Appendix 2 - Specifications

Module: BTX8221 – Bachelor Thesis
Project: Appointment System for MIDATA
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1 Background and Problem Definition

Patients with heart disease do not have an easy life, between frequent medical appointments, support groups, rehabilitation, special nutrition, medication, coaching and sport. Therefore, the BFH and I4MI want to develop an application, which we will call "Heart App" here, to help patients with the various tasks mentioned above. Patients can help each other, discuss, and plan activities together.

A central module of this application is the time management, which is involved in all the other modules and thus helps to get organised.

The aim of this project is to develop a proof of concept of MIDATA cloud-based medical calendar module for mobile health applications such as Heart App. It was decided to use MIDATA as the cloud platform. MIDATA is a cooperative providing a data storage service for patients, doctors, and researchers. The advantage of MIDATA is its transparency and security, and their servers are in Switzerland.

We will base the demonstration of this module by integrating it in a mocked-up Heart App application.

2 Goals

The project aims at answering the following research questions:

1. Which actors and scenarios are involved in mobile application projects regarding calendar functions?
2. How should a FHIR-based mobile medical calendar be built?
    a. Which FHIR resources are involved?
    b. Which information are mandatory, and which are optional?
3. How should an application that uses MIDATA as a cloud service be built?
    a. What are the solutions and the possibilities proposed by MIDATA?
    b. What are the limitations of MIDATA?
    c. How must the communication to MIDATA be designed?
4. What should the software architecture of a mobile medical calendar module based on FHIR and MIDATA look like?

This will result in a MIDATA cloud-based medical calendar module integrated into a mocked-up Heart App application.

3 Project Scope and Requirements

- A prototype of a MIDATA cloud-based medical calendar module for mobile health applications will be developed and presented within the Heart App context.
- The prototype will be an Android application, but a cross platform framework will be used with aim of a release on iOS.
- The prototype will be developed with React-Native 0.67.
- Users must own a MIDATA account.
- The medical calendar is built on top of FHIR R4 specification.
- Users can export their appointments to system's calendars with respect for privacy.
- Users can create appointments with other users.
- Users can create reminders.
- Physician can send appointments to their patients that are using the application.

4 Functional Description of the Requirements

P = priority, H = high, M = medium, L = low

IDs	*Functions*	*Descriptions*	*Details*	*P*
A	***Appointments***			
A.1	Create an appointment.	Users can create an appointment from the schedule view, but also from specific views with predefined parameters e.g., create an appointment from the chat with another user, and this user will automatically be in participant section. Parameters: • Title • Description • Date and Hour • Duration • Participants • Instructions • Notification policies	FHIR-resource: Appointment	H
A.2	Read an appointment.	Users can visualize an appointment's detais they own or participate in by clicking on it on the schedule view or in other views who an appointment may appear.	FHIR-resource: Appointment	H
A.3	Update an appointment.	Users can update an appointment they have created from the schedule view. They may edit every parameter. Parameters: • Title • Description • Date and Hour • Duration • Participants • Instructions • Notification policies	FHIR-resource: Appointment	H
A.4	Delete an appointment.	Users can delete an appointment they own or participate in. For the last case, the appointment will remain for the other users, but the user who delete it will be seen as "declined".	FHIR-resource: Appointment	H

IDs	Functions	Descriptions	Details	P
A.5	Receive an invitation to an appointment.	Users will be notified if they received an appointment invitation.	FHIR-resource: Appointment	H
A.6	RSVP to an invitation to an appointment.	Users can respond to an invitation by “accepted”, “declined”, “tentative”. In every case the appointment will remain on the calendar in case the user changes their mind.	FHIR-resource: Appointment>participant>status Default value: “needs-action”	H
A.7	Set up notifications’ policies to an appointment.	Users can setup personalized notification policies to an appointment, such as the number of reminders and when they will be launched.	Local notifications Library: Notifee FHIR-resource: unknown	H
B	***Reminders***			
B.1	Create a reminder.	Users can create a reminder from the schedule view, but also from specific views with predefined parameters e.g., create a reminder in medication section of the app. Parameters: • Title • Description • Date and Hour • Periodicity • Instructions • Notification policies	FHIR-resource: Task (more investigation must be done)	M
B.2	Read a reminder.	Users can visualize a reminder detail by clicking on it on the schedule view or when the reminder is remined.	FHIR-resource: Task (more investigation must be done)	M
B.3	Update a reminder.	Users can update an appointment they have created from the schedule view. They may edit every parameter. Parameters: • Title • Description • Date and Hour • Periodicity • Instructions • Notification policies	FHIR-resource: Task (more investigation must be done)	M
B.4	Delete a reminder.	Users can delete an appointment they own or participate in. For the last case, the appointment will remain for the other users, but the user who delete it will be seen as “declined”.	FHIR-resource: Task (more investigation must be done)	M
B.5	Set up notifications’ policies to a reminder.	Users can setup personalized notification policies to a reminder, such as the number of reminders and when they will be launched.	Local notifications Library: Notifee	M

IDs	Functions	Descriptions	Details	P
			FHIR-resource: unknown	
C	Export			
C.1	Export to system's calendars manually.	Users can export an appointment with different privacy policies to a chosen calendar on the system.	Library: Expo API - Calendar	H
C.2	Set up the export automatically.	Users can setup the automatic export of appointments with different privacy policies to a chosen calendar on the system.	Library: Expo API - Calendar	H
C.3	Export privacy policies.	Users can choose between different export policies for the appointment to ensure data protection and privacy.		H
D	***Navigation***			
D.1	Visualize the schedule.	Users have a view with a calendar and the schedule of the selected day.	Library: wix/react-native-calendars	H
D.2	Open the calendar in specific views.	The module will provide function to open modal windows on other view to interact with the calendar.		L
E	***MIDATA***			
E.1	Login the MIDATA account.	Users can login with their MIDATA account. They must accept the consent of the required data.	Protocol: OAuth2	H
E.2	Logout the MIDATA account.	Users can logout.		L

5 Deadlines

Deliverables	***Deadlines***
Article for the “Book”.	01.06.2022
Poster.	06.06.2022
Movie.	16.06.2022
Report.	16.06.2022
The module.	16.06.2022
Technical documentation.	16.06.2022
Presentation for the final day.	17.06.2022

6 Version control

Versions	***Dates***	***Descriptions***	***Authors***
v1.0	14.03.2022	First draft.	Fahrni Alex
v1.1	25.03.2022	Adjustments	Fahrni Alex