



# LIVING **G**ULBENKIAN

**FINAL REPORT 2020**

**Prototypes**

# INDEX

3

## Introduction

Executive Summary

5

## Background

Team  
Client  
Schedule

10

## Overview

The App  
Core Features

12

## Process

User Research  
Low Fidelity Prototype  
Low Functionality Prototype  
High Fidelity Prototype  
Fully Functional Prototype

24

## Conclusion & Summary

Conclusion  
Summary

27

## Annex



# INTRODUCTION

# EXECUTIVE SUMMARY

## Project Overview

In the context of the course “User-Centered Design” we were challenged to create a solution for an activity that was aggravated with the COVID-19 pandemic, but that could also be useful when eventually the pandemic ends.

Considering that overcrowding was one of the problems that increased the infection rate, we decided to provide a safe way for people to navigate inside a public space without worrying of running into crowded spaces.

## User Research

User research provides the insight needed to ensure that all design decisions benefit the user.

In the project’s early stage we performed field observations, inquiries and interviews in order to identify essential personas and scenarios.

On development stages, and due to COVID-19, we couldn’t perform presencial studies so we resorted to online user tests.

## Design Process

Our design process followed a 3-step workflow: prototyping, testing and refining the Solution.

This cyclic model allowed to improve our prototype by implementing feedback multiple times.

## The Solution

The result of our work is ***LivingGulbenkian***, a mobile app designed to improve the experience of the Gulbenkian Foundation users.

It allows users to observe in real time the capacity of people in each place in order to have a safe and efficient way of visiting the Foundation.

Other functionalities like personalized notifications and information on the places made their way in the app.





**BACKGROUND**

# TEAM

Our team is comprised of six students studying Computer Engineering in Instituto Superior Técnico.

Our website can be found at:

<https://web.tecnico.ulisboa.pt/ist180888/>

And the code to our project:

<https://github.com/isabelSoares/CCU-2021>



**Francisco Mira**  
Project Manager



**Isabel Soares**  
Design Lead



**Francisco Cecílio**  
User Research



**Ricardo Machado**  
Back-End Lead



**Lídia Custódio**  
Front-End Lead



**Filipe Amaral**  
Documentation Lead



# | CLIENT

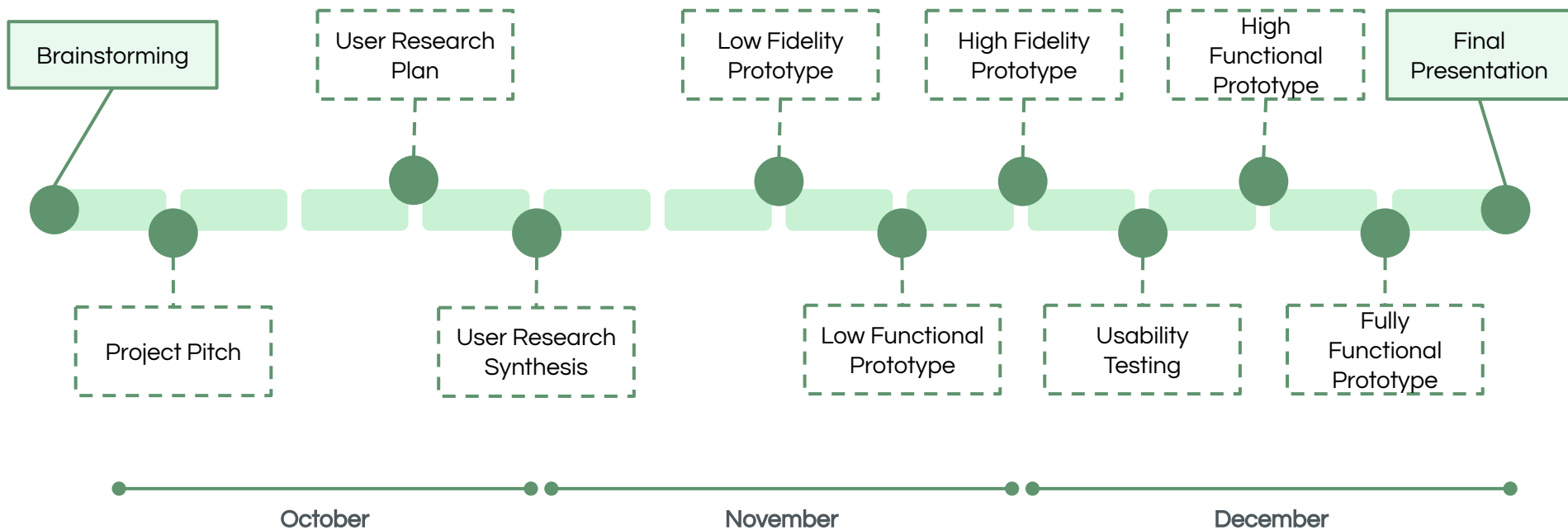
When tackling the overcrowding problem, we wanted to choose a concrete space where we could directly define routes to particular spots and help people navigate safely.

In the end, we chose **Calouste Gulbenkian Foundation** for its green space in the middle of the city of Lisbon. The gardens, museums and cafes are the main reason people like to go there.

Our application *LiveGulbenkian* was developed for people who frequently go to Gulbenkian and for new Gulbenkian goers that are unsure of what activities they could do.



# SCHEDULE



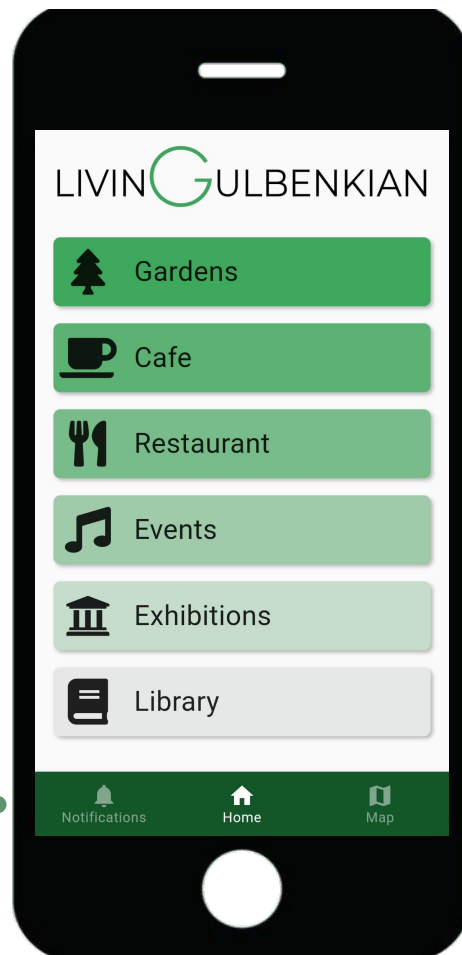




# OVERVIEW

# THE APP

*Living Gulbenkian* was developed to provide a safe way for people to navigate around Gulbenkian, as well as integrating information of the activities users can perform there.



Custom notification defined by the user

Location and capacities for the gardens.

Information for the Cafe.

Information for the Restaurant.

Agenda for next music events.

Agenda for next exhibitions.

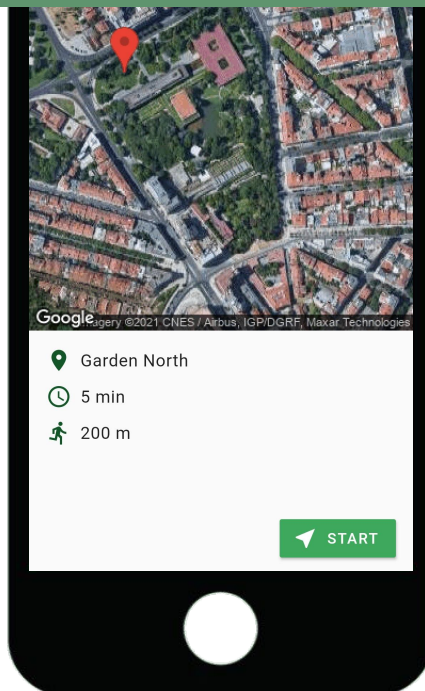
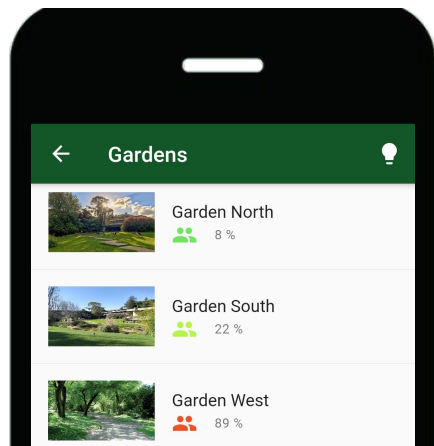
Information for the Library.

Map of Gulbenkian Foundation.

# CORE FEATURES

## Capacity of spaces

Our main feature for the application is to provide information of the current capacity of each space in Gulbenkian. This way a user could decide to go to a place knowing if the space is full or not.

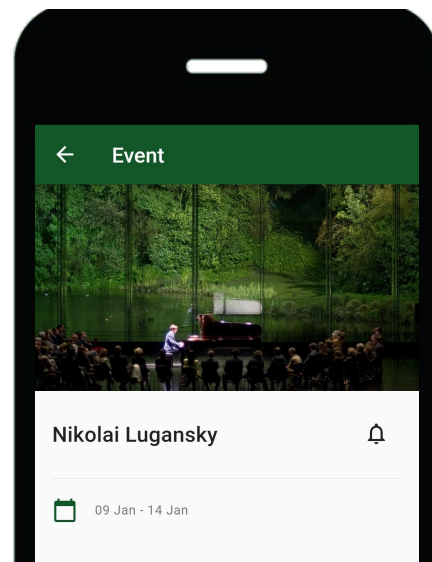


## Crowd-free routes

Considering the capacity of spaces, we have a basic navigation functionality to create routes around the Gulbenkian space.

## Cultural agenda

We provide information for the next events happening in Gulbenkian. The user can add notifications for upcoming events that they want to be warned about, including general notifications for a type of event.







**PROCESS**



# USER RESEARCH

On the first stage of development, our user research was intended to provide us with an idea of who our users are and what are their motivations and needs regarding the problem that we were developing our solution for.

We approached our research in three different ways.

1.

## Presencial user interview

We interviewed a few people that were walking around the gardens in Gulbenkian.

We got around 10 answers.



2.

## Presencial staff interview

We interviewed the managers of the gardens, museum, library, cafe and restaurant.

They provided us with essential information regarding the spaces in Gulbenkian.



3.

## Online questionnaire

We developed an online inquiry that we shared via Facebook.

From the 100 answers to the questionnaire we got a broader sense of what our users needed.



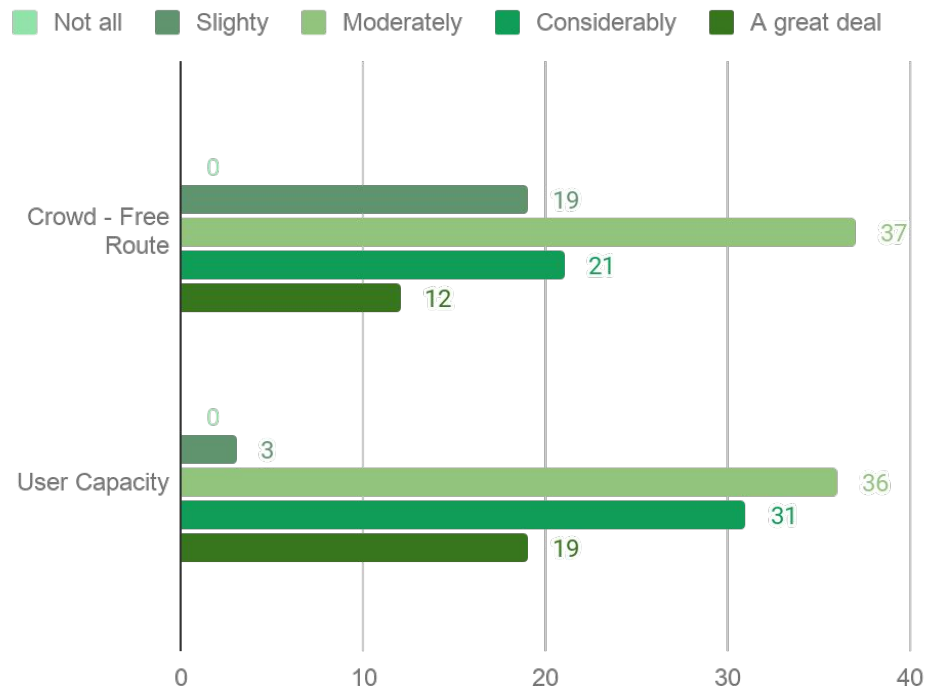
# USER SYNTHESIS

Regarding the presential user interviews, the most relevant questions and answers were:

Question	Main answer
In what areas they usually spend more time.	Garden
What activities they like to perform.	Walk in the garden
What areas they experienced crowds.	Garden

From these results, we knew that the gardens should have a main priority in our application, for it is the most popular space in Gulbenkian.

Regarding the online questionnaire, we asked the users how useful were the features we were proposing. (From 100 answers)



# PERSONAS

To consolidate our user research results, we created three personas to represent different types of users with different needs.

For each one we created a scenario that depicts how our solution would affect their routine.



Maria Pereira  
41, Human Resources

Maria works in Lisbon and enjoys spending time in the gardens with her family.

Sometimes her favorite spots in the garden are already taken and she spends too much time looking for another.



Rui Alves  
30, Classical music fan

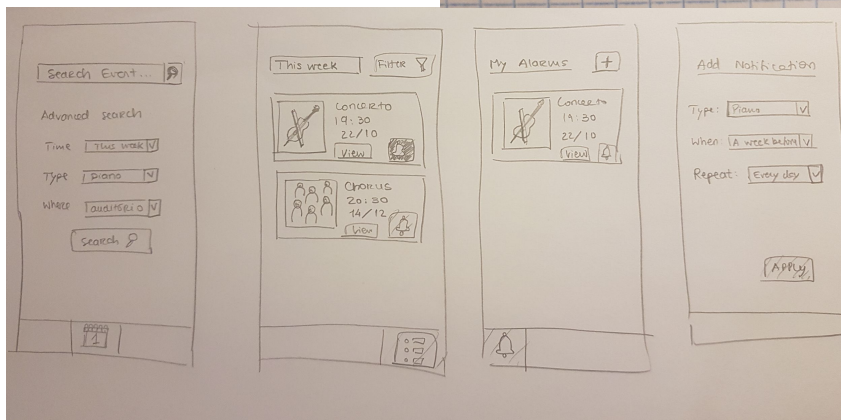
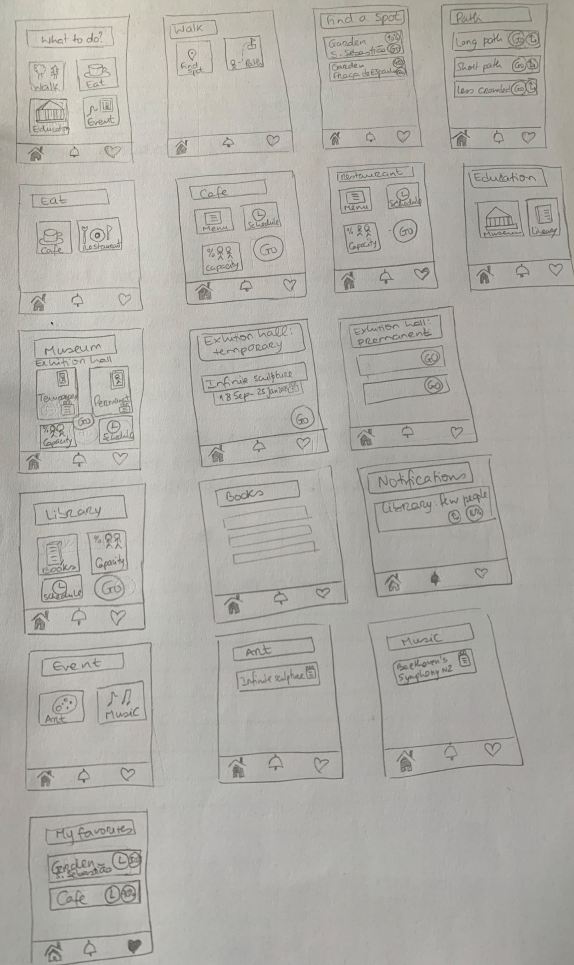
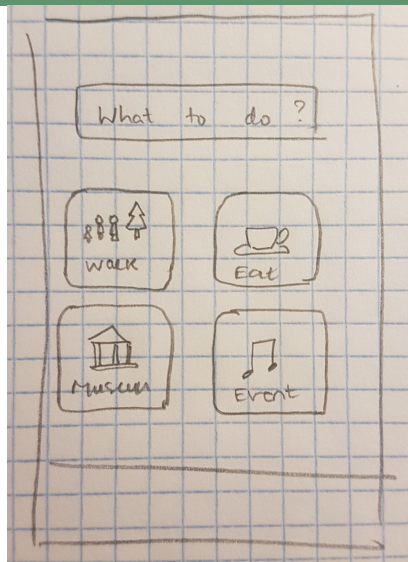
Rui loves classical music and plays piano since a very young age. He likes to attend music events at Gulbenkian.

Sometimes he finds too late what events are happening, and there are some that he would like to attend.

# PROTOTYPE 0 FIRST SKETCHES

For an initial phase of prototyping, we divided our team in groups to sketch different ideas for our interface.

With all the different sketches made, we started developing our first low fidelity prototype taking the best ideas from each sketch.

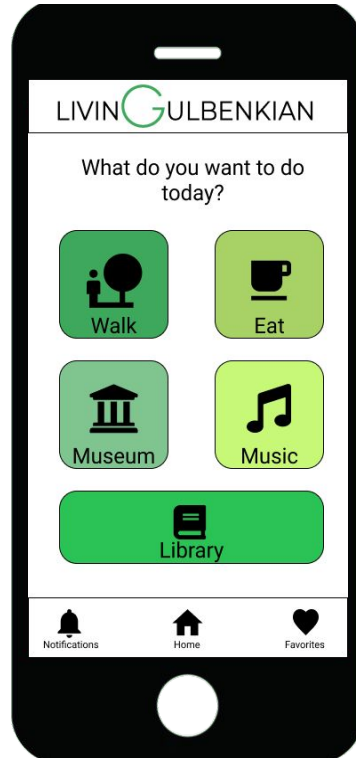




# PROTOTYPE 1 LOW FIDELITY PROTOTYPE

We developed our low fidelity prototype in Figma to provide an easier way to work at the same time as a group considering we could not be together in person.

This workflow was also advantageous to perform user tests because we could talk to our users through a video call, with no need to be physically in the same room.



We divided our home screen in terms of activities people could perform at Gulbenkian: walk in the gardens, eat, go to the museum, music events and go to the library.

On the bottom bar we had a button to go the notifications menu and another for the favorites. Notifications would have the user defined notifications for spaces, events... and favorites was a shortcut for spaces and events that the user checks often.

## PROTOTYPE 1

# USABILITY TESTING

We performed our usability tests using the low-fi prototype and asked the users to perform six tasks that would interact with most of the application.

1. Choose a spot in the garden that is not too crowded.
2. Add a notification for when the library has a capacity of less than 30% between 13:30 - 17:00
3. See the cafe menu and start navigation there
4. Add a notification for each Piano Concert event a week before
5. Check the map of the gardens and their capacity
6. Check my favorite dishes

## Wizard of Oz

We performed a variation of Wizard of Oz because we couldn't be physically present with our users.

We setup a video call via Zoom and asked the users to share their screen while they interacted with the prototype we made in Figma.

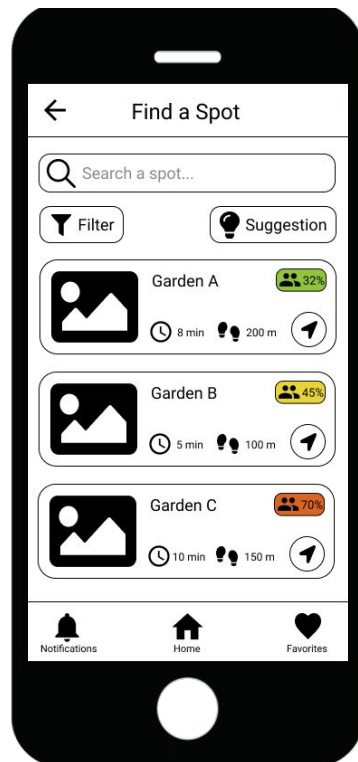
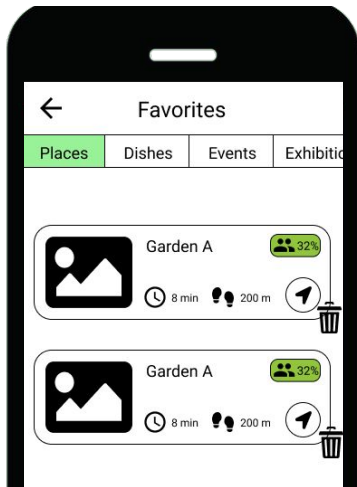
## Think aloud

As they performed the tasks, we asked the users to say what they were thinking so we could have a better idea of the thinking process a user has when interacting with our prototype, including the main struggles.

# PROTOTYPE 1 USER FEEDBACK

Through these tests, we understood that most tasks were easy and intuitive to perform.

The users liked the organization of the favorites menu and how the capacity of each space was visualized.



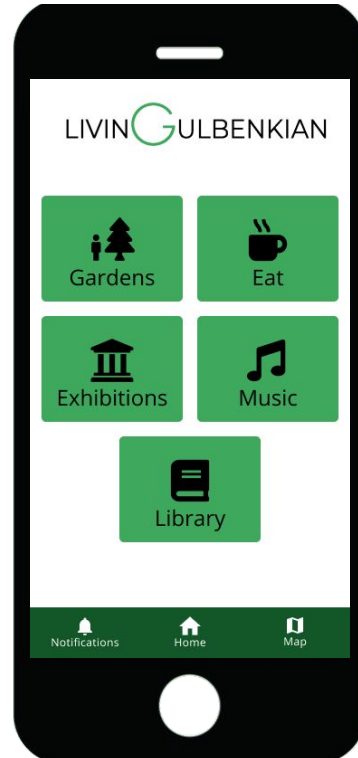
However, they did not like the way that “everything looked like a button”. This was a main struggle the users had, because it made the interface not intuitive.

PROTOTYPE 2

# LOW FUNCTIONALITY PROTOTYPE

In this new iteration of design, we took the feedback from user testing and greatly changed our interface.

We merged the favorites menu with the notifications one because the users were a bit confused with the difference between them.



## User feedback

Most of the users considered that the design of this prototype was much better than the previous one.

They felt that the screens were more consistent because we used the same type of buttons everywhere. The problem regarding with “everything looked like a button” was solved.

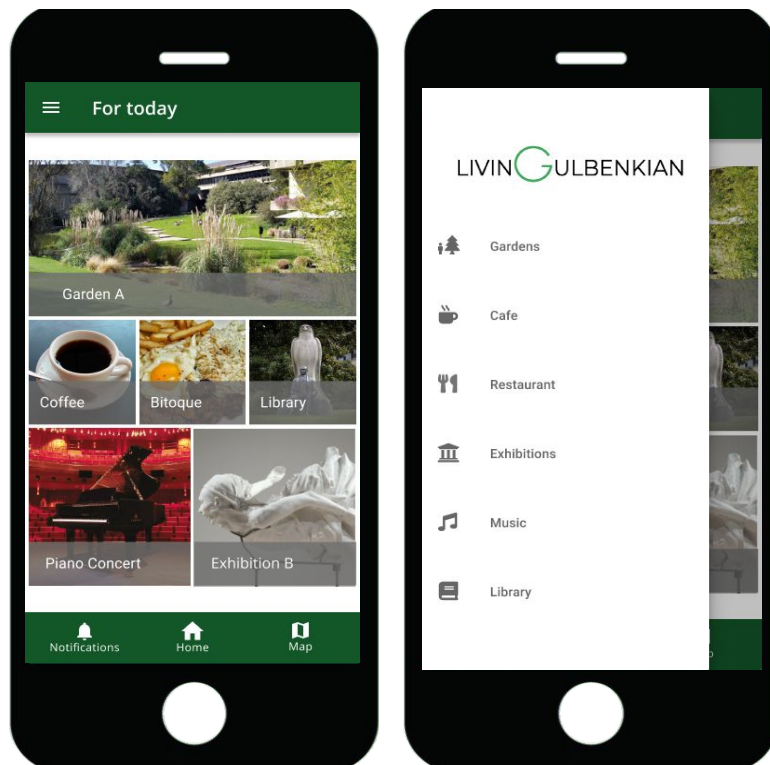
The users also liked that the notifications and favorites were merged, for it was a point of confusion.



## PROTOTYPE 3 HIGH FIDELITY PROTOTYPE

For the high fidelity prototype, we decided to approach the home screen in a different way.

Instead of showing directly the different menus, we wanted to give suggestions to the user of what activities they could do that day at Gulbenkian, but still keeping the different menus at hand in a navigation drawer.



## PROTOTYPE 3

# USABILITY TESTING

Like for the previous prototypes, we setup our user tests remotely through a video call via Zoom and asked the users to share their screen while they interacted with the prototype.

We tested 11 users with ages between 20 and 60.

## Think aloud

We asked the users to say what they were thinking while they executed the tasks to give us more feedback on the main difficulties.

## User feedback

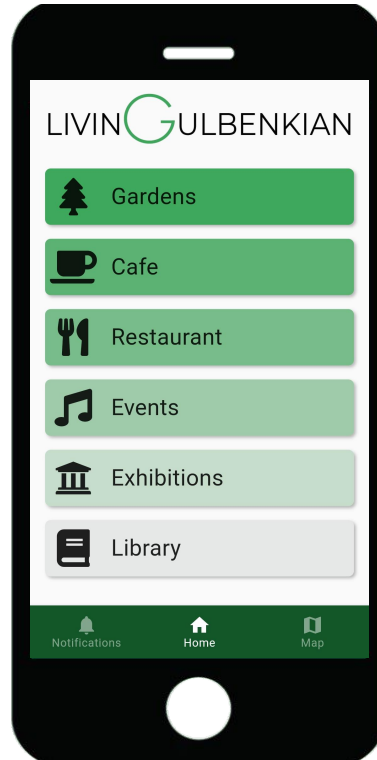
The main feedback we got back from users was that the home screen was very confusing. What we planned as a menu of suggestions for activities, the users viewed it as a high-level navigation for the other menus.

We knew that the home screen had to be a main focus on the next iteration of design.

## PROTOTYPE 4

# FULLY FUNCTIONAL PROTOTYPE

Due to the misunderstanding with the home menu approach, we decided to go back and give a high-level navigation for the rest of the menus in the shape of a list of options that the user could choose from.



This change in design greatly improved the navigation in our prototype. Afterwards, the users thought that our prototype was more intuitive and easier to use.



# CONCLUSION & SUMMARY



# | CONCLUSION

In the past decade, as technology advanced, society learned new ways of being connected through distance and portuguese people were not an exception. We tend to be more and more attracted to technology and sometimes forget the power of taking in a breath of fresh air while surrounded by trees and birds chirping. During this pandemic, feeling nature's touch represents an urgent need but also a big risk and our team decided to face this problem by creating a solution: safe traveling.

We believe that our solution is effective in reducing the risks of traveling outside, by choosing the Gulbenkian Foundation as it's focus. This app wouldn't also be possible without understanding the user's thoughts and feels towards our multiple developed prototypes, as they're the main source of determination for our team to reach the best possible final prototype.

We learned that feedback is key in developing apps and it was great, interviewing strangers in order to come up with ways to solve problems with their experience with Gulbenkian.



# | SUMMARY

With this project, we hope we have provided a solution for the problem of overcrowding, specifically in Gulbenkian. In Covid times, going outside is not always easy or safe, so we hope this solution could attenuate this fear.

We also know that overcrowding in small spaces was already an issue before the risk of infection with COVID-19, so, in many ways, our solution could still be applied after Covid.

With this idea for a solution that we had, through an iterative design process, we slowly improved our concept and application interface.

Our users gave positive feedback for the final product and we think we have achieved what we set out to do. It was a great learning experience and we know that there is always room for improvement.







**ANNEX**

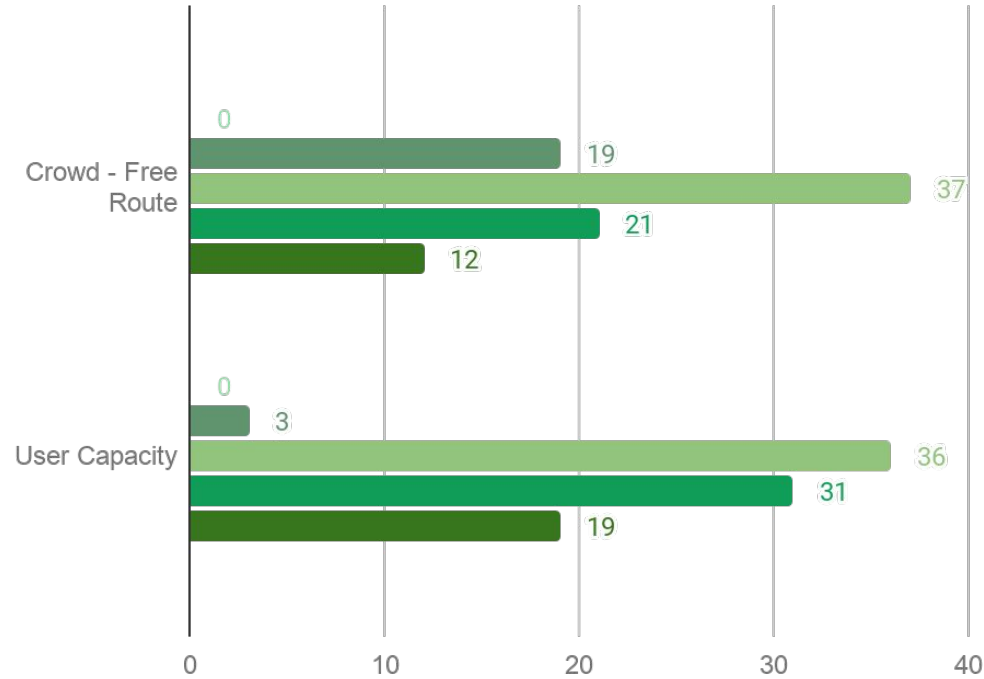




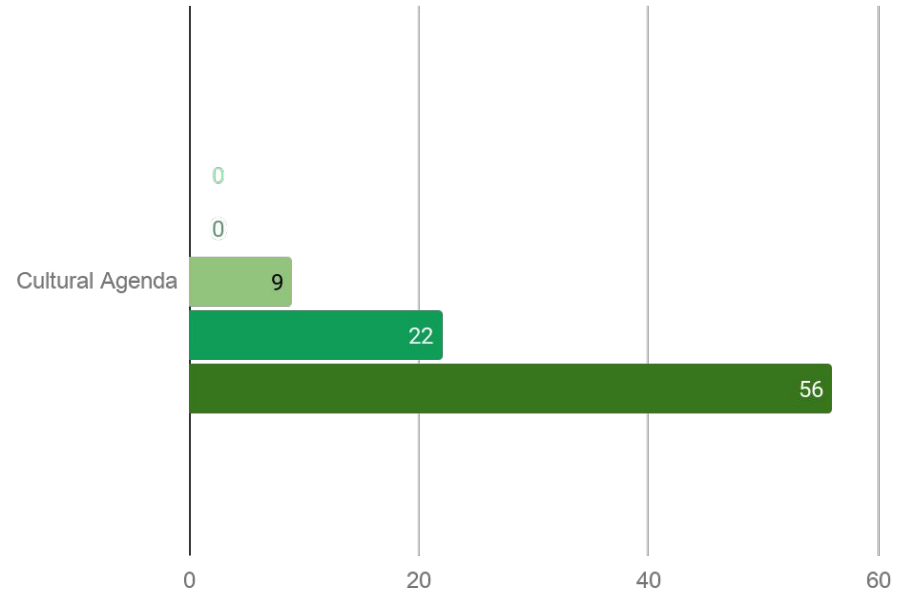
# USER RESEARCH PLAN

# WHAT USER NEEDS?

Not all Slightly Moderately Considerably A great deal



Not all Slightly Moderately Considerably A great deal







# PERSONAS



*"If there's a beautiful day outside, I can't stay cooped up at home!"*

**Type:**

User that spends most of their free time in the garden.

## Maria Pereira

She enjoys nature and outdoor activities.

**Biography:**

She is 41 years old, married and has 2 kids. She works in Human Resources in a company located in Lisbon. She grew up in the countryside so she enjoys being in touch with nature.

**Activities:**

She usually goes to the Gulbenkian garden so that her children can play around the nature. Sometimes, when she goes there alone, she likes reading a book in the cafe at lunch break.

**Technology:**

She is accustomed to using map applications when she goes to new places.



*"Music is a piece of Art that goes in the ears straight to the heart."*

**Type:**

User that loves cultural events.

## Rui Alves

He is a fan of classical music.

**Biography:**

He is 30 years old. Beethoven and Mozart are his favorite composers of all time. From a young age he has learned to play the piano and he joined the music conservatory.

**Activities:**

He loves to attend events like live music at Gulbenkian garden, as well as in a nearby auditorium.

**Technology:**

During the confinement, he got used to attend music events through online streaming, so he can't wait to attend live events again. This is why he is willing to use any app that will enable him to do so.

Photo by [Edward Cisneros](#) on [Unsplash](#)





*“Arts are a very human way of making life more bearable”*

**Type:**

User that can only study in the Gulbenkian facilities.

## João Silva

He studies art and likes to go expositions.

**Biography:**

He is 21 years old. He studies at Faculdade de Belas Artes that is located in Lisbon. His degree is sciences of art and heritage. He decided to study art because he always loved to visit galleries.

**Activities:**

His favorite place to study is the Gulbenkian Library, where he can find several books that he would not have access to otherwise. He usually goes both alone or with some colleagues of his.

**Technology:**

He is young, so he is used to dealing with technology. He is always installing new mobile apps.



# SCENARIOS



*"If there's a beautiful day outside, I can't stay cooped up at home!"*

**Type:**

User that spends most of their free time in the garden.

## Maria Pereira - Scenario (1/2)

### Before LivinGulbenkian:

It's a beautiful day outside, so Maria and her family decide to go to the Garden of Gulbenkian.

Normally, when she arrives at the Garden she goes straight to her favorite spot.

Since it's a beautiful day, the Garden is filled with other families.

Maria and her family need to spend some time walking around until they find an empty spot to sit on, so that her children can play.



*"If there's a beautiful day outside, I can't stay cooped up at home!"*

**Type:**

User that spends most of their free time in the garden.

## Maria Pereira - Scenario (2/2)

### After LivinGulbenkian:

It's a beautiful day outside, so Maria and her family decide to go to the Garden of Gulbenkian.

When they arrive, she opens the app on her phone and searches for an empty spot.

The app informs her of a spot and how to get there.

She goes there with her family, and they get to spend more time together.



*"Music is a piece of Art that goes in the ears straight to the heart."*

**Type:**

User that loves cultural events.

## Rui Alves - Scenario (1/2)

### Before LivinGulbenkian:

Rui likes to attend piano concerts at Gulbenkian.

Periodically, he checks Gulbenkian's website for an upcoming piano concert.

He forgot to check the website for a while, and found out that a friend of his went to a piano concert last week that was of his liking.





*"Music is a piece of Art that goes in the ears straight to the heart."*

**Type:**

User that loves cultural events.

## Rui Alves - Scenario (2/2)

**After LivinGulbenkian:**

Rui likes to attend piano concerts at Gulbenkian.

The app notifies him for every upcoming piano concert.

When the concert is of his liking, he's glad that he was notified and proceeds to go to the website to buy a ticket.



*“Arts are a very human way of making life more bearable”*

**Type:**

User that can only study in the Gulbenkian facilities.

## João Silva - Scenario (1/2)

**Before LivinGulbenkian:**

João has to write an essay about the book “Arte Contemporânea”, which is only available at the Gulbenkian library.

He goes there and the place is full. There are 2 girls that arrived 15 minutes earlier and are waiting to get in as well.

Frustrated for not being able to know when there is room, João gives up and goes home.



*“Arts are a very human way of making life more bearable”*

**Type:**

User that can only study in the Gulbenkian facilities.

## João Silva - Scenario (2/2)

**After LivinGulbenkian:**

João has to write an essay about the book “Arte Contemporânea”, which is only available at the Gulbenkian library.

He checks the app to see if the library has available spots before actually going there.

The app tells him that there are many available spots, so he goes there and writes his essay.



# USABILITY TESTING



# Critical Tasks

1

Choose a spot in the garden that is not too crowded

2

Add a notification for when the library has a capacity of less than 30% between 13:30 - 17:00

3

See the cafe menu and start navigation there

4

Add a notification for each Piano Concert event a week before

5

Check the map of the gardens and their capacity

6

Check my notifications dishes

# Analysis of results

For each task, we used these metrics:



Time spent



Number of clicks



Number of errors and what errors that user did



Feedback

# Analysis of results - Time, clicks and errors

	Time		Clicks		Errors
	Average	Ideal	Average	Ideal	Average
Task 1	0:22	0:09	5.273	5	1
Task 2	1:18	0:19	20.182	17	1
Task 3	0:19	0:09	6.818	6	0
Task 4	0:53	0:14	19.818	9	2
Task 5	0:09	0:02	1.909	1	0
Task 6	0:09	0:05	3.818	2	1



# ARCHITECTURE



# Technology Employed

We developed our application using Flutter.

The database and notifications were implemented using Firebase.

The creation of routes and maps were integrated with Google Maps.

The code for our project can be found at:

[https://github.com/isabelSoares/CCU-2021/tree/master/my\\_app](https://github.com/isabelSoares/CCU-2021/tree/master/my_app)





# QUESTIONNAIRE

# LivinGulbenkian

Dear participant,

We are students from Instituto Superior Técnico, working on a project from the course "User Centered Design". Our goal is to develop an application that informs the user on the capacity of different spaces within the Calouste Gulbenkian Foundation space as well as calculating an effective, customized and crowd free route.

We will be recording information pertaining to your experience during visits to the Calouste Gulbenkian Foundation, as well as data pertaining to the usage and adoption of new technologies.

All information will be kept in anonymity and will be exclusively analyzed by this project's team. Data will also be used on a presentation/result exhibition within the "User Centered Design" course.

Your participation is voluntary and you can forfeit at any moment without any penalty.

This questionnaire has an expected duration of 5 minutes.

**\*Obrigatório**

## Demographic

1. What is your gender? \*

*Marcar apenas uma oval.*

- Female
- Male
- Prefer not to say
- Outra: \_\_\_\_\_

2. What is your age? \*

*Marcar apenas uma oval.*

- less than 18
- 18 - 25
- 26 - 35
- 36 - 50
- 50 - 70
- more than 70

## Smartphone

3. Do you own a smartphone? \*

*Marcar apenas uma oval.*

Yes

No *Avançar para a pergunta 8*

### Smartphone

4. What type of system does your phone have? \*

*Marcar apenas uma oval.*

Android

iOS

Outra: \_\_\_\_\_

5. How many hours per day do you spend on your smartphone? \*

*Marcar apenas uma oval.*

less than 1 hour

1 - 3 hours

4 - 6 hours

more than 6 hours

### Maps

6. Do you use GPS-based map applications? (e.g Google Maps) \*

*Marcar apenas uma oval.*

Yes

No



## 7. How often do you use these type of applications? \*

Marcar apenas uma oval por linha.

	Everytime	Frequently	Sometimes	Rarely	Never	N/A
When going to a new place	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When going to a place you went once	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When going to a familiar place	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## Gulbenkian

## 8. Have you ever been to Gulbenkian? \*

Marcar apenas uma oval.

Yes

No    Avançar para a pergunta 13

## Going to Gulbenkian

## 9. When you go to Gulbenkian, where do you spend your time? \*

Marcar tudo o que for aplicável.

Gardens

Library

Museum

Cafe

Restaurant

Outra:  \_\_\_\_\_

## 10. What activities do you do? \*

*Marcar tudo o que for aplicável.*

- Study
- Read a book
- Walk in the garden
- Spend time with friends / family
- Visit the museum / expositions
- Have a picnic
- Attend an event
- Have a snack / coffee
- Have lunch

## 11. Have you ever experienced crowded areas in Gulbenkian? \*

*Marcar apenas uma oval.*

- Yes
- No *Avançar para a pergunta 13*
- I don't remember *Avançar para a pergunta 13*

### Crowded Areas

## 12. Where have you experienced crowded areas? \*

*Marcar tudo o que for aplicável.*

- Gardens
- Library
- Museum
- Cafe
- Restaurant

Outra:  \_\_\_\_\_

### Gulbenkian during COVID-19

## 13. Would you go to Gulbenkian during the pandemic? \*

*Marcar apenas uma oval.*

- Yes
- No *Avançar para a pergunta 16*
- Maybe

## Gulbenkian gardens during COVID-19

14. You are spending time in the park and suddenly find yourself in the middle of a crowd. How does that make you feel? \*

*Marcar apenas uma oval.*

	1	2	3	4	5	6	7	8	9	10	
Not comfortable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Very comfortable

15. You and your family want to sit on the grass but that area is crowded right now. How do you procede? \*

*Marcar apenas uma oval.*

- Go in anyway because you don't mind crowds
- You go drink a coffee and hope the crowd is gone when you go back
- You don't want to wait, you just go and sit somewhere else
- Stay back and wait for the crowd to disperse

## Mobile application

16. How useful do you think these functionalities would be? \*

*Marcar apenas uma oval por linha.*

	Not useful	Slightly useful	Useful	Very useful	Extremely useful
Plan a crowd-free route inside Gulbenkian	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Have information of the capacity of spaces inside Gulbenkian	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## Suggestions

17. Do you think it would be useful to have the cultural agenda of Gulbenkian in the application? \*

*Marcar apenas uma oval.*

	1	2	3	4	5	
Not useful	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Very useful

18. What other functionalities would find useful in the mobile application?

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Thank you for your time!

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Este conteúdo não foi criado nem aprovado pela Google.

Google Formulários