaction between Interfaces These interfaces interact seamlessly, as the user can move between different interfaces via buttons and links, making it easier to access the information and services they need. Alerts and notifications can also be used to guide users to new content or services based on their previous interactions

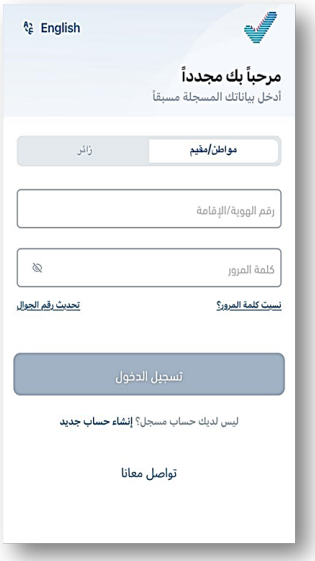

Figure 6: Login interface

Figure 7: Profile interface

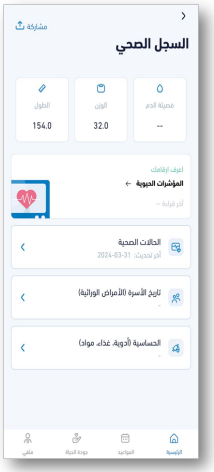

Figure 8: Health record interface

0.4 The conclusion

The ”Sehhaty” application is a comprehensive digital platform for health systems for users by providing a variety of health services easily and quickly. The application allows users to access medical records, what are the appointments, remote medical consultations, and access to laboratory results, resulting in a personalized healthcare experience and saving time and effort. In addition to this application, it has become among the people who reach effective communication between healthy people, which contributes to improving the quality of life and the general advancement

0.5 The References

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