Dashboard of a car

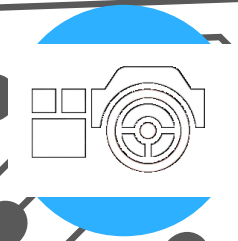
Final Presentation

Human-Computer Interaction

P6

Hugo Paiva de Almeida 93915 LEI
Rui Fernandes 92952 LEI
Carlos Michell Senas 81377 LEI

Introduction

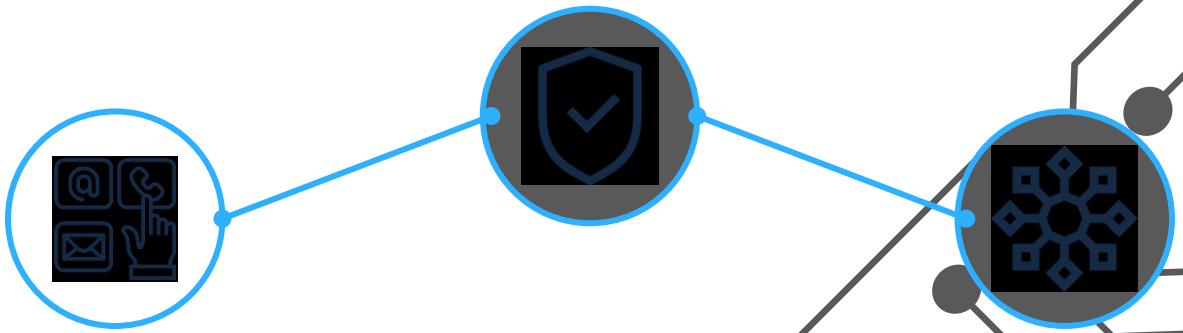


Contextualization

Why this project?

Personal Interest

Project Objectives



All utilities

Reduce the risk

Universal System

Personas

Sean Perkins

Age	Gender	Education	Location
45 years old	Male	Bachelor Degree	Porto

Details

Needs

Tangible results

Wants

See results before spending money.

Values

Detailed planning

Decisions backed up by analytics or data

Personas

Isabel Sousa

Age	Gender	Education	Location
18 years old	Female	Bachelor Student	Lisboa

Details

Needs

Measurable impact

Wants

Something that doesn't take long to set up

Products that integrate with other existing technology

Values

Time savings

Products that fit easily into her workflow

Scenarios

Play a song on bluetooth device

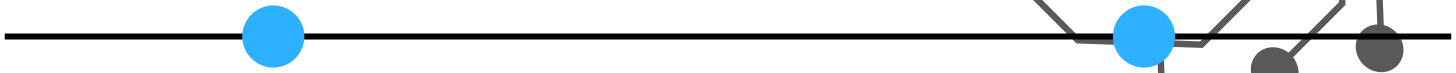
Sean is tired of the car radio and wants to listen to the music on his phone

He connects his phone through bluetooth using the dashboard's settings menu

He goes to the audio menu and plays "Club Tropicana" through bluetooth

Scenarios

Get vehicle status information



Isabel receives a warning on the dashboard with the indication that the tire pressure is low

Taking advantage of this warning, she uses the car's dashboard to check the tire pressure, the car's oil level, amongst other information

Scenarios

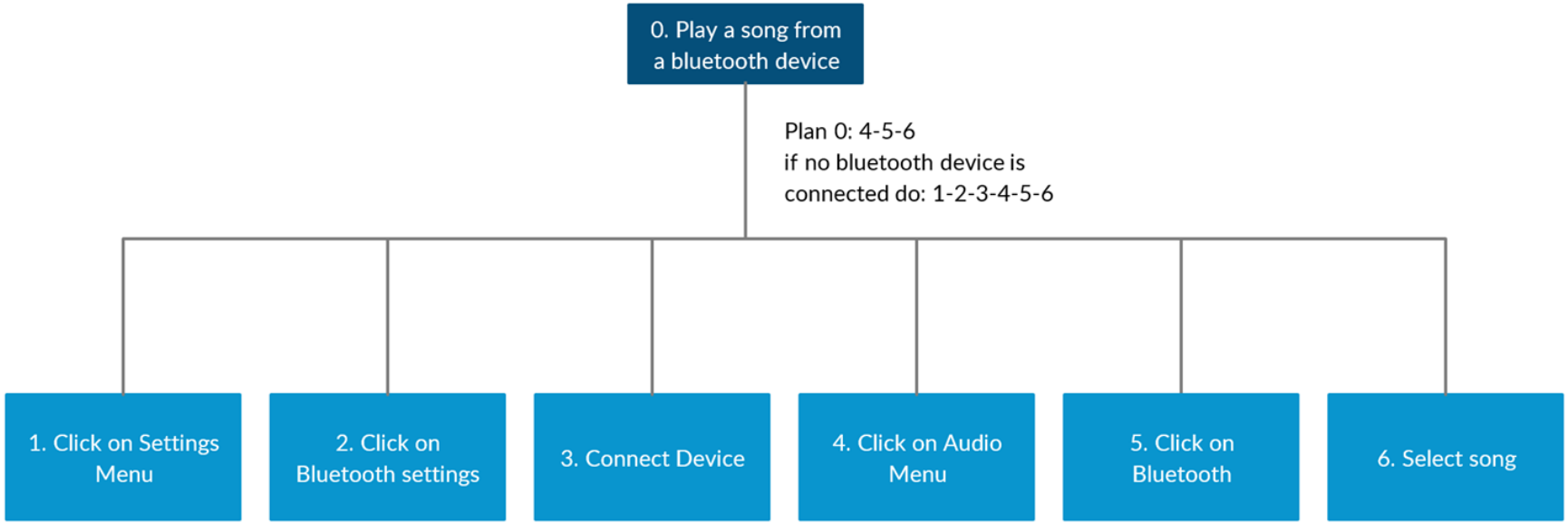
Call emergency number

Sean is driving at night. As he passes the supermarket, notices that a fire is starting

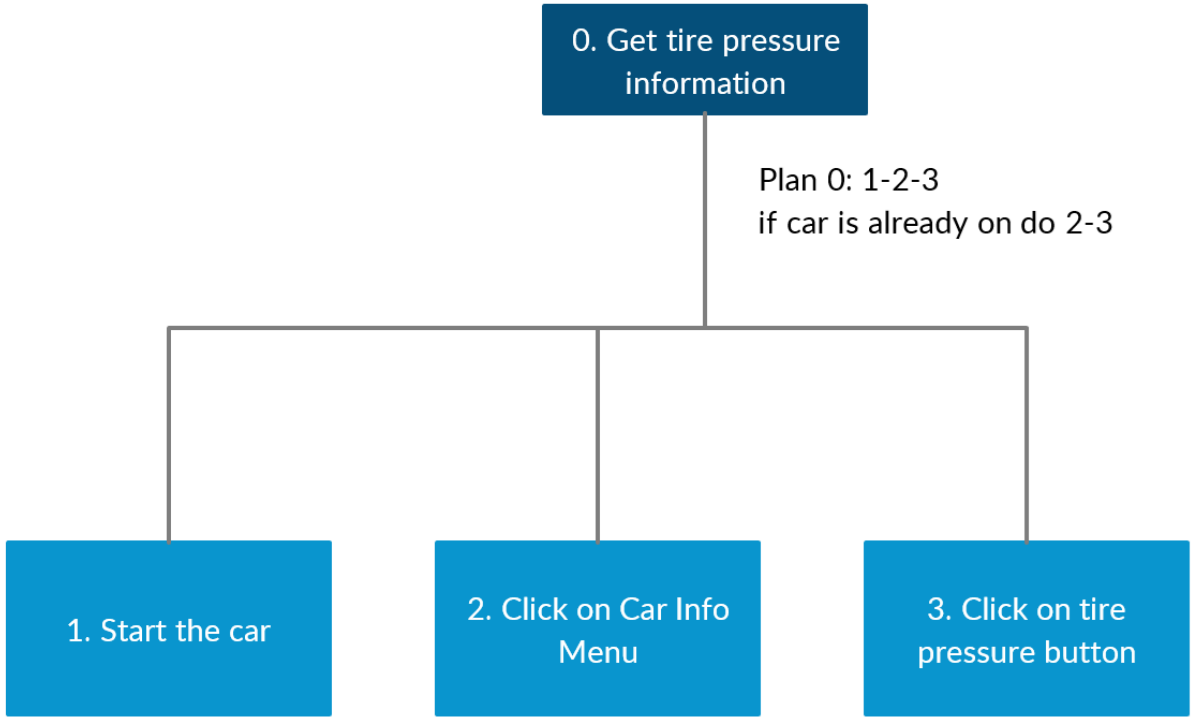
He quickly decides to call the fire department

Using the dashboard's phone menu he quickly called the emergency number and reported the incident

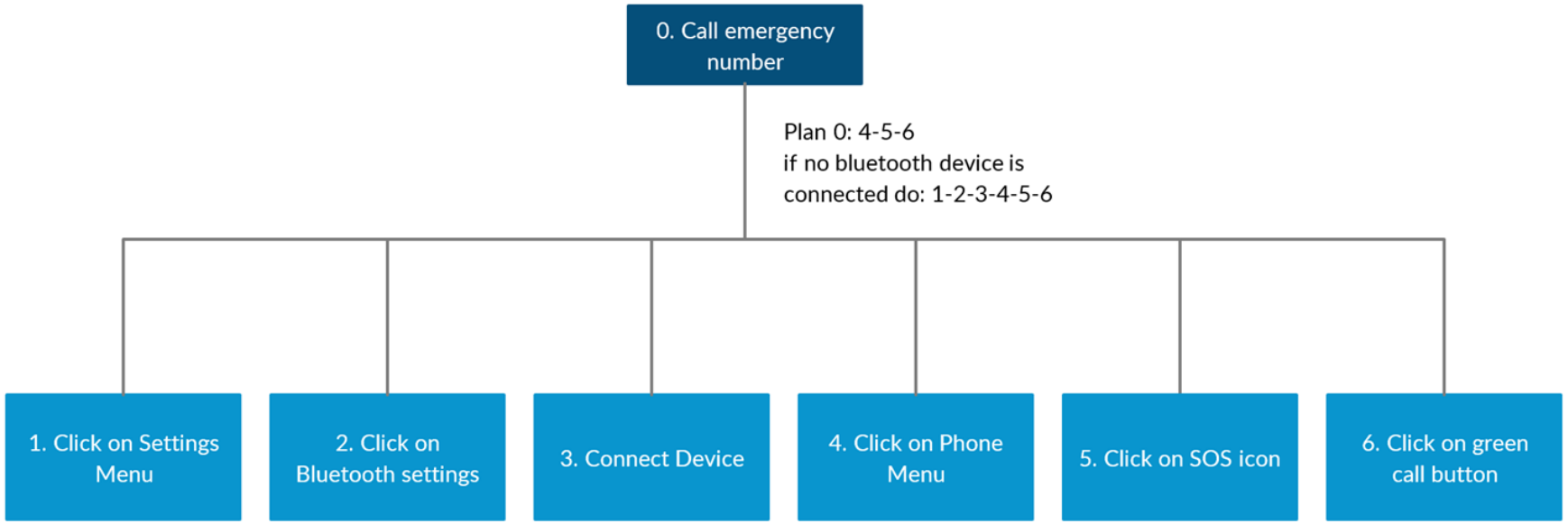
Task


0. Play a song from a bluetooth device
Plan 0: 4-5-6
if no bluetooth device is connected do: 1-2-3-4-5-6
1. Click on Settings Menu
2. Click on Bluetooth settings
3. Connect Device
4. Click on Audio Menu
5. Click on Bluetooth
6. Select song

Task


0. Get tire pressure information
Plan 0: 1-2-3
if car is already on do 2-3
1. Start the car
2. Click on Car Info Menu
3. Click on tire pressure button

Task


0. Call emergency number
Plan 0: 4-5-6
if no bluetooth device is connected do: 1-2-3-4-5-6
1. Click on Settings Menu
2. Click on Bluetooth settings
3. Connect Device
4. Click on Phone Menu
5. Click on SOS icon
6. Click on green call button

Requirements

Non-Functional

Usability

The application should be easy to learn and use, have a pleasant design and make the user make as few errors as possible

Availability, Reliability and Maintainability

The application should be accessible to the user whenever needed, with low chance of critical failures and when they happen, they should be fixed quickly

Performance and Scalability

The system should have a fast response time and handle different workload while maintaining the performance requirements

Requirements

Functional

Accomplishable

Internal vehicle information display

Control of the electrical systems of the doors, windows and air conditioning of the vehicle

Connecting bluetooth devices, namely smartphones with basic phone features

Sound system control

Integrated navigation system with map, routes and location search

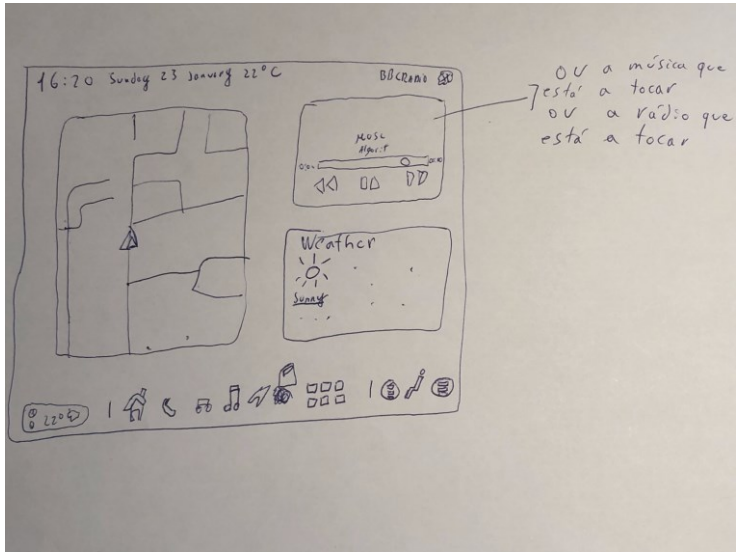
Not Accomplishable

Inclusion of an app store where the user can download extra applications

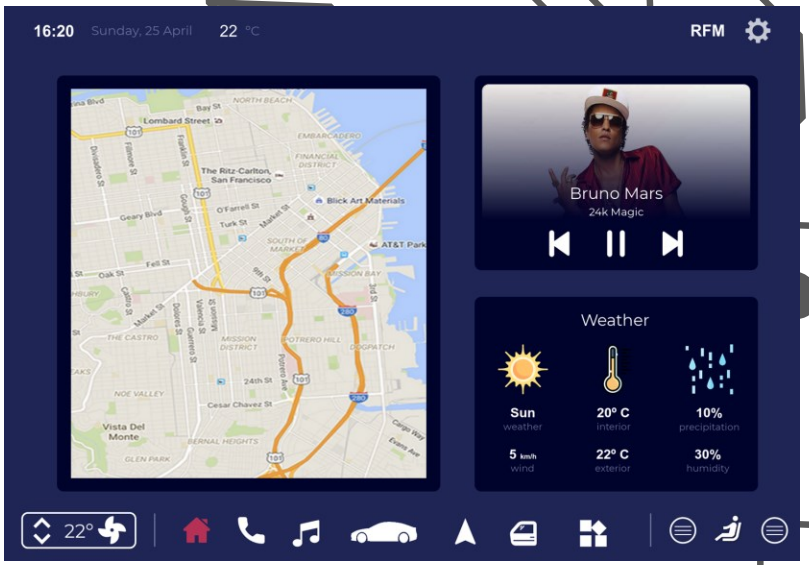
External application support e.g. Uber, Skype, TuGas, Shazam, miio, etc.

Low Fidelity Prototype

Digital Prototype made with Proto.io



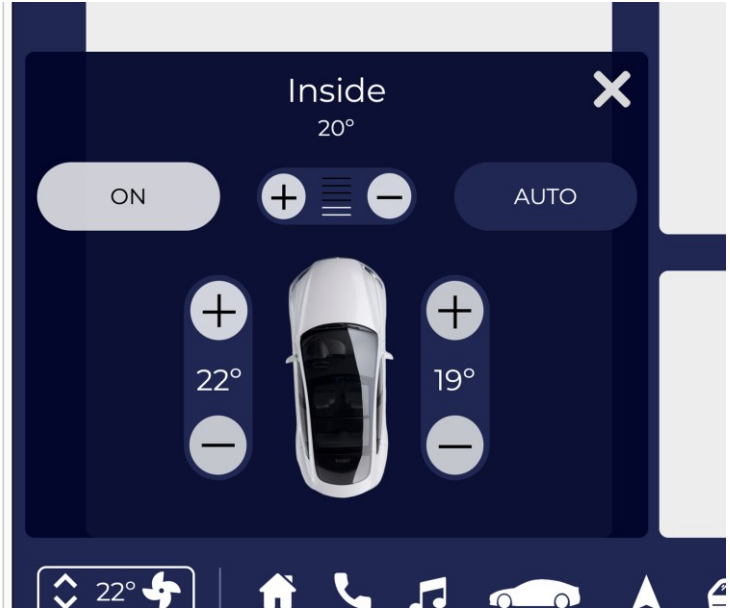
Started with brainstorming in a paper prototype



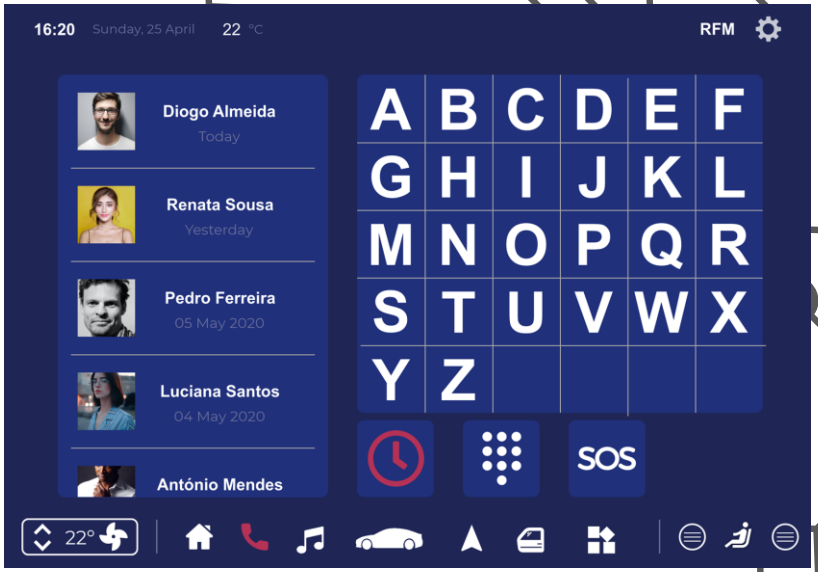
Transitioned to digital prototype with proto.io

Low Fidelity Prototype

Digital Prototype made with Proto.io



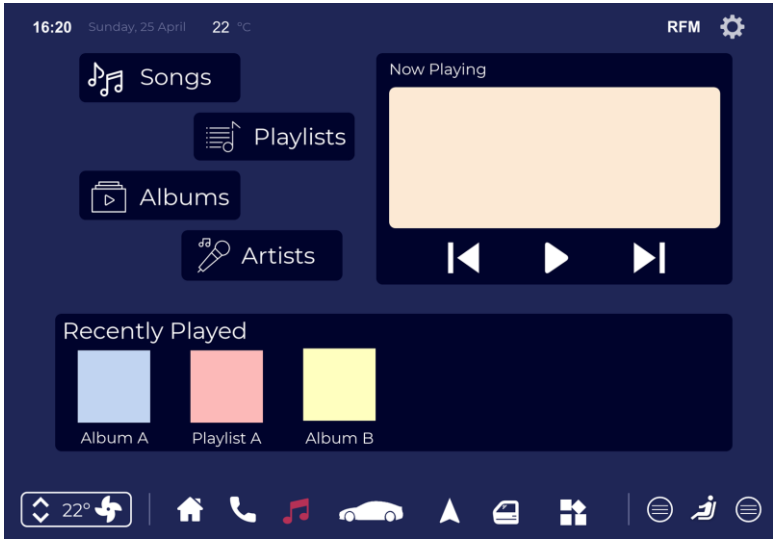
Air control



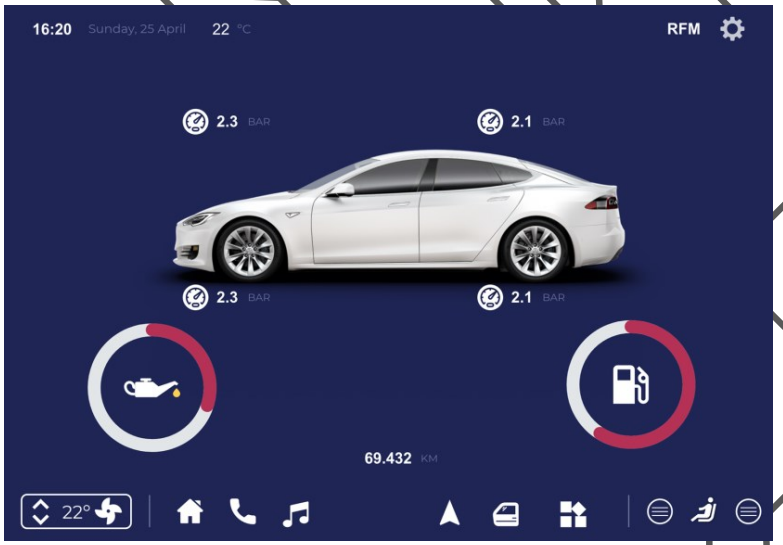
Phone menu

Low Fidelity Prototype

Digital Prototype made with Proto.io



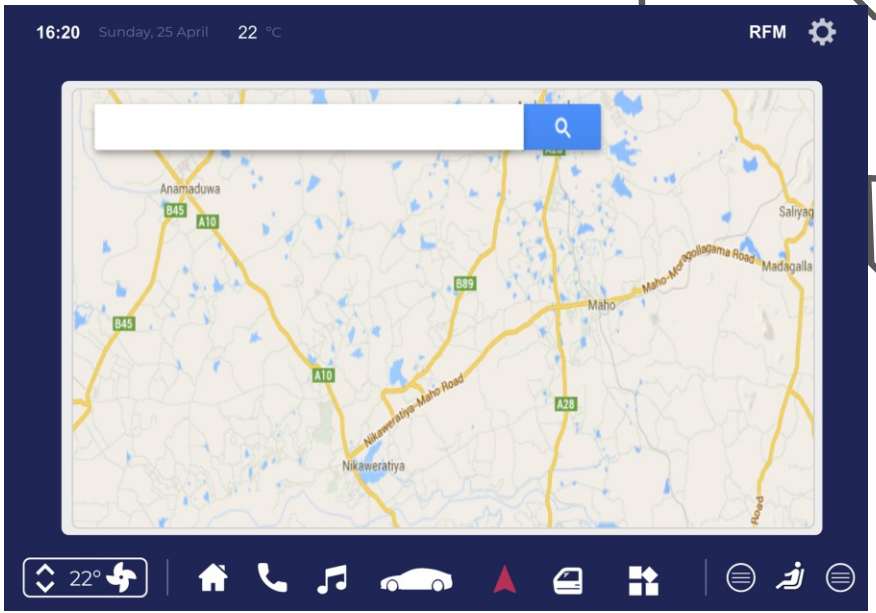
Music menu



Car info menu

Low Fidelity Prototype

Digital Prototype made with Proto.io

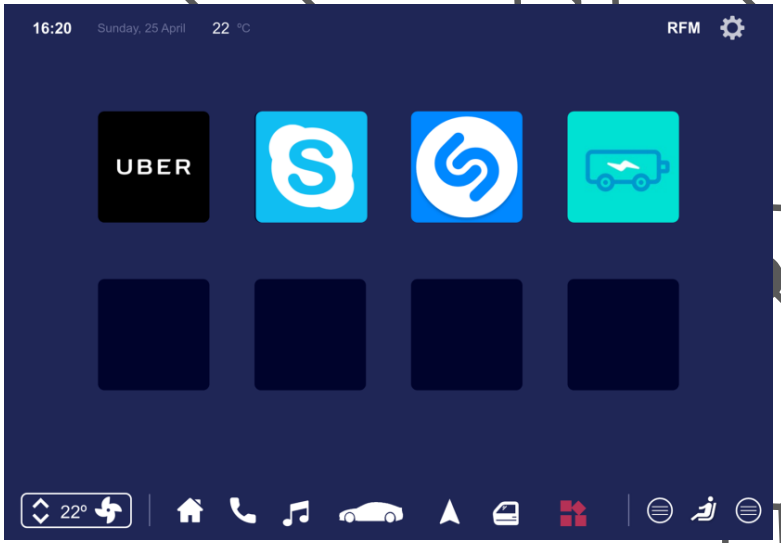


Navigation menu

Low Fidelity Prototype

Digital Prototype made with Proto.io

Door menu



Apps menu

User Evaluation

Low fidelity Prototype

- Used Google forms to make and review the user evaluation based on the documentation provided
- The goal was to evaluate the system as a whole (Ease of learning, efficiency of use, error frequency, intuitive design, etc)
- Tasks:
    - Turn on the A/C and raise the temperature on the left side
    - Increase fan intensity and turn on rear defroster
    - Call “Alberto Reis” and then call the emergency number
    - Lock all doors and roll up the driver’s window
    - Check the car’s fuel
- Total of eight (8) participants

User Evaluation

High fidelity Prototype

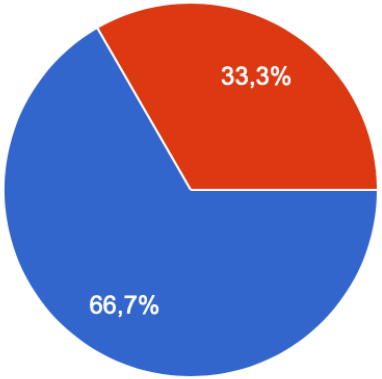
- Tested the same tasks
- Added new tasks relating to the now implemented music feature:
  - Play the song “24K Magic” from a bluetooth device (phone) and increase the volume
  - Increase the ‘Bass’ level on the sound settings menu
- Total of six (6) participants

User Evaluation

Results

Género

6 respostas

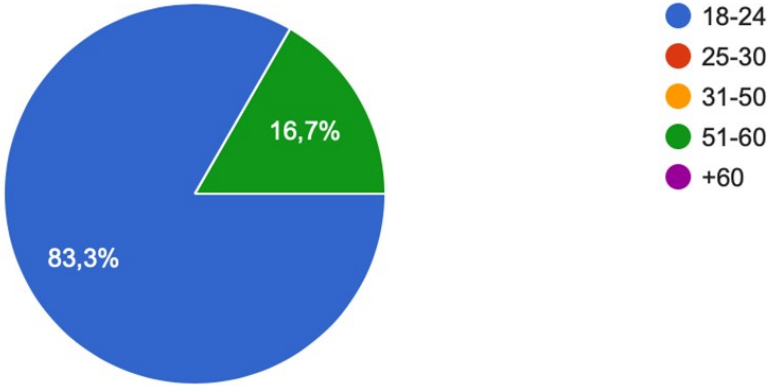


User Evaluation

Results

Idade

6 respostas



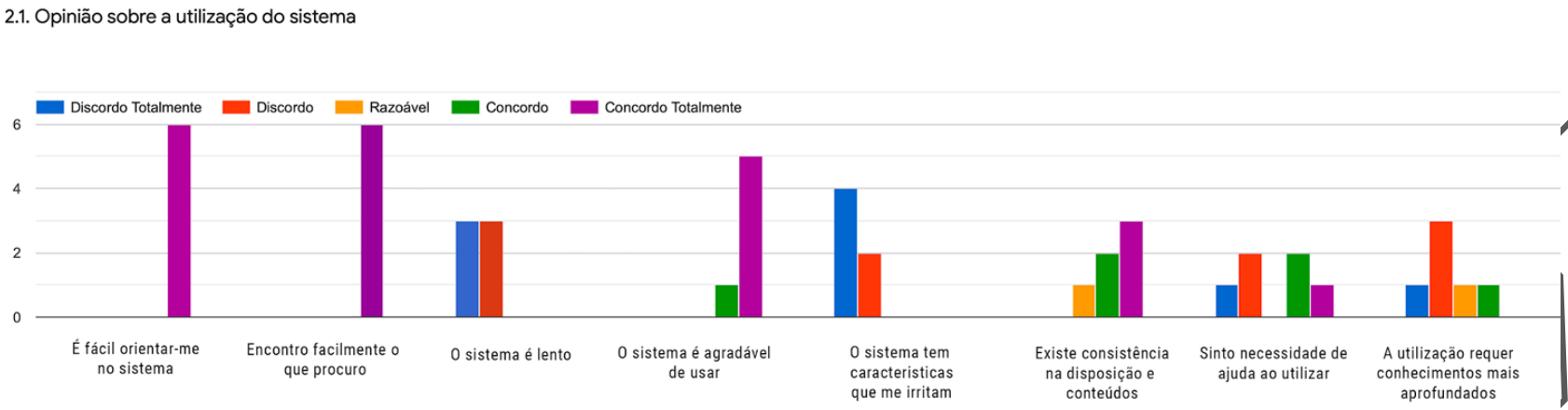
User Evaluation

Results

Task ID	Description	Low Fidelity Prototype	High Fidelity Prototype
1	**Turn on the A/C and raise the temperature on the left side**	**Easy**	**Very Easy**
2	Increase fan intensity and turn on rear defroster	Easy	Easy
3	Call “Alberto Reis” and then call the emergency number	Very Easy	Very Easy
4	Lock all doors and roll up the driver’s window	Easy	Easy
5	Check the car’s fuel	Very Easy	Very Easy
6	**Turn on heated seats for the driver’s side**	**Easy**	**Very Easy**
7	Play the song “24K Magic” from a bluetooth device (phone) and increase the volume	-	Easy
8	Increase the ‘Bass’ level on the sound settings menu	-	Very Easy

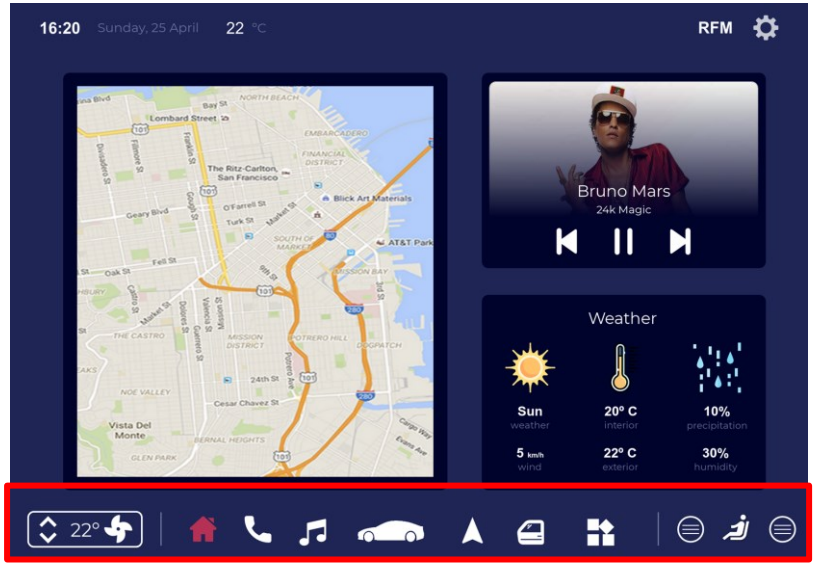
User Evaluation

Results

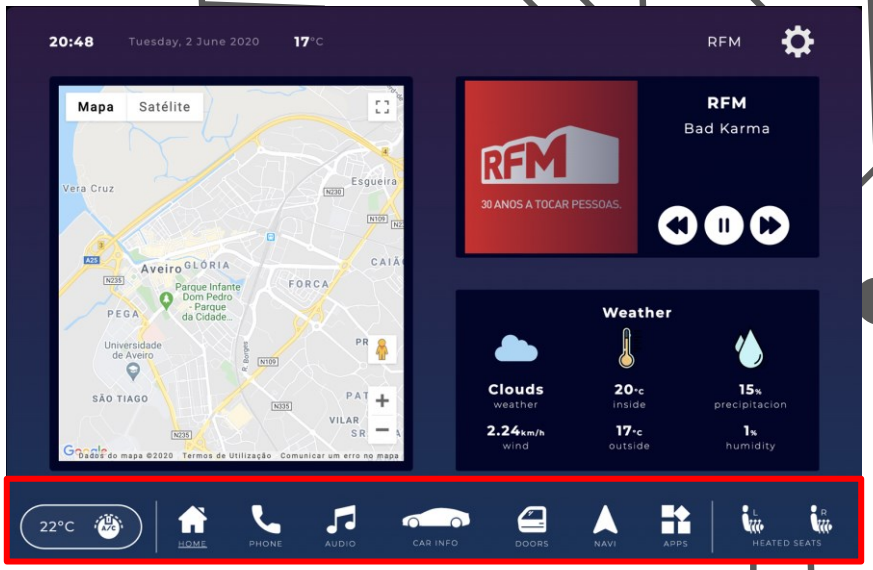


User Evaluation

Update: Labels on navbar icons



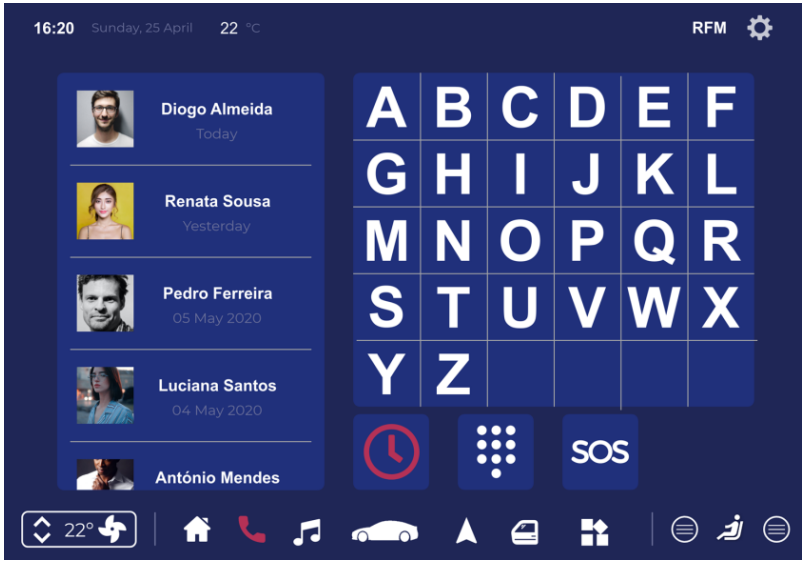
Before LFP Usability Test



After LFP Usability Test

User Evaluation

Update: Identifier on recent calls



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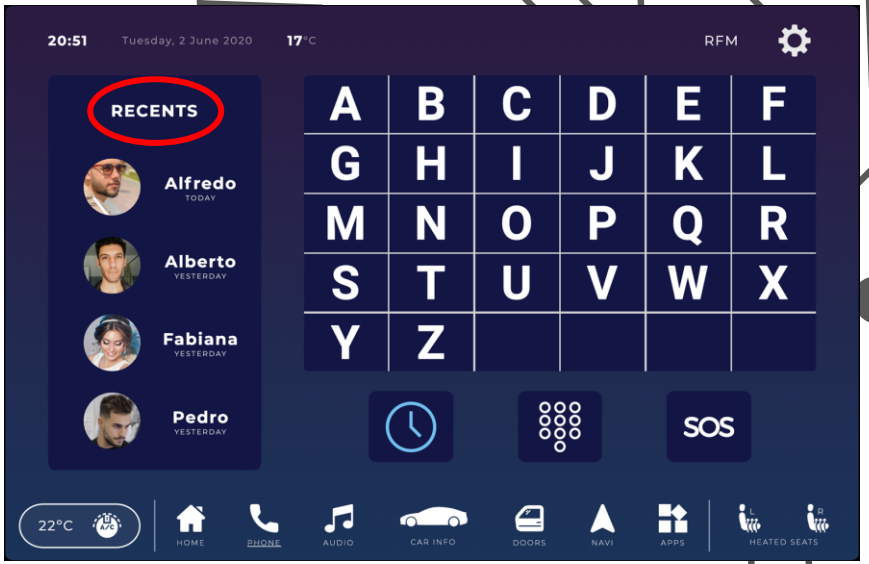
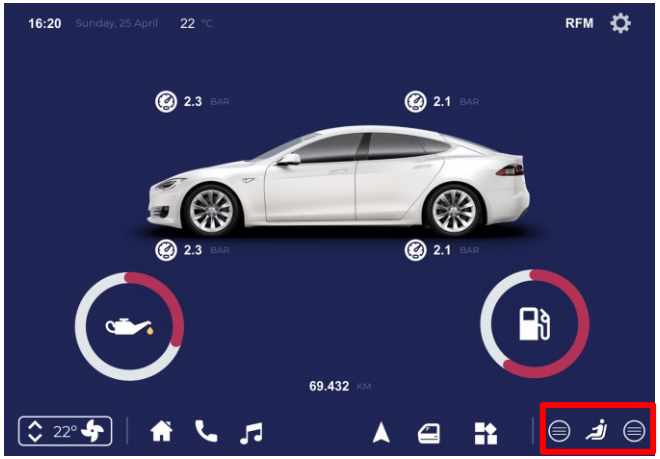


After LFP Usability Test

User Evaluation

Update: Side identifier for heated seats



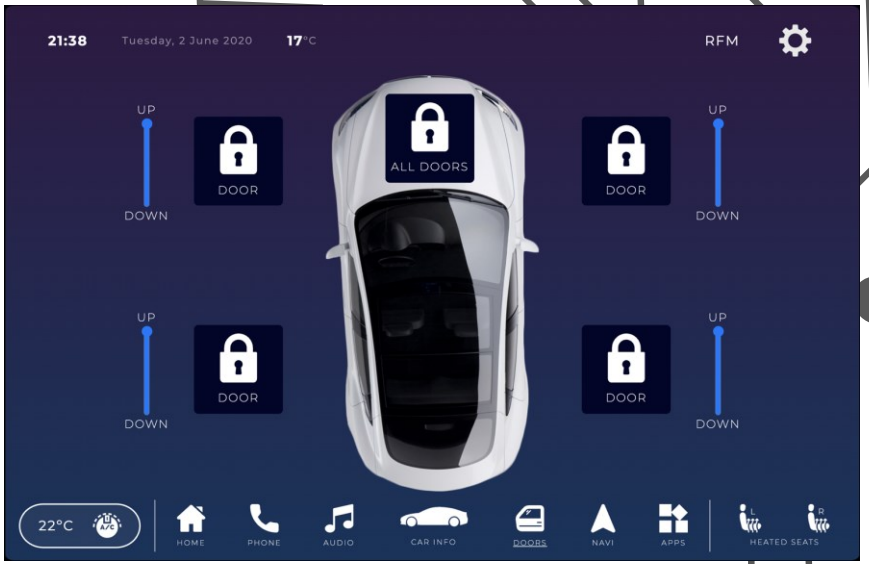
Before LFP Usability Test

After LFP Usability Test

User Evaluation

Update: Change of doors menu (icons, labels)

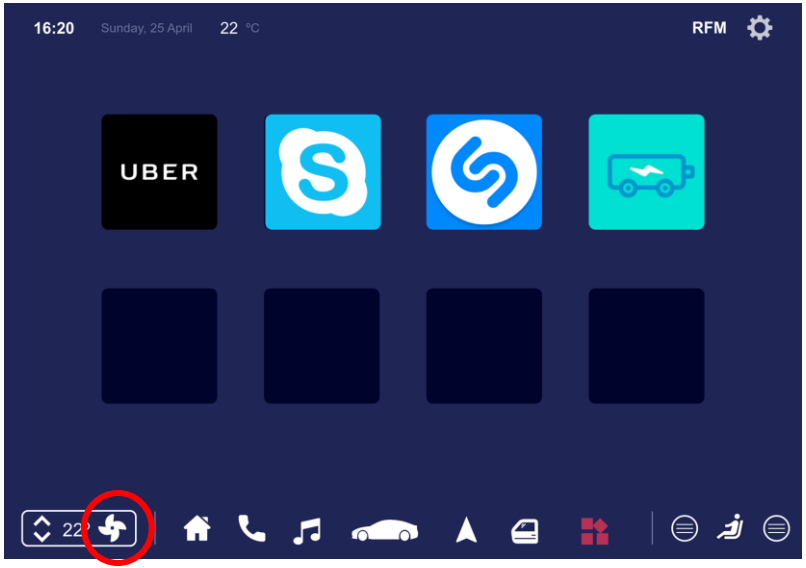
Before LFP Usability Test



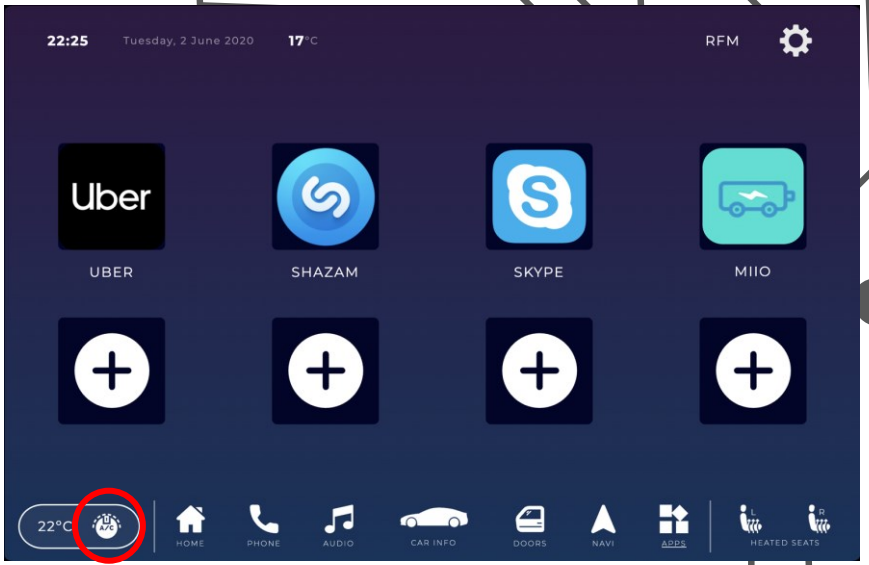
After LFP Usability Test

User Evaluation

Update: Better choice of icon for A/C



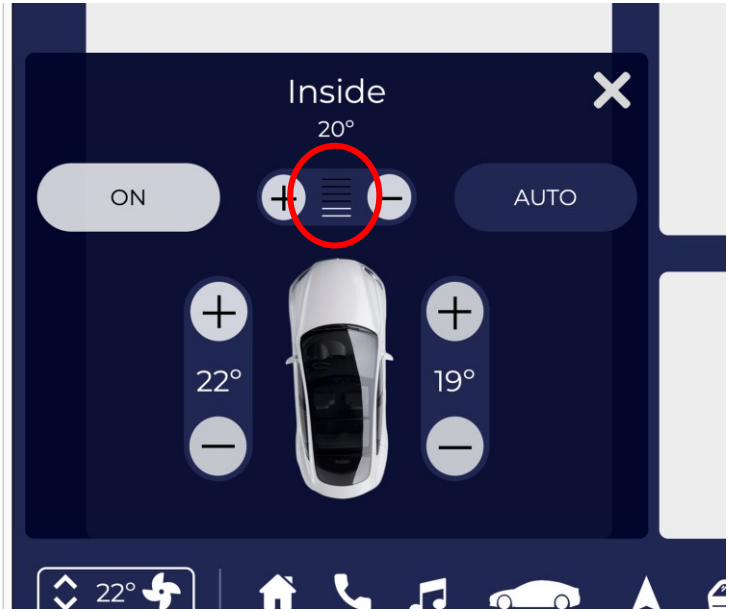
Before LFP Usability Test



After LFP Usability Test

User Evaluation

Update: Better choice of icon for fan intensity



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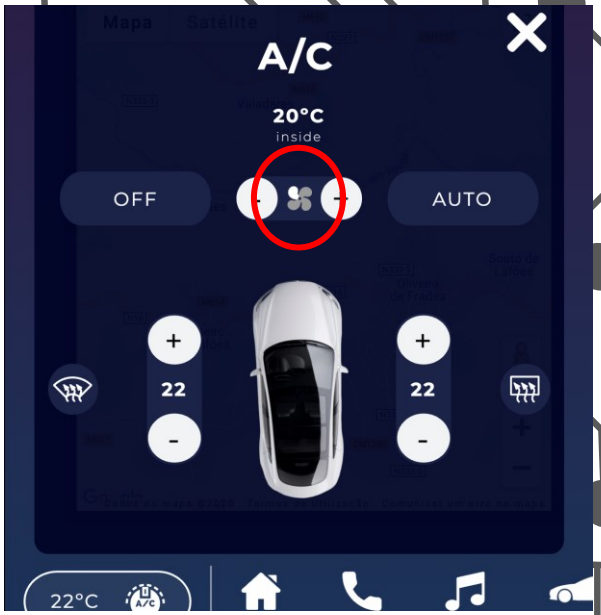
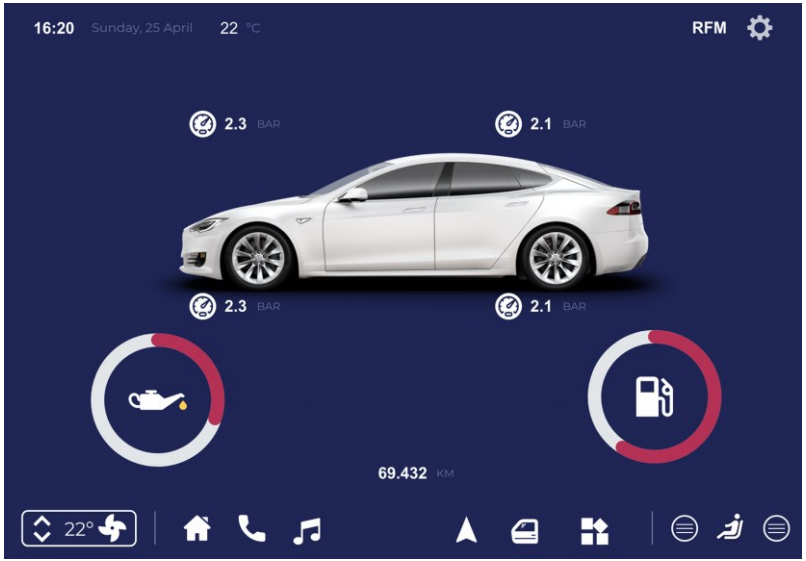


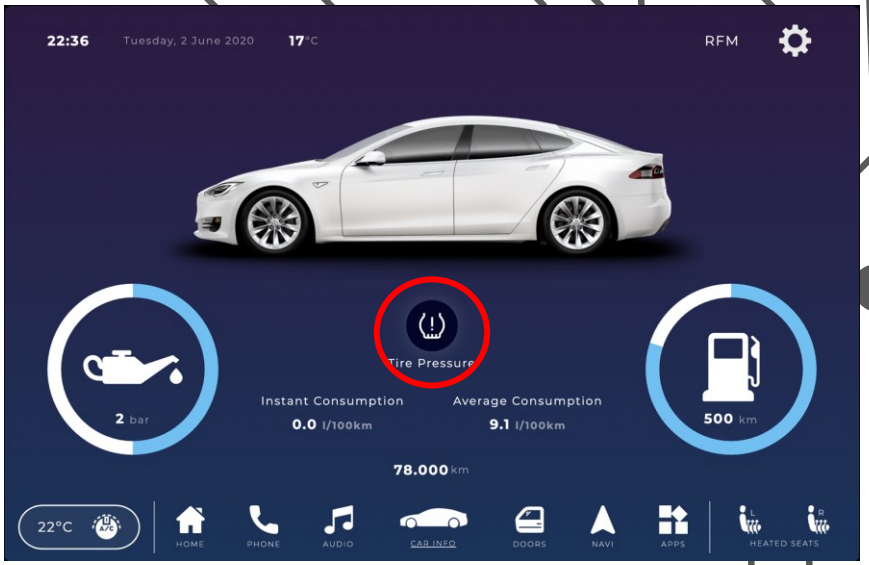
After LFP Usability Test

User Evaluation

Update: Visual feedback when completing tasks



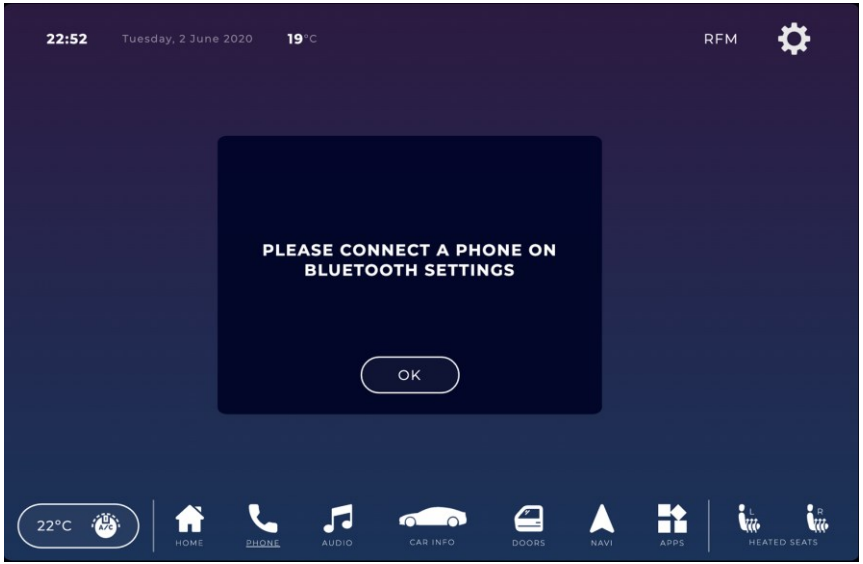
Before LFP Usability Test



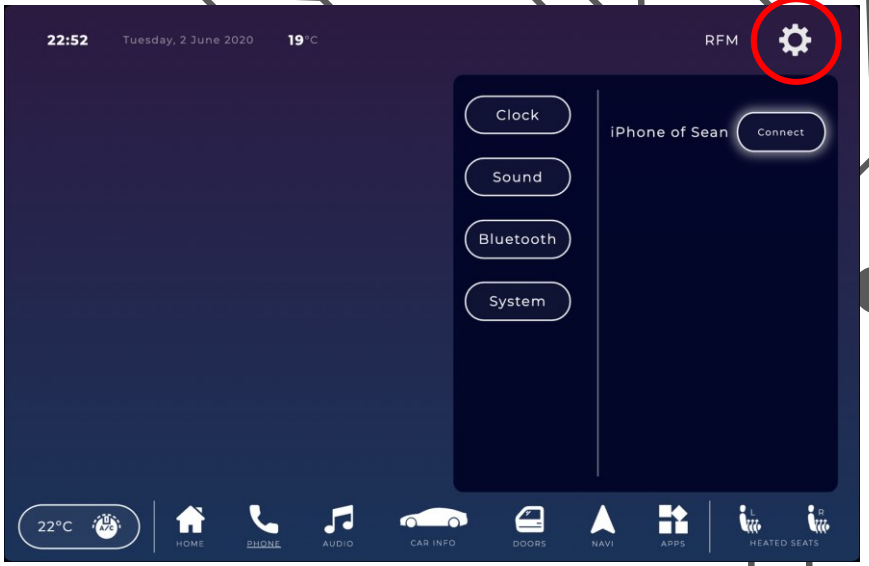
After LFP Usability Test

User Evaluation

Update: Open settings when warning of Bluetooth device not connected



Before Usability Test on Functional Prototype



After Usability Test on Functional Prototype

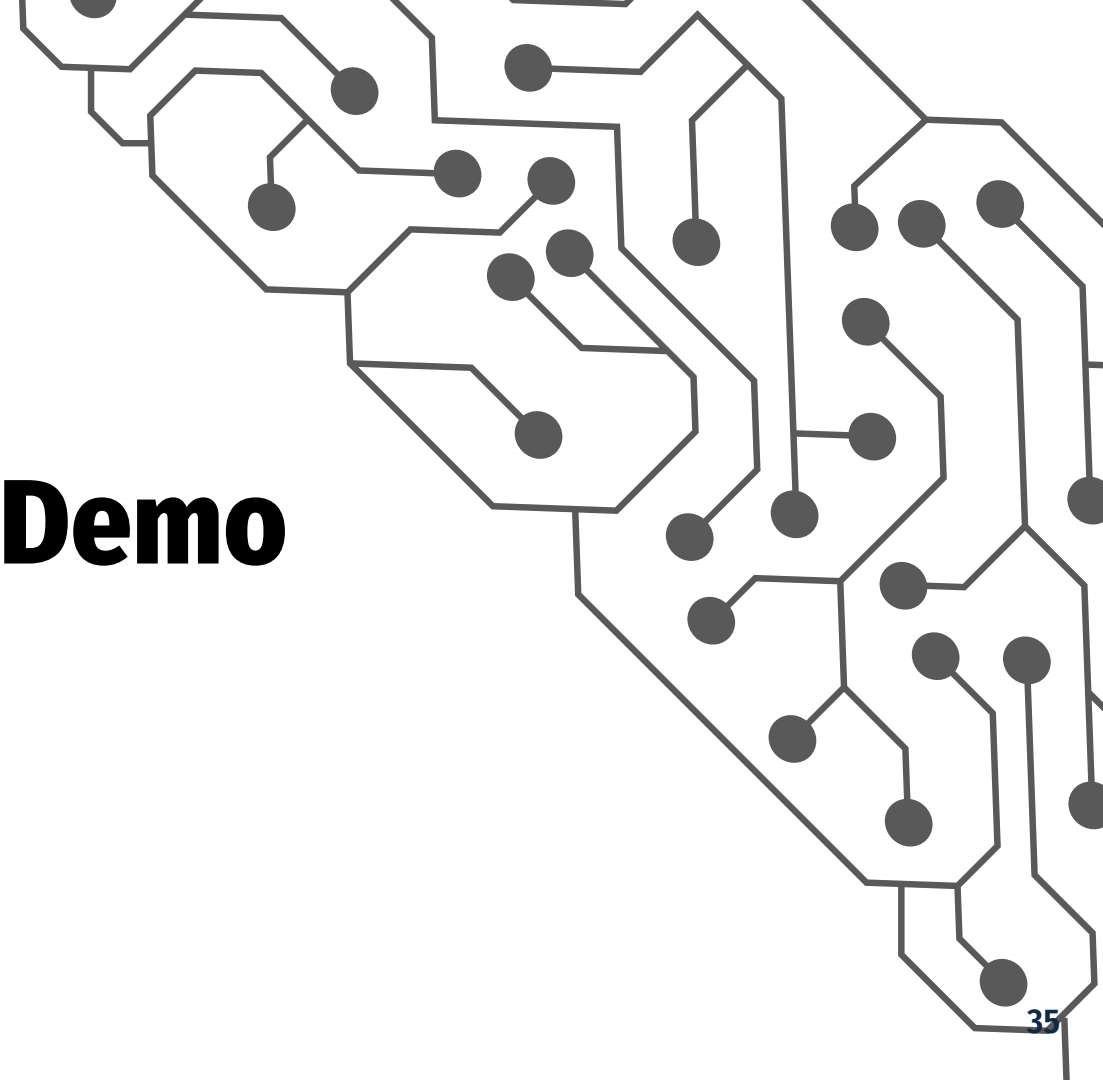
Platform Used For Functional Prototype

- Website based on HTML, CSS and JavaScript web programming
- Prior knowledge on this technologies
- External libraries for some functionalities or display:
    1. Swup JS
    2. Maps JavaScript API
    3. ProgressBar JS

Heuristic Evaluation on Functional Prototype

	Carolina	Orlando	Lucas
	Severity	Severity	Severity
No button to close settings tab (**User control and freedom**)	3	-	2
Top bar temperature doesn't specify if its inside or outside (**Consistency and Standards**)	2	1	1
Color on heated seats is not very noticeable (**Aesthetic and minimalist design**)	-	-	1
Notification windows and pop-ups should close when click outside or switching screens (**User control and freedom**)	-	2	1

Demo



Future Work

More feedback and animations throughout the interface

Waze implementation on navigation menu

Support for external apps and app-store

Developing a physical prototype integrated into a real car

Acknowledgements

Special thanks to all the people that helped us making this possible!

Hugo Paiva de Almeida 93915 LEI - 33.33%

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