THOMAS MORE

MEMORY TRACKER
TEAM: LST - C

Analysis and design report

Egemen Alkan
Maciej Chuchra
Muhammad Zubair
Pierina Lopez Lopez Monserrate
Stjepan Raguz
Williem De Bie
German Novykov

2023 - 2024

Table of contents

1.Introduction

Over the last few years, the awareness of memory-related challenges affecting people's lives has increased, these challenges are significant difficulties in managing their daily lives, including appointments, tasks, and medication routines. Taking into account this need, in this report we would like to propose the development of an application that focuses on assisting people with memory problems in organizing and managing their daily lives.

Our target audience, that deals with memory issues, often struggle with their weekly schedules. From unique and recurring appointments to daily routines and medication management, the complexities of their lives required a reliable and intuitive solution. Many of our target audience rely on other individuals, like relatives, informal carers to keep track to their activities, but the challenge lies in tracking tasks, appointments, and medication processes effectively.

The app wants to do more than just help with daily tasks and medication. It also wants to tackle the problem of forgetting important details. It encourages friends, carers, and helpers to join in. Together, they can create a detailed log. This log doesn't just help the person remember events, but it also gives everyone a better understanding of how the person is doing overall.

This report suggests creating an easy-to-use app for people with memory problems. The goal is to make their lives smoother by aiding with daily tasks, medication management, and preserving important information. The app aims to improve the overall quality of life for these individuals and provide support for those caring for them.

2.Assignment description

Our team has been given the opportunity to work on a special project. Our job is to create an app that helps younger people, aged 18 to 50, who have trouble remembering things because of memory problems. We've

talked to the people who want this app and have done some research. What we've learned will help us build the app. This report will share what we know and show how our app can really help people who need it.

2.1. Background information

The reason we're making this app is to help these young people manage their daily lives on their own. Right now, they use calendars to keep track of appointments and daily tasks like chores, eating breakfast, and taking medicine. But sometimes they forget things, even with the calendar. They also keep diaries to remember what happens each day, like meeting friends. But finding the right notes can be hard. They need something better, like a digital diary.

Sometimes, they have bad days and it's important for their friends and family to help them remember what happened. Doctors also need to know about any side effects of medicines, which patients can forget. So, there's a real need for a system that helps with all of this.

2.2. Objectives and target groups

Main Users: The primary focus of our app is on younger individuals, specifically those between the ages of 18 and 50 who are living with dementia. This group often faces several challenges in their lives, possibly balancing work and family while managing their condition. The app aims to help them keep as much independence as possible by providing support with memory-related tasks and daily organization. This will improve their ability to manage personal responsibilities and improve their quality of life.

Caretakers: Caretakers, including family members and professionals, play an important role in supporting individuals with dementia. The app will provide them with tools to better monitor and assist with the patient’s daily activities, healthcare appointments, and medication schedules. This not only helps with the caretaking process but also offers peace of mind knowing that they have a reliable system to depend on.

Doctors: Medical professionals will find the app very helpful for tracking the patient’s health progress and medication intake. It will offer an up-to-date and simplified way to receive patient feedback, monitor side effects, and adjust treatments as necessary. This could lead to more effective management of the condition and potentially slow the progression of dementia symptoms.

Acquaintances: Friends and extended family members who might not be daily caretakers but are still involved in the patient's life can use the app to stay informed about the patient's schedule and provide emotional support which is vital for the well-being of someone with dementia.

Guests: Even casual visitors can engage with the app through a simplified access method, such as a QR code, to leave notes or messages that can help support the patient’s social interactions and memories of events.

In this section, we also highlight how an automated system will not only benefit individuals with dementia but will also improve the functioning of the organizations and associations that support them. By providing a centralized system that manages information and communication, the app will enable these groups to operate more effectively, ensuring that resources are utilized in the best way to support the well-being of younger dementia patients.

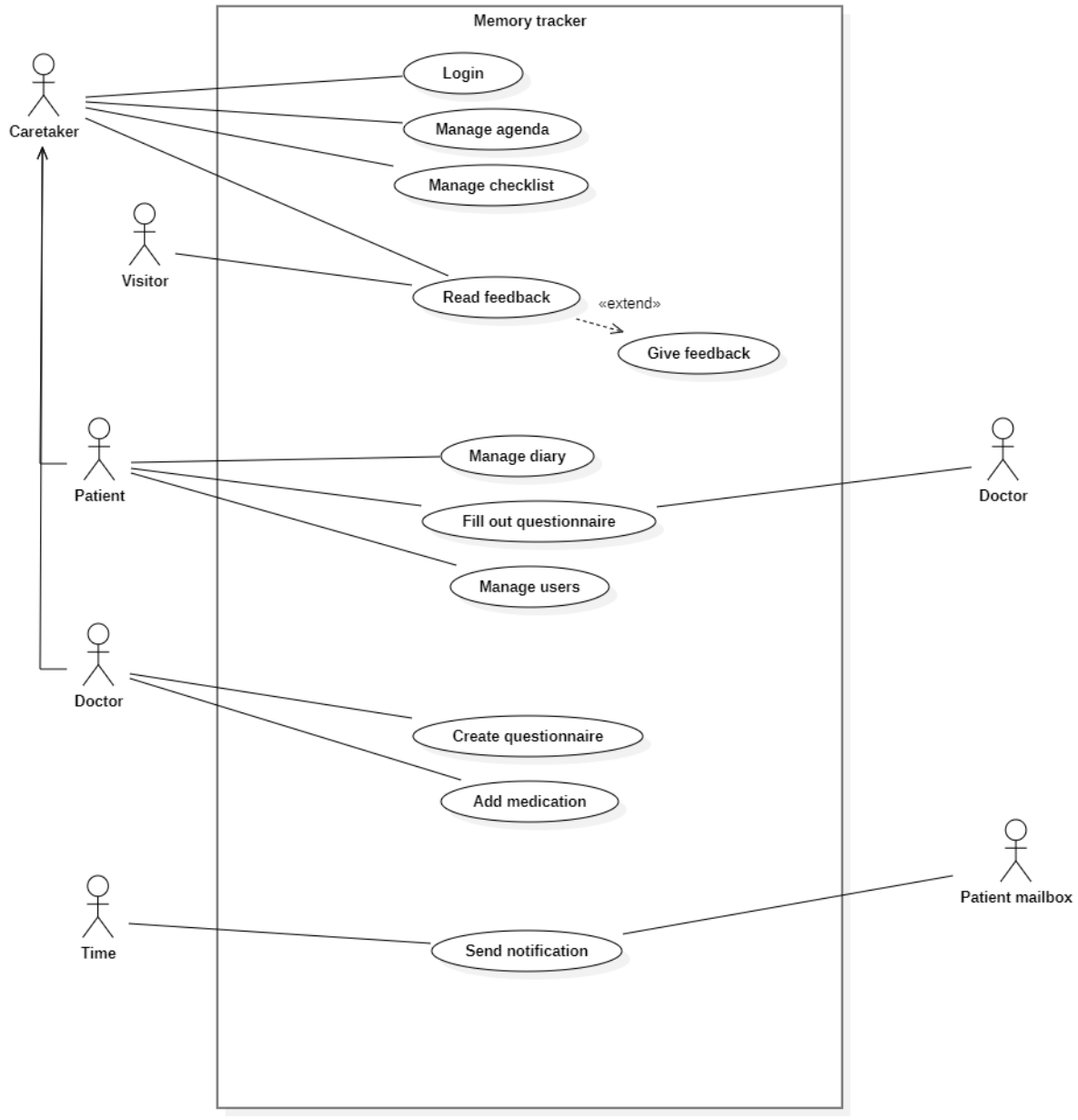
3.Requirements analysis

In the next section, we'll outline the specific functions our app will perform. We've gathered the necessary insights from our discussions with the client and through our research. Now, we're ready to detail these functions.

We'll start with a use case diagram to give a visual representation of how users will interact with the app. Following that, we'll describe each function, focusing on its purpose and importance in the overall system. Our intention is to provide a clear and comprehensive understanding of how each feature will contribute to the effectiveness of the app.

3.1. Functional requirements

Use Case Diagram

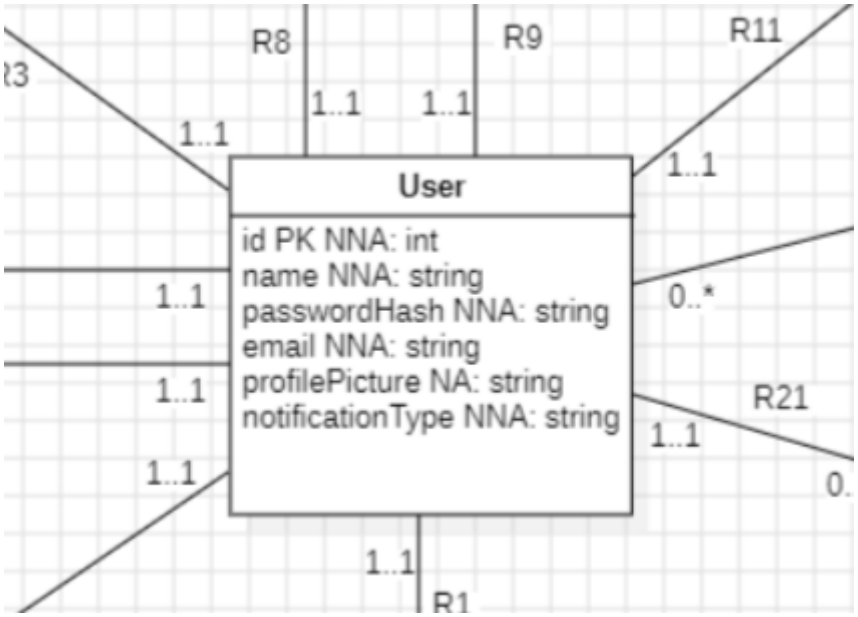


Use Case Prototypes with Data Model View

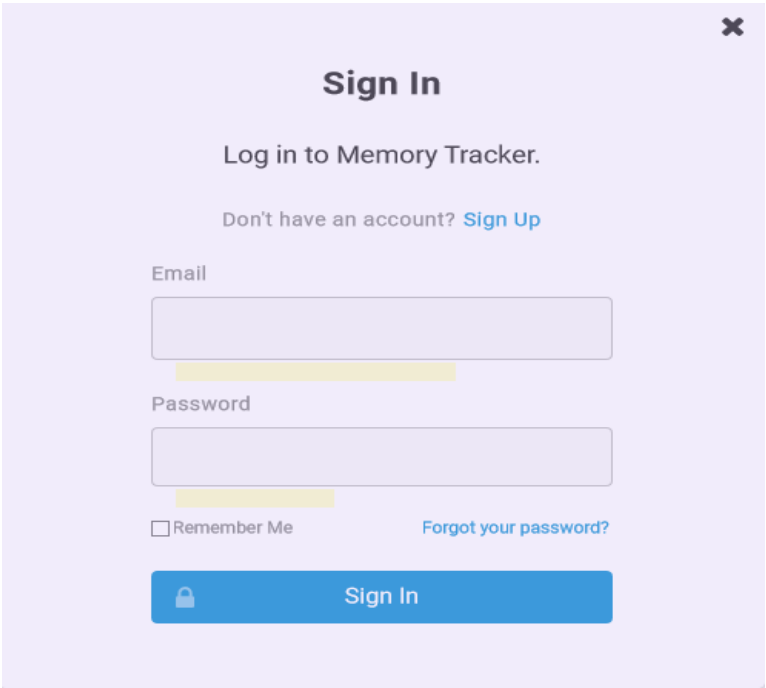
Login

Functionality: As a caretaker, I can login.

Data model view:



Screens:

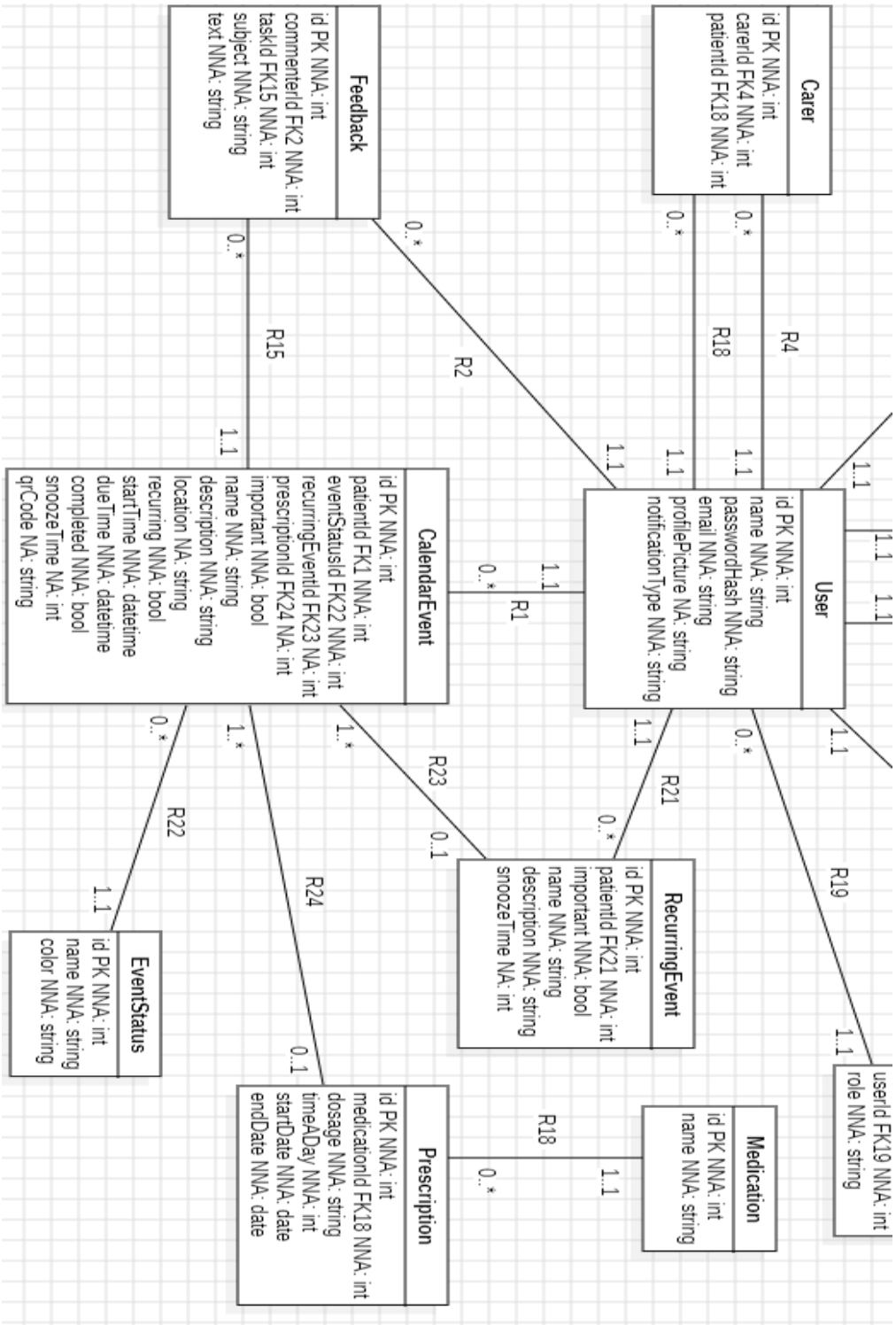


Manage Agenda

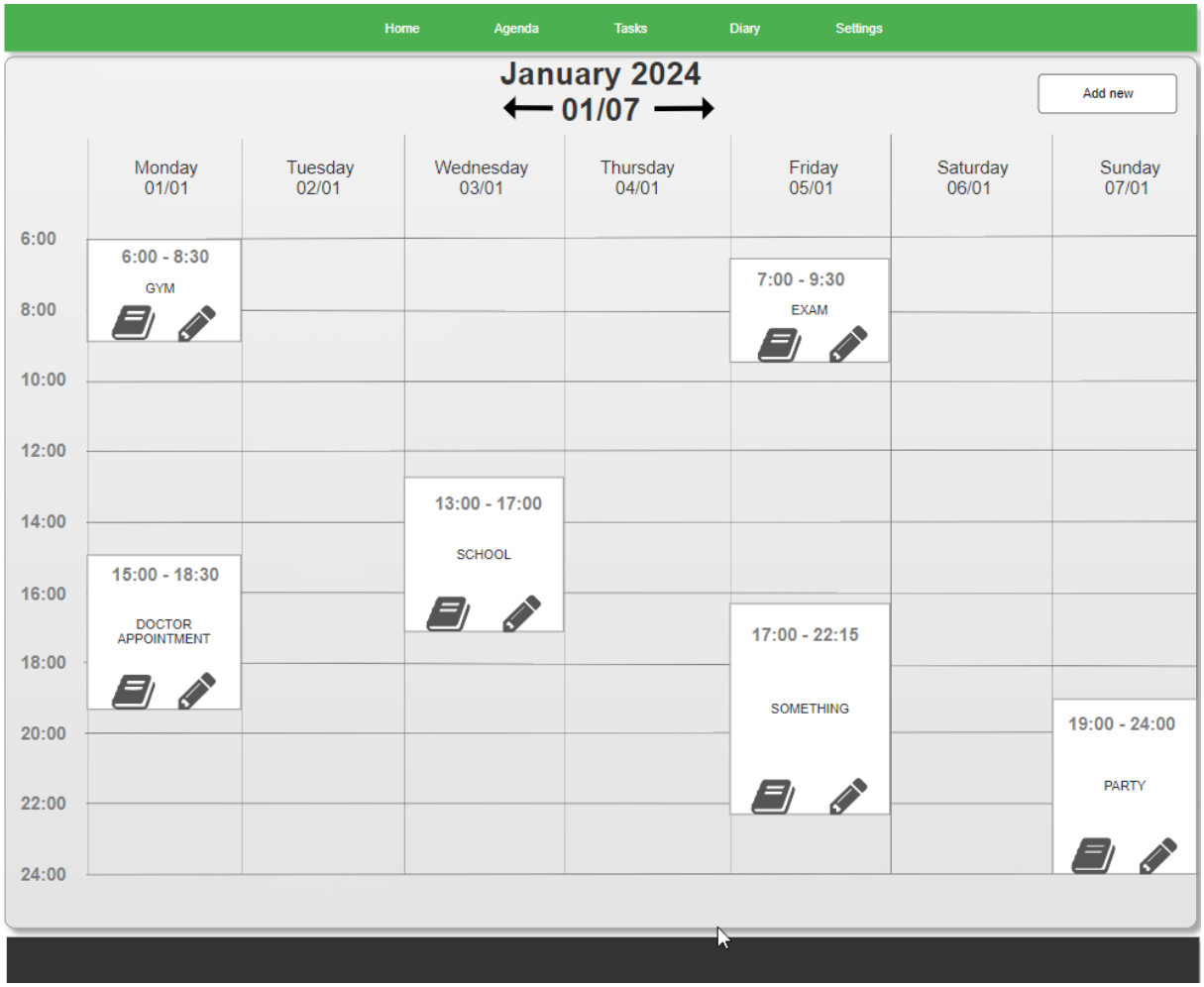
Functionality: As a caretaker, I can manage the agenda to plan the tasks accordingly.

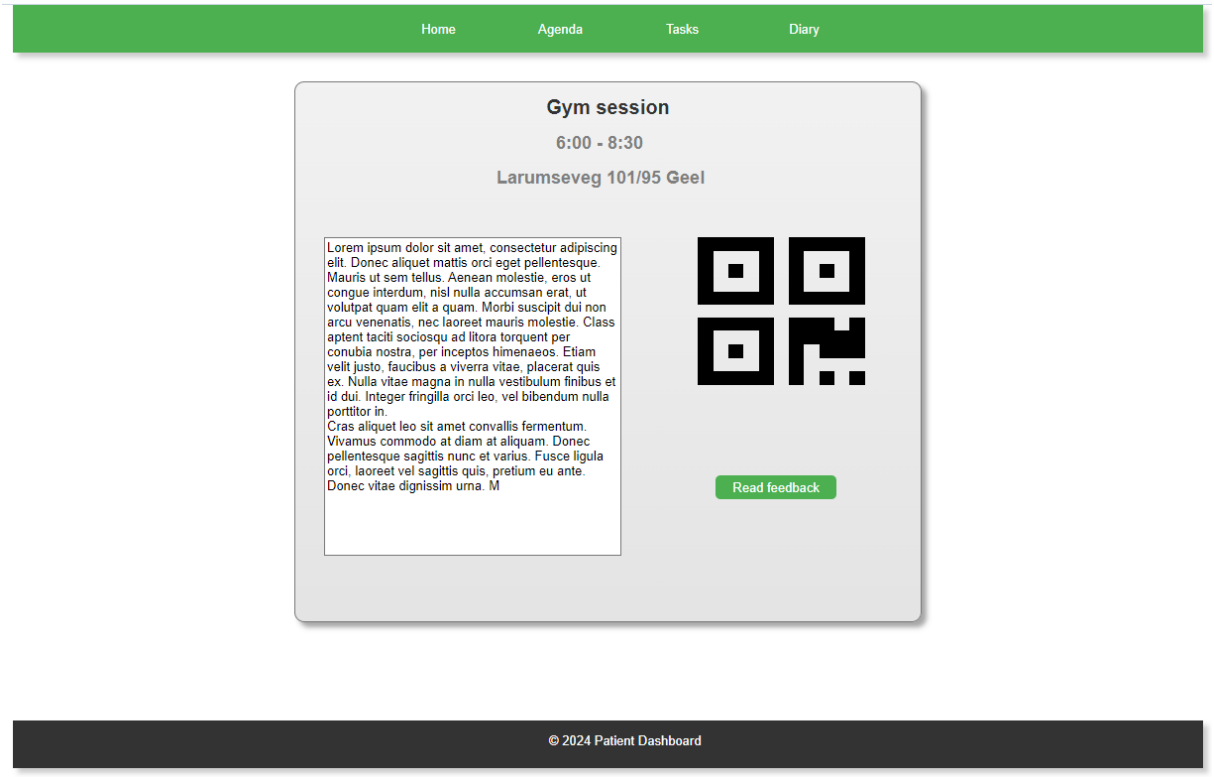
Precondition: The actor is logged in as caretaker.

Data model view: Calendar Event



Screens:


Home
Agenda
Tasks
Diary
Settings
January 2024
01/07
Add new
Monday 01/01
Tuesday 02/01
Wednesday 03/01
Thursday 04/01
Friday 05/01
Saturday 06/01
Sunday 07/01
6:00
8:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
24:00
6:00 - 8:30
GYM
7:00 - 9:30
EXAM
13:00 - 17:00
SCHOOL
15:00 - 18:30
DOCTOR APPOINTMENT
17:00 - 22:15
SOMETHING
19:00 - 24:00
PARTY

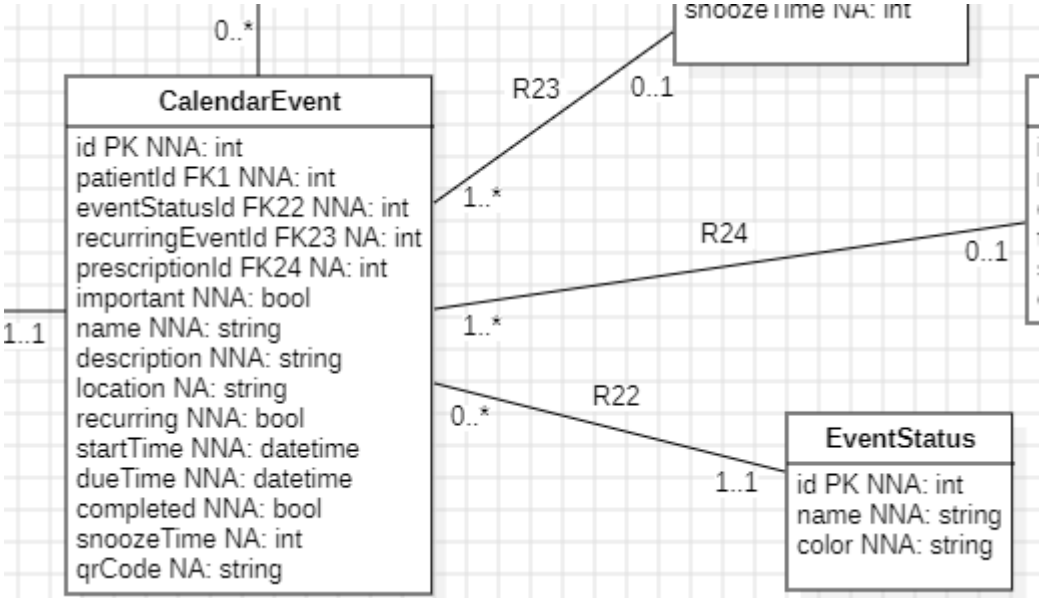

Home
Agenda
Tasks
Diary
Gym session
6:00 - 8:30
Larumseveg 101/95 Geel
Lorem ipsum dolor sit amet, consectetur adipiscing elit. Donec aliquet mattis orci eget pellentesque. Mauris ut sem tellus. Aenean molestie, eros ut congue interdum, nisl nulla accumsan erat, ut volutpat quam elit a quam. Morbi suscipit dui non arcu venenatis, nec laoreet mauris molestie. Class aptent taciti sociosqu ad litora torquent per conubia nostra, per inceptos himenaeos. Etiam velit justo, faucibus a viverra vitae, placerat quis ex. Nulla vitae magna in nulla vestibulum finibus et id dui. Integer fringilla orci leo, vel bibendum nulla porttitor in.
Cras aliquet leo sit amet convallis fermentum. Vivamus commodo at diam at aliquam. Donec pellentesque sagittis nunc et varius. Fusce ligula orci, laoreet vel sagittis quis, pretium eu ante. Donec vitae dignissim urna. M
Read feedback
© 2024 Patient Dashboard

Manage Checklist

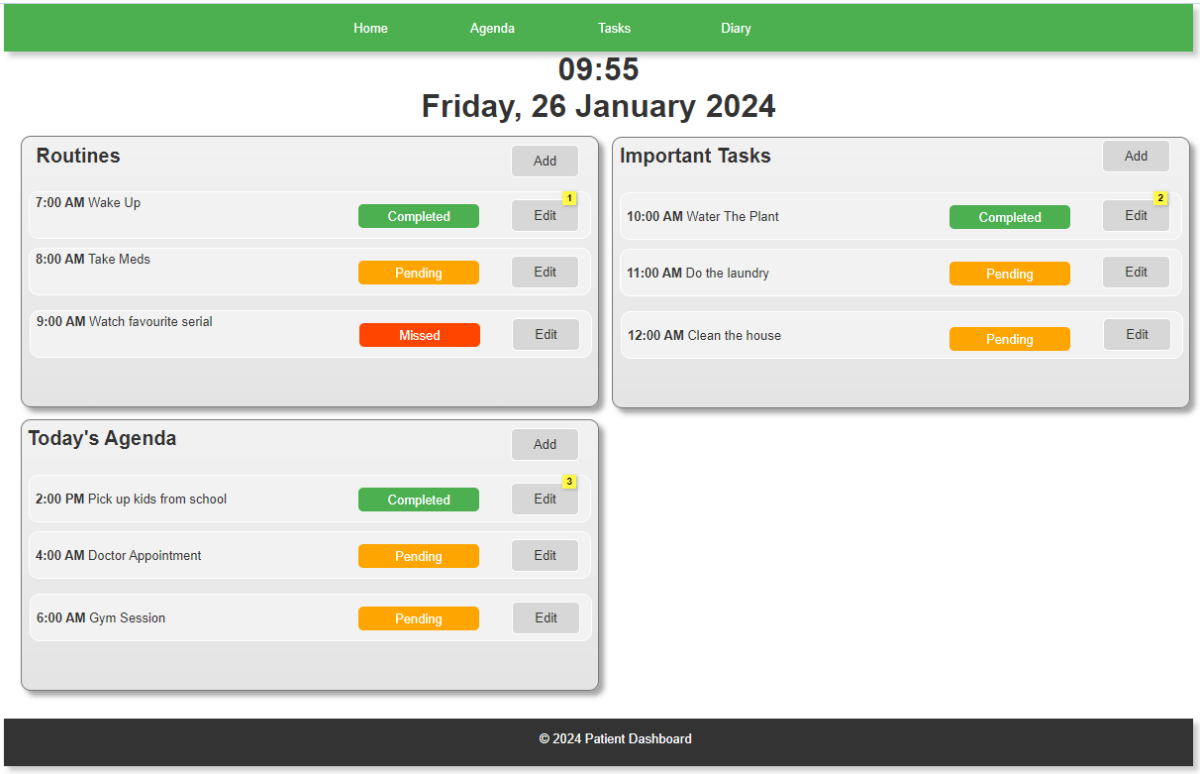
Functionality: As a caretaker, I can manage checklists to keep track of the tasks.

Precondition: The actor is logged in as caretaker.

Data model view: Event Status



Screens:

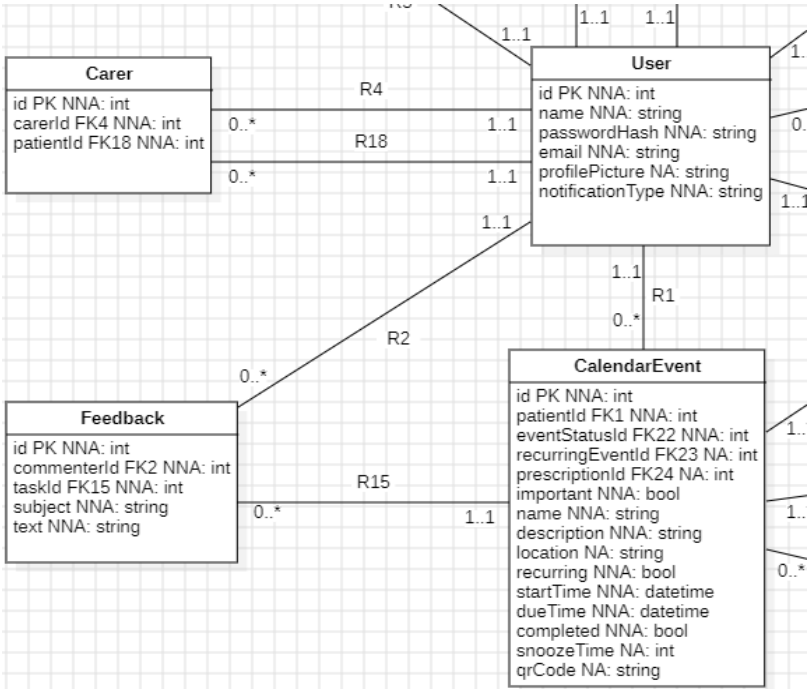


Read Feedback (Caretaker)

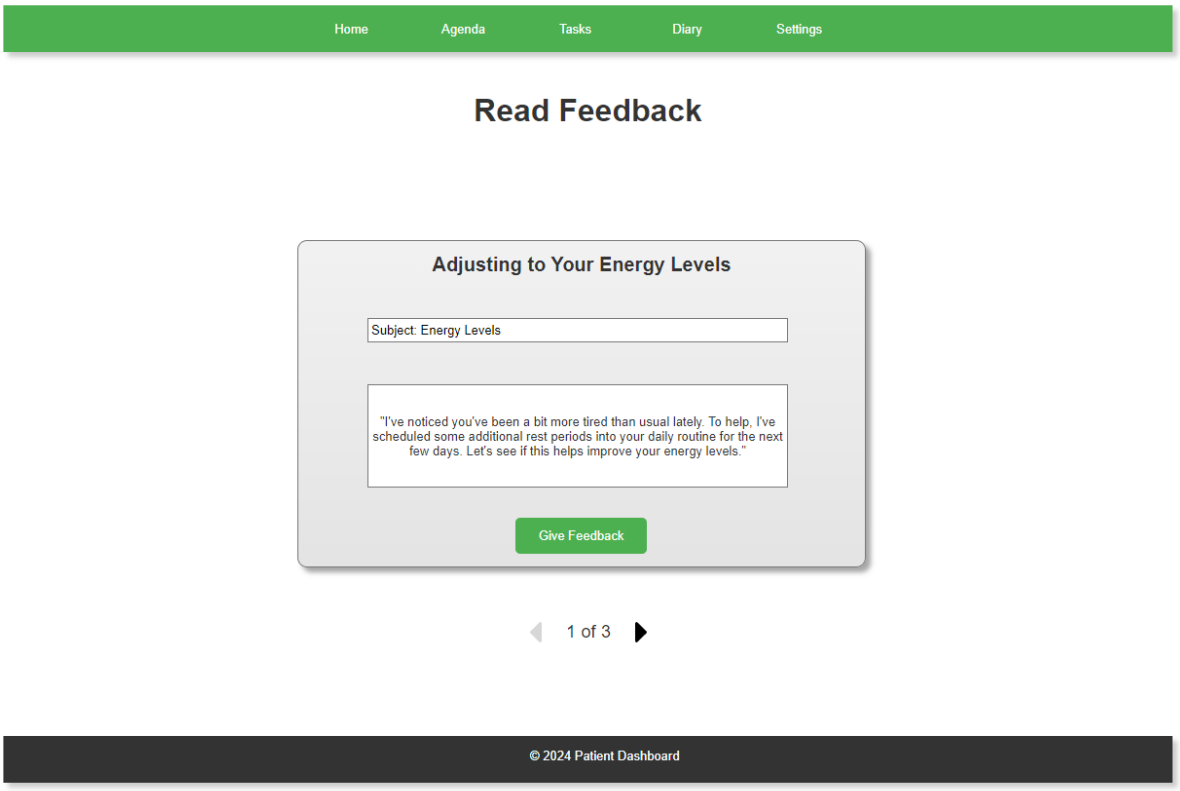
Functionality: As a caretaker, I can read the feedback.

Precondition: The actor is logged in as caretaker.

Data model view: Feedback



Screens:

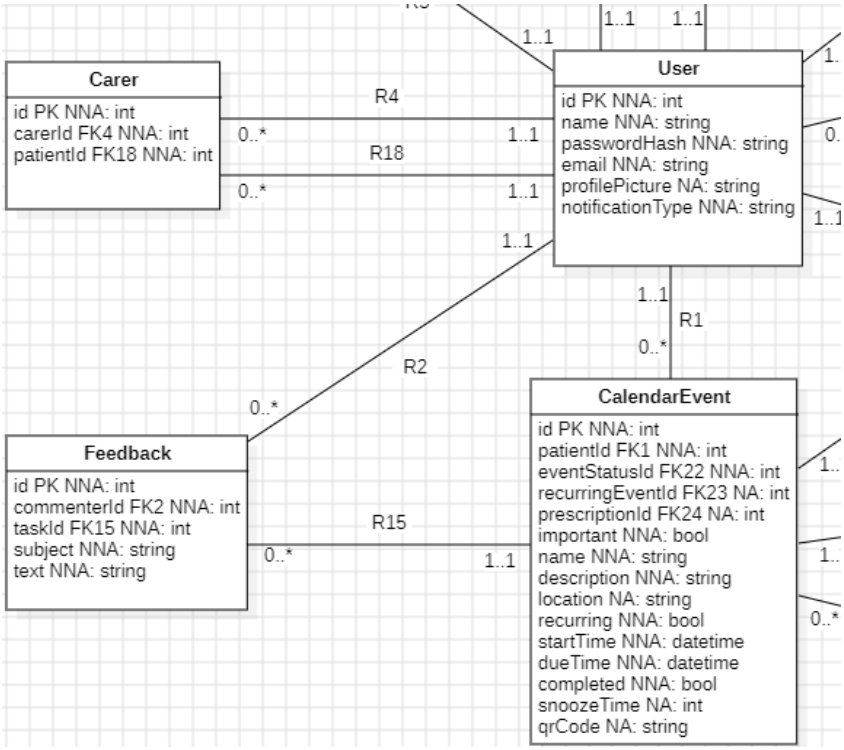


Read feedback (Visitor)

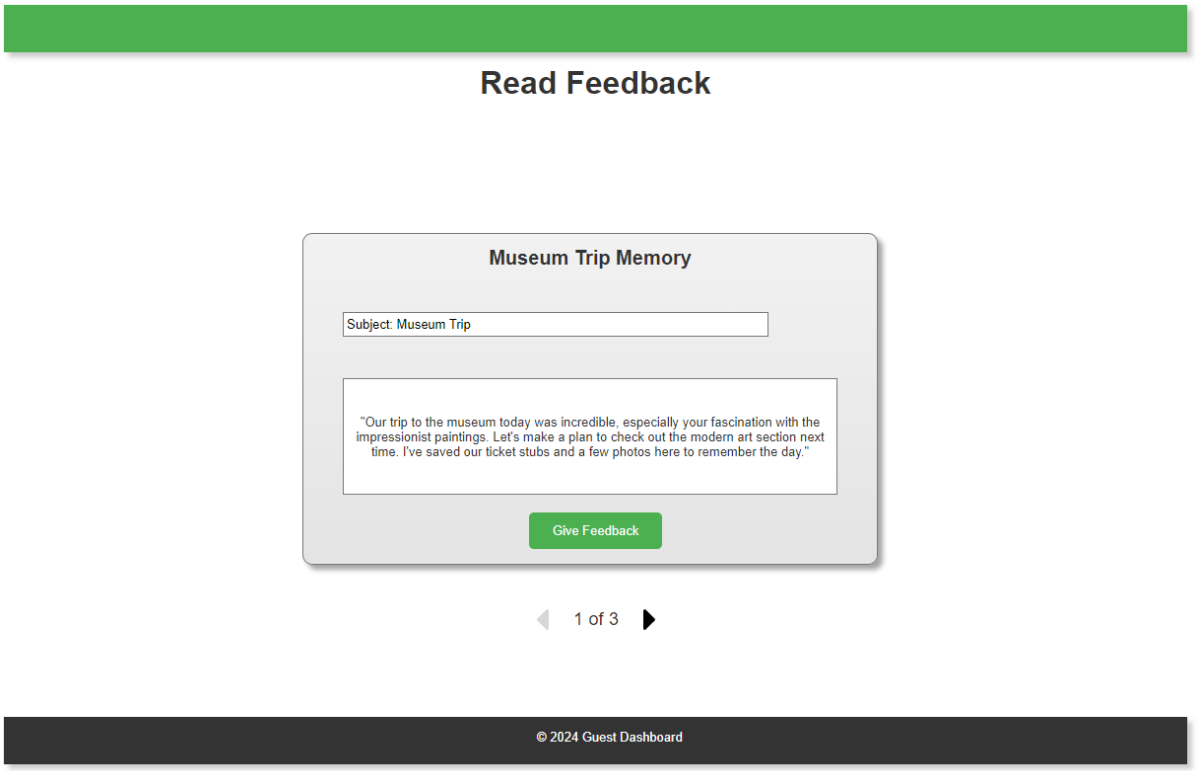
Functionality: As a visitor, I can read the feedback.

Precondition: The visitor scans the QR code.

Data model view: Feedback



Screens:

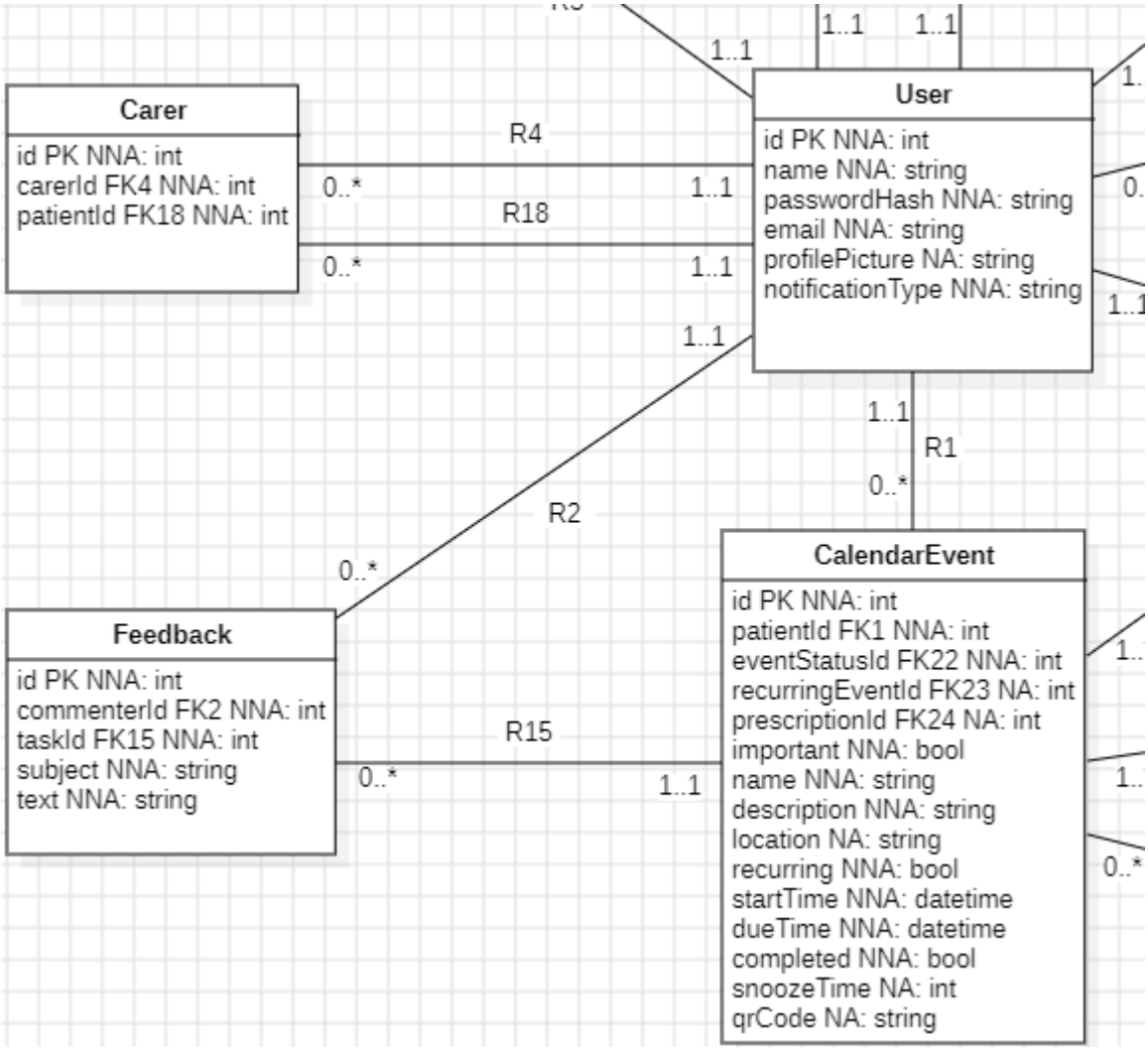


Give Feedback (Caretaker)

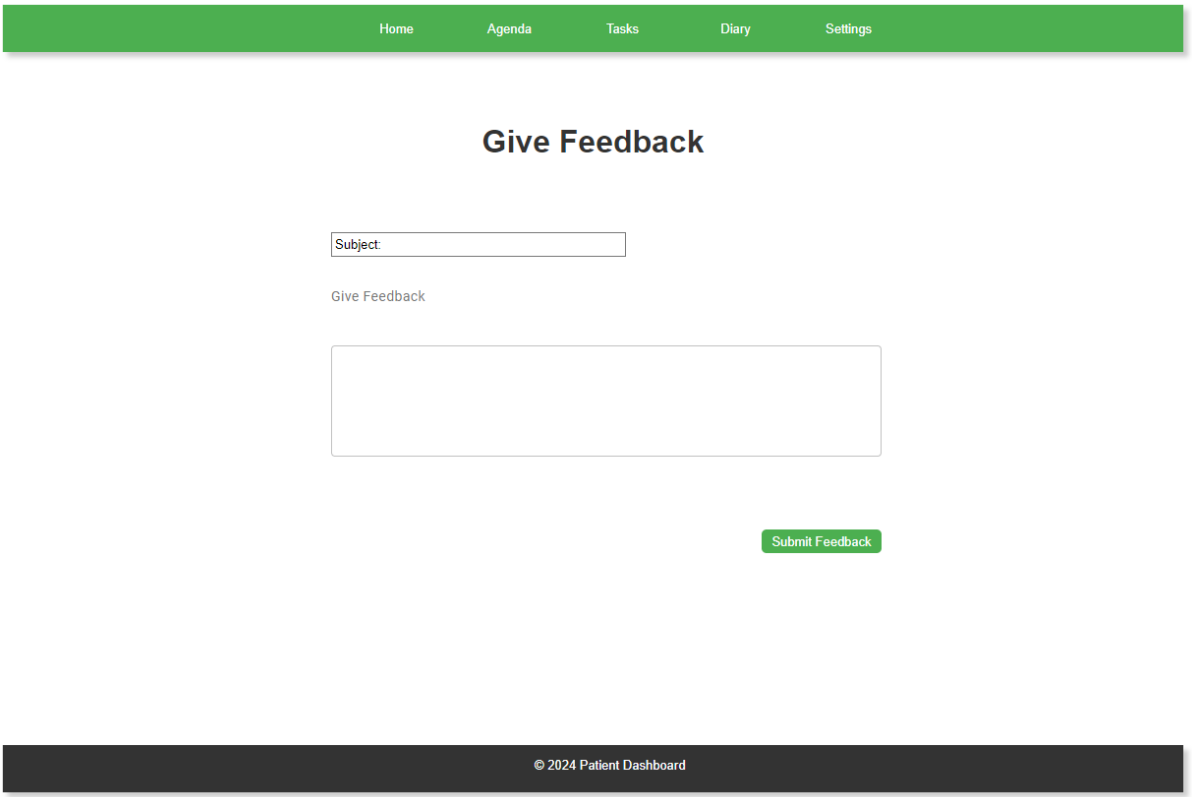
Functionality: As a caretaker, I can give feedback.

Precondition: The actor is logged in as caretaker.

Data model view: Feedback



Screens:

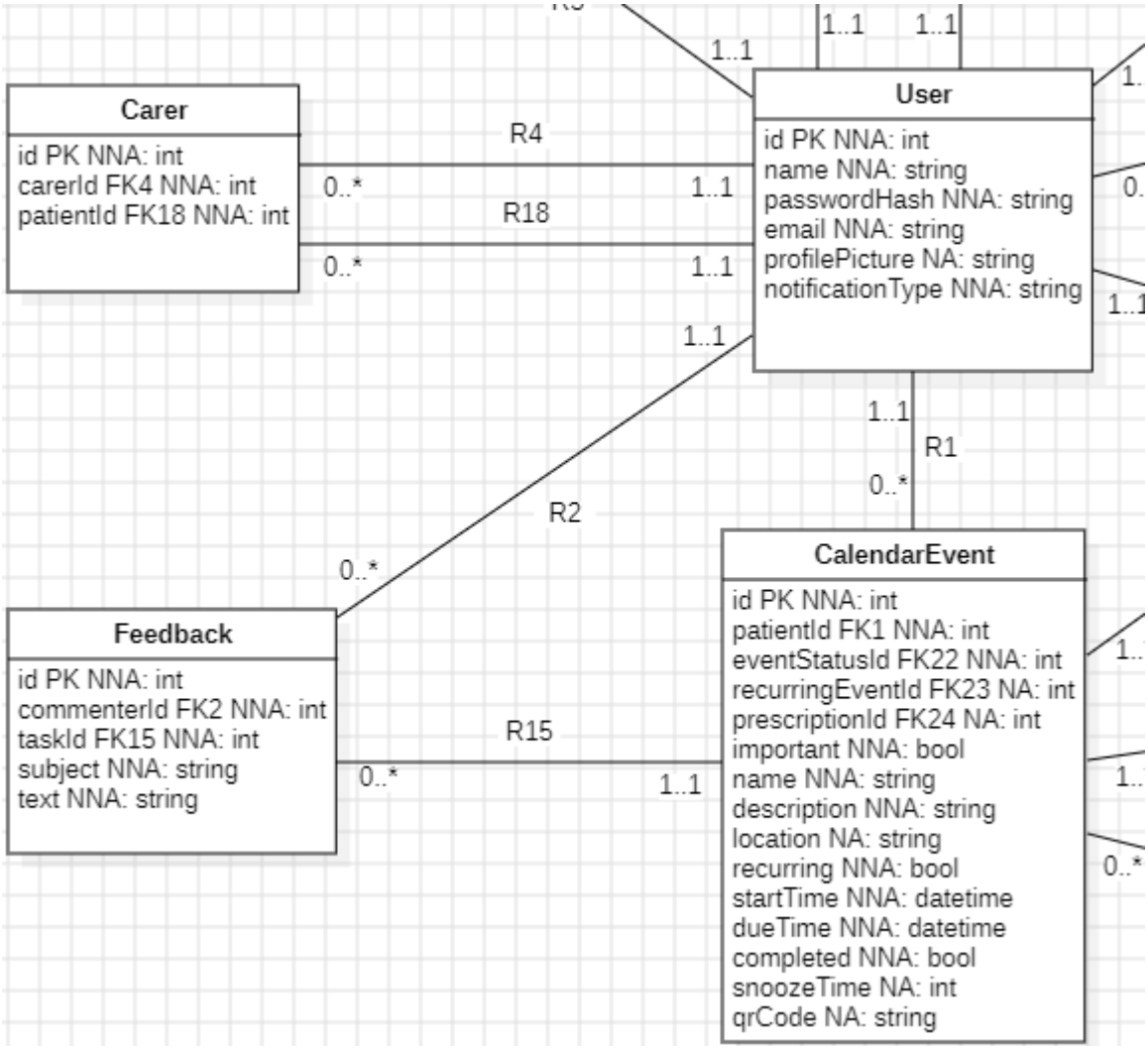


Give Feedback (Visitor)

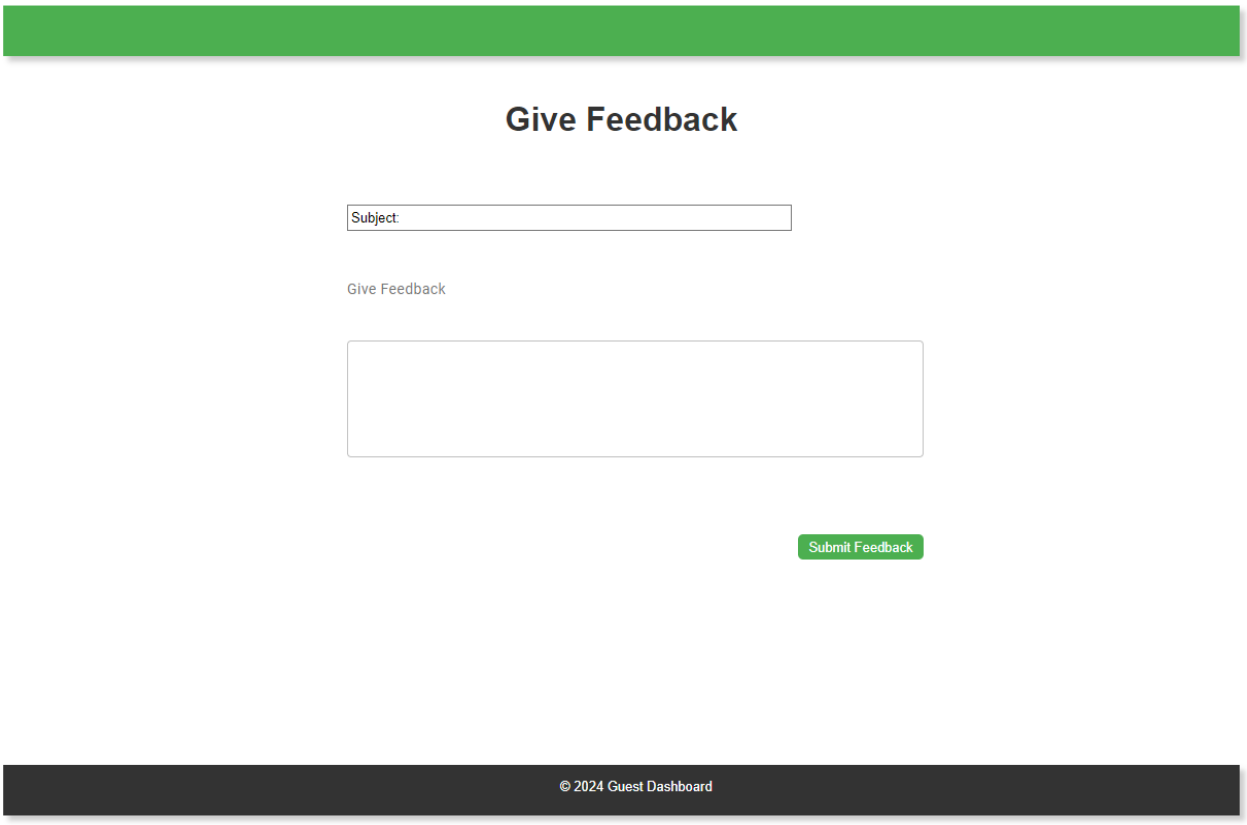
Functionality: As a visitor, I can give feedback.

Precondition: The actor is logged in as caretaker.

Data model view: Feedback



Screens:

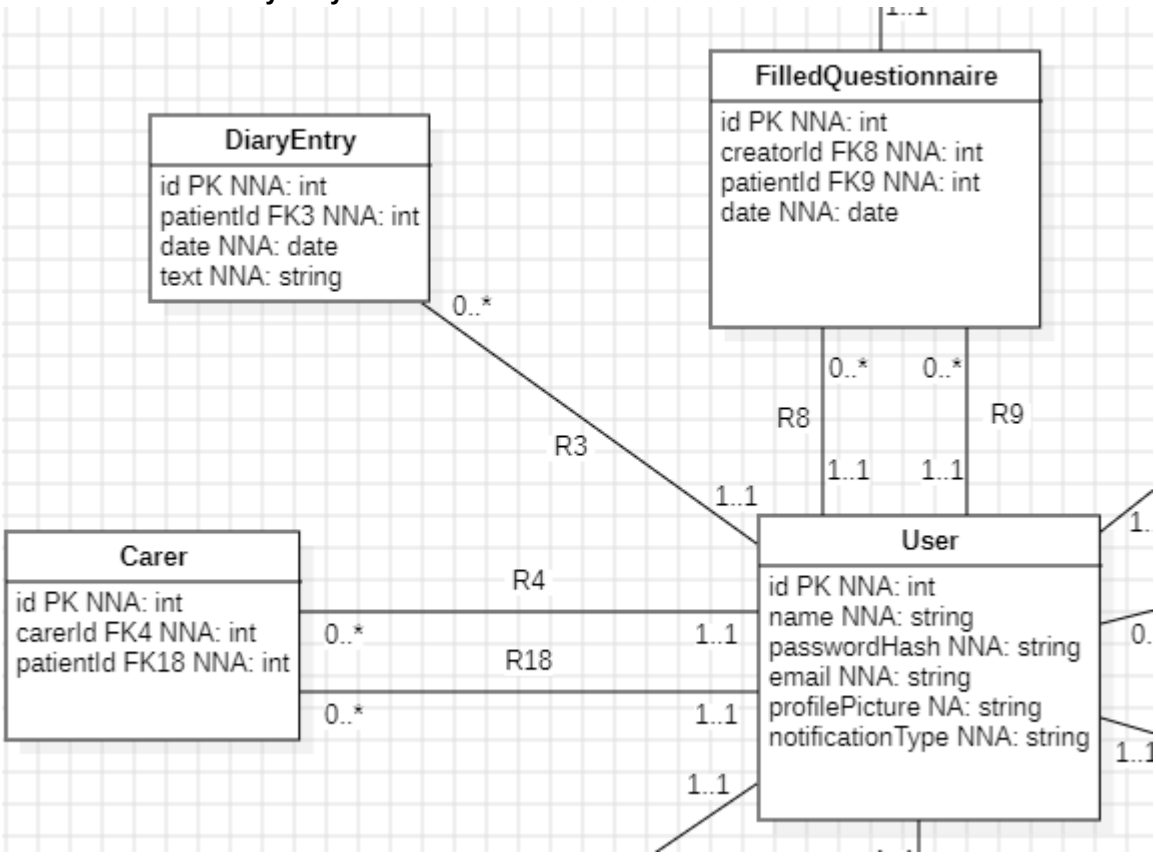


Manage Diary

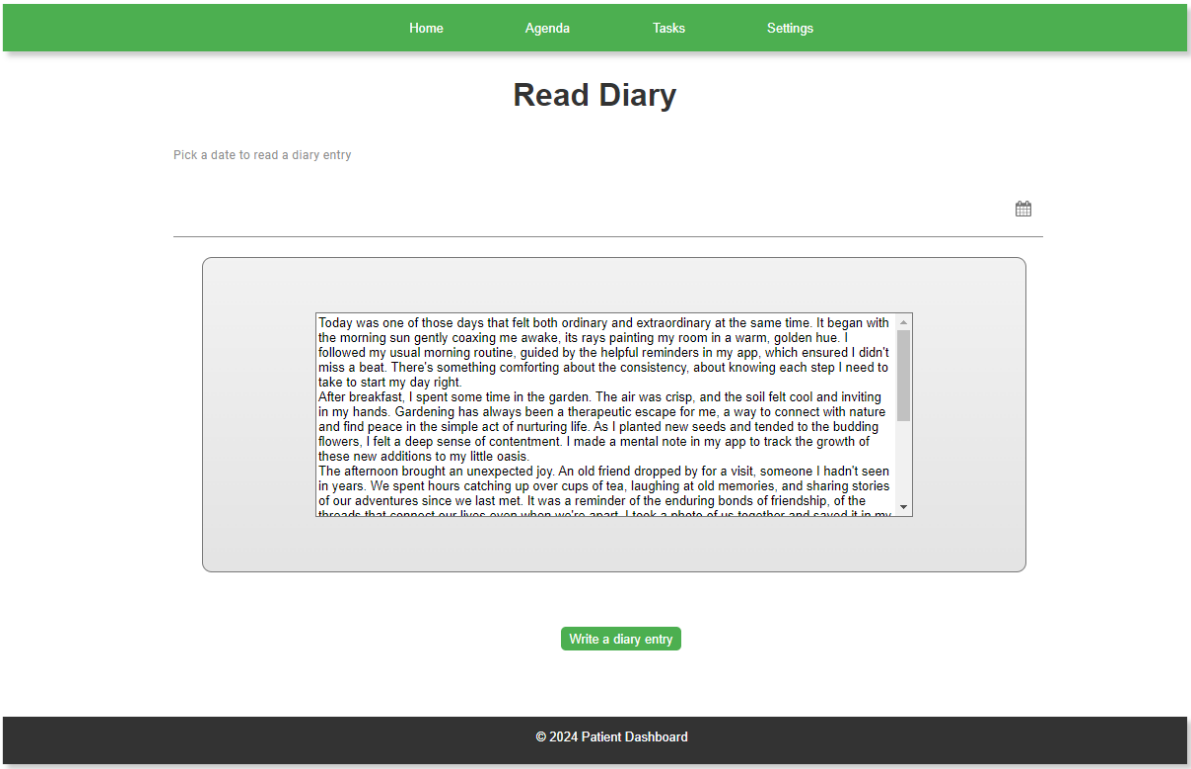
Functionality: As a Patient, I can manage my diary to keep track of my health and activities.

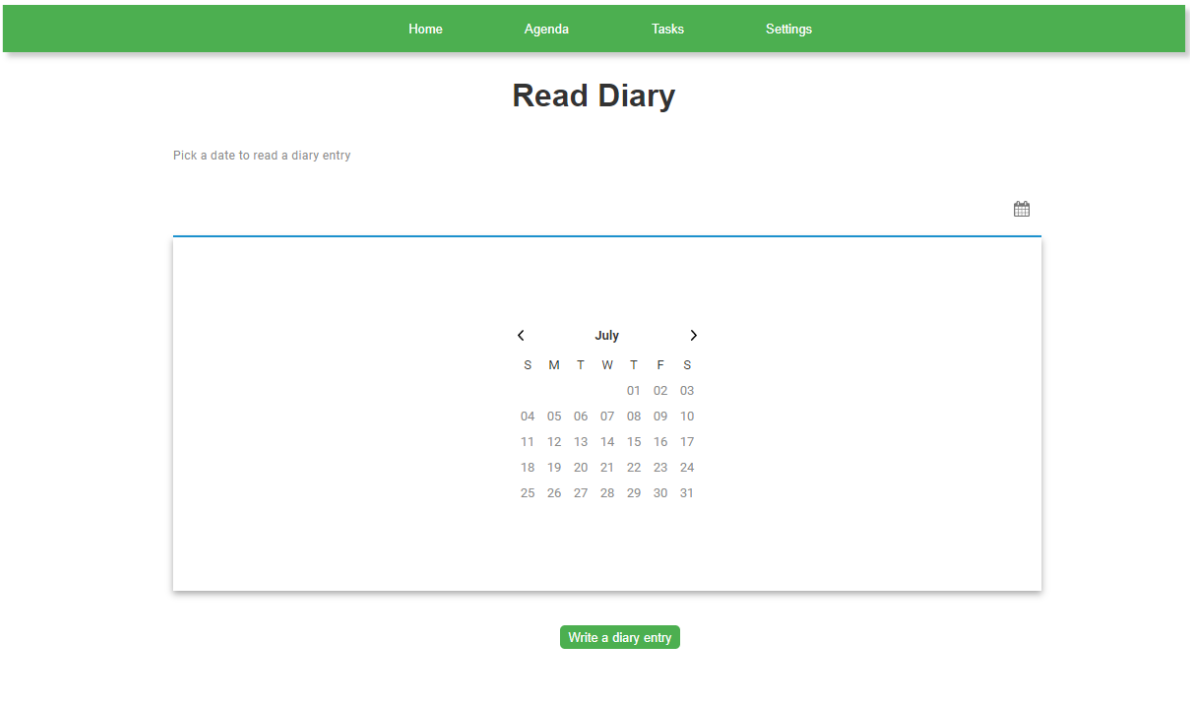
Precondition: The patient must be logged in to access their diary.

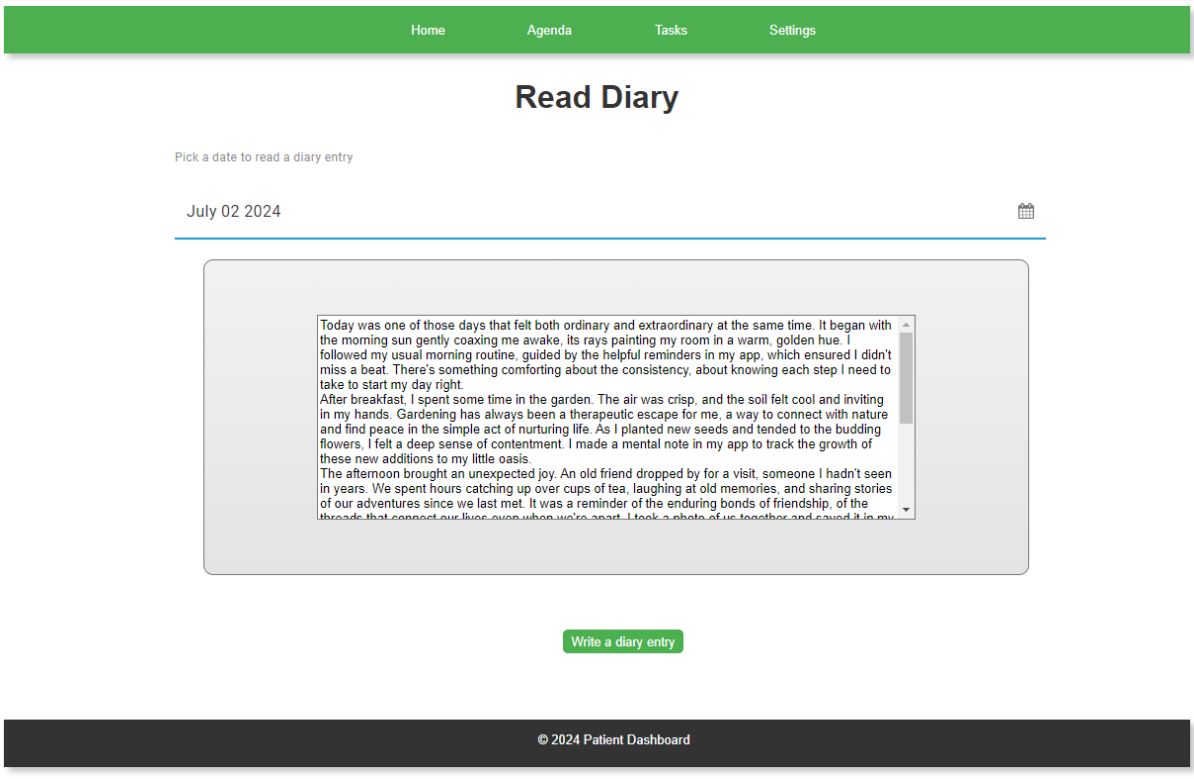
Data model view: DiaryEntry

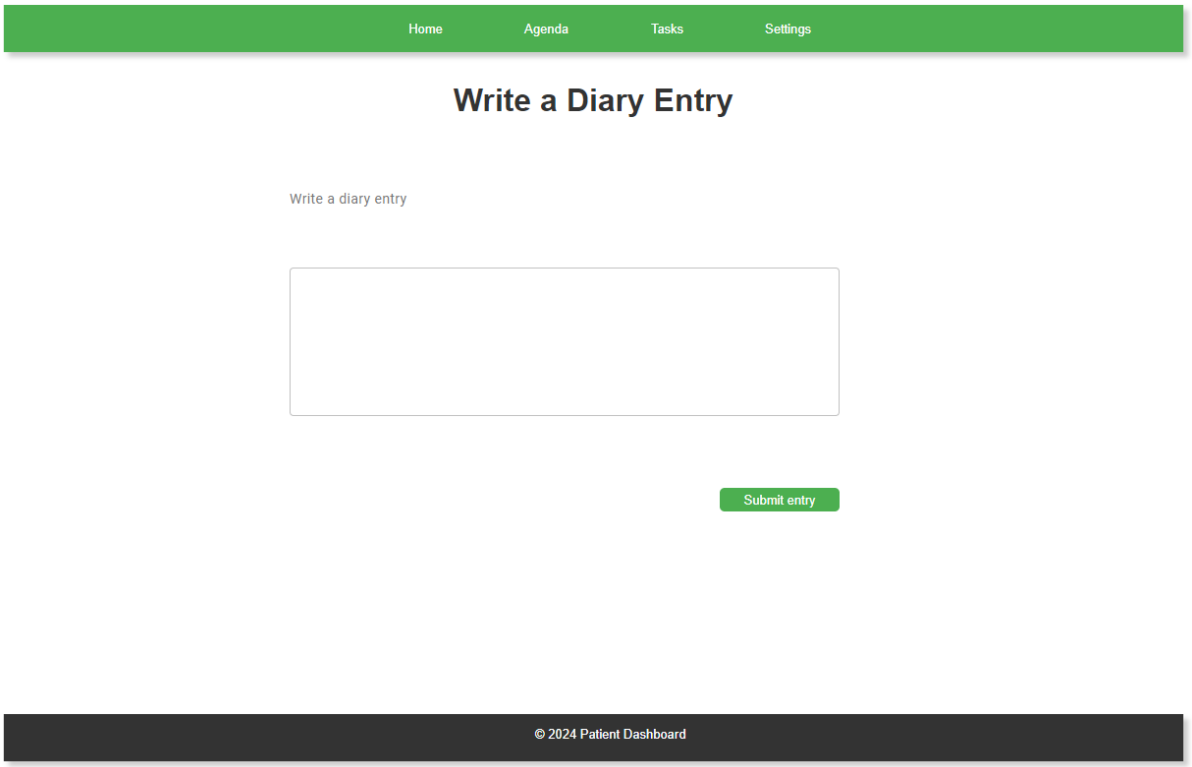


Screens:




Home
Agenda
Tasks
Settings
Read Diary
Pick a date to read a diary entry
July
S M T W T F S
01 02 03
04 05 06 07 08 09 10
11 12 13 14 15 16 17
18 19 20 21 22 23 24
25 26 27 28 29 30 31
Write a diary entry
© 2024 Patient Dashboard


Home
Agenda
Tasks
Settings
Read Diary
Pick a date to read a diary entry
July 02 2024
Today was one of those days that felt both ordinary and extraordinary at the same time. It began with the morning sun gently coaxing me awake, its rays painting my room in a warm, golden hue. I followed my usual morning routine, guided by the helpful reminders in my app, which ensured I didn't miss a beat. There's something comforting about the consistency, about knowing each step I need to take to start my day right.
After breakfast, I spent some time in the garden. The air was crisp, and the soil felt cool and inviting in my hands. Gardening has always been a therapeutic escape for me, a way to connect with nature and find peace in the simple act of nurturing life. As I planted new seeds and tended to the budding flowers, I felt a deep sense of contentment. I made a mental note in my app to track the growth of these new additions to my little oasis.
The afternoon brought an unexpected joy. An old friend dropped by for a visit, someone I hadn't seen in years. We spent hours catching up over cups of tea, laughing at old memories, and sharing stories of our adventures since we last met. It was a reminder of the enduring bonds of friendship, of the
Write a diary entry
© 2024 Patient Dashboard

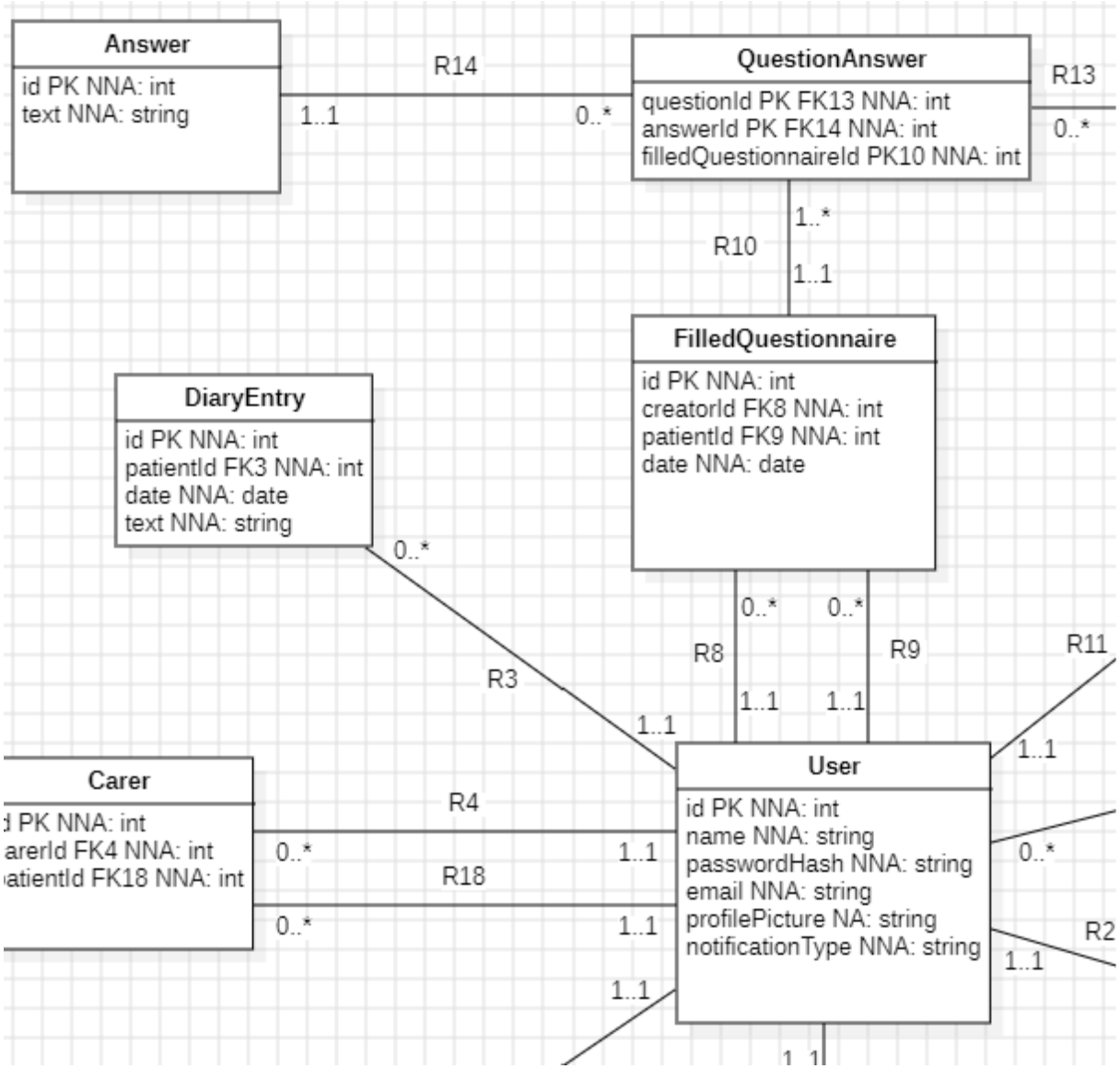


Fill out questionnaire

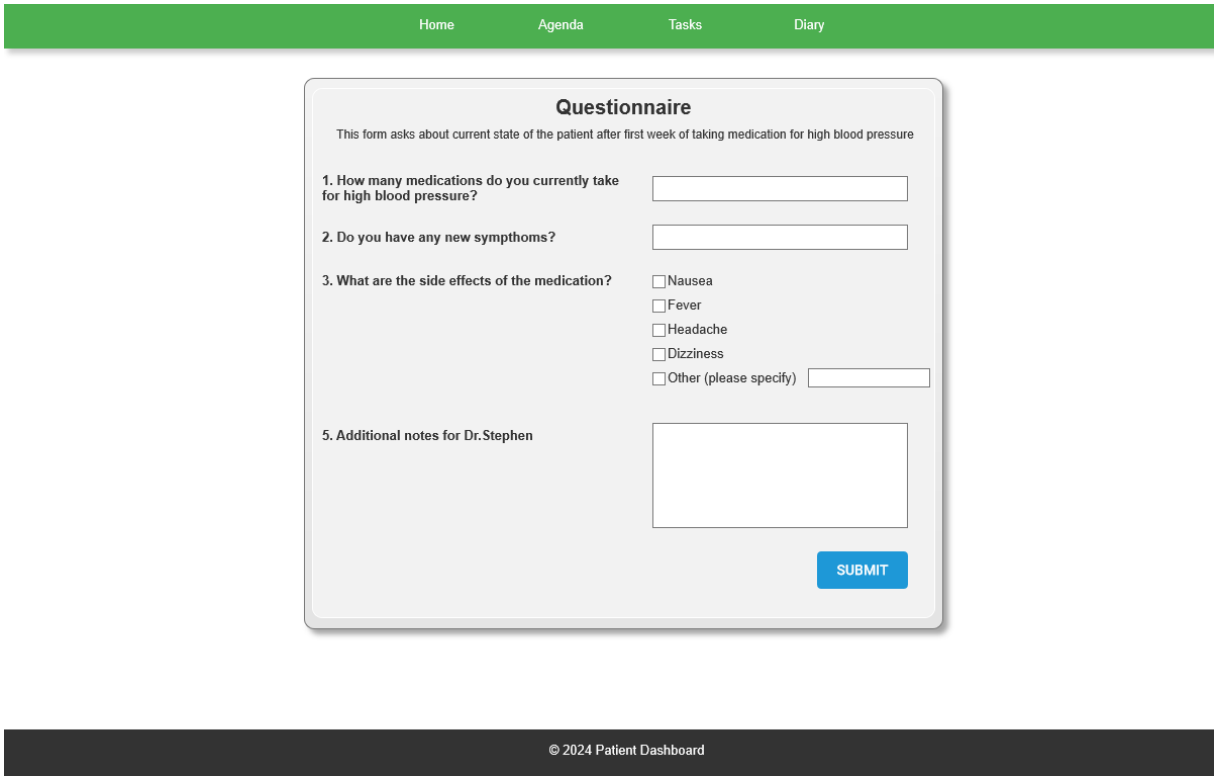
Functionality: As a Patient, I can fill out a questionnaire to provide health updates or information.

Precondition: The patient must have access to the questionnaire, which is likely provided by the doctor or the healthcare system.

Data model view: FilledQuestionnaire



Screens:

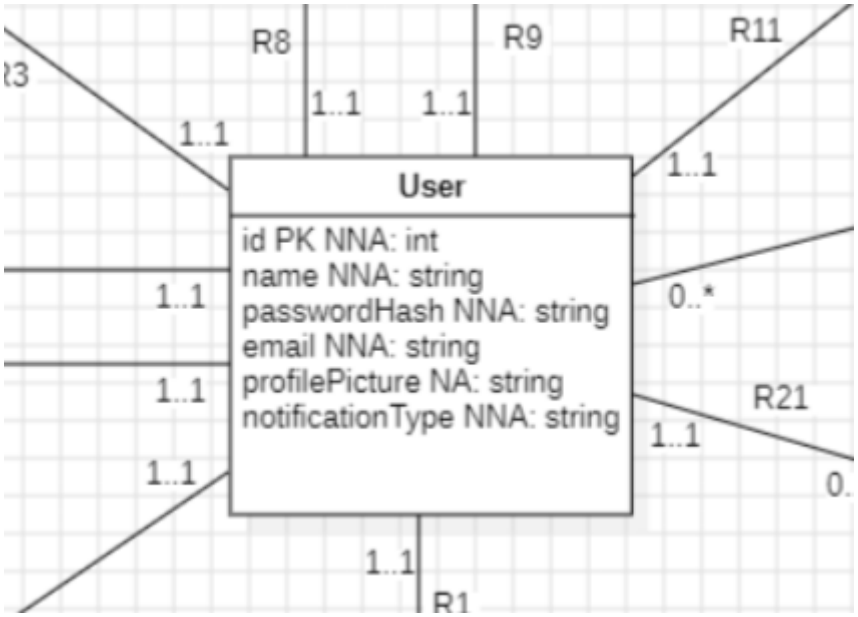


Manage User

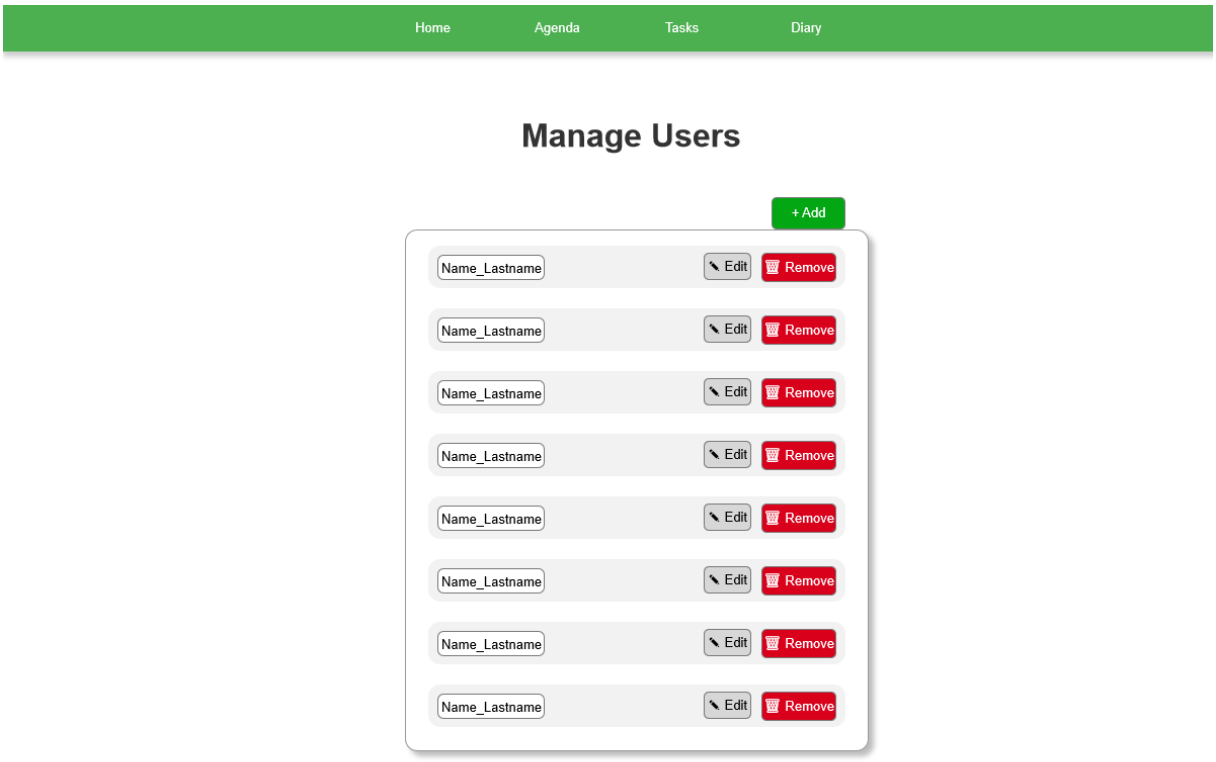
Functionality: As a Patient, I can manage users to control who has access to my health records and personal health information.

Precondition: The patient must be registered and logged into the system, and must have the necessary permissions to manage users associated with their account.

Data model view:



Screens:

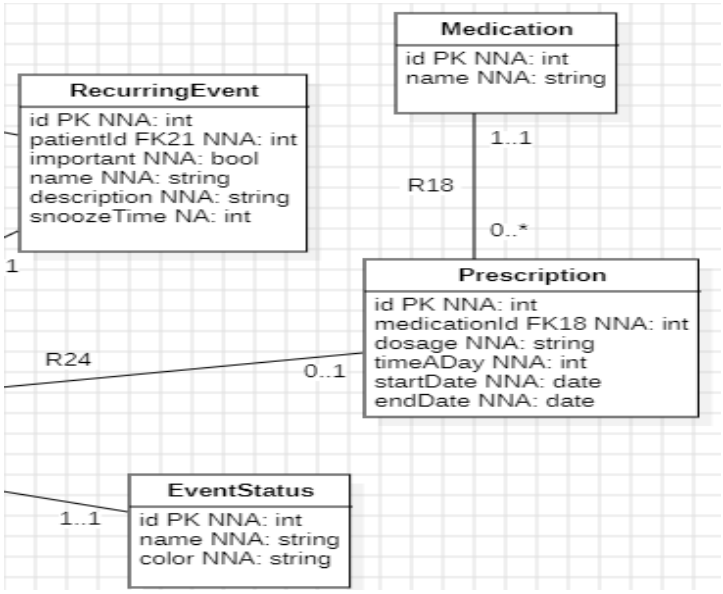


Add medication

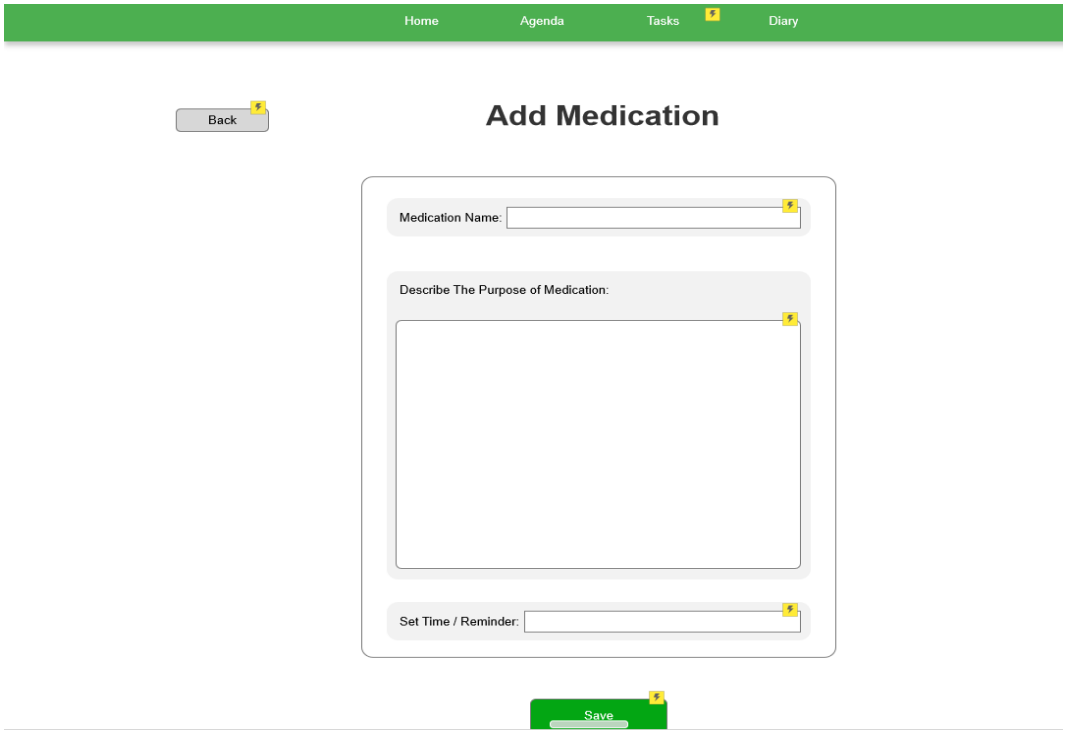
Functionality: As a Doctor, I can add medication to a patient's profile to ensure proper treatment is followed.

Precondition: The doctor must have access to the patient's profile and sufficient privileges to modify the medication list.

Data model view:



Screens:

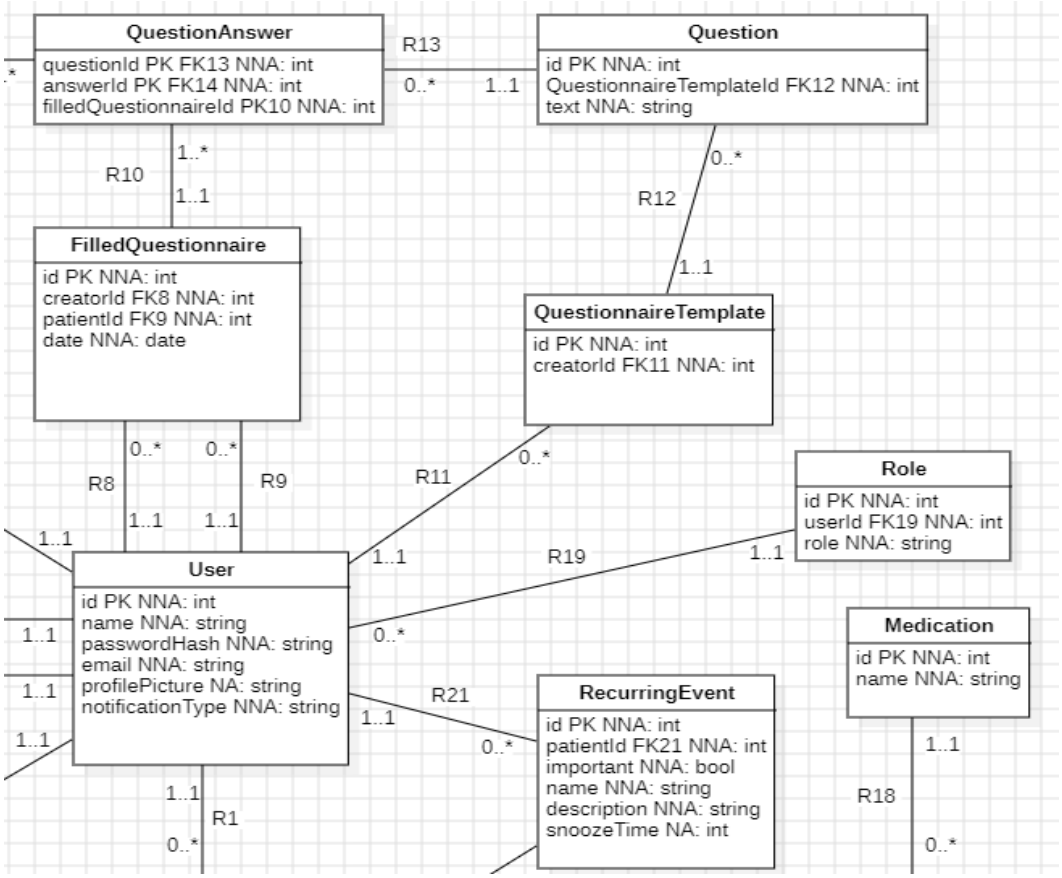


Create questionnaire

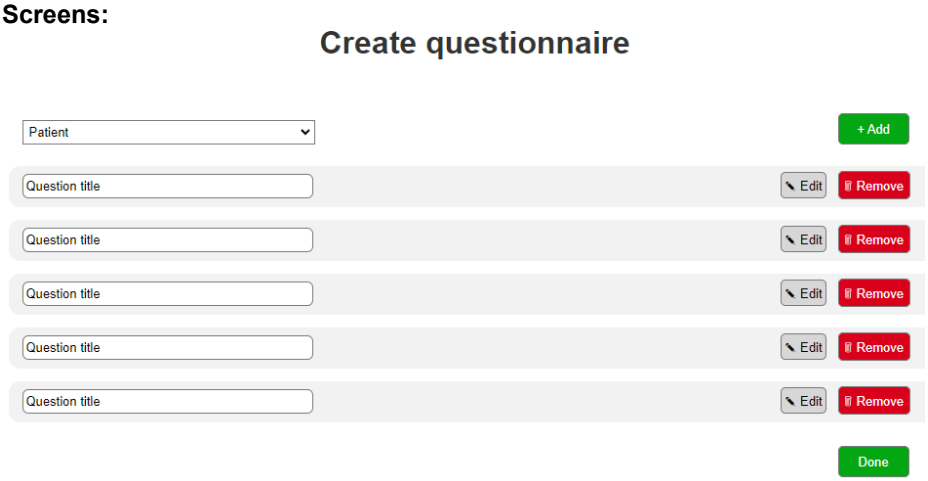
Functionality: As a Doctor, I can create a questionnaire to collect specific information from patients.

Precondition: The doctor must be logged in and have the necessary permissions to create questionnaires.

Data model view: QuestionnaireTemplate



Screens:

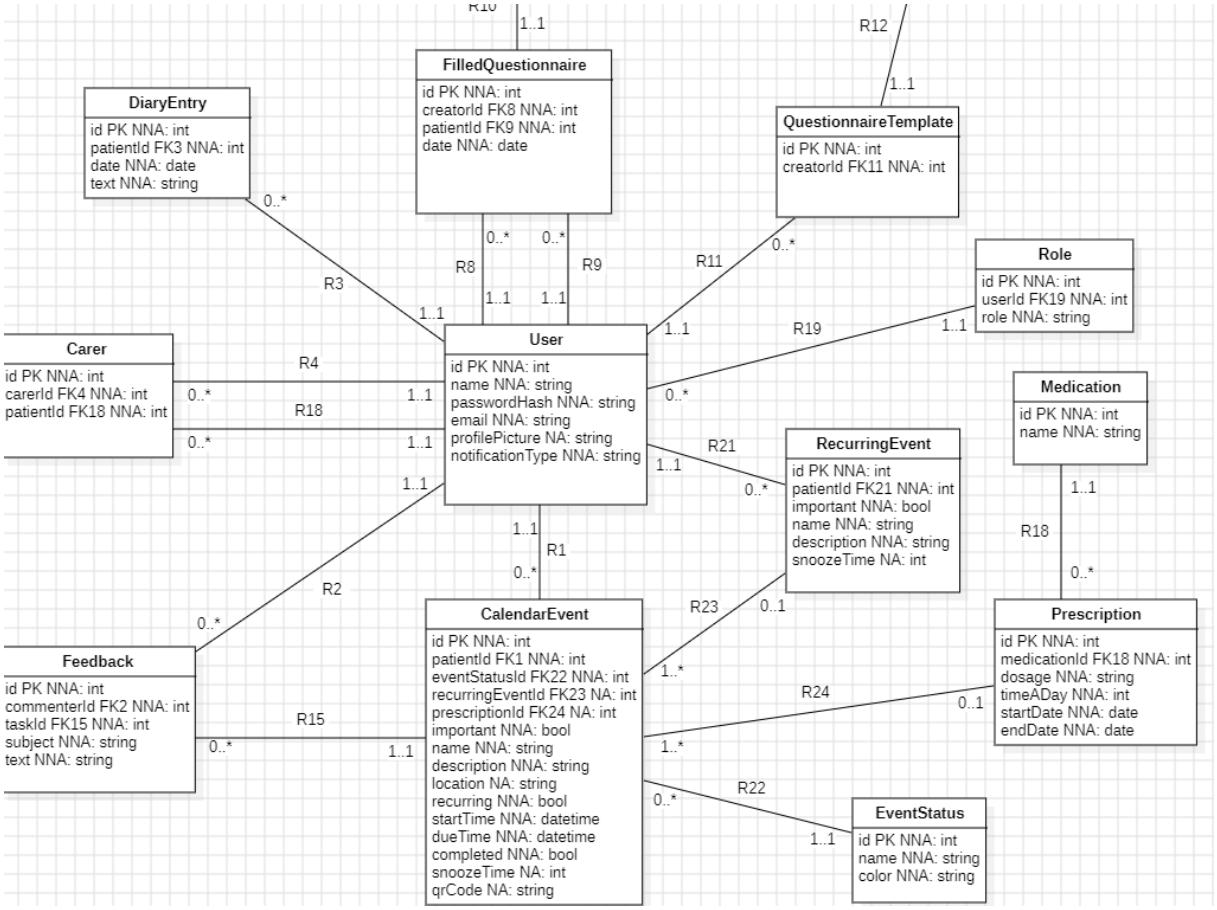


Send notification

Functionality: As a Time-based function, I can send notifications to remind patients of important tasks or information.

Precondition: The notification system must be set up with triggers based on time or events to send out notifications accordingly.

Data model view:



Non-functional requirements

Implementation

Our project will be written in PHP with Laravel framework. To manage design and give our project an eye-friendly look we are going to use CSS with Tailwind framework. To create solid support for the application, we decided to use MySQL which is operating in a relational structure database. For authentication and access control, we will be using Jetstream which

works alongside the Laravel framework.

External Interface

Our application should be compatible with Google Calendar and Trello because (thanks to our private research) we are aware that they are the most popular applications used by people with Dementia.

Security

Use data protection procedures to guarantee user data security and privacy. To prevent unwanted access to user accounts secure authentication methods. Using middleware, such as the implemented authentication protocol will accomplish this aim. Additionally, we will use Laravel's hash function for your credentials.

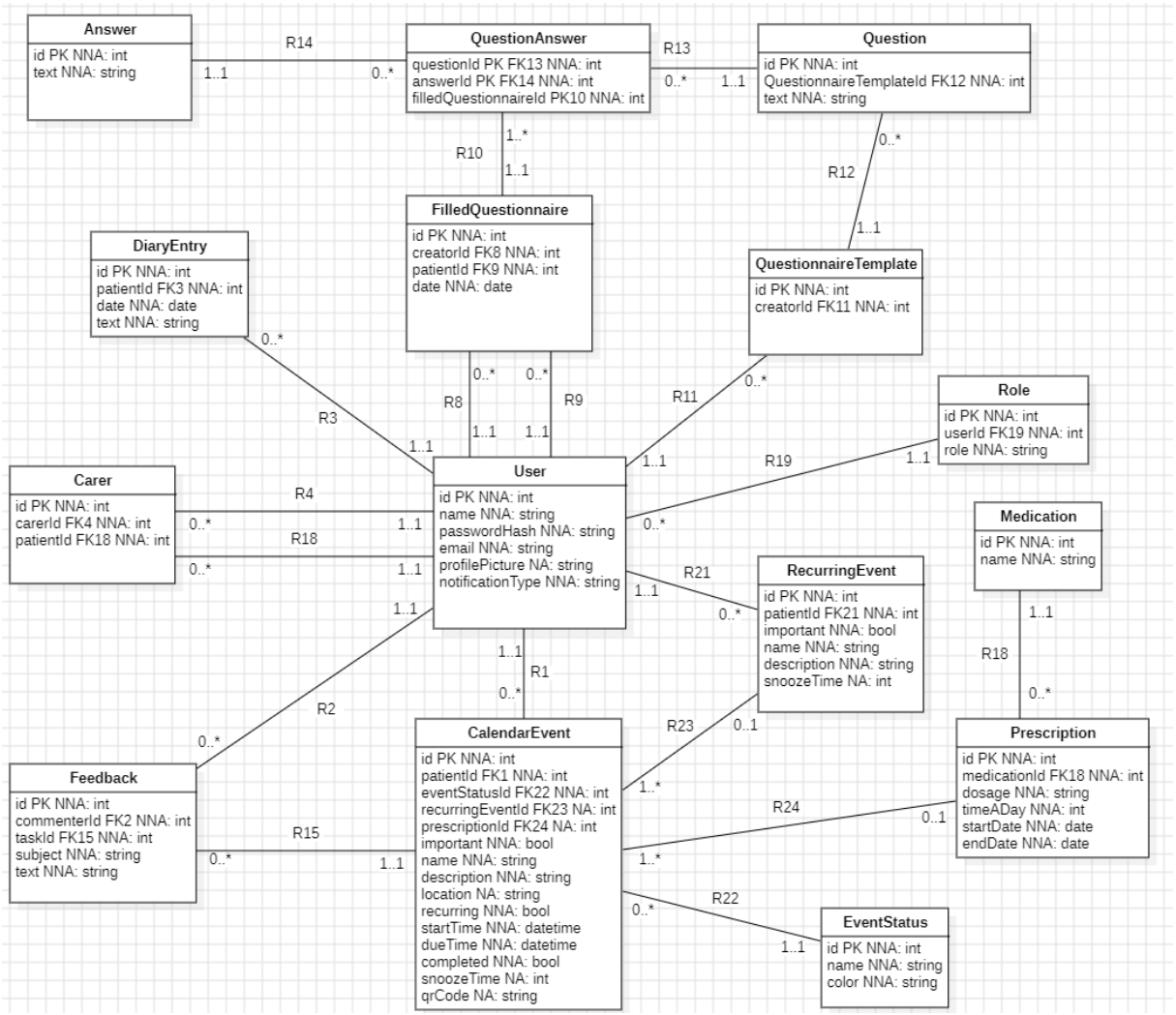
Performance

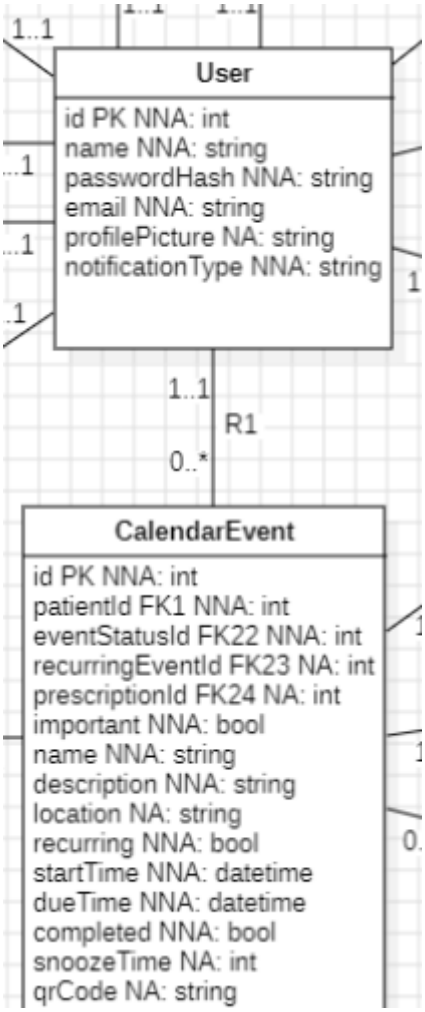
We wanted to improve the user experience by making the program load more quickly. Created by us programs with the least amount of system resources make it possible to support users who have slower internet connections or older devices.

Scalability

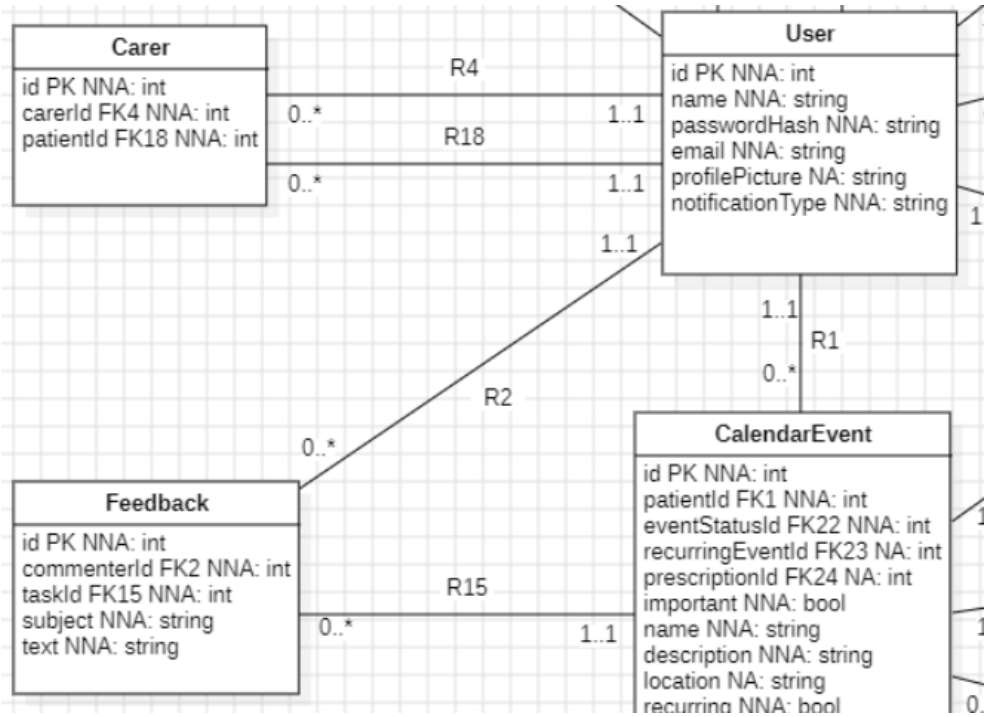
Scalability is a very important aspect of our project. Our application was designed to handle many actions simultaneously. Thanks to that we can provide users with a lot of information at the same time without causing unnecessary confusion and data overload.

Data Model

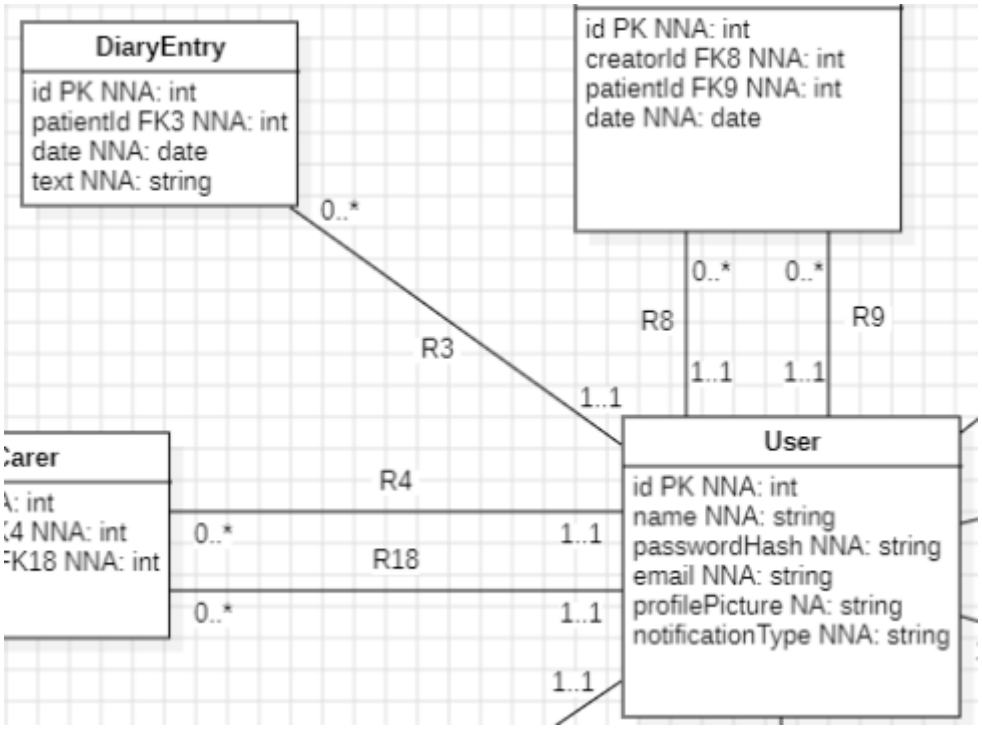

Answer
id PK NNA: int
text NNA: string
R14
1..1
0..*
QuestionAnswer
questionId PK FK13 NNA: int
answerId PK FK14 NNA: int
filledQuestionnaireId PK10 NNA: int
R13
0..*
1..1
Question
id PK NNA: int
QuestionnaireTemplateId FK12 NNA: int
text NNA: string
R10
1..*
1..1
FilledQuestionnaire
id PK NNA: int
creatorId FK8 NNA: int
patientId FK9 NNA: int
date NNA: date
R12
0..*
1..1
QuestionnaireTemplate
id PK NNA: int
creatorId FK11 NNA: int
DiaryEntry
id PK NNA: int
patientId FK3 NNA: int
date NNA: date
text NNA: string
0..*
R3
1..1
R8
R9
0..*
0..*
1..1
1..1
R11
0..*
1..1
Role
id PK NNA: int
userId FK19 NNA: int
role NNA: string
R19
1..1
Carer
id PK NNA: int
carerId FK4 NNA: int
patientId FK18 NNA: int
R4
R18
0..*
1..1
0..*
1..1
User
id PK NNA: int
name NNA: string
passwordHash NNA: string
email NNA: string
profilePicture NA: string
notificationType NNA: string
0..*
R21
1..1
0..*
RecurringEvent
id PK NNA: int
patientId FK21 NNA: int
important NNA: bool
name NNA: string
description NNA: string
snoozeTime NA: int
Medication
id PK NNA: int
name NNA: string
1..1
R18
0..*
1..1
R1
0..*
R2
0..*
1..1
Feedback
id PK NNA: int
commenterId FK2 NNA: int
taskId FK15 NNA: int
subject NNA: string
text NNA: string
R15
0..*
1..1
CalendarEvent
id PK NNA: int
patientId FK1 NNA: int
eventStatusId FK22 NNA: int
recurringEventId FK23 NA: int
prescriptionId FK24 NA: int
important NNA: bool
name NNA: string
description NNA: string
location NA: string
recurring NNA: bool
startTime NNA: datetime
dueTime NNA: datetime
completed NNA: bool
snoozeTime NA: int
qrCode NA: string
R23
0..1
1..*
R24
0..1
1..*
Prescription
id PK NNA: int
medicationId FK18 NNA: int
dosage NNA: string
timeADay NNA: int
startDate NNA: date
endDate NNA: date
R22
0..*
1..1
EventStatus
id PK NNA: int
name NNA: string
color NNA: string



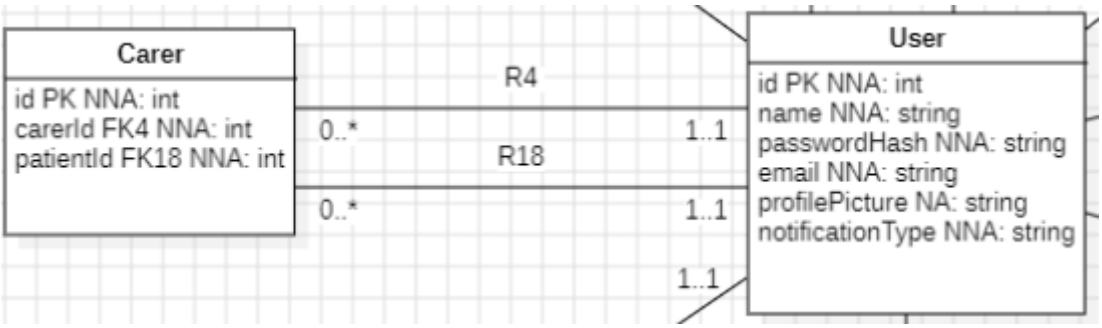
R1: user has multiple calendar events; a calendar event belongs to one person



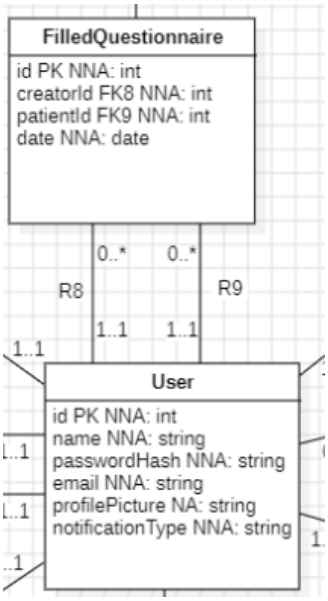
R2: User can leave a feedback; Feedback belongs to one user



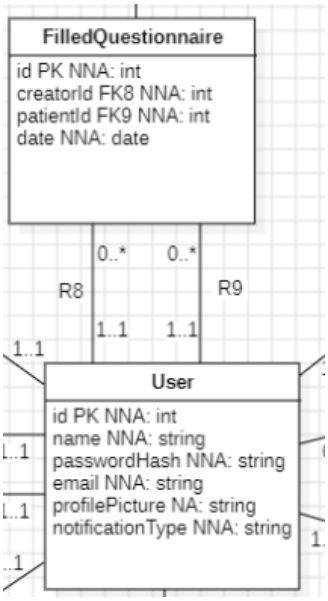
R3: User has multiple entries in his diary; Diary entry belongs to one user

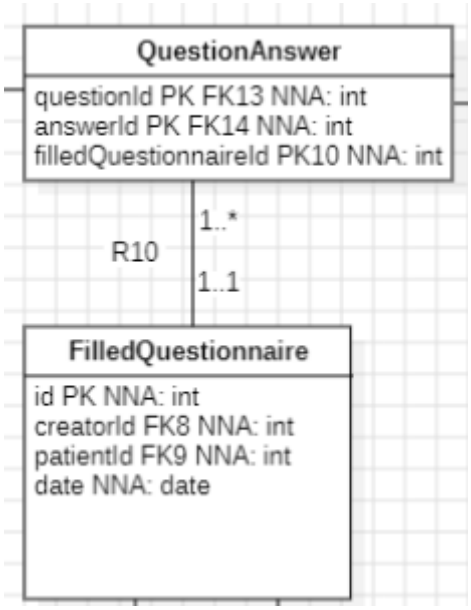


R4: User can have multiple carers; Carer belongs to one patient

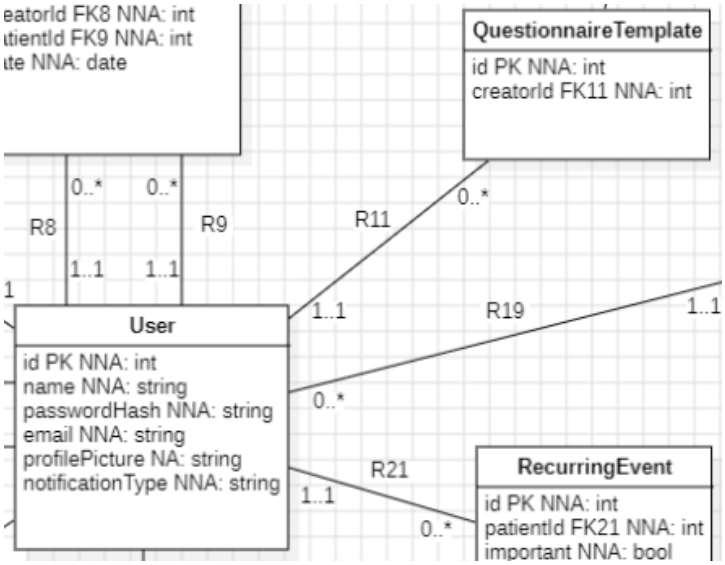


R8: User can have many questionnaires; filled questionnaire belongs to one user

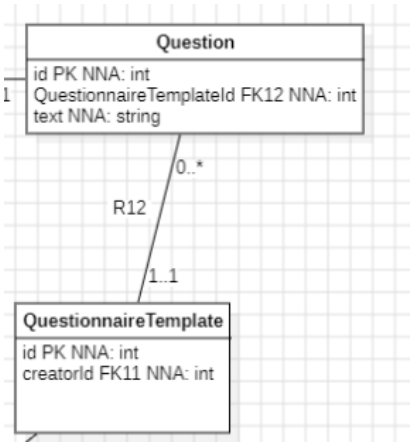




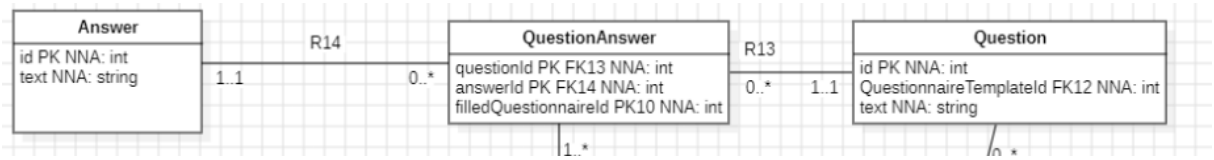
R10: Questionnaire has multiple answers; Answer belongs to one questionnaire



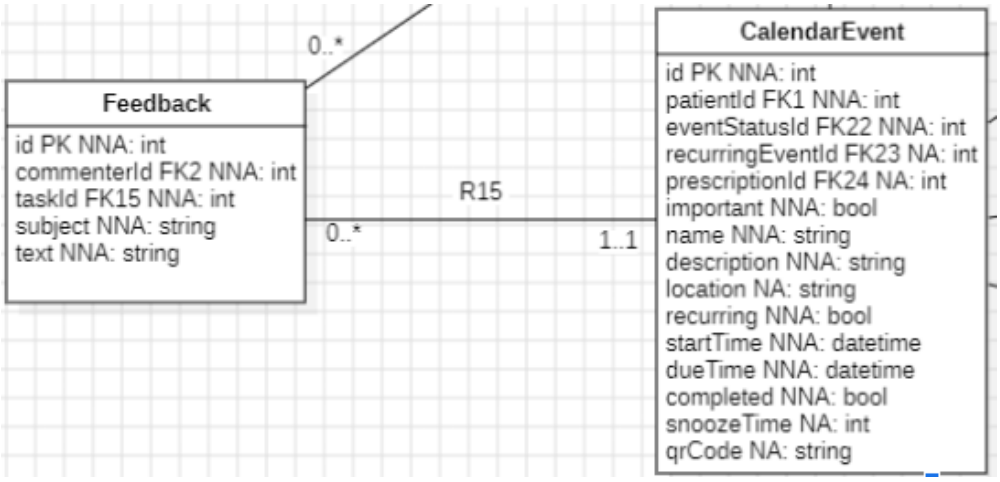
R11:User has many questionnaire templates; questionnaire template belongs to one user



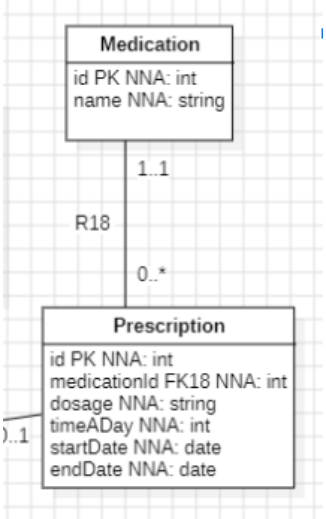
R12: Questionnaire Template can have many questions; Question has one questionnaire template.



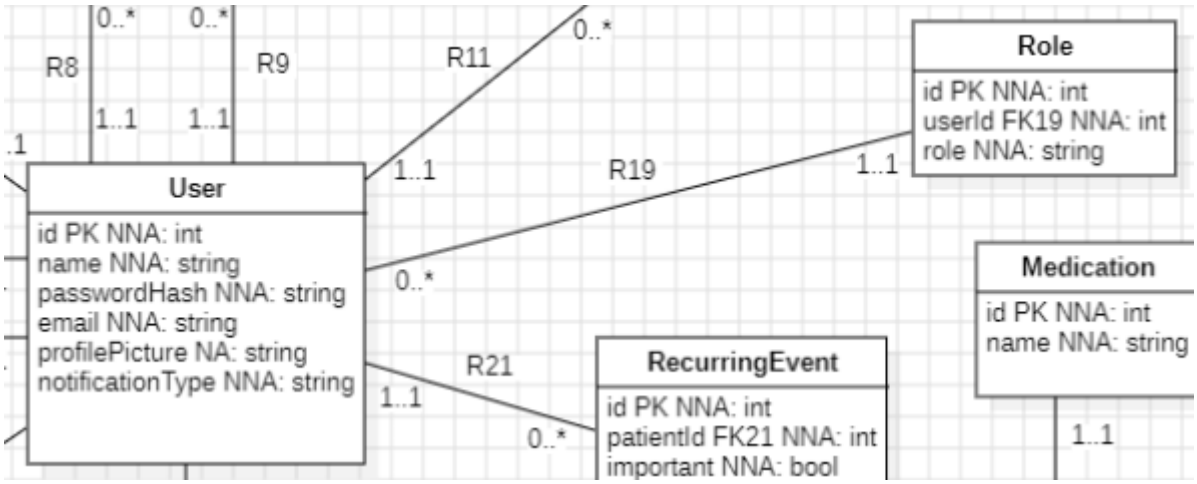
R13 & R14: Relationship between Question and Answer is a many to many relationship using QuestionAnswer entity



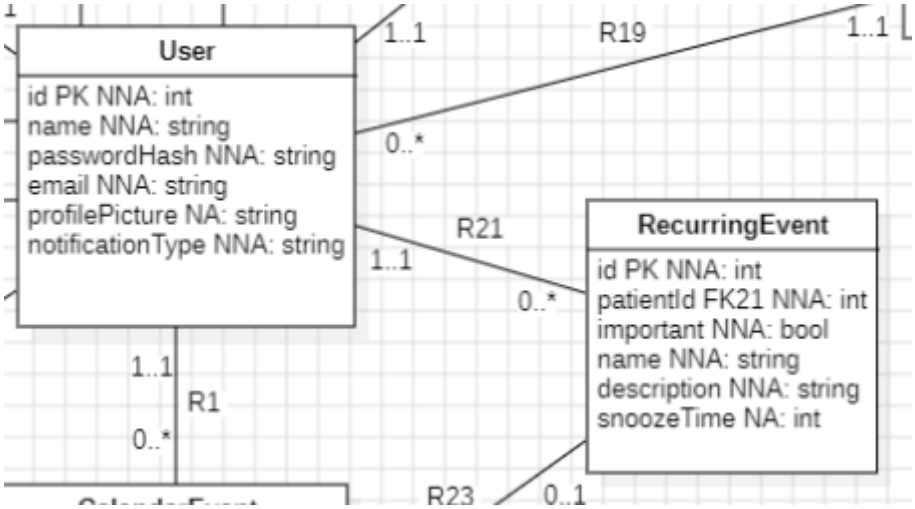
R15: One Feedback is in one CalendarEvent; CalendarEvent can have many feedback



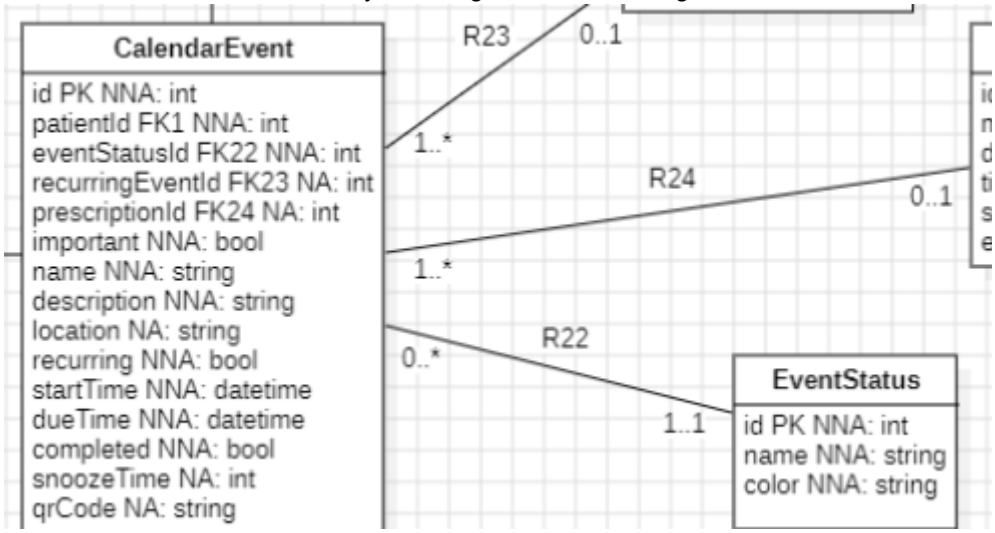
R18: Medication can have many Prescriptions; One medication belongs to one prescription



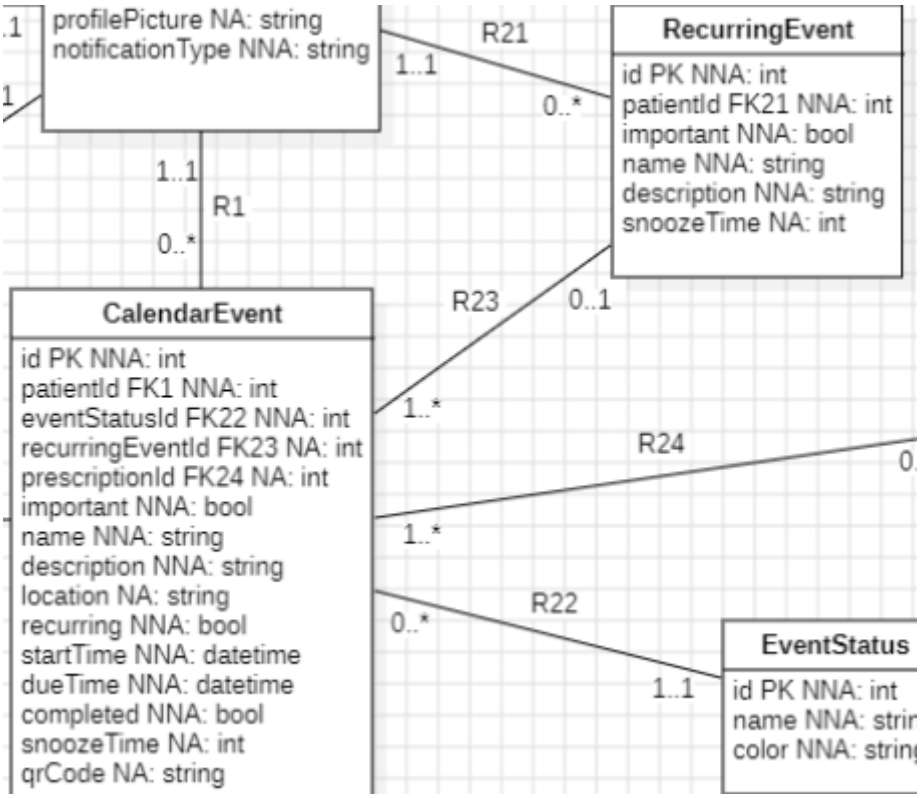
R19: User has one role; One role can have many users



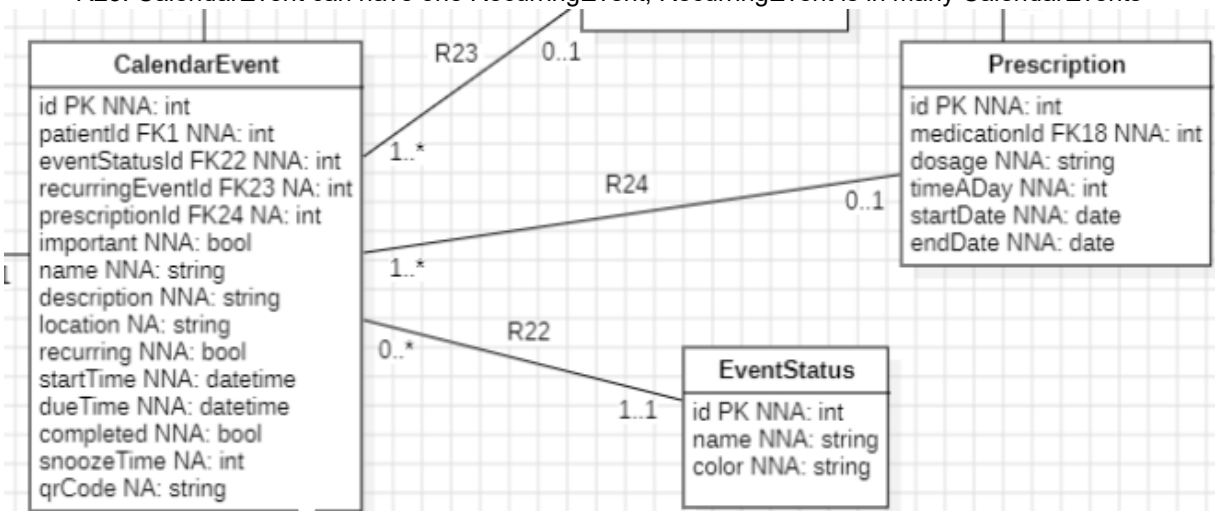
R21: User can have many recurring events; Recurring event has one user



R22: CalendarEvent has one EventStatus; EventStatus has many Calendar Events



R23: CalendarEvent can have one RecurringEvent; RecurringEvent is in many CalendarEvents



R24: CalendarEvent can have one Prescription; Prescription has one or many CalendarEvents

Priority by functionality

Indicate for all functionalities / use cases which MoSCoW-priority should be assigned.

MUST HAVE	SHOULD HAVE	COULD HAVE	WON'T HAVE
Login	Fill out questionnaire	Manage diary	
Manage agenda	Add user		
Manage checklist	Create questionnaire		
Add medication	Give feedback		
Send notification	Read feedback		