deti universidade de aveiro
departamento de eletrónica, telecomunicações e informática

Assignment 2

Design and prototyping of an application using a human-centered approach

OSTEOVITAE

Osteopathy and Therapeutic Massages Clinic

Group 3, Class P2

Diogo Baptista 79405

Renato Valente 89077

Rita Amante 89264

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Metrado Integrado em Engenharia de Computadores e Telemática

OSTEOVITAE

WHAT IS?

Osteovitae is a clinic that provides Osteopathy and Therapeutic Massages services, in the district of Aveiro, municipality of Oliveira do Bairro.

It is a private entity managed by the owner himself who is also the sole provider of health care.

REASON FOR CHOICE

This clinic belongs to a family member of the group, which allows a better collection of requirements and the execution of usability tests.

AVAILABLE SERVICES

- Osteopathy
- Foot reflexology
- Thai massage
- Geothermal massage
- Chiropractic
- Shiatsu
- 3-Needle Method

OBJECTIVES

GOAL

Osteovitae intends to have an **mobile application** to facilitate the clinic management.

The main objective of this application is to allow information to be easily available, making the service more efficient and effective.

USERS

This application will be available for two types of users - **Doctor** and **Patient** - which makes it respect the usability criteria, since we do not know what the user experience is with mobile devices.

PERSONAS

PERSONA 1: DOCTOR

Xavier Santos is 26 years old and is an Osteopath and Therapeutic Masseur.

He has been practicing sports since he was 6 years old and for a long time he was an athlete of high competition in Volleyball, always managing to reconcile his studies with sport. It was his connection to sport that made him an Osteopath, due to the injuries he suffered throughout his career.

He recently opened his own practice - Osteovitae - and would like to have a mobile application that facilitates him in various functions, such as making appointments. And he would like the patients to also have access to the application (with appropriate remarks).

Xavier has no difficulties in dealing with new technologies.

PERSONAS

PERSONA 2: PATIENT

Manuel Martins is 70 years old, is a retired businessman, married and has two children and 5 grandchildren.

He worked throughout his life in the food trade, not dedicating time to physical exercise.

Alcides recently suffered an accident on his right leg, where he was already operated on at the hip (Coxarthrosis). He is overweight and has pain when sitting and walking. On the advice of a friend, he decided to go to Osteovitae.

Alcides has some difficulties in dealing with new technologies, but he is always willing to learn with the help of his oldest grandson.

PERSONAS

PERSONA 3: PATIENT

Beatriz Santos is 22 years old, a Management student and a high level Athletics competition athlete.

She practiced sport since she was 8 years old. She started with gymnastics, but at the age of 10 she decided to go to athletics and, at the moment, she is competing for Benfica.

Beatriz's big goal is to go to the Olympics and, if she can keep her performance, she will. Due to the overload of training hours, Beatriz suffered a small stretch in the quadriceps. For her recovery she will use Osteovitae.

Beatriz is very social. She has an YouTube channel and her Instagram has more than 1000 followers.

FUNCTIONAL REQUIREMENTS

For the collection of requirements, interviews were conducted with both types of users. The functional requirements collected were as follows:

- Make / cancel an appointment (Doctor and Patient)
- Access the list of all appointments (Doctor and Patient)
- View appointment schedule (Doctor)
- Access the list of all patients (Doctor)
- Send message to patient (Doctor)
- Access to the notifications list (Patient)
- Access the list of all treatments (Patient)
- Access to clinic information (Doctor and Patient)

NON-FUNCTIONAL REQUIREMENTS

The non-functional requirements collected were as follows:

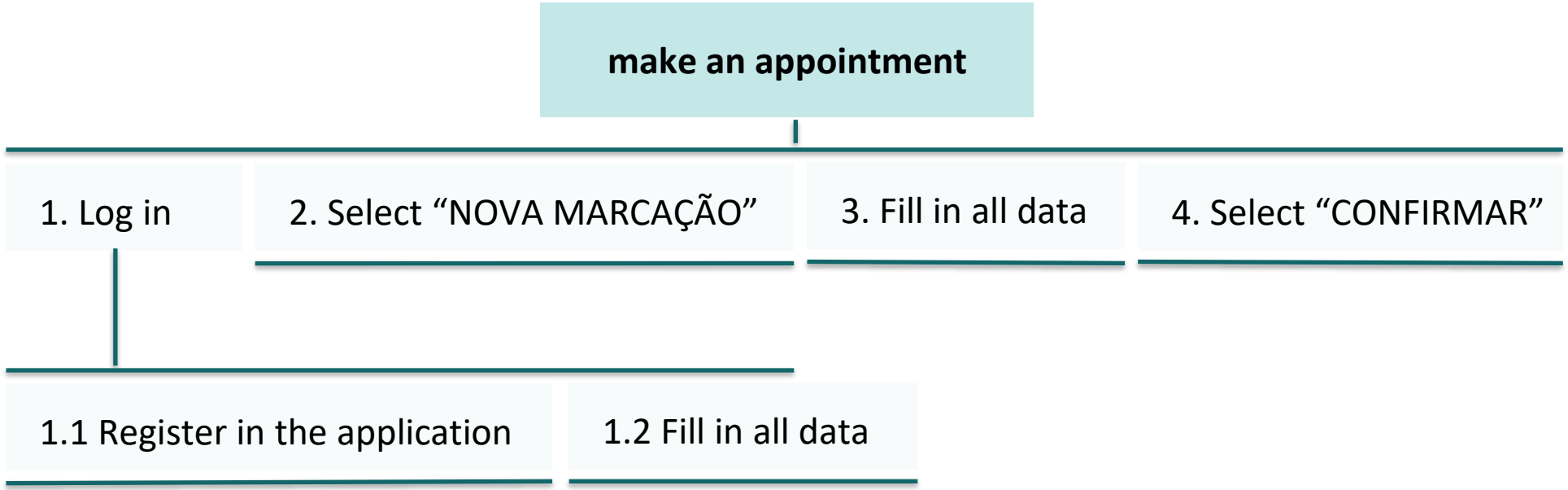
- A new user may be able to make an appointment after more than 2 minutes of interaction with the application;
- The application must have an intuitive menu and applicable colors (neither too dark nor too light);
- The font size must be medium / large;
- Ensure the privacy of user data;
- The sending of messages must be done by SMS always 24 hours before the scheduled consultation;
- Ensure that a location search takes less than 1 minute.

SCENARIO 1

Doctor and Patient

MAKE AN APPOINTMENT

Beatriz is a regular patient of Osteovitae. She wants to make her appointments faster and simpler, so that she is not always contacting the doctor.

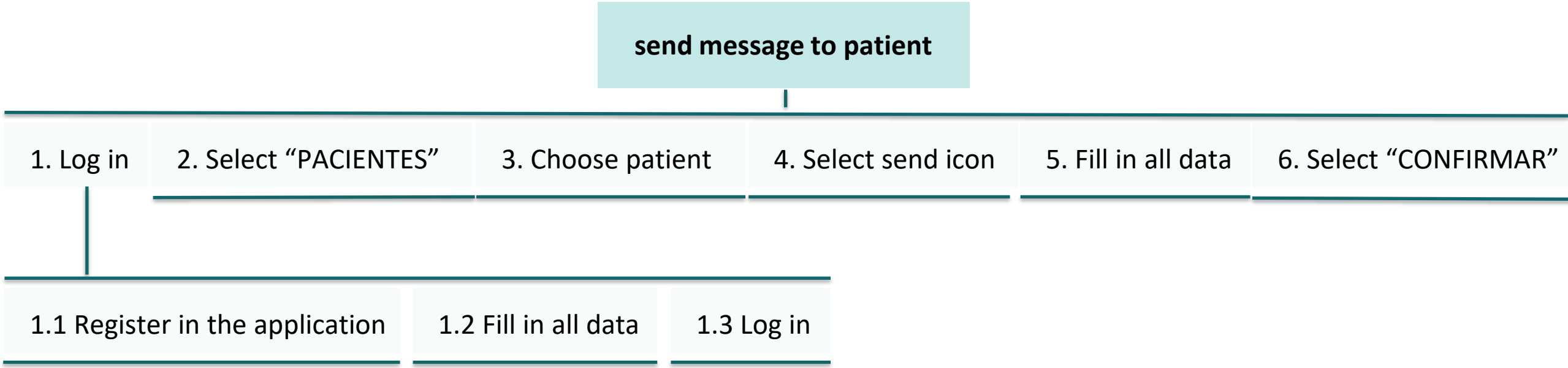


SCENARIO 6

Doctor

SEND MESSAGE TO PATIENT

Xavier is late for an appointment and wants to quickly notify his patient.

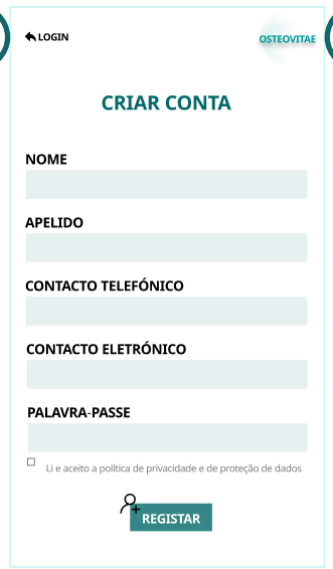


LOW FIDELITY PROTOTYPE

DOCTOR

1

2



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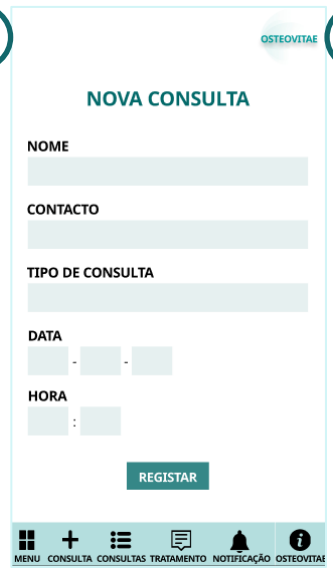

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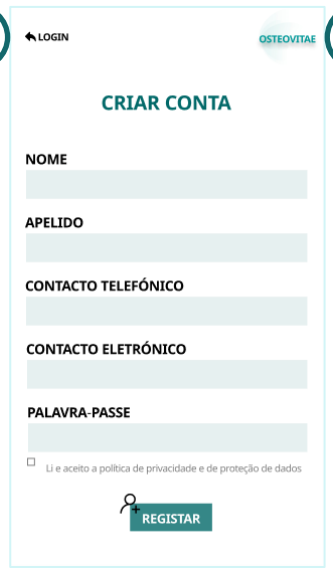
LOW FIDELITY PROTOTYPE

PATIENT

1

2



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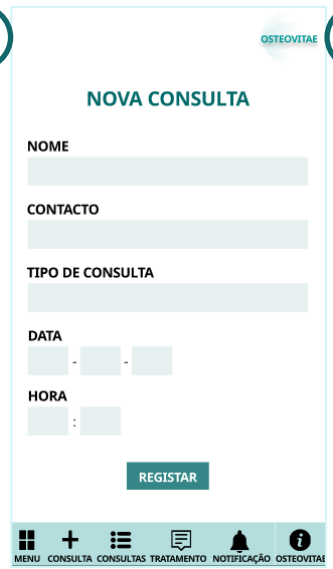
4



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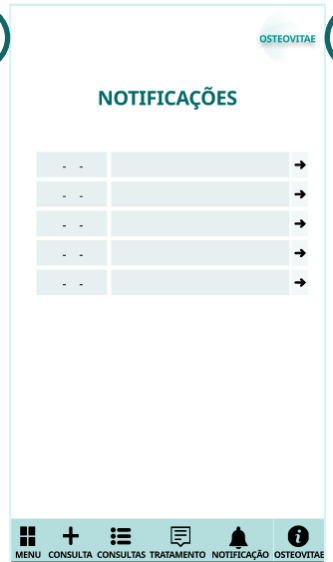

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USER EVALUATION

PARTICIPANTS

To evaluate the usability of the low fidelity prototype, two types of analysis were made: analytical and empirical. Usability tests were carried out with family members, , two young people and three middle-aged people, for both users.

ANALYTICAL METHOD – HEURISTIC EVALUATION

Some icons are not intuitives	Heuristic: Recognition rather than recall	Severity: 2
Listing order	Heuristic: Consistency and standards	Severity: 2
Missing help information	Heuristic: Help and documentation	Severity: 1
Lack of double confirmation	Heuristic: Error prevention	Severity: 3

USER EVALUATION

	EMPIRICAL METHOD – OBSERVATION	Difficulty level *				
TASK 1	Find the option to make a new appointment and register an appointment.	1	**2**	3	4	5
TASK 2	Find the option to cancel an appointment and save this operation.	1	**2**	3	4	5
TASK 3	Find the option to view the calendar and scroll through the months.	**1**	2	3	4	5
TASK 4	Find the option with the history of all appointments.	**1**	2	3	4	5
TASK 5	Find the option where all the patients are listed and with their contacts.	**1**	2	3	4	5
TASK 6	Find the option of sending messages to a specific patient.	1	**2**	3	4	5
TASK 7	Find the option with all treatments and select a specific description.	1	**2**	3	4	5
TASK 8	Find the option to access clinic information.	**1**	2	3	4	5
TASK 9	Find the list of notifications and select a specific one.	**1**	2	3	4	5

* The level of difficulty includes: if the task was completed, if the user made mistakes, if the user asked for help, if the user felt lost.

FUNCTIONAL PROTOTYPE

TOOLS AND LIBRARIES USED

The functional prototype was developed in Microsoft Visual Studio - WPF C#.

It was necessary to use the *FireSharp* library to interact the application with the database.

MAIN CHANGES

- Implementation of several confirmation steps to perform an error-prone task;
- dynamic clinic location;
- Adding help information;
- List information in a universal way.

DOCTOR

LOGIN

In comparison to the low-fidelity prototype, the login is done with a phone number, since, being a mobile application, it makes more sense to be associated by a phone number rather than email and it is not allowed to create an account, as there is only one doctor.

After a more detailed analysis of the usability problems, an informational message (warning) was added if the user entered the data incorrectly.

FINAL PROTOTYPE

DOCTOR

MENU

Regarding the low-fidelity prototype, the option of viewing data about the office was removed, since the user is the owner of the office, there is no point in having access to this data.

After a more detailed analysis of the usability problems, the option to send notifications was added, because before the process was not explicit and also because it was a notification per patient and now it is a notification for all patients.

Compared to the low-fidelity prototype, all options have been added to the footer menu.

FINAL PROTOTYPE

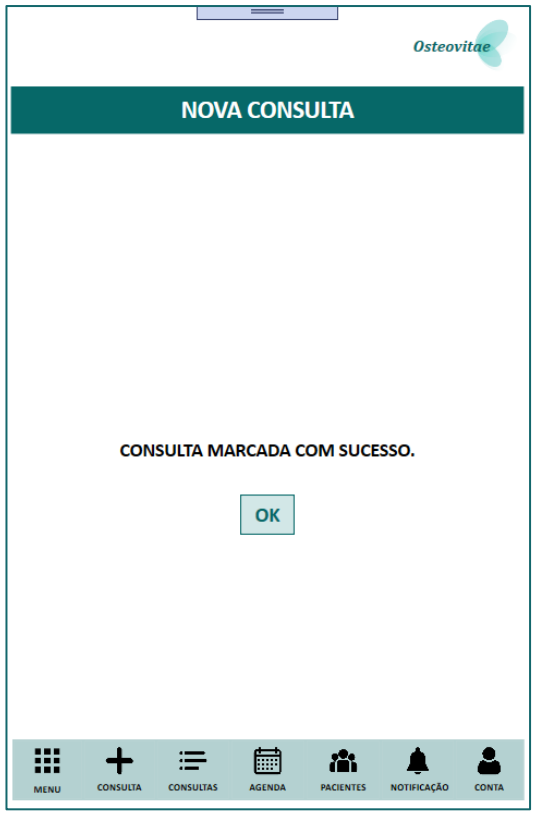
DOCTOR

NEW APPOINTMENT

Compared to the low-fidelity prototype, the user does not have to enter the data manually anymore. So to set the appointment date, the doctor must select a day on the calendar and it will be automatically filled, and to set the time, he must scroll through the available times with the hour and minute arrows.

After a more detailed analysis of the usability problems, an informational message (warning) was added if the user did not enter some data.

DOCTOR Cont.



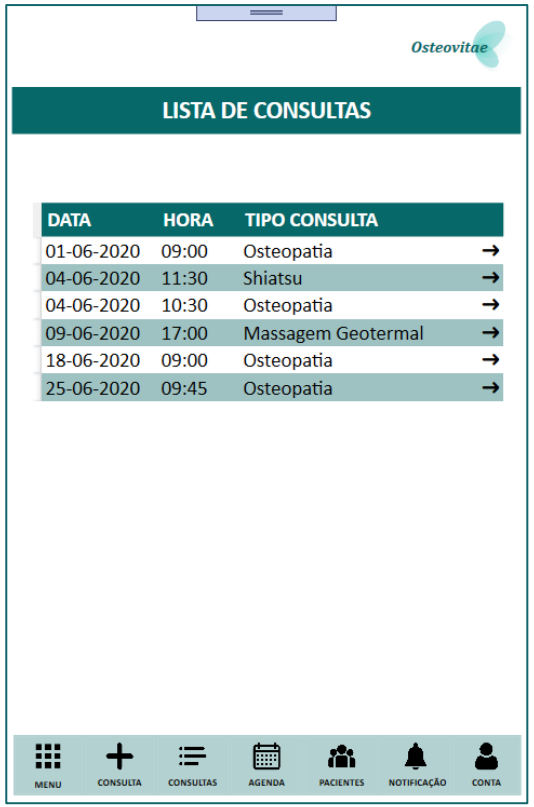
NEW APPOINTMENT

A report of the appointment to be scheduled has been added, so that the user can analyze the data before definitively confirm it.

A confirmation message was also added to confirm the success of the operation.

FINAL PROTOTYPE

DOCTOR

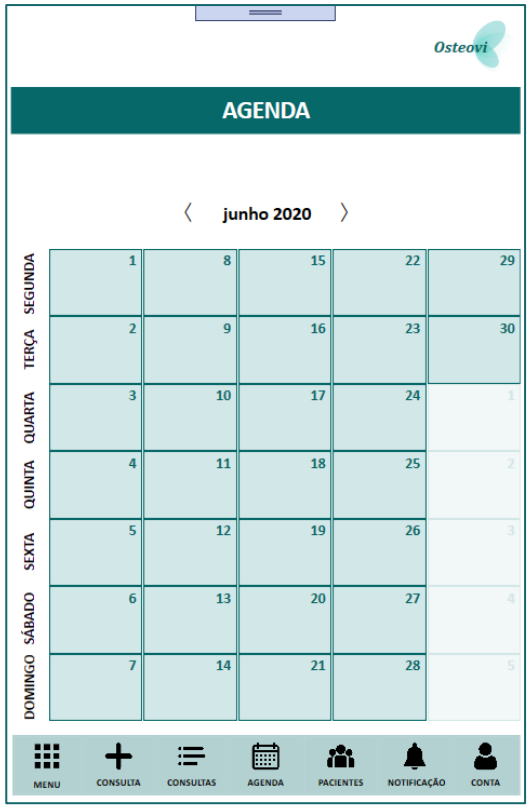


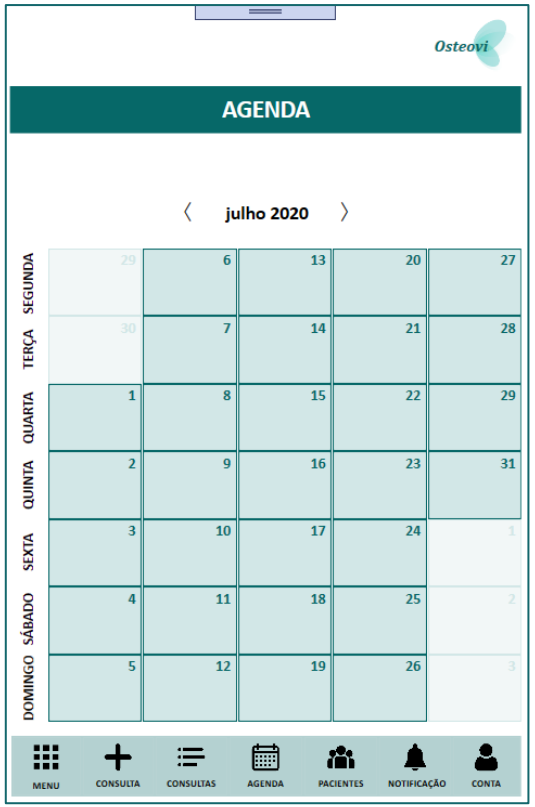
APPOINTMENTS LIST

Compared to the low-fidelity prototype, the user can select the appointment and a report is displayed either.

FINAL PROTOTYPE

DOCTOR





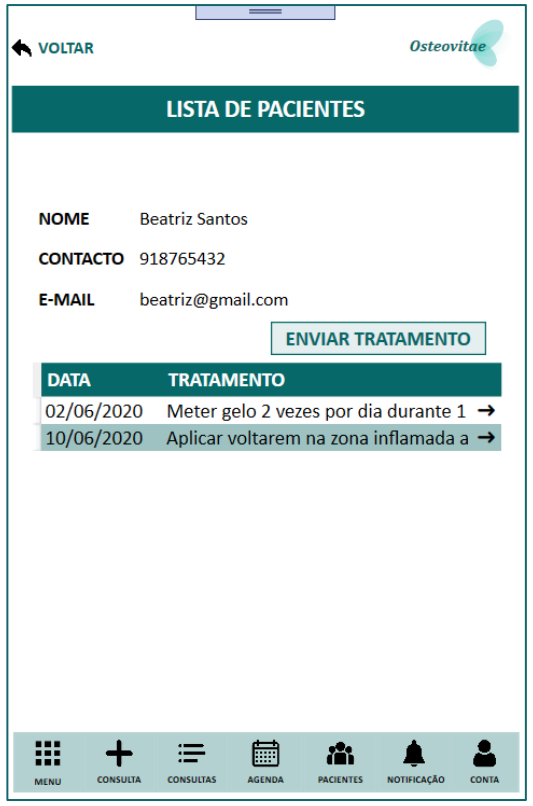
SCHEDULE

Since the members of the group were not familiar with the database, it was not possible to interact the agenda with the database.

Given this, this interaction would be a future work.

FINAL PROTOTYPE

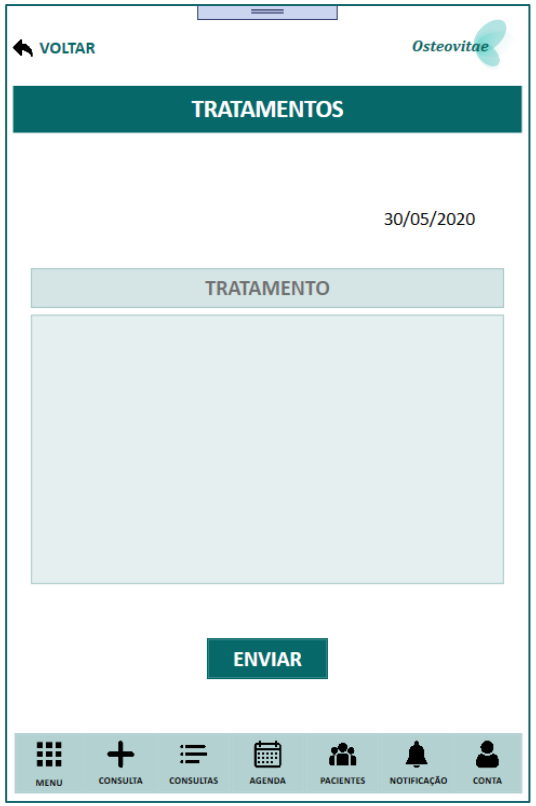
DOCTOR

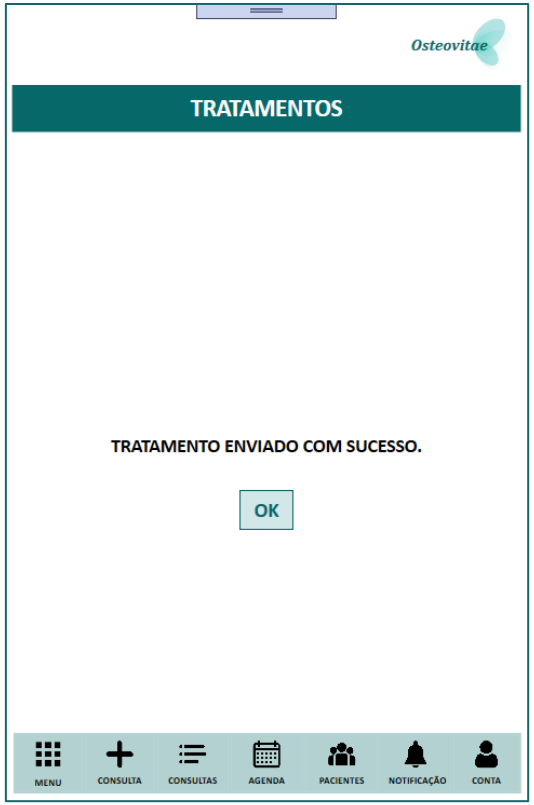


LIST OF PATIENTS

Compared to the low-fidelity prototype, the patient list allows viewing information about the selected patient and the treatments sent to that patient and even allows a new treatment to be sent.

DOCTOR Cont.





TREATMENTS

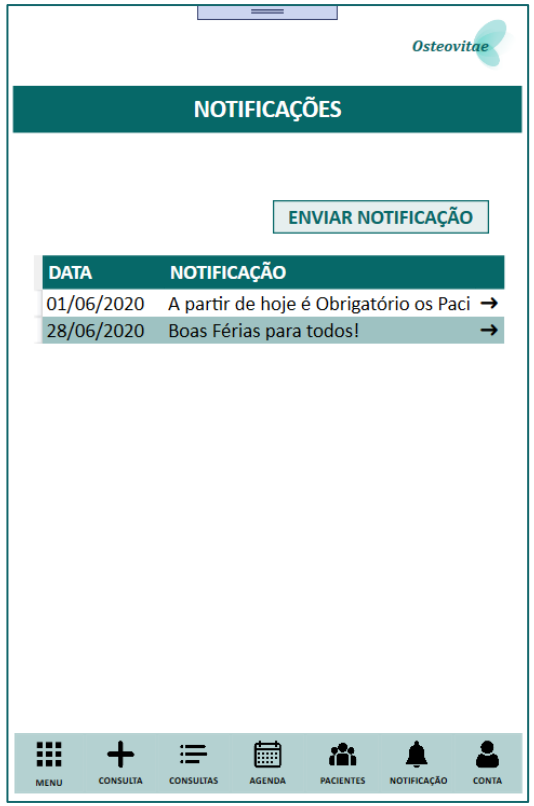
Compared to the low-fidelity prototype, when sending a treatment, the current date of sending is always recorded.

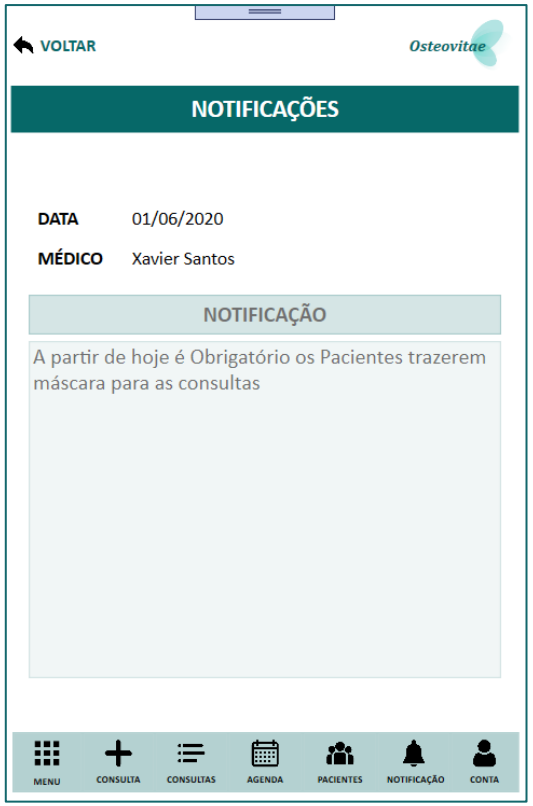
A new confirmation message was added before adding the treatment permanently.

An informational message was also added to confirm the success of the operation.

FINAL PROTOTYPE

DOCTOR



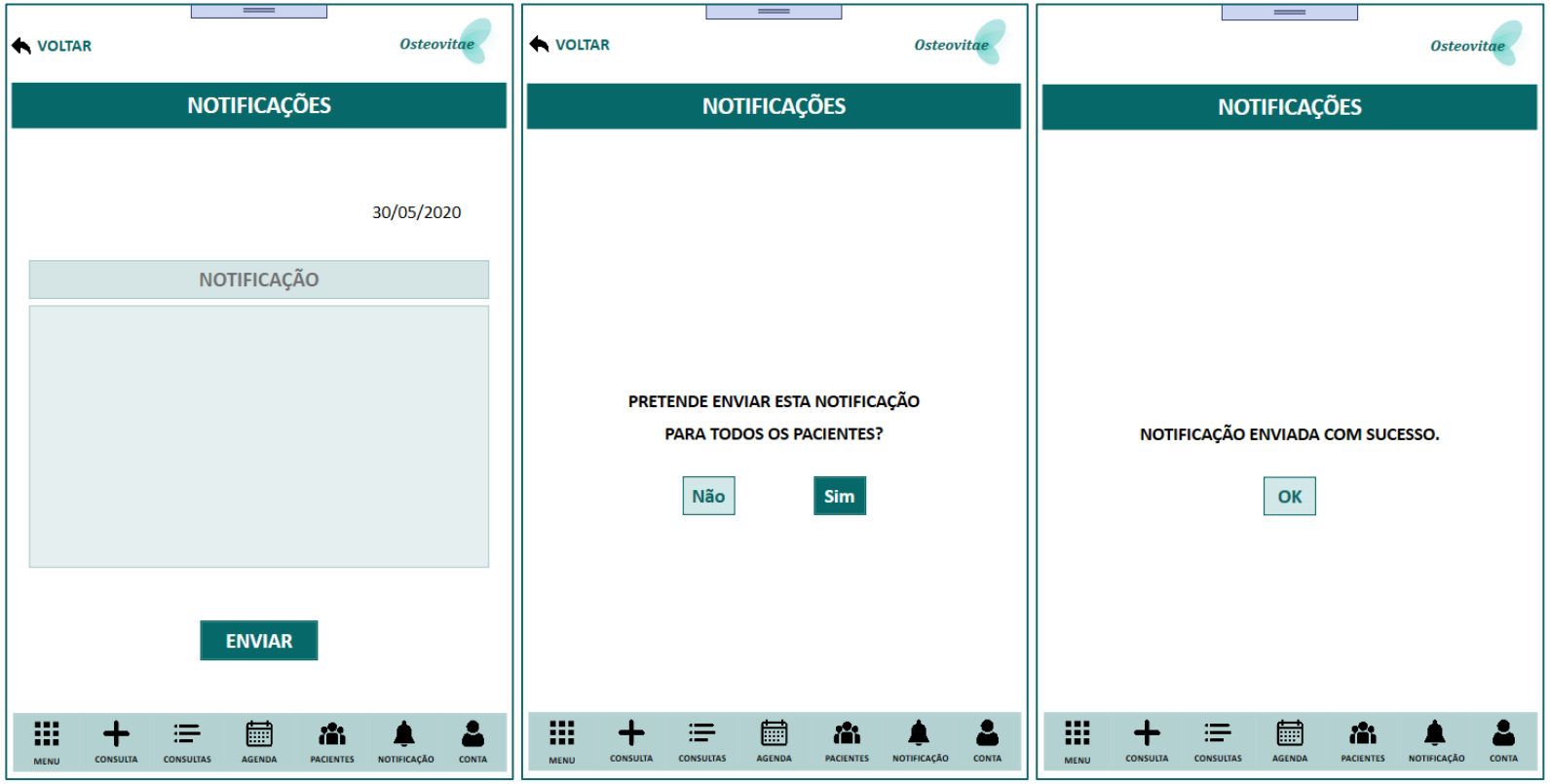


NOTIFICATIONS

Compared to the low-fidelity prototype, in the menu there is an option for sending notifications, since notifications are sent to all patients and not one notification per patient.

A list of all notifications that the doctor sends to his patients is now displayed. And a more detailed view of the notification sent is allowed.

DOCTOR Cont.



NOTIFICATIONS

Compared to the low-fidelity prototype, when sending a notification, the current date of sending is always recorded.

A new confirmation message was added before adding the notification permanently.

An informational message was also added to confirm the success of the operation.

FINAL PROTOTYPE

DOCTOR

PERSONAL ACCOUNT

Compared to the low-fidelity prototype, the user can edit personal data, except the contact, since this corresponds to the patient's ID in the database.

PATIENT

LOGIN

In comparison to the low-fidelity prototype, the login is done with a phone number, since, being a mobile application, it makes more sense to be associated by a phone number rather than email.

After a more detailed analysis of the usability problems, an informational message (warning) was added if the user entered the data incorrectly.

PATIENT

CREATE ACCOUNT

In comparison to the low-fidelity prototype, the user is asked to always confirm the entered password.

After a more detailed analysis of the usability problems, an informational message (warning) was added if the user entered the data incorrectly or did not accept the data privacy policy.

PATIENT

MENU

Compared to the low-fidelity prototype, all options have been added to the footer menu.

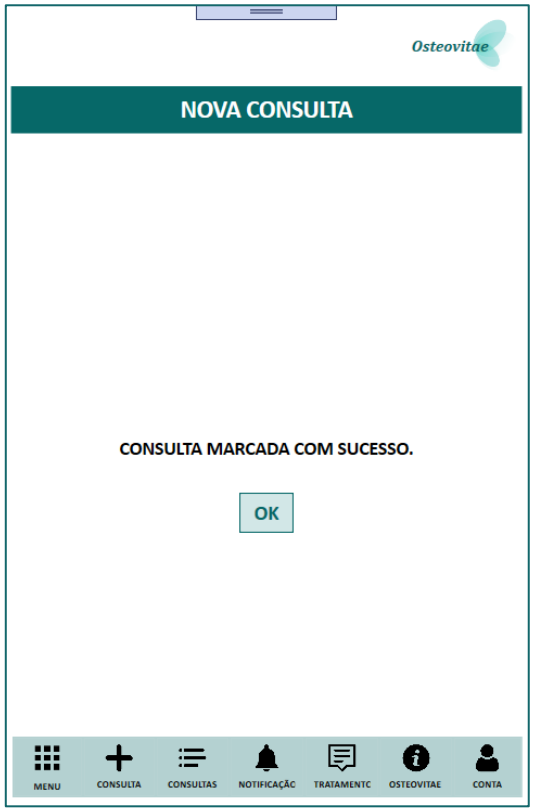
PATIENT

NEW APPOINTMENT

Compared to the low-fidelity prototype, the user does not have to enter the data manually anymore. So to set the appointment date, the patient must select a day on the calendar and it will be automatically filled, and to set the time, he must scroll through the available times with the hour and minute arrows.

After a more detailed analysis of the usability problems, an informational message (warning) was added if the user did not enter some data.

PATIENT Cont.



NEW APPOINTMENT

A report of the appointment to be scheduled has been added, so that the user can analyze the data before definitively confirm it.

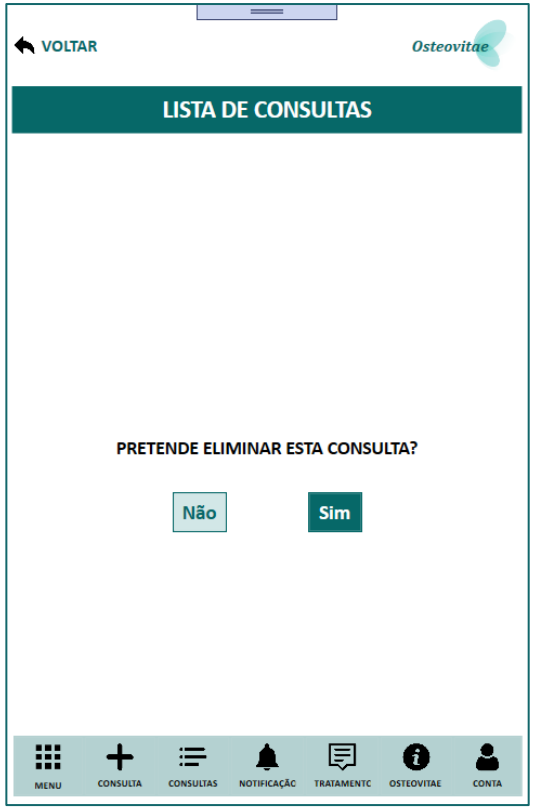
A confirmation message was also added to confirm the success of the operation.

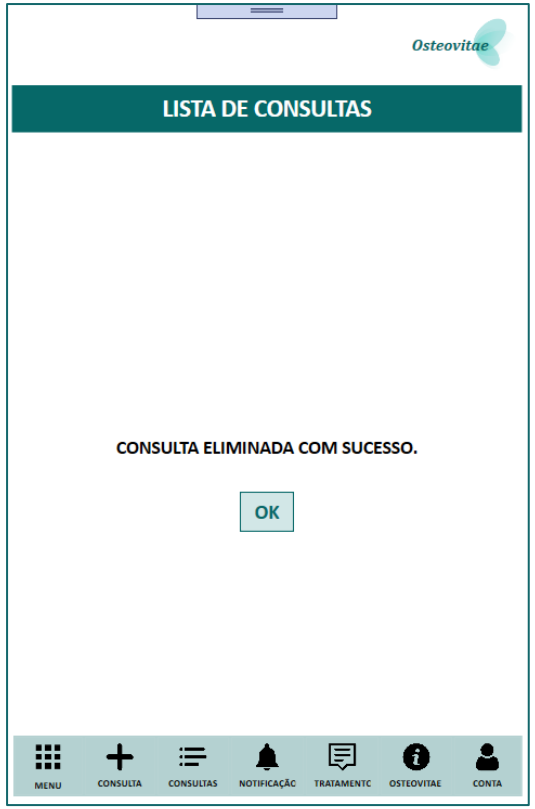
PATIENT

APPOINTMENTS LIST

Compared to the low-fidelity prototype, the user can select the appointment and a report is displayed either as an option to delete it.

PATIENT



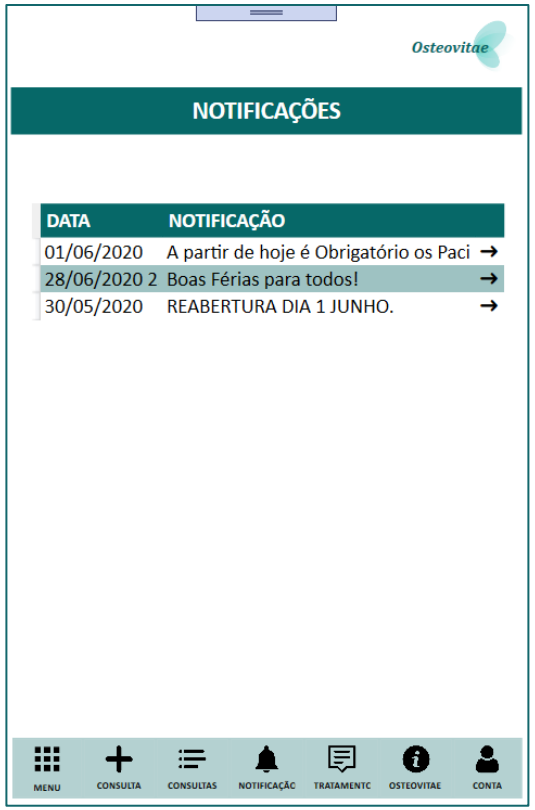


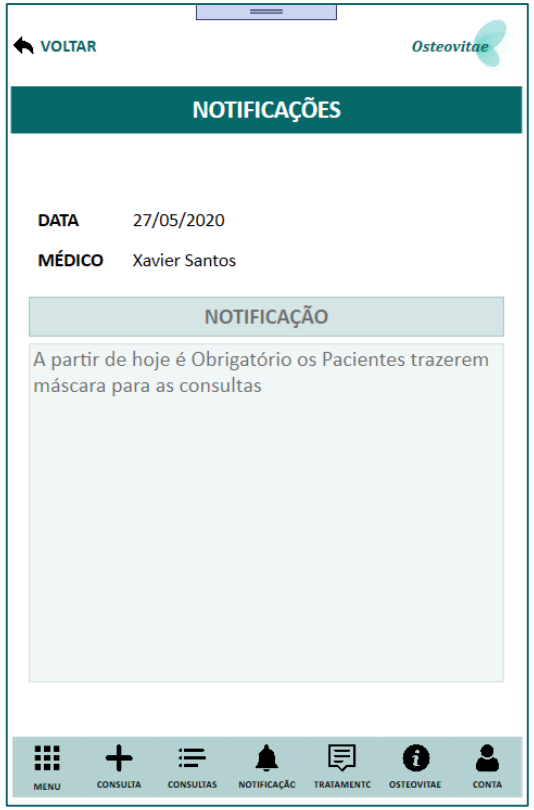
APPOINTMENTS LIST

A new confirmation message was added before deleting the appointment permanently.

An informational message was also added to confirm the success of the operation.

PATIENT

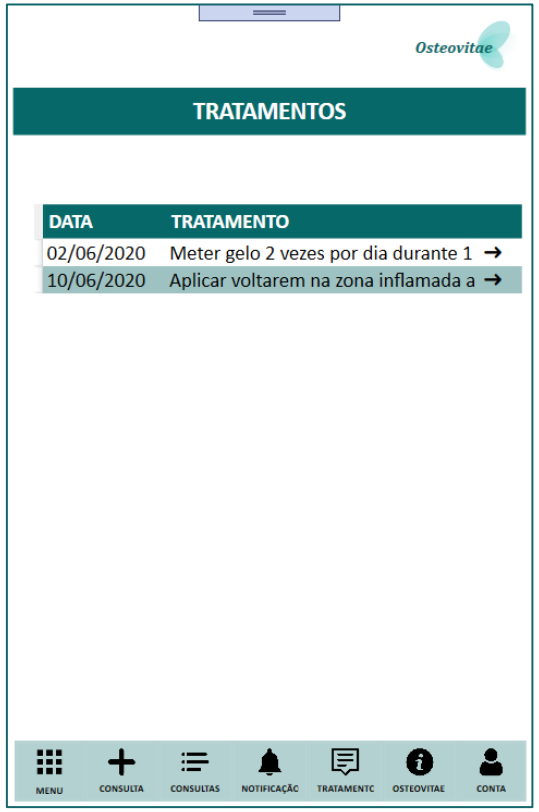




NOTIFICATIONS

Compared to the low-fidelity prototype, the user can access each notification received and obtain information about who sent it and when it was sent, as well as its content.

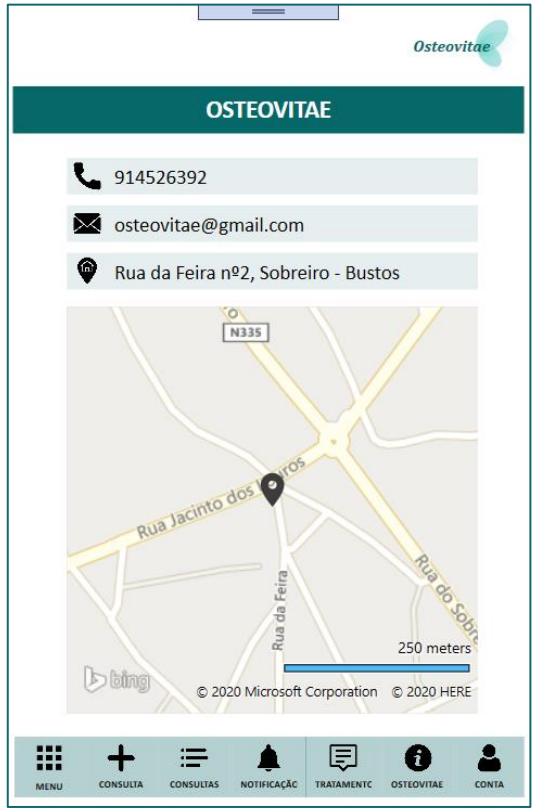
PATIENT



TREATMENTS

Compared to the low-fidelity prototype, the user can access each treatment received and obtain information about who sent it and when it was sent, as well as its content.

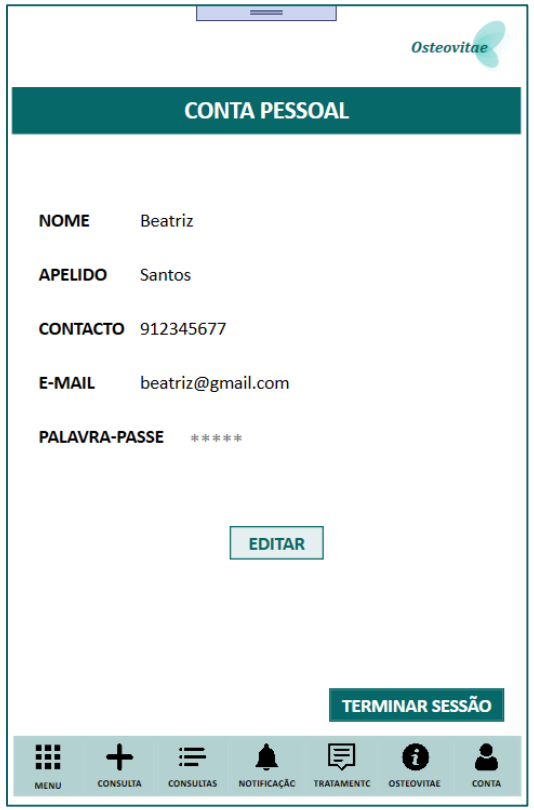
PATIENT



OSTEOVITAE

In comparison with the low-fidelity prototype, the user can interact with the map, since the location is already available.

PATIENT



PERSONAL ACCOUNT

Compared to the low-fidelity prototype, the user can edit personal data, except the contact, since this corresponds to the patient's ID in the database.

USER EVALUATION

PARTICIPANTS

To evaluate the usability of the final prototype, an empirical analysis was carried out, where three friends and two family members were observed for both users.

DOCTOR'S TASKS		Difficulty level *				
TASK 1	Find the option to make a new appointment and register an appointment.	**1**	2	3	4	5
TASK 2	Find the option to view the calendar and scroll through the months.	**1**	2	3	4	5
TASK 3	Find the option with the history of all appointments.	**1**	2	3	4	5
TASK 4	Find the option of sending notifications to all patients.	**1**	2	3	4	5
TASK 5	Find the option where all the patients are listed and with their contacts.	**1**	2	3	4	5
TASK 6	Find the option of sending treatments to a specific patient.	1	**2**	3	4	5
TASK 7	Find the option to view and edit account data.	**1**	2	3	4	5

* The level of difficulty includes: if the task was completed, if the user made mistakes, if the user asked for help, if the user felt lost.

USABILITY TEST

PATIENT'S TASKS		Difficulty level				
TASK 1	Find the option to make a new appointment and register an appointment.	1	2	3	4	5
TASK 2	Find the option to cancel an appointment and save this operation.	1	2	3	4	5
TASK 3	Find the option with the history of all appointments.	1	2	3	4	5
TASK 4	Find the option with all notifications and select a specific description.	1	2	3	4	5
TASK 5	Find the option with all treatments and select a specific description.	1	2	3	4	5
TASK 6	Find the option to access clinic information	1	2	3	4	5
TASK 7	Find the option to view and edit account data.	1	2	3	4	5

* The level of difficulty includes: if the task was completed, if the user made mistakes, if the user asked for help, if the user felt lost.

CONCLUSIONS

FUTURE WORK

- Allow editing the contact, without deleting data from the database;
- Make a dynamic agenda, that is updated in real time;
- Allow SMS to be sent to patients, according to their appointments, that is, 24h in advance of an appointment;
- When creating an account, receive an SMS with a confirmation code to validate the account;
- Validate all data entered by the user;
- Allow only the choice of available times.

TEAM WORK

The work was carried out uniformly by all members of the group.