

# HealthMap

System For Identifying Clinic Paths Within the Hospital Using NFC Technology.

Supervised by: Dr. Maraim Alnefaie

Graduation Project 2 (5O2598-3)

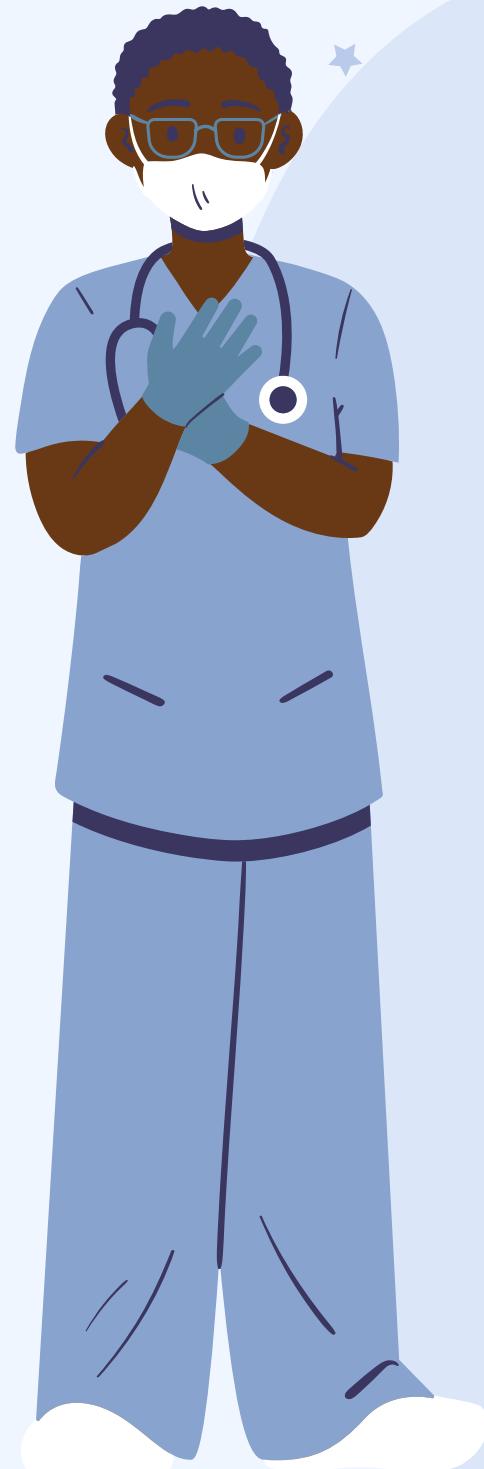
Information Technology Department

Taif University

Fall 2025



# Presented by:

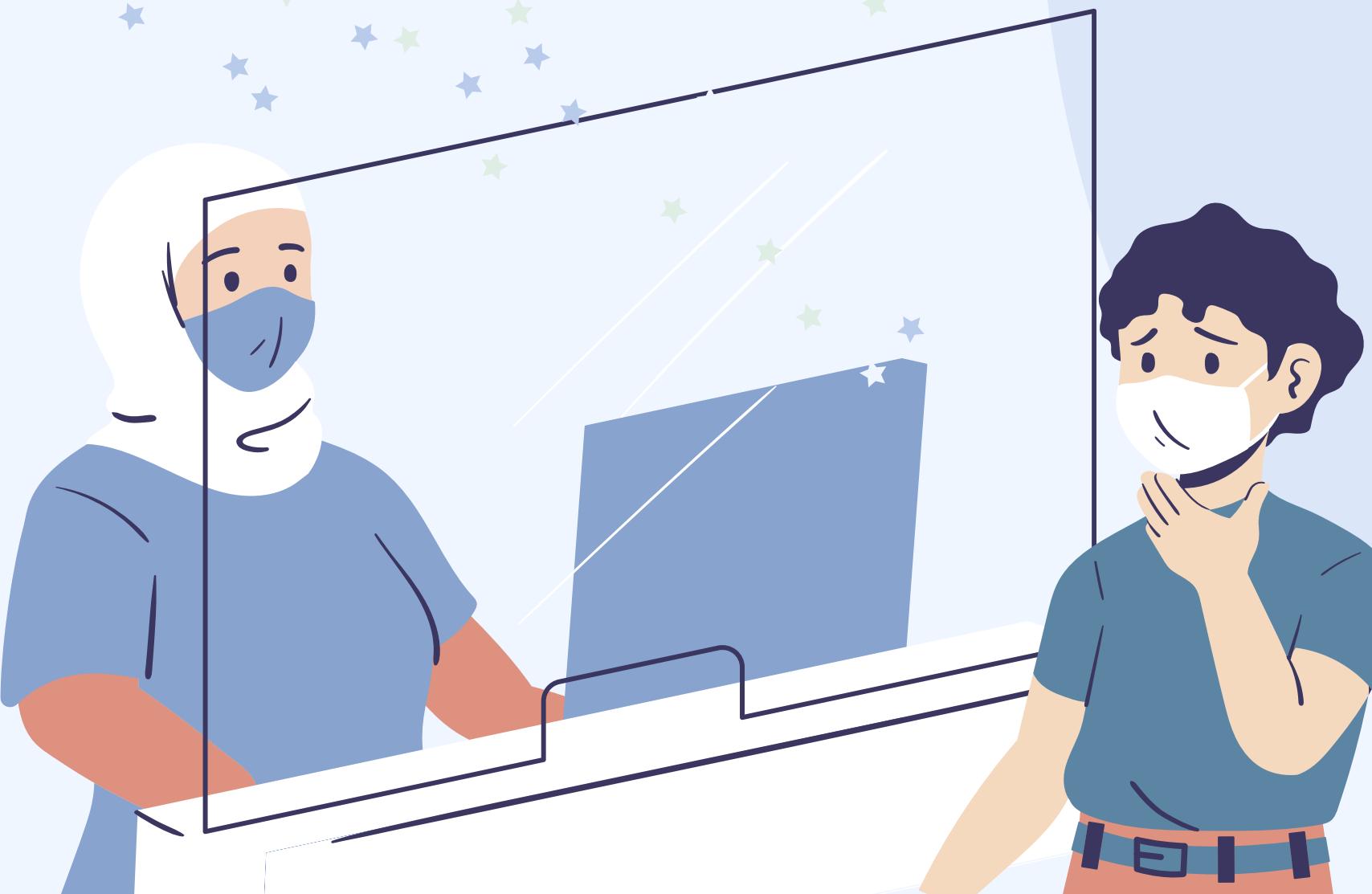


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# Outlines:

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- Problem Statement
- Objective
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# 01.

# Introduction





## The HealthMap project aims

to develop a smart indoor navigation application to address challenges in guiding patients to clinics within large hospitals using NFC technology. This application improves patient experience and operational efficiency by providing real-time, accurate directions to various hospital departments. With its user-friendly interface

HealthMap simplifies the hospital navigation process, reducing confusion and stress for patients. Additionally, it integrates features like appointment scheduling and real-time location tracking, ensuring both patients and healthcare staff can navigate efficiently within the facility.



The use of NFC technology ensures precise and seamless navigation, further enhancing the overall hospital experience.

# 02.

## Problem Statement



# Key Points:

**01**

- Large hospitals often present challenges in guiding patients to various clinics and departments.

**03**

- HealthMap seeks to simplify hospital navigation, reducing stress and enhancing the patient journey.

**02**

- This can lead to wasted time, increased confusion, and a negative impact on patient satisfaction.



# 03. Objectives



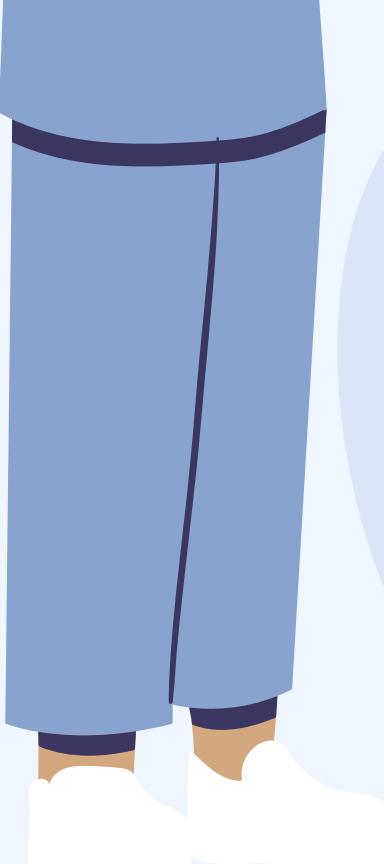
# Project Objectives



Improve patient experience with accurate indoor navigation.



Utilize NFC and barcode scanning for easy access to information.



Enhance hospital operational efficiency.



Support healthcare staff with real-time patient tracking.

# 04. Scope



# Scope



Patient



Hospital



Doctor

# 05. Questionnaire Result



# Questionnaire Result

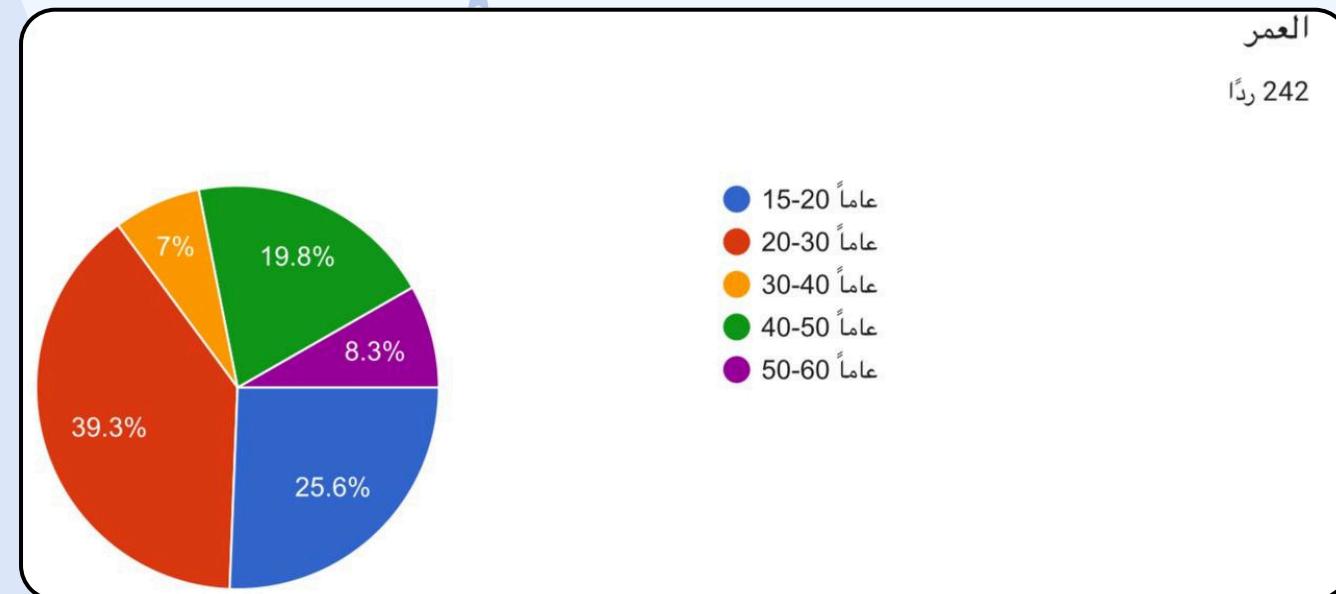


Figure 1

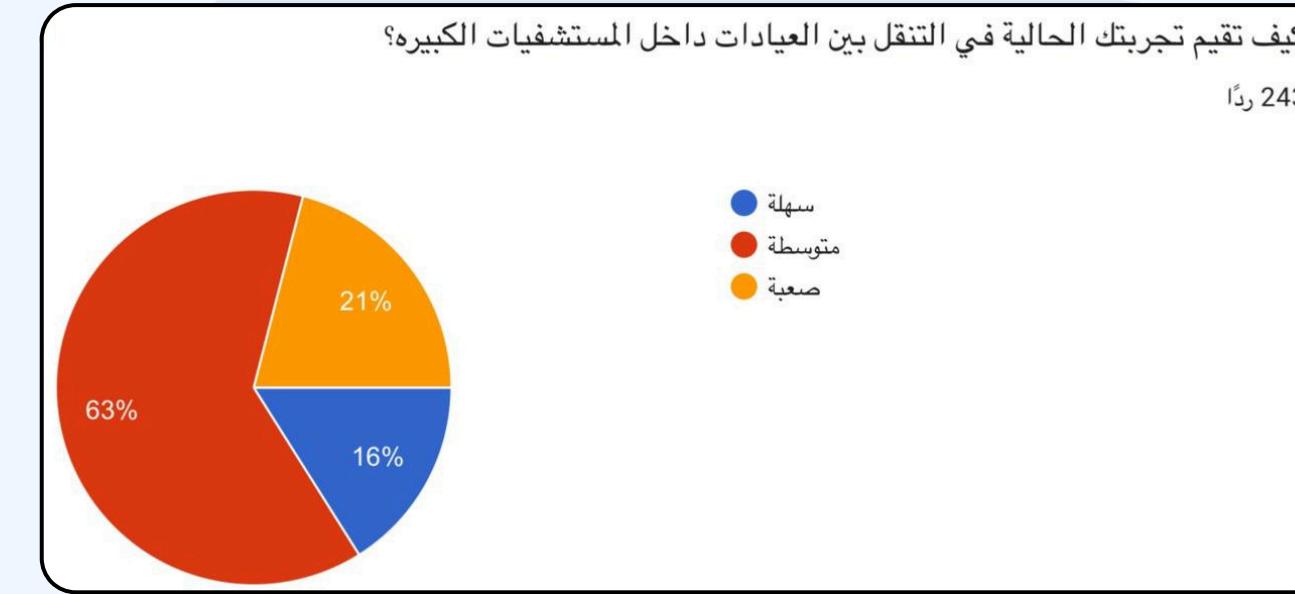


Figure 2

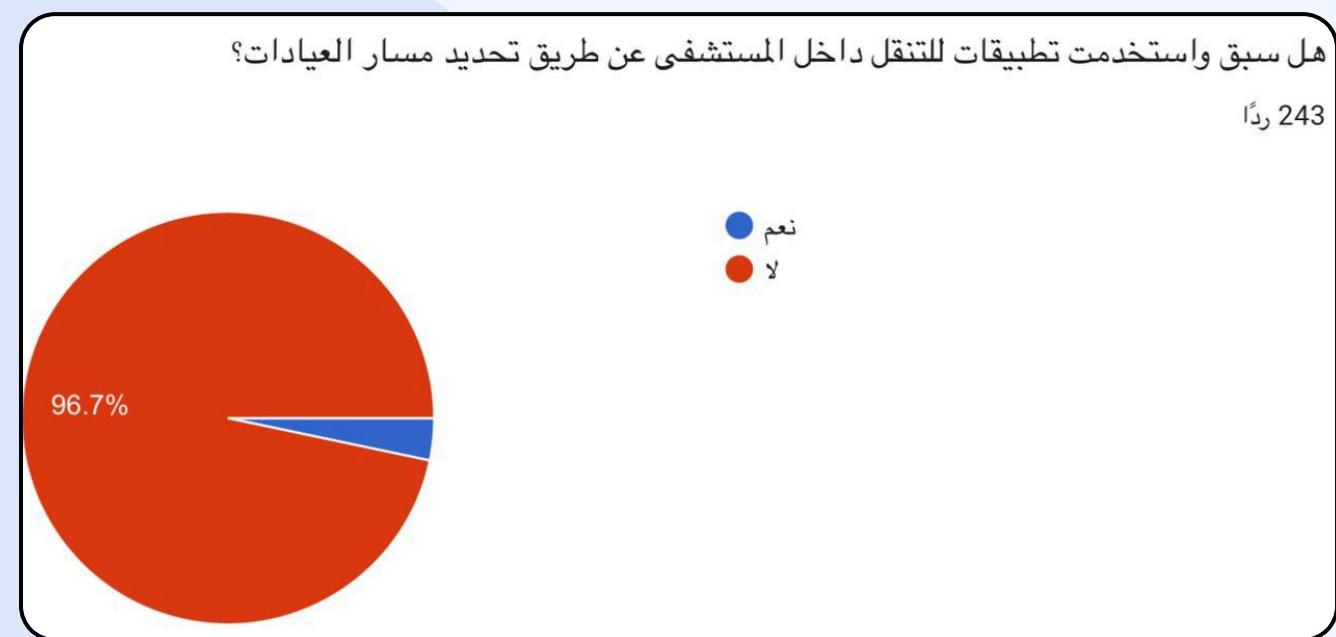


Figure 3

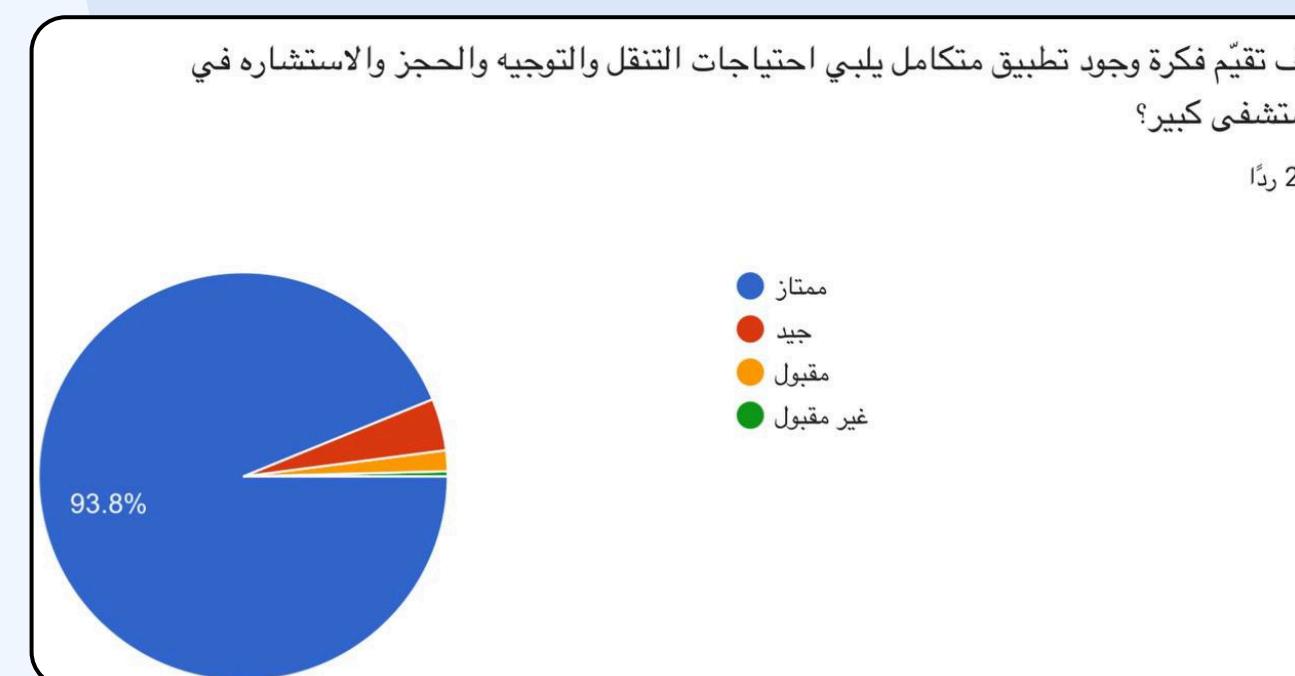


Figure 4

# Questionnaire Result

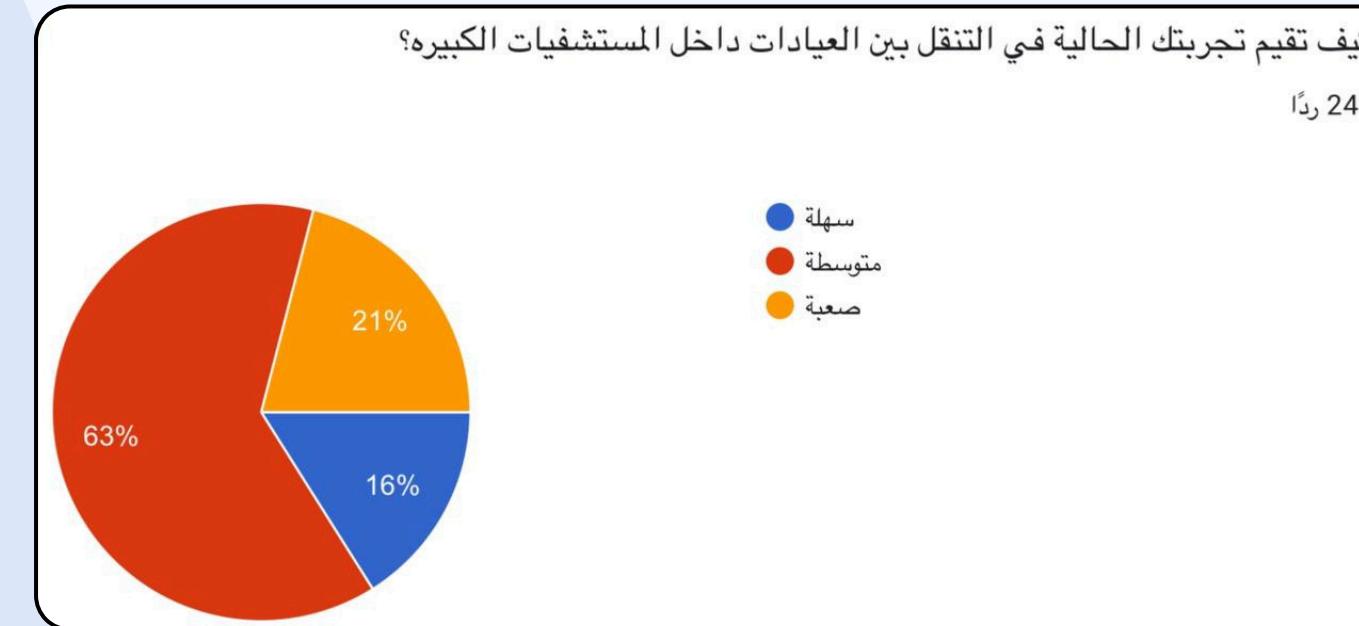


Figure 5

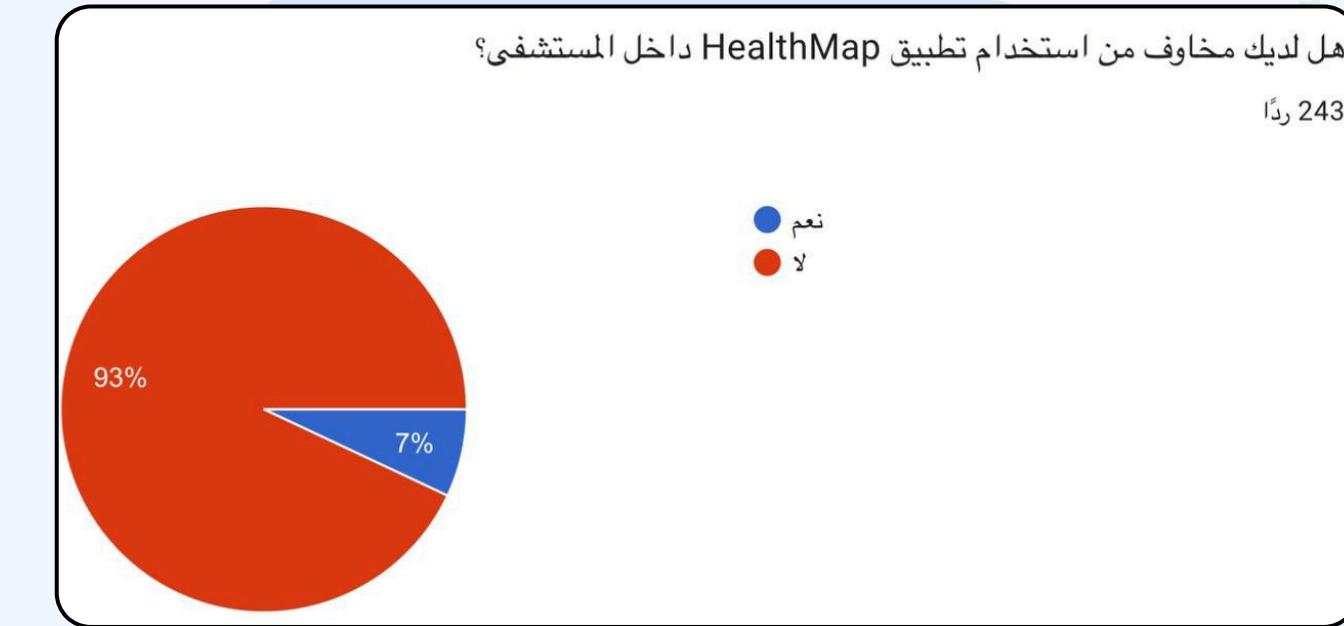


Figure 6

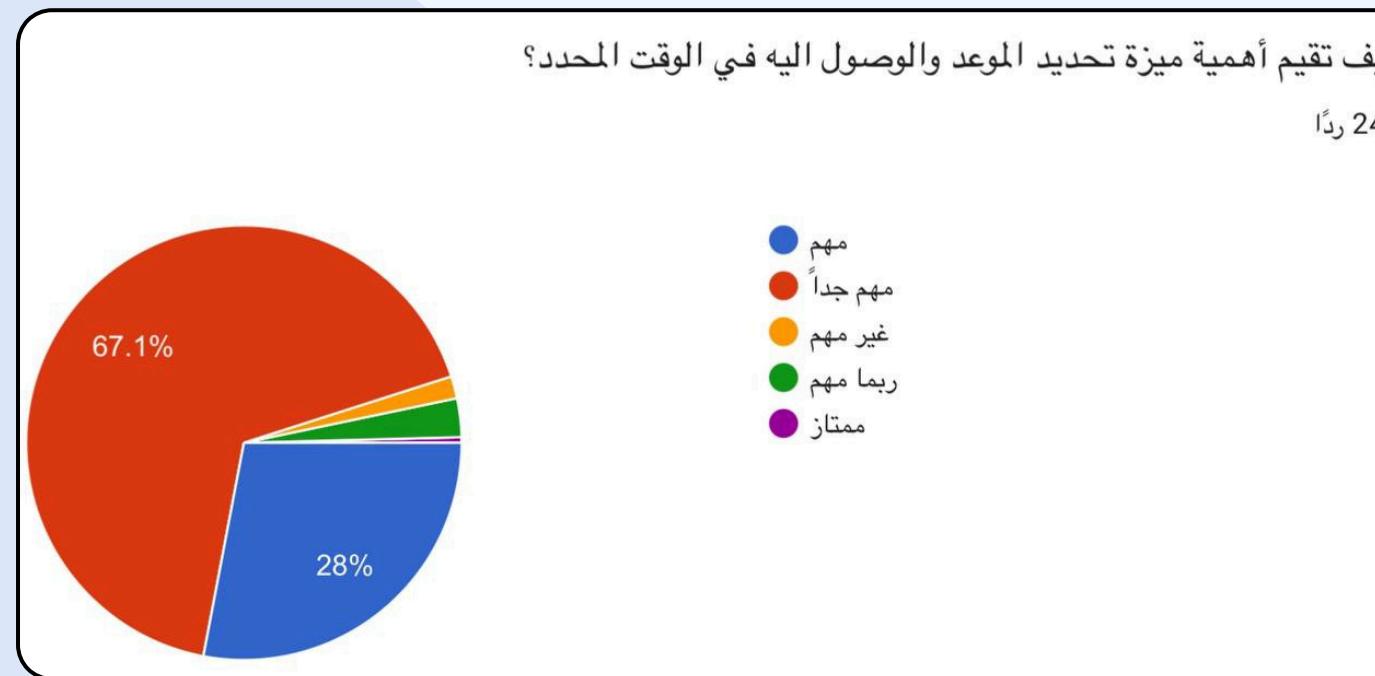


Figure 7

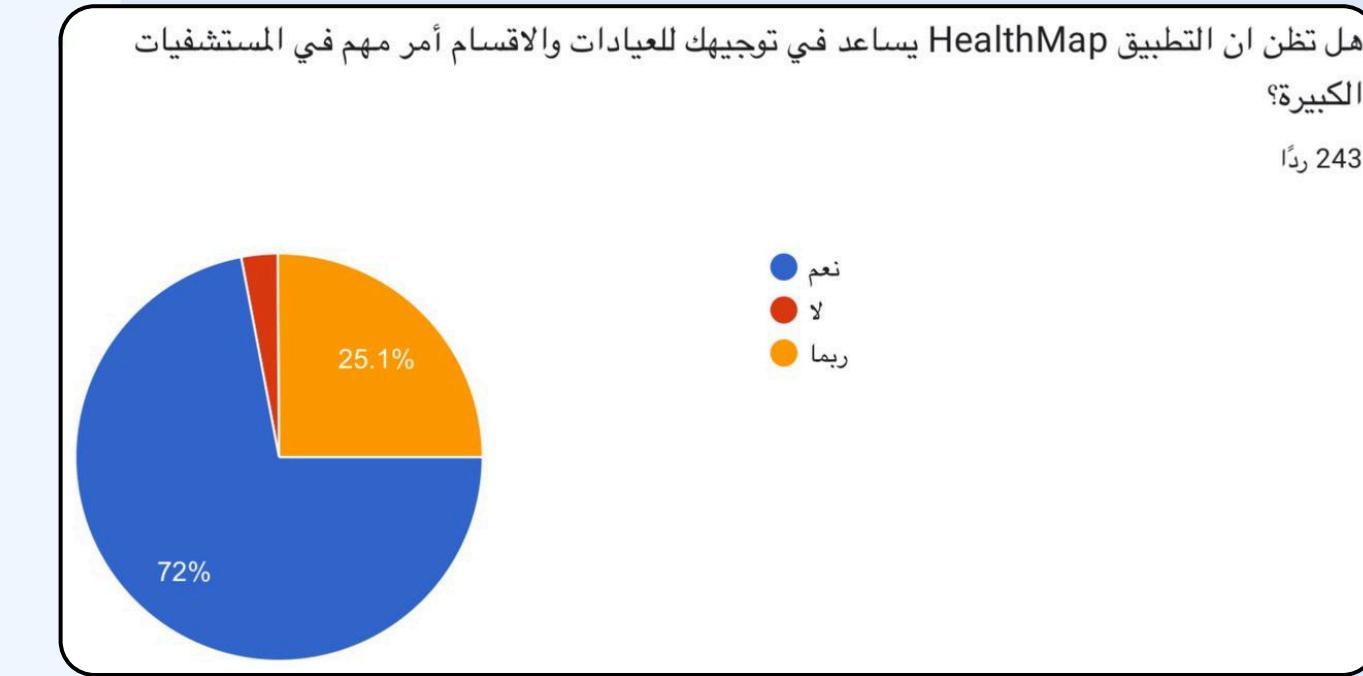


Figure 8

# Questionnaire Result



You can visit this questionnaire



Click here

هل ترى أن إضافة تنبيهات للحالات الطارئه لطلب المساعدة سيكون مفيد؟

رداً 243

- نعم
- لا
- ربما

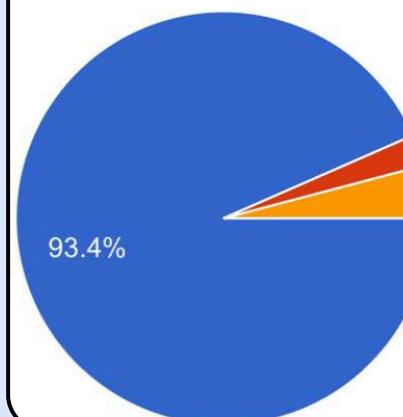


Figure 9

كيف تقيّم فكرة وجود تطبيق متكملي يلبي احتياجات التنقل والتوجيه والจอง والاستشاره في مستشفى كبير؟

رداً 243

- ممتاز
- جيد
- مقبول
- غير مقبول

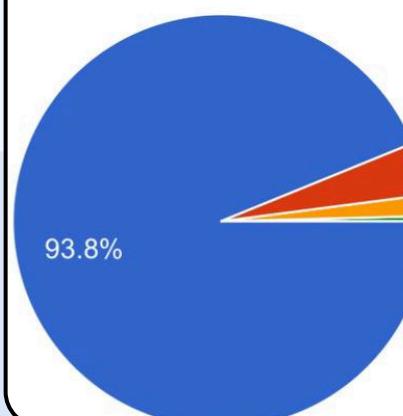


Figure 10

هل تفضل وجود تقنية NFC أو مسح الباركود لتحديد موقعك وتوجيهك داخل المستشفى؟

رداً 243

- نعم
- لا
- ربما

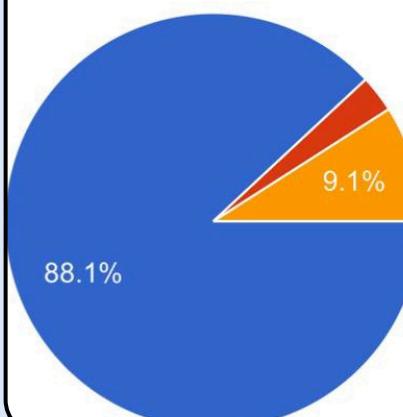


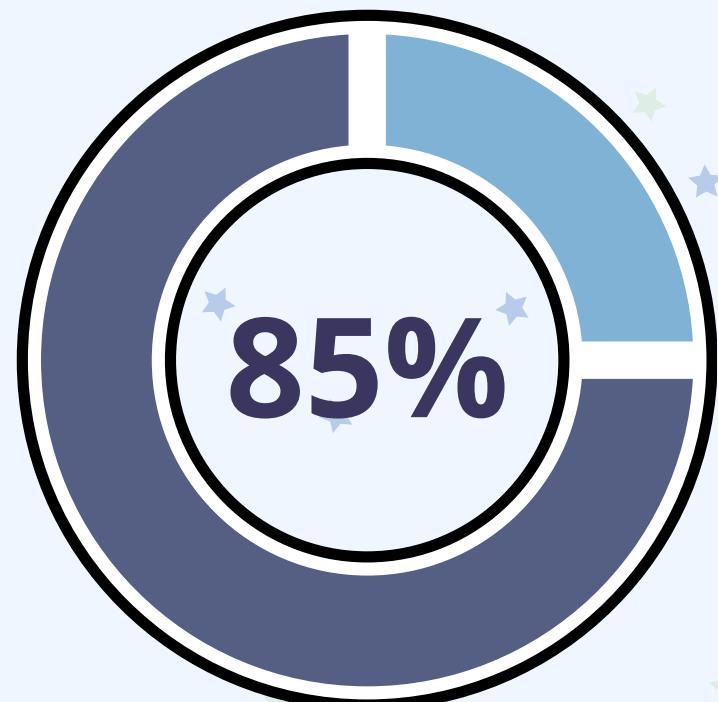
Figure 11

# Survey results for the application



**Addressing a Clear Need:** User feedback highlighted a strong demand for an innovative solution to simplify navigation within large hospitals, making the app a vital tool for improving user experience.

**Positive Reception and Support:** Survey respondents showed great enthusiasm and acceptance of the idea, underscoring the app's significance and their support for its implementation to create a smarter, more efficient healthcare journey.



# 06. Literature Review



# Background for NFC

**Near Field Communication (NFC)** is a short-range wireless communication technology that enables data exchange between devices within close proximity, typically less than 10 cm. It operates in three modes:

1. Reader Mode: A device reads information from NFC tags or cards.
2. Peer-to-Peer Mode: Two NFC-enabled devices exchange data directly.
3. Card Emulation Mode: A device acts like an NFC card for payments or access control.

NFC is widely used in applications such as contactless payments, access control, and healthcare. In biomedical fields, it supports tasks like disease monitoring and sensor integration. It is seamlessly integrated into daily life through smartphones, enhancing convenience and usability.



# Applications

## Our App: HealthMap

**It is an application that provides internal navigation using NFC technology, real-time patient tracking, appointment booking, direct consultations.**

**01.** Sehaty:  
It is an application that helps users monitor their health by counting steps, calories, and tracking weight. It also provides medical records and consultations, along with health and nutrition articles.

**02.** King Faisal Specialist Hospital App:  
It is an application that offers appointment booking, access to test results, and direct communication with healthcare providers.

**03.** Seha:  
It is an application that allows users to schedule appointments, access telemedicine consultations, and manage medical records.

# Applications

04.

**Altibbi:**

It is an application that provides online consultations with certified doctors, access to medical articles, and a symptom checker to understand health concerns.

05.

**King Saud Medical City (Watheeq Patient):**  
It is an application that allows users to book appointments, access medical records, and receive reminders for upcoming visits.

06.

**Maweidi:**

It is an application that allows users to locate clinics and hospitals, view specialists, and book appointments.

07.

**Istishari:**

It is an application that connects users with healthcare professionals through chat or video consultations and provides a library of health articles.

08.

**My Clinics KSA:**

It is an application that helps users find clinics, book appointments, and access their medical records.

09.

**King Abdullah Medical City (Manarah Alsiha):**

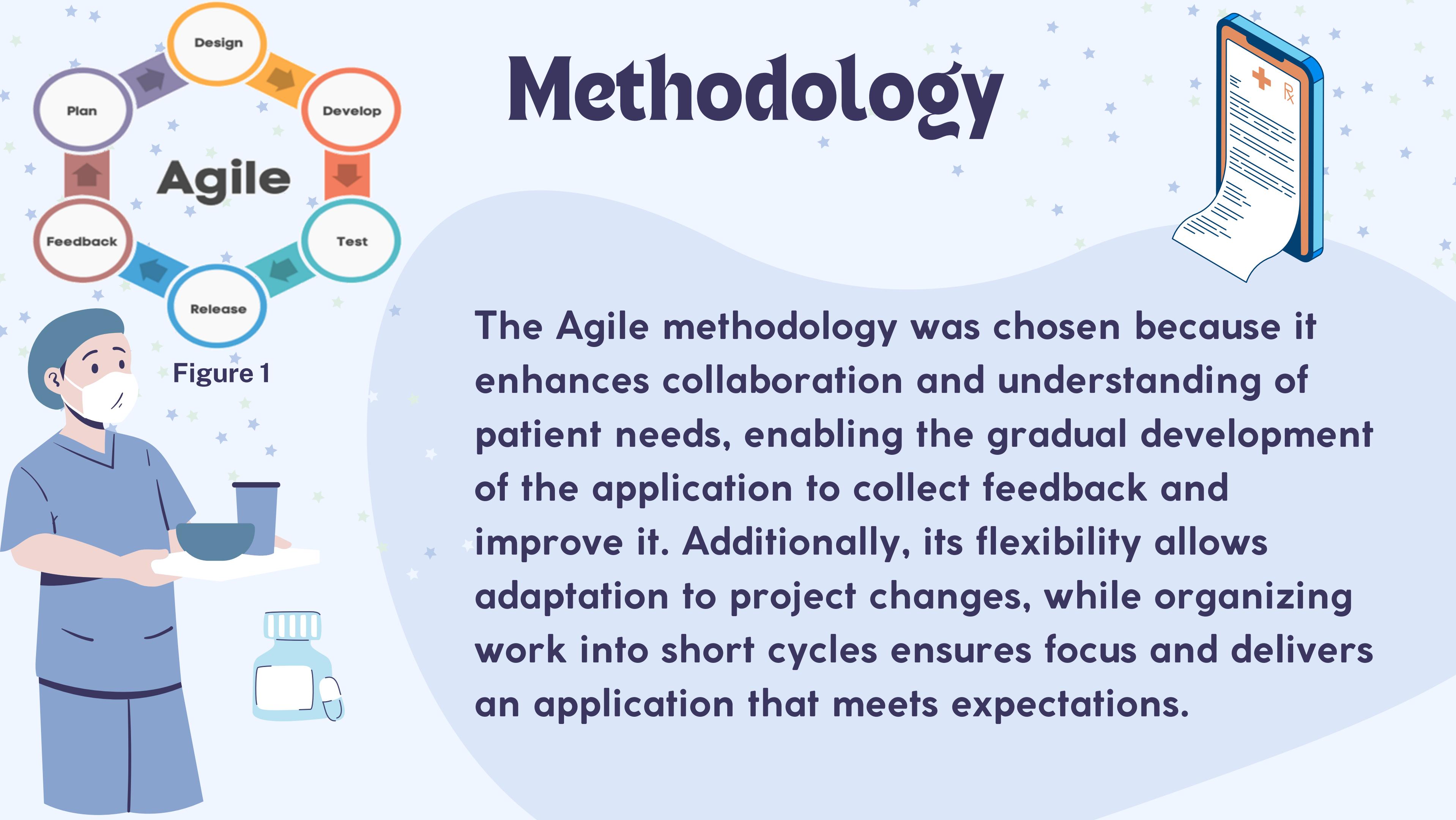
It is an application that provides appointment scheduling, access to medical records, and notifications for healthcare services.

# Comparison between related work



07.

# System Analysis and design



# Methodology

The Agile methodology was chosen because it enhances collaboration and understanding of patient needs, enabling the gradual development of the application to collect feedback and improve it. Additionally, its flexibility allows adaptation to project changes, while organizing work into short cycles ensures focus and delivers an application that meets expectations.

# Diagram

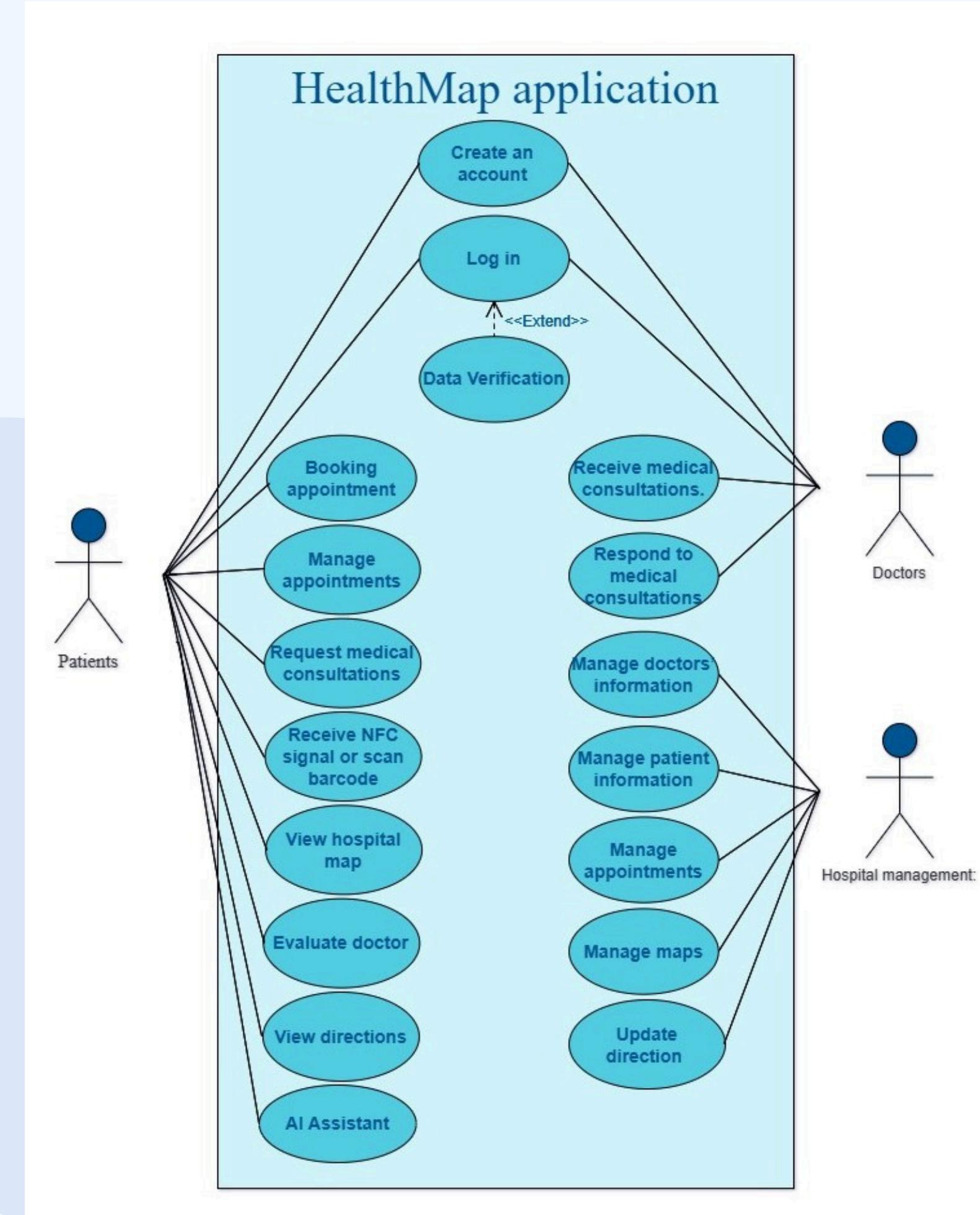


Figure 2 Use Case



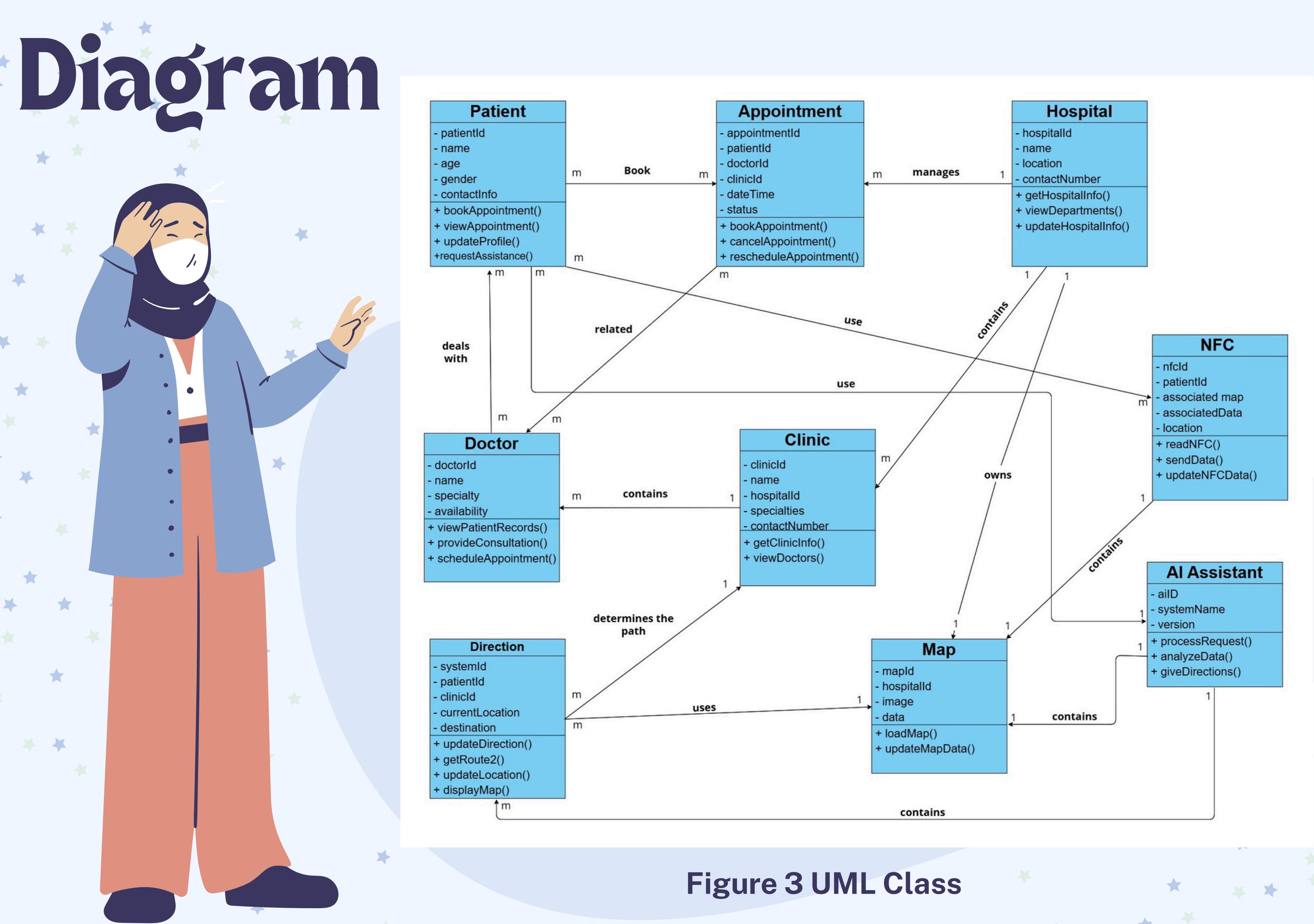
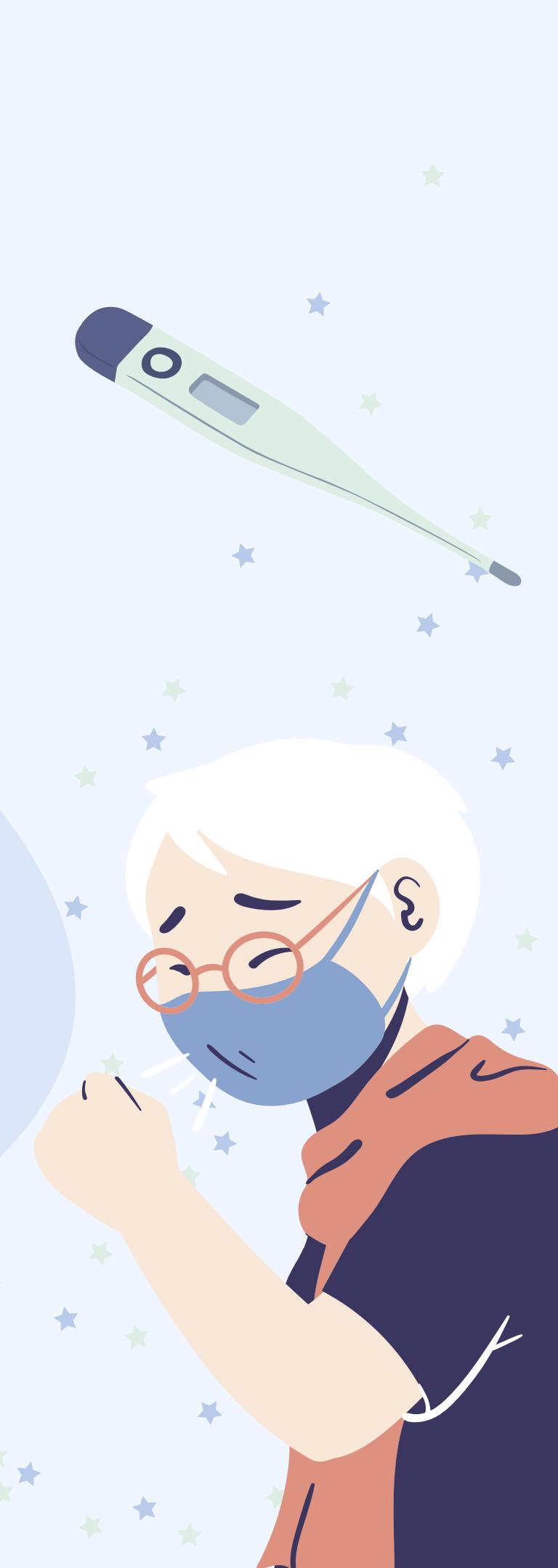


Figure 3 UML Class



# Diagram

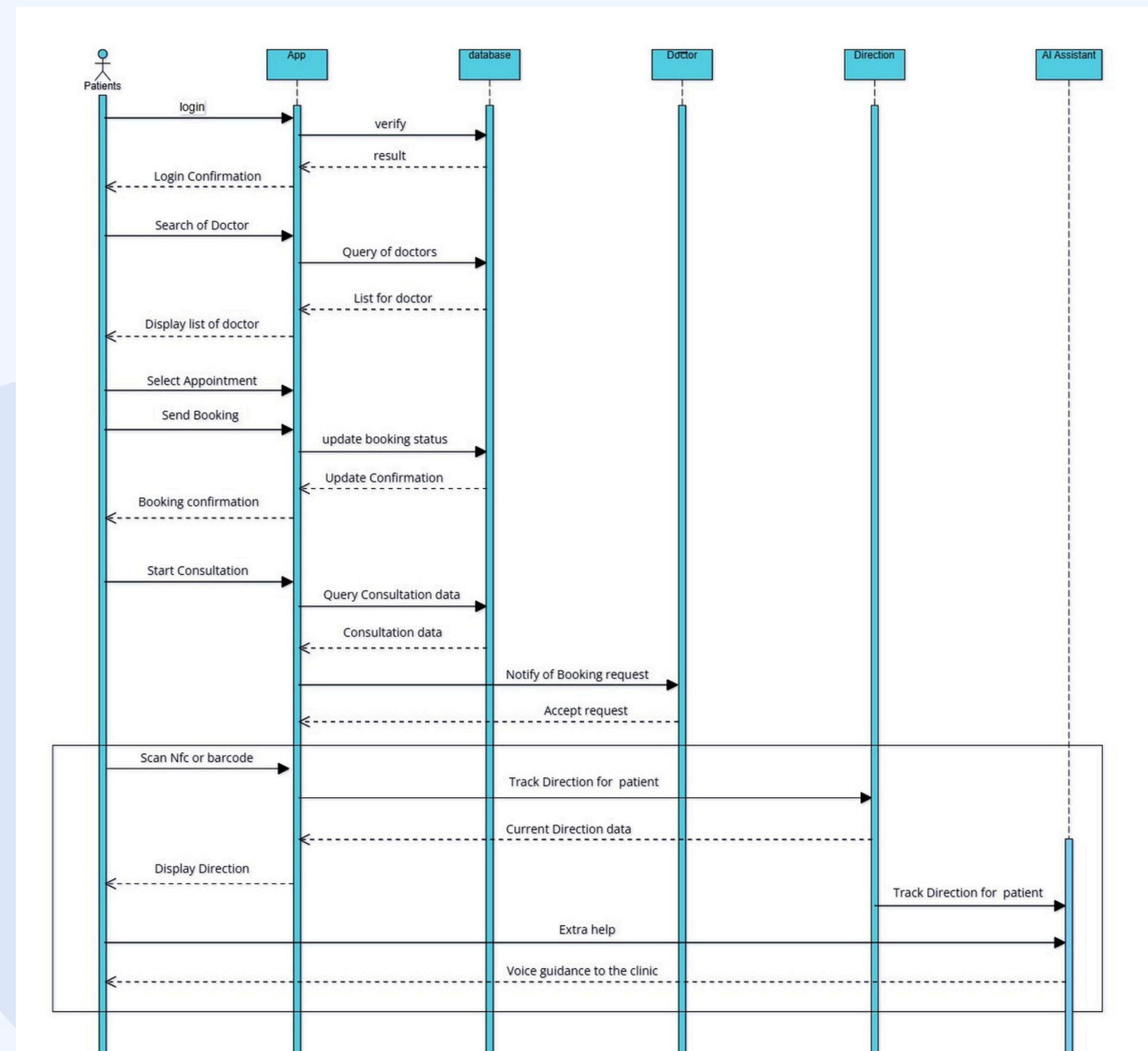


Figure 4 UML Sequence Diagram for patient



# Diagram

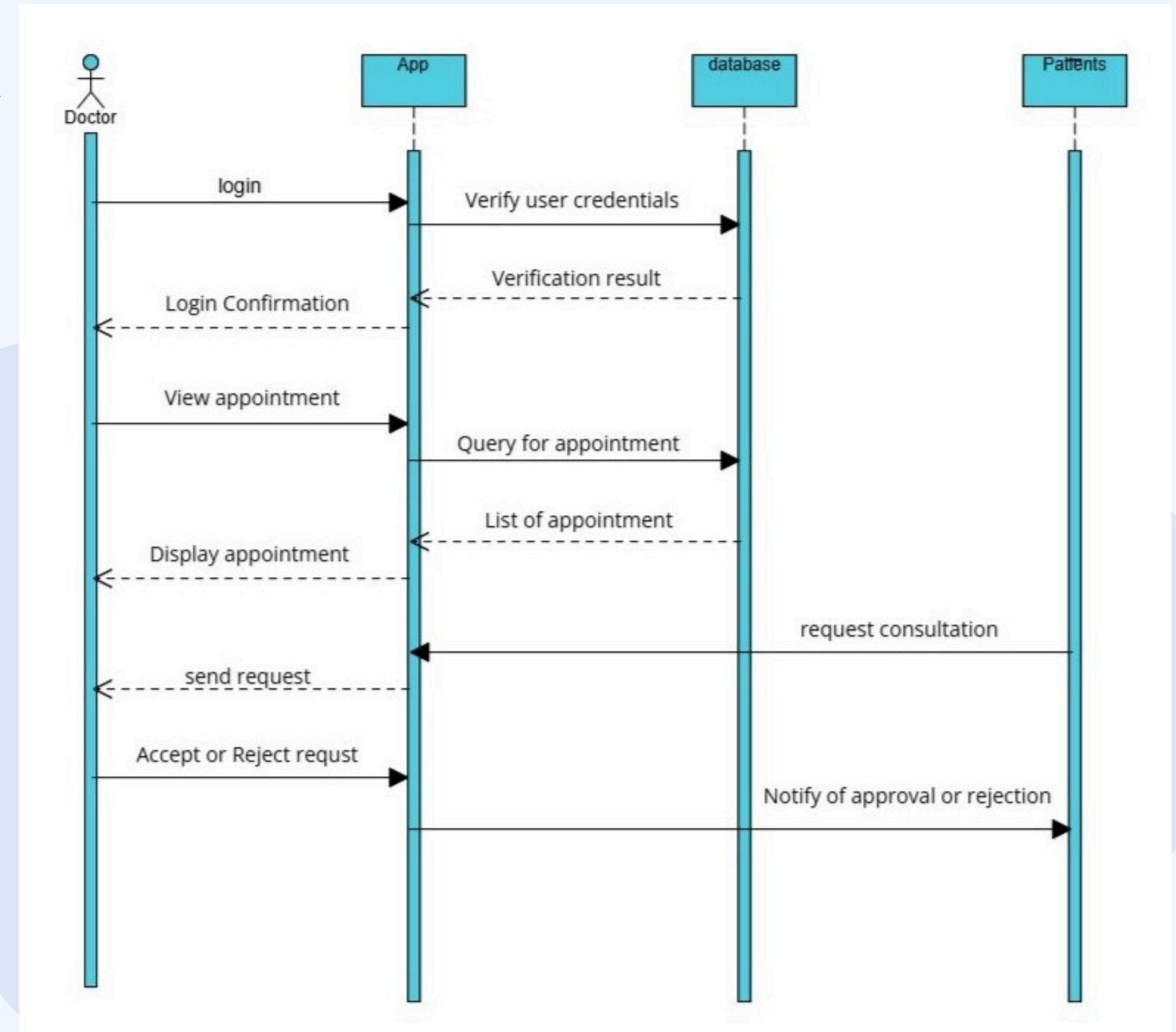


Figure 5 UML Sequence Diagram for doctor



# Diagram

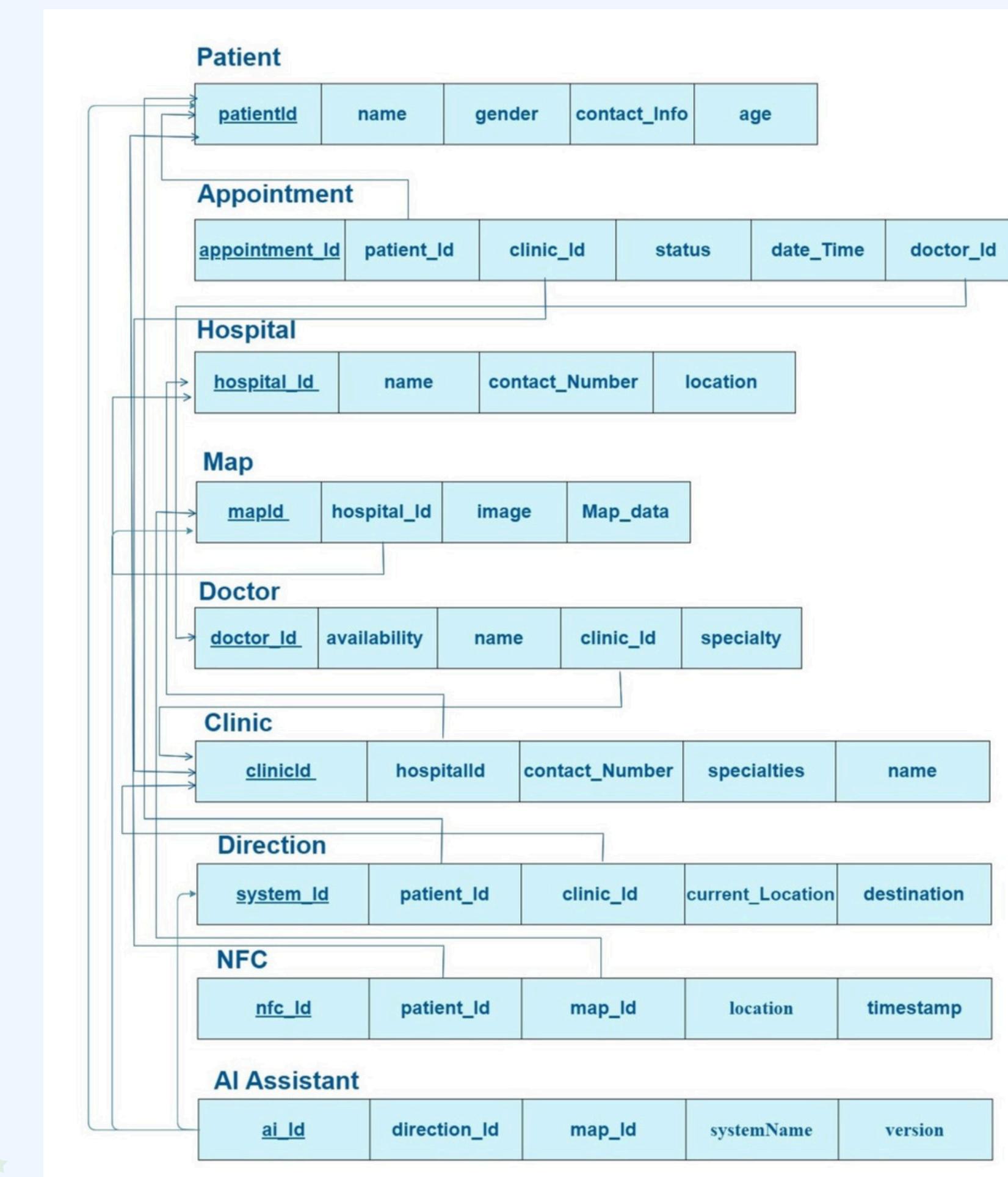
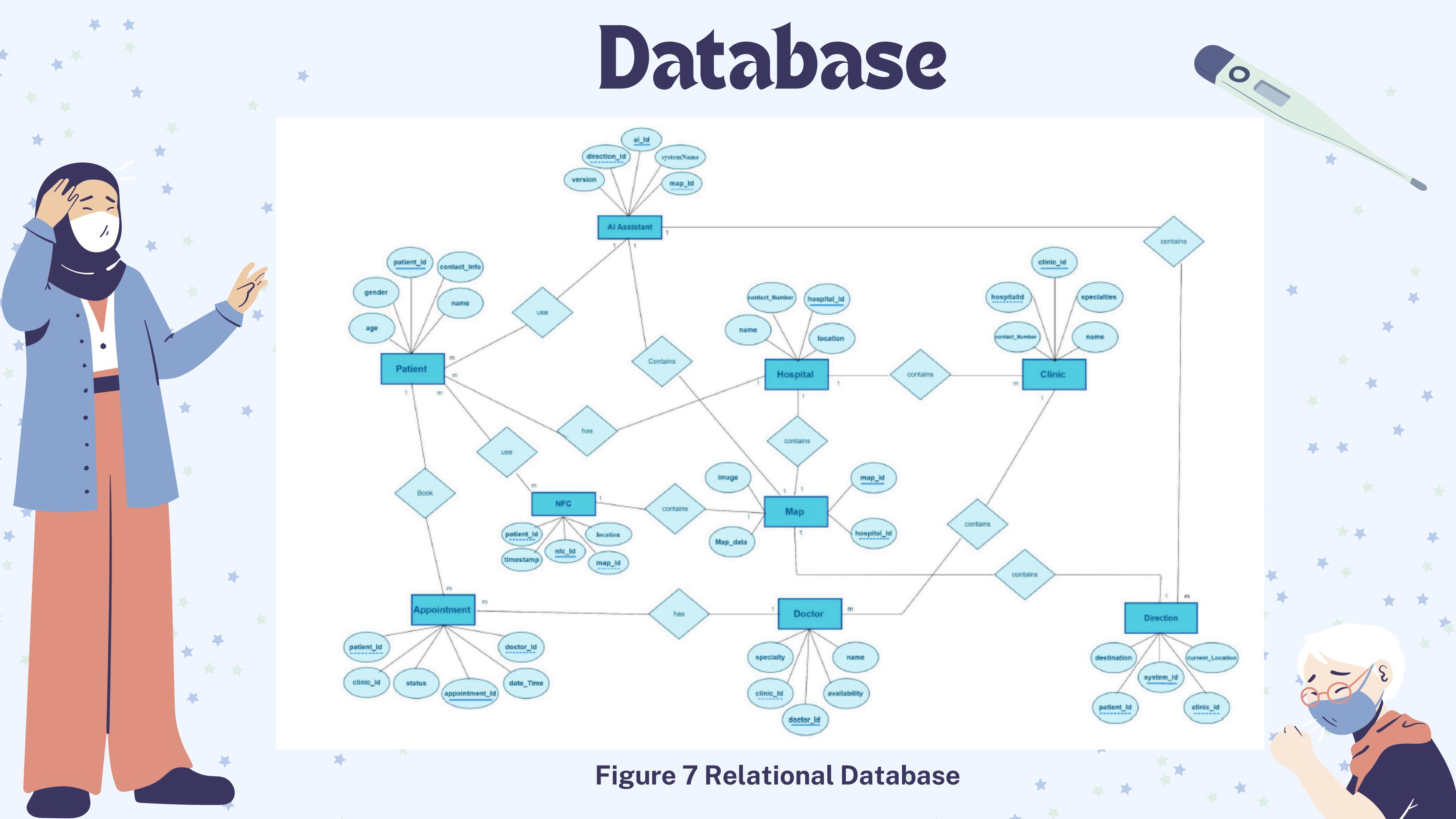


Figure 6 ER Diagram



# Database



# 08. System Requirement



# Requirements



# Functional:

User registration,  
appointment booking,  
NFC navigation.

# Non-Functional:

Performance, security,  
offline functionality,  
accessibility

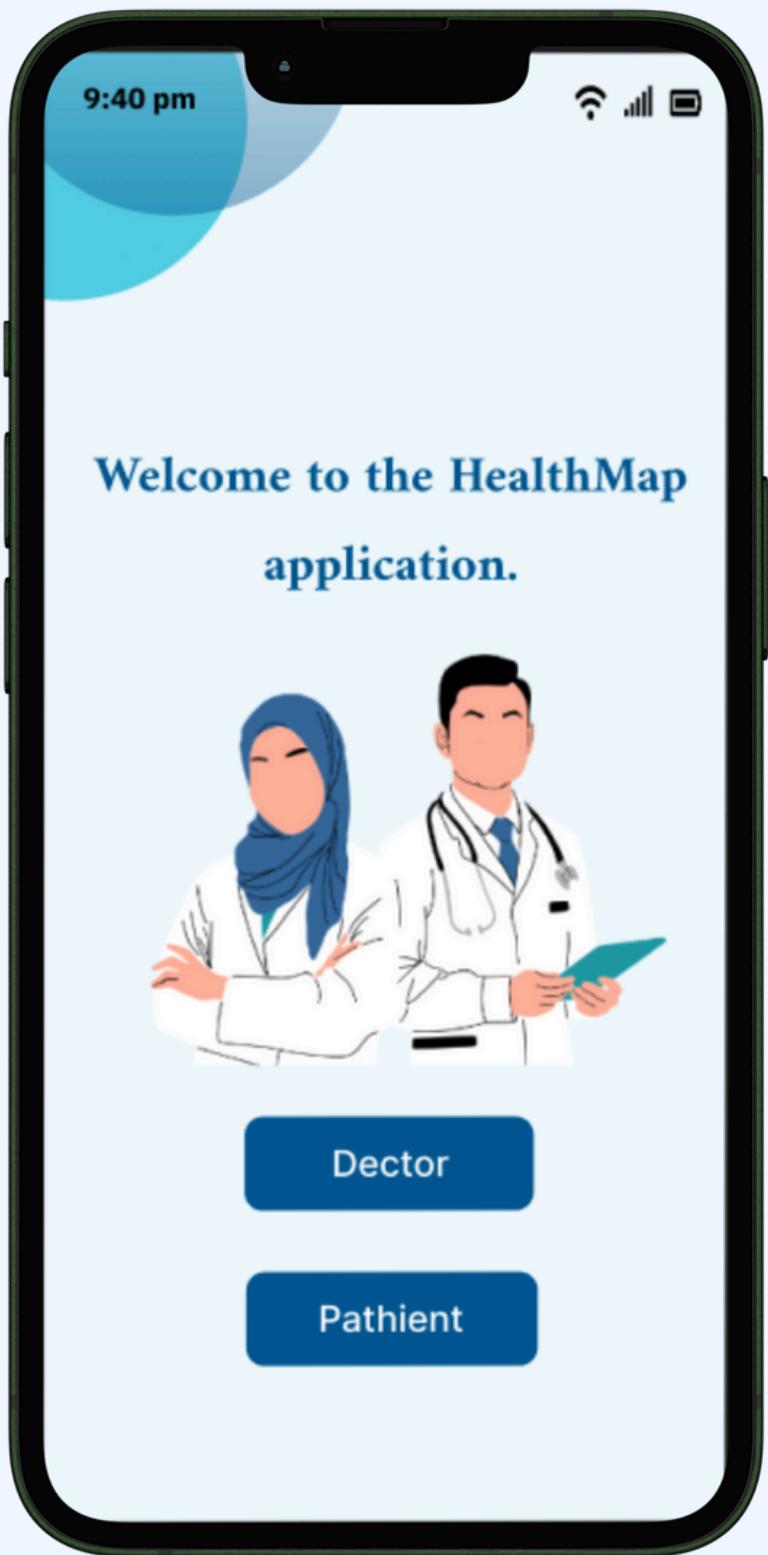


# 09. Prototype

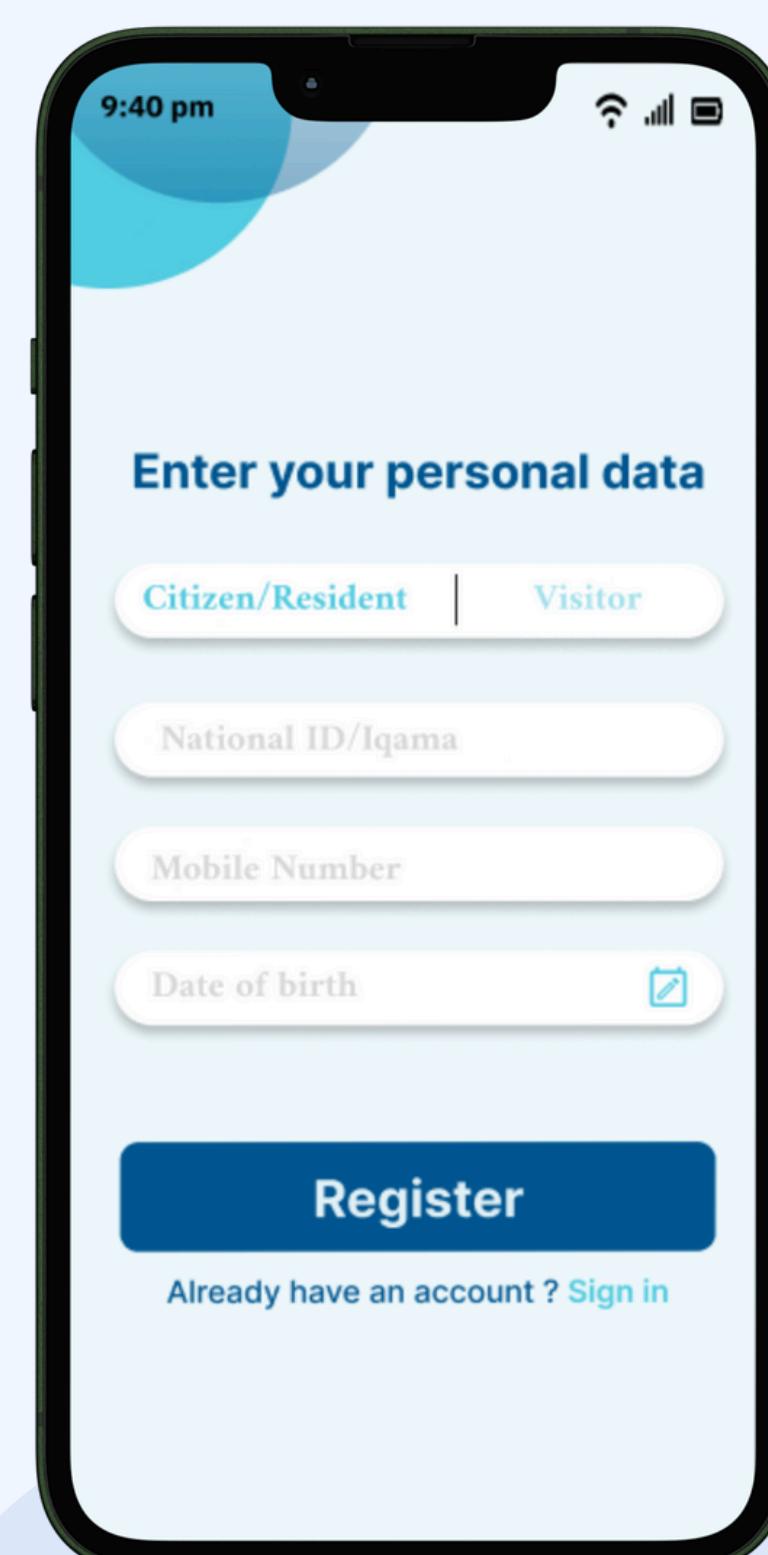




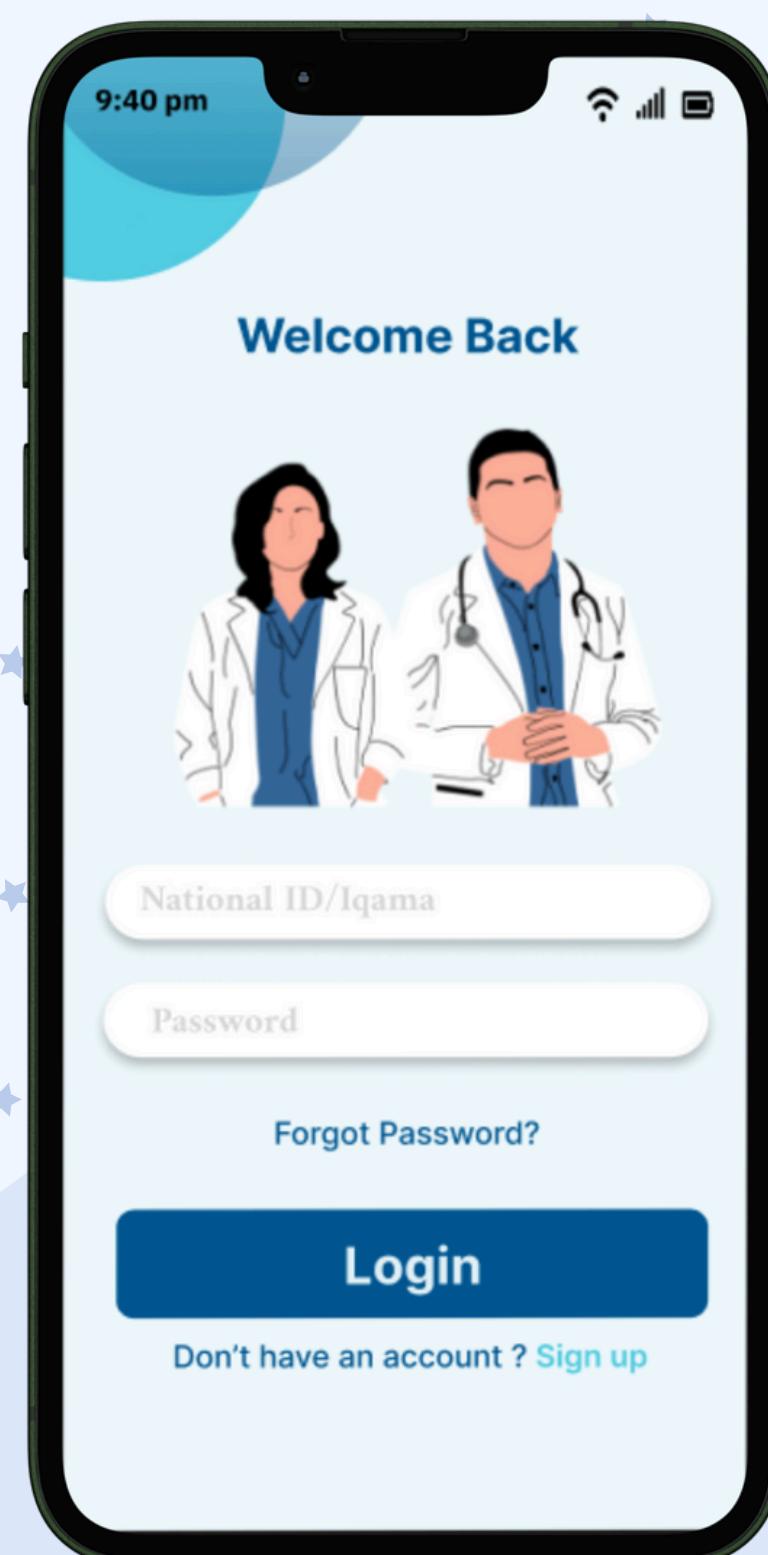
**Figure 1**



**Figure 2** Login as a patient or doctor



**Figure 3** New registration



**Figure 4** Login



# As a patient

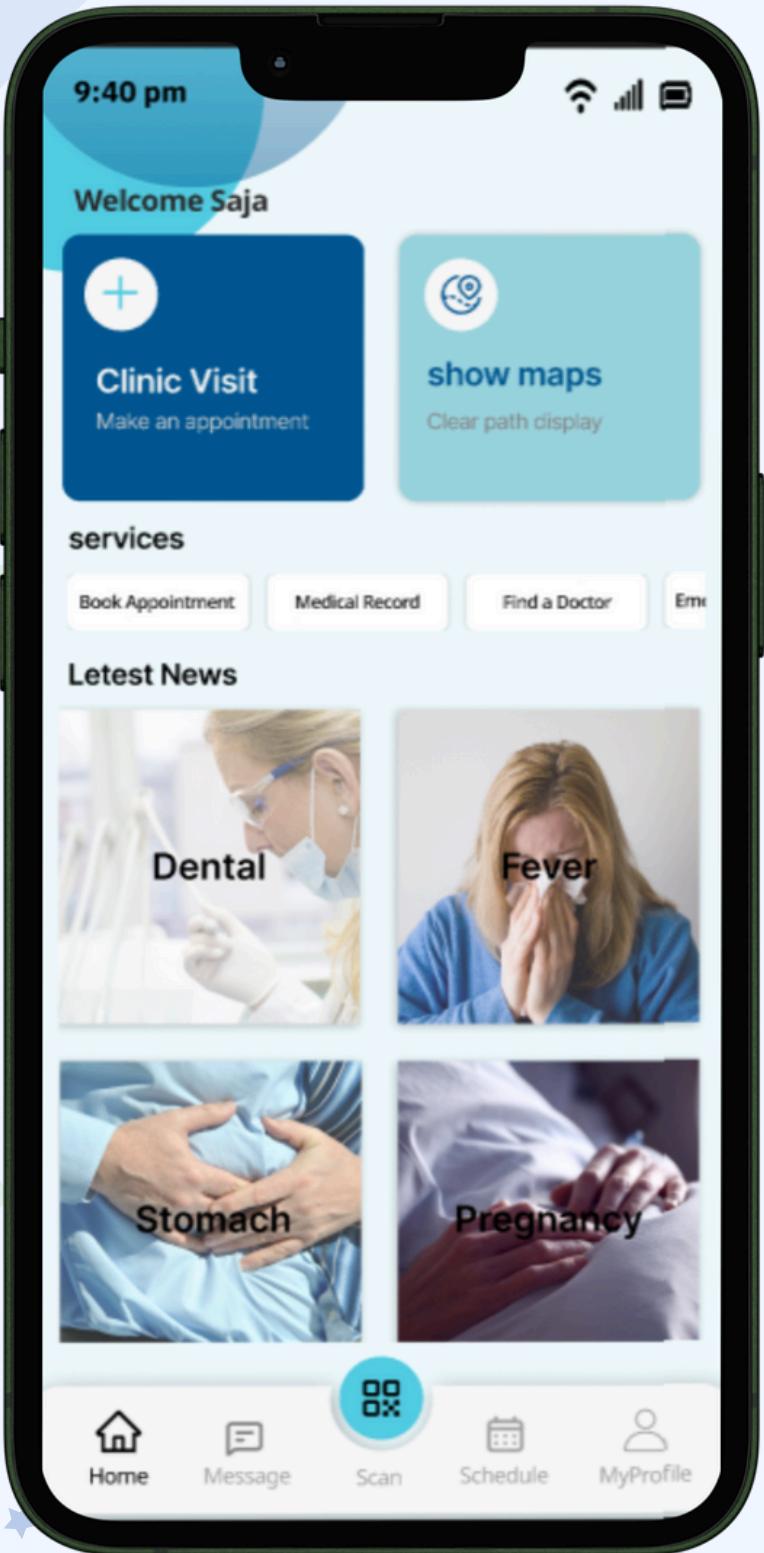


Figure 5 Home page

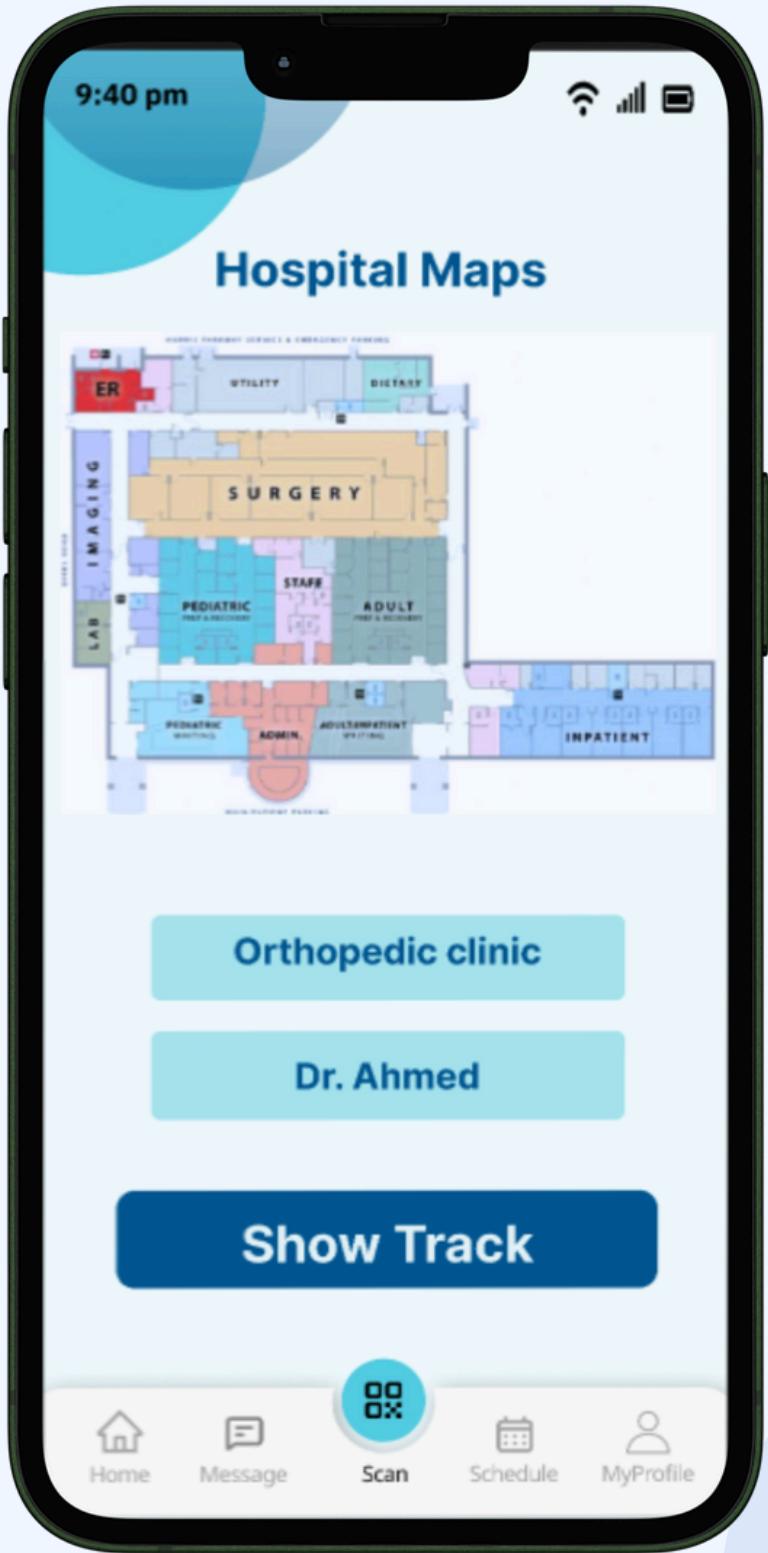


Figure 6 Show the clinic and the doctor

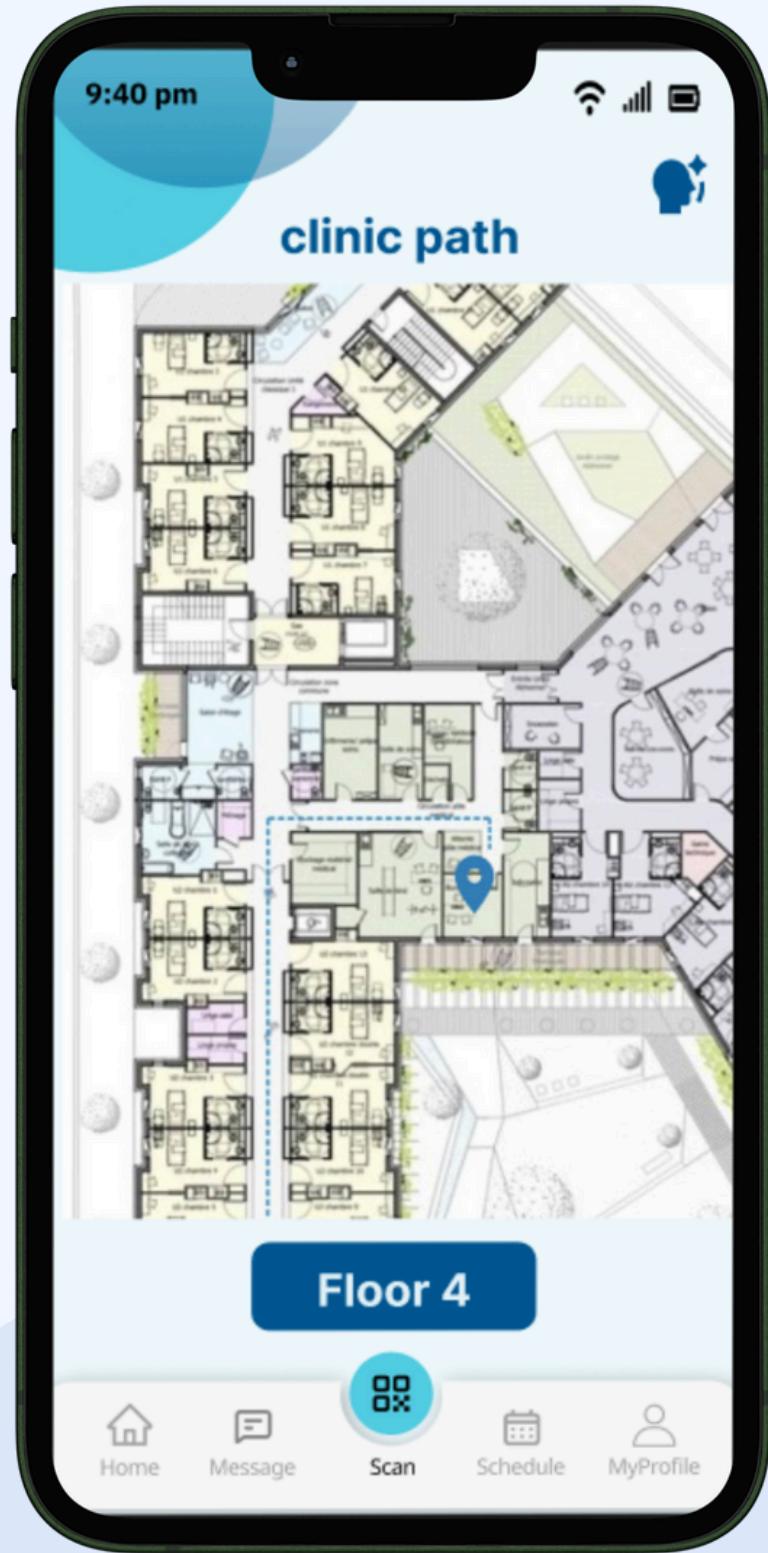


Figure 7 View the clinic path

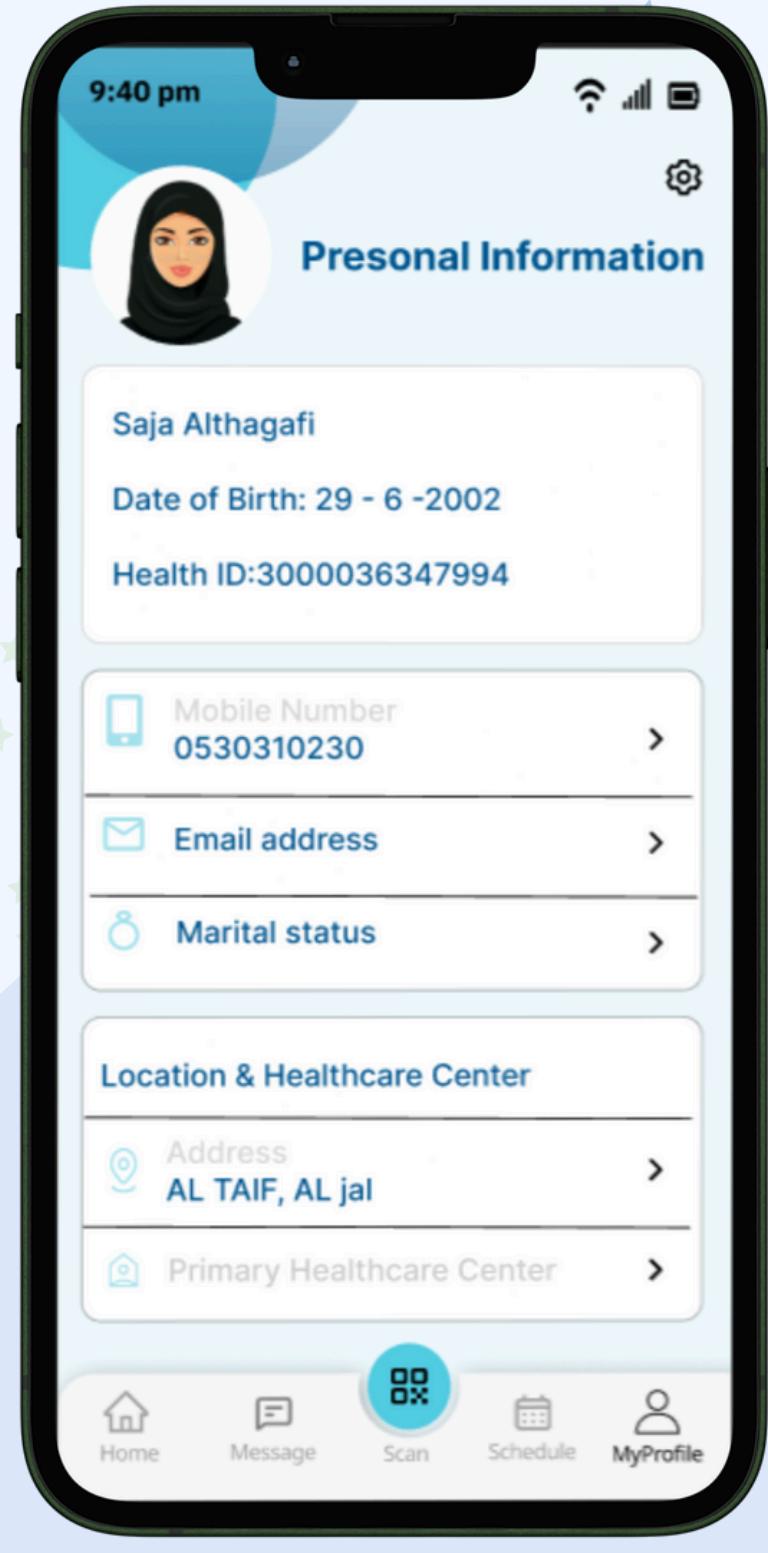


Figure 8 Your personal information

# As a doctor

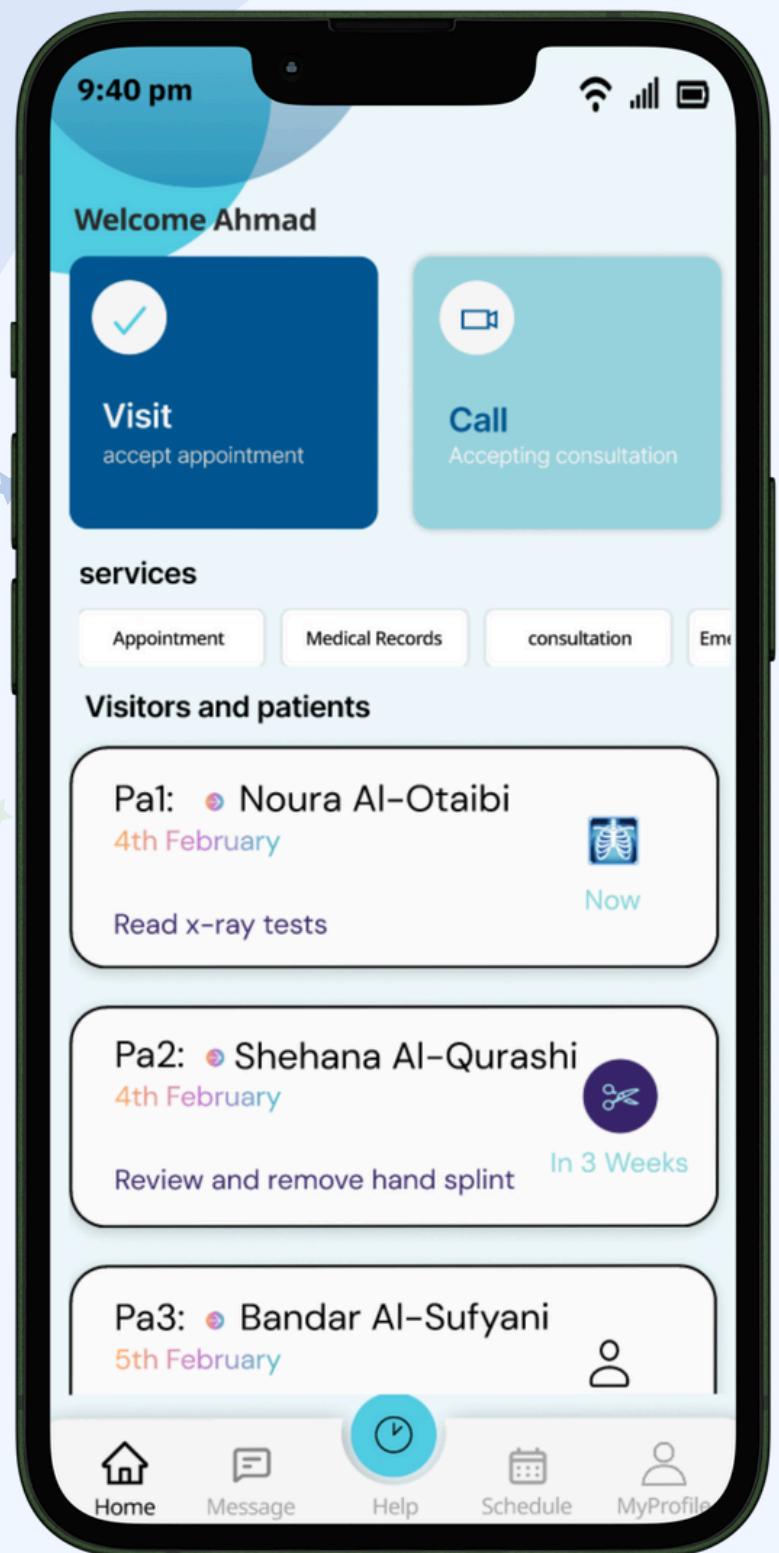


Figure 9 Home page

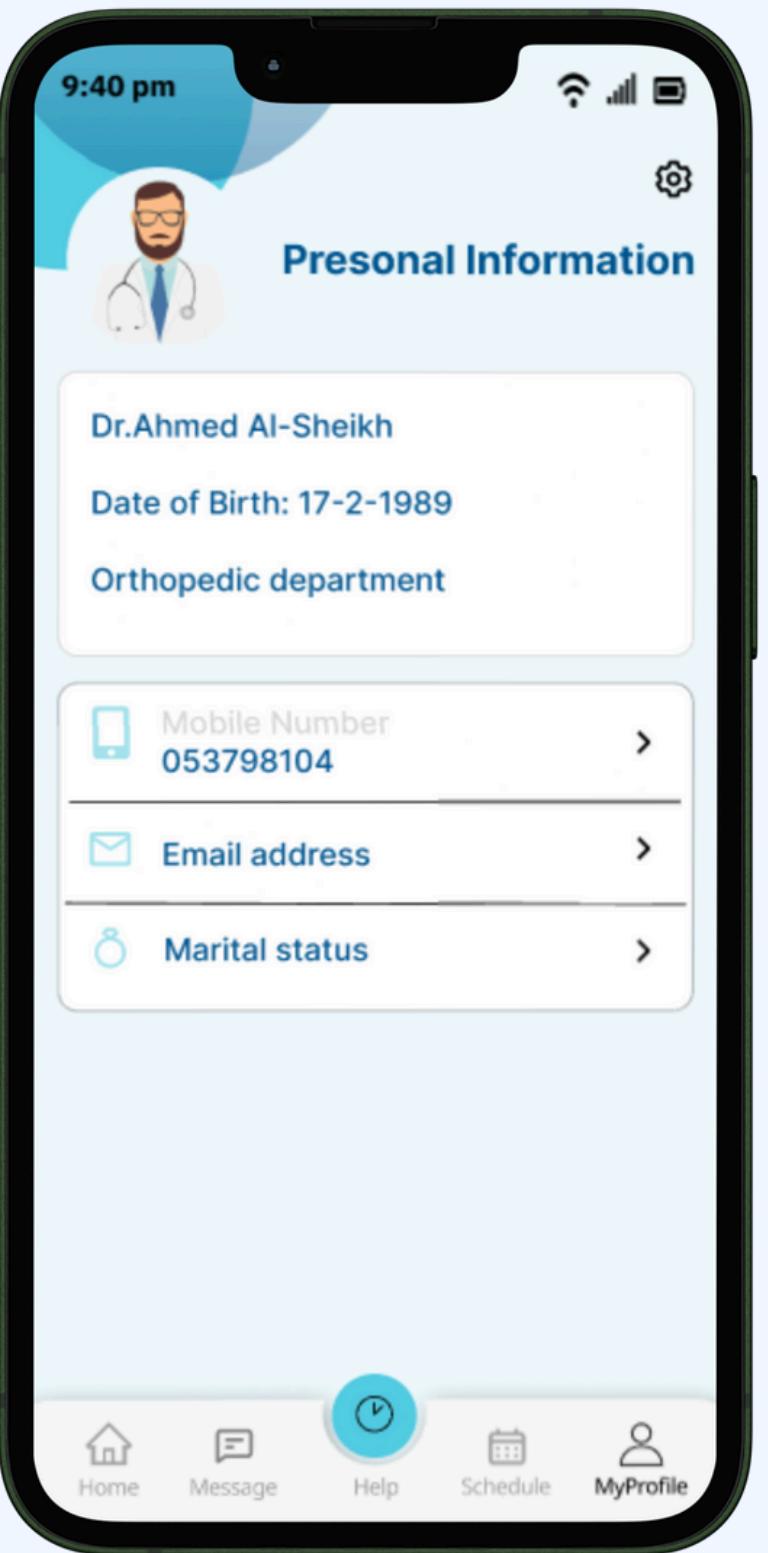


Figure 10 personal information for doctor

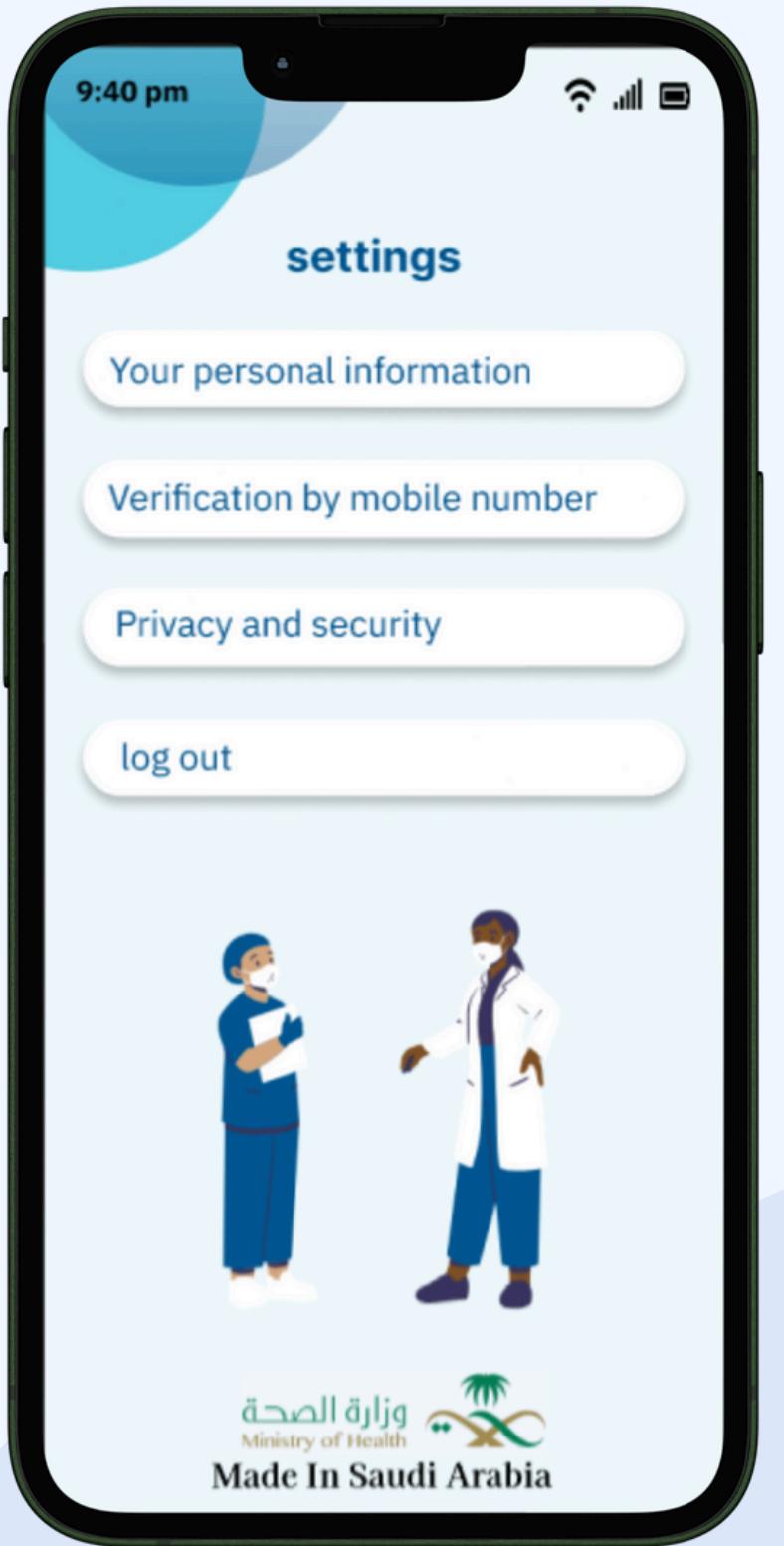


Figure 11 Settings and log out



# 10. implementation



# Demonstration



To see the demo click here

Figure 1



# 11. Usability



# Questionnaire Results for usability

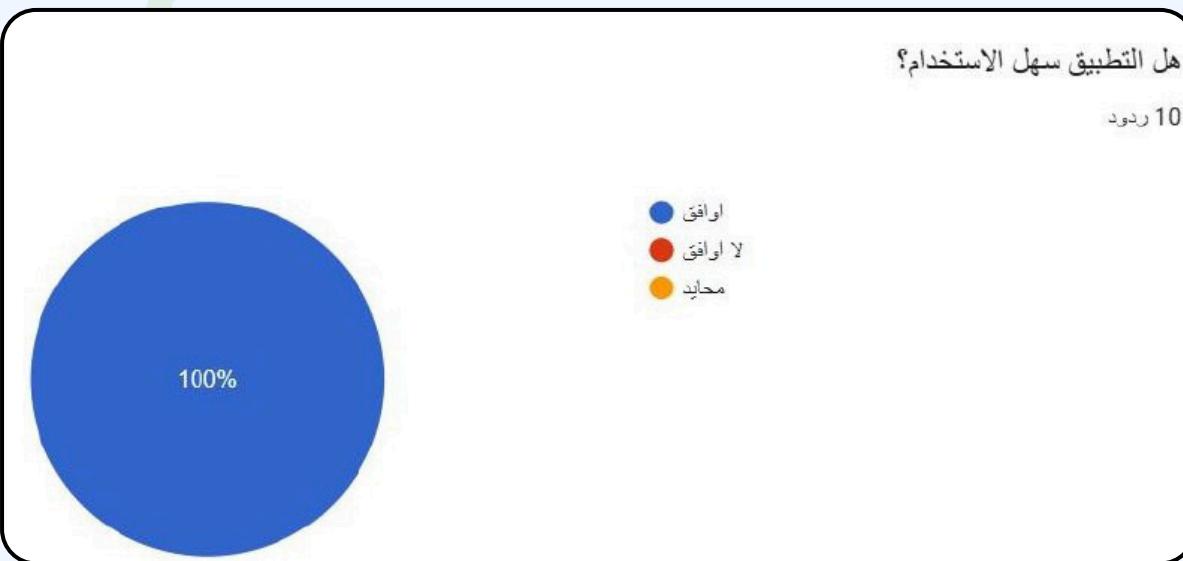


Figure 1

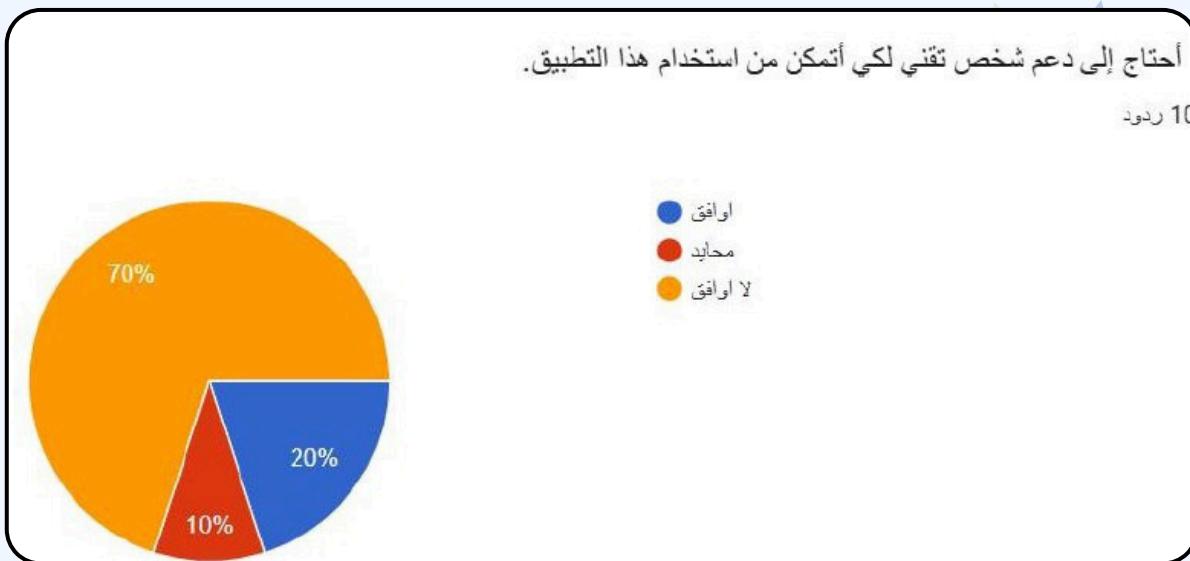


Figure 2

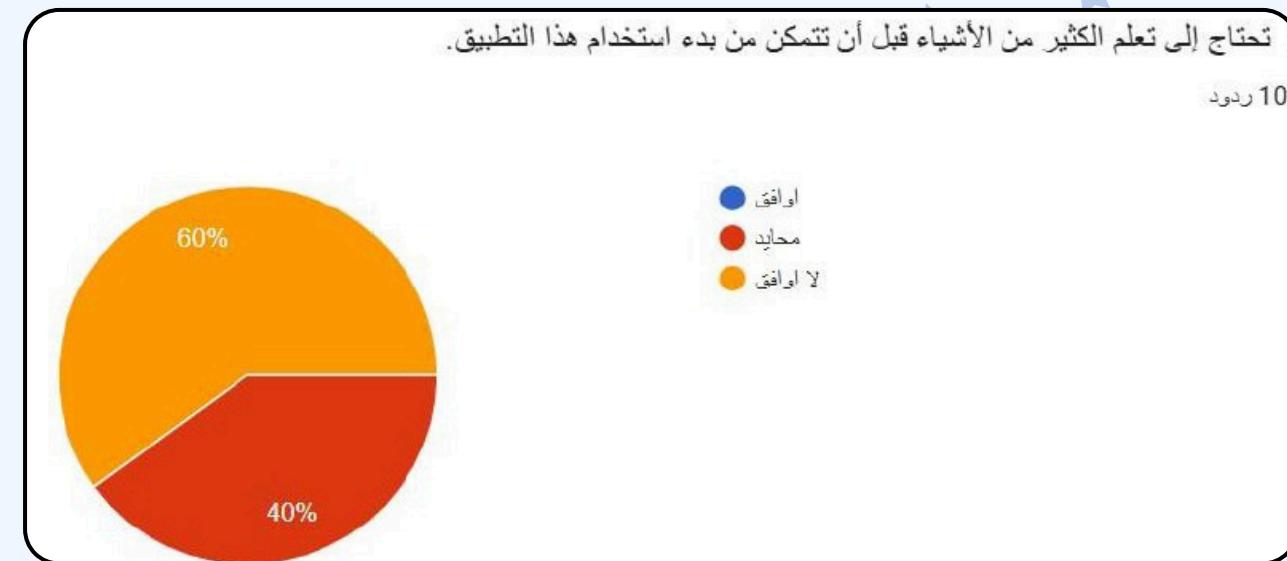


Figure 3

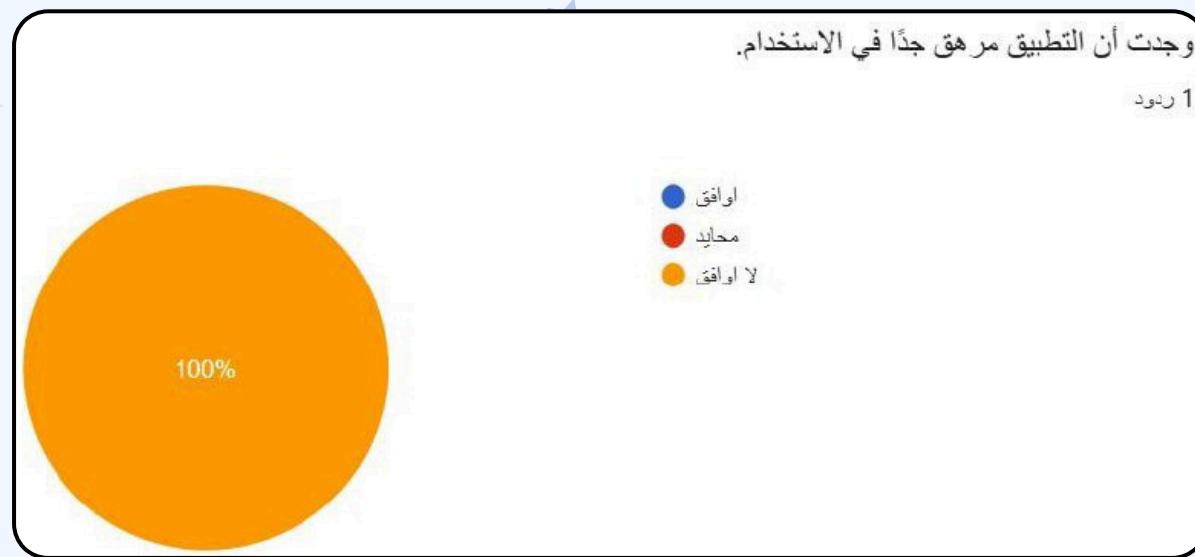


Figure 4

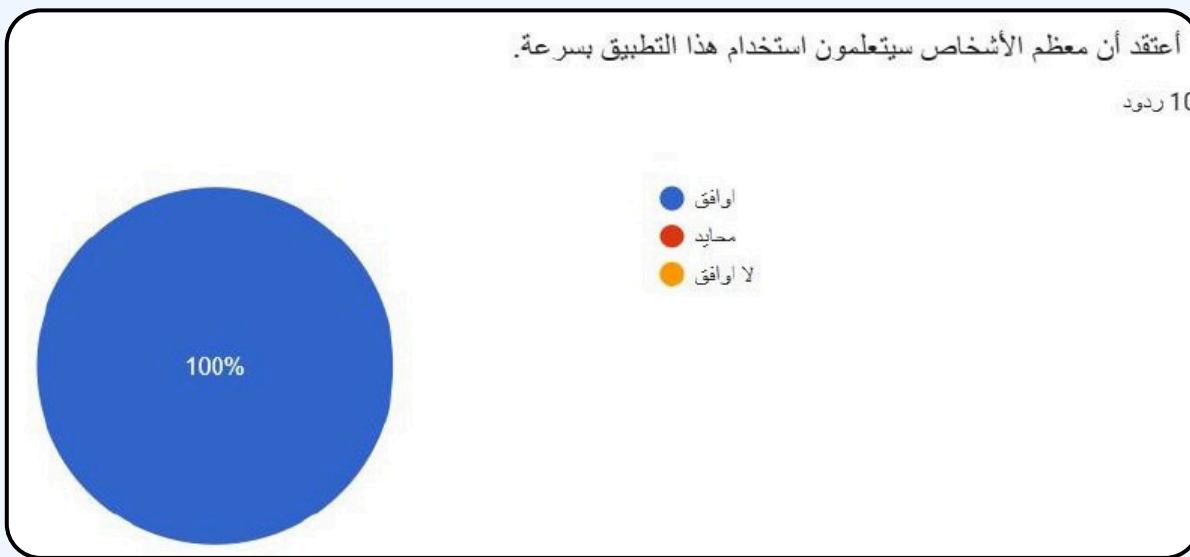


Figure 5

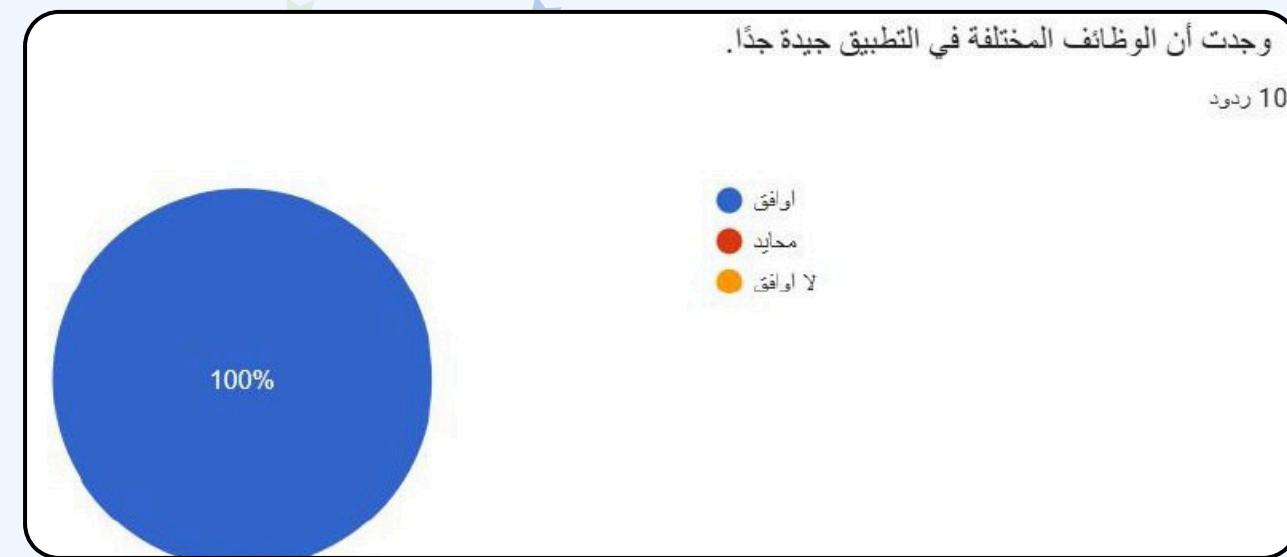


Figure 6



# Survey results for the Usability

## Findings Summary:

The questionnaire results showed that most participants found the application easy to use. Opinions were split regarding the need for technical support and prior learning. Many did not find the app cumbersome, and views were nearly balanced on how quickly people could learn it. Most participants strongly agreed that the app's features were highly effective.



# 12. Benefits



# Expected Benefits

01

Enhanced patient navigation and experience

02

Improved accessibility with AI voice and sign language support

03

Increased operational efficiency and reduced congestion

04

Better resource management using predictive analytics

05

Enhanced safety with real-time monitoring

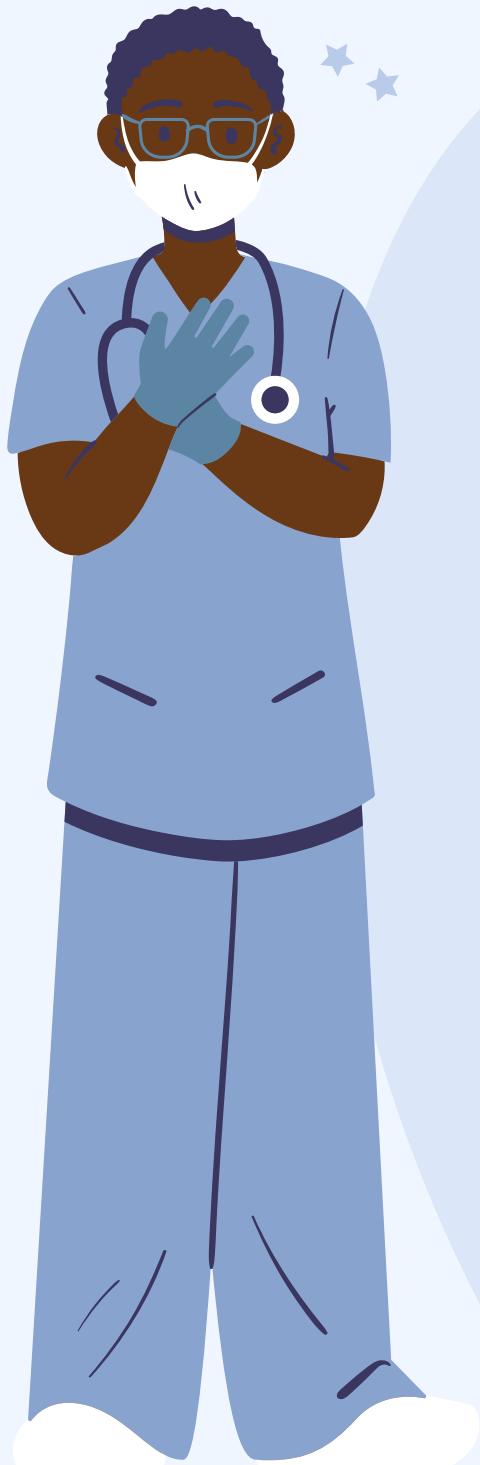


# 13. Conclusion



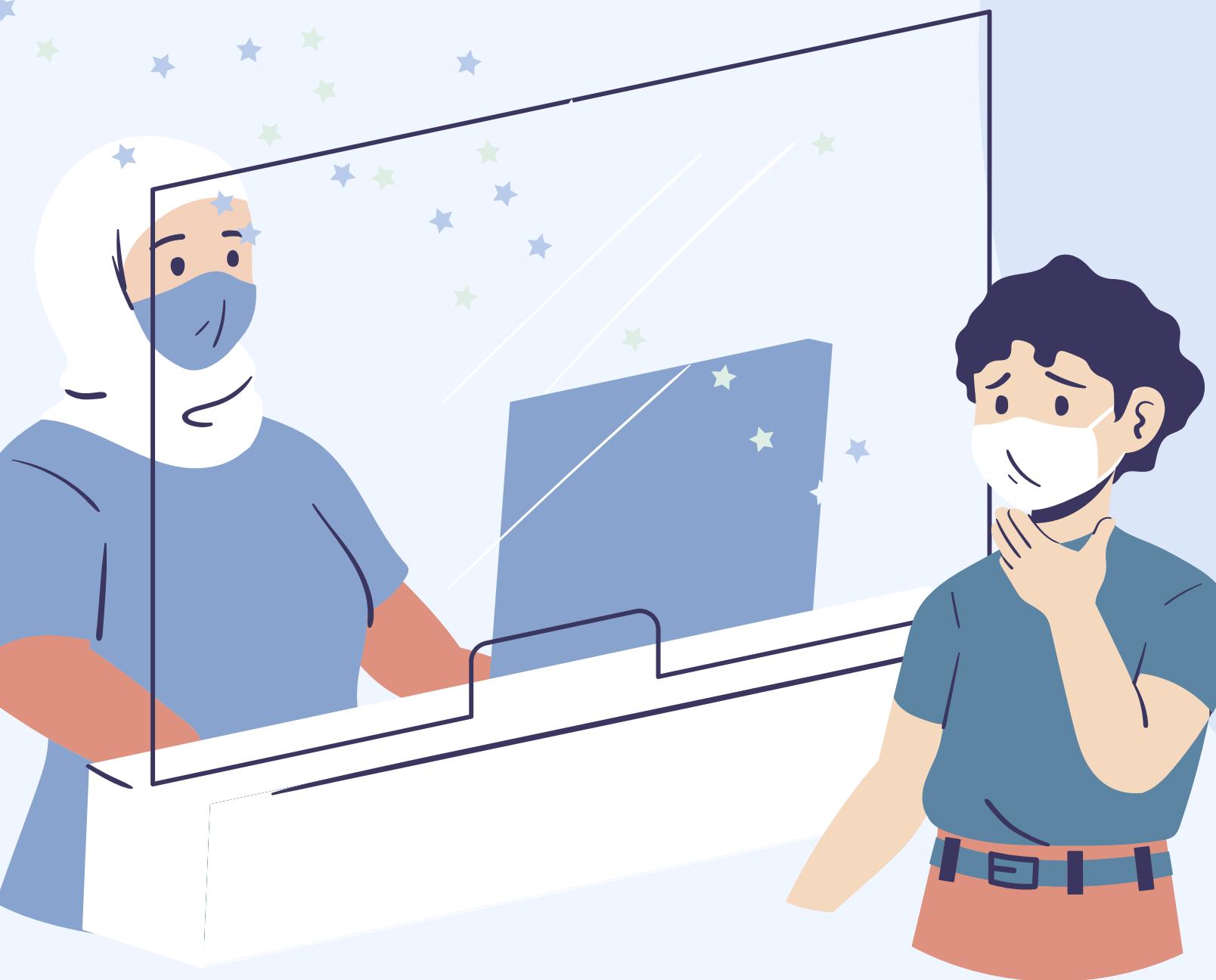
# HealthMap Conclusion:

- The HealthMap provides a comprehensive solution for patient care management by incorporating features like real-time updated maps, continuous healthcare, appointment booking, medical consultations, and on-site assistance using NFC technology.
- It ensures that patients receive timely care and support throughout their journey within healthcare settings.



# 14.

# Future Work



# Future Enhancements:

**Request for Patient Companions Electronically Instead of the Paper-Based System, with the Addition of an Emergency Button.**



- Explore IoT integration for real-time health monitoring.

# 15. References



# References



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4. Munir, M. W., Perälä, S., & Mäkelä, K. (2012). Utilization and impacts of GPS tracking in healthcare: a research study for elderly care. *International Journal of Computer Applications*, 45(11), 35-37.
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# HealthMap

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We would also like to extend our heartfelt thanks to our families, who never hesitated to offer their unwavering support and motivation. Their words and sacrifices were the fuel that kept us going and helped us complete this project. We spared no effort in refining and reviewing our work multiple times to ensure it meets the highest standards.



# Thank you Any Questions?

