Wildfire Prevention and Fighting Dashboard Design

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Introduction

As time goes by, we come to the conclusion that wildfires are some of the most fierce and dangerous threats to human and wildlife safety.

As reported by the Institute for Nature Conservation and Forests (ICNF), the number of fire incidents in rural areas has exceeded 6,000 since the beginning of this year (2024), with a total area of over 137,000 hectares affected by fire.

Figure 1: ICNF rural fire indicators

One of the ways to prevent wildfires is by using technological tools that can detect and combat them more effectively.

The project is comprised of several stages, which have been classified into the following four sections:

- Section 1: from the problem description to the definition of stakeholders;
- Section 2: from the designed sketches to the iteration process;
- Section 3: from the description of the sketches in low fidelity to a description of the constituent parts of the requested system for this project;
- Section 4: from aspects of human interaction with the system to the overall improvements made.

This report will focus on the initial two sections, which have been the primary focus of the project thus far.

Section 1

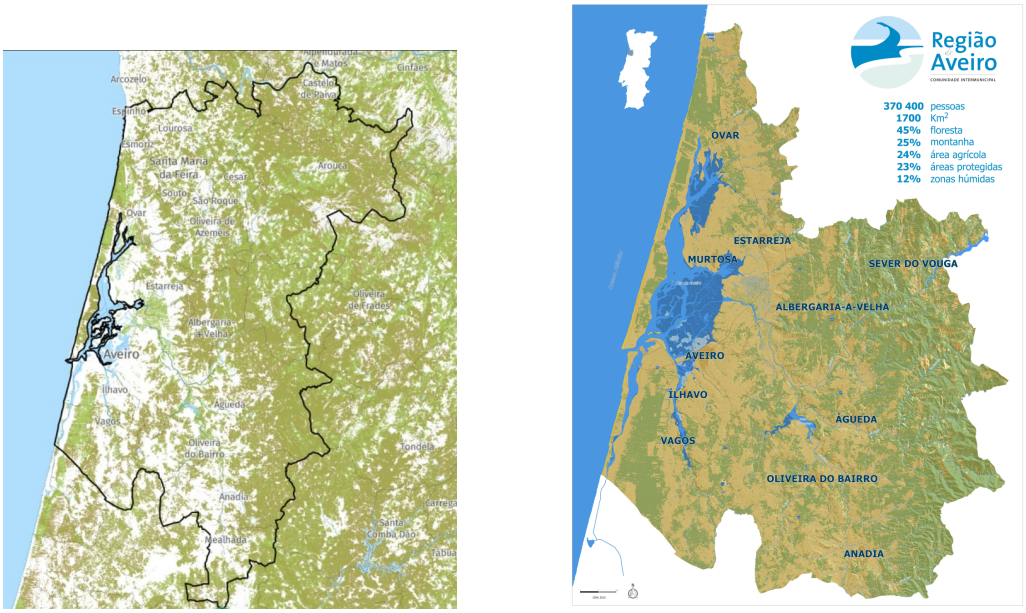
1.1 Problem Description

For this work, we were given the task to create a dashboard that could simulate a real-time, real-world system for wildfire prevention.

In order to fulfil the above-mentioned objective, we were required to select one of two districts, namely Aveiro or Viseu. Our task was to analyse both districts, with a particular focus on the forest area in each. This area was considered crucial, since that it would be the location of the deployment of cameras and sensors, which would be used to collect data essential for preventing forest fires. To achieve that goal, Silvanet Wildfire Sensors and Mesh Gateways are necessary to survey and detect wildfires effectively.

In this particular instance, the decision was taken to select the Aveiro district. The district is situated in close proximity to our location, which constitutes one of the factors that led to our decision to select it. As illustrated in the district maps below, this district is characterised by a significant forest area. To be more precise, the total area of the Aveiro district is approximately 2808 km^2, with the forest area accounting for approximately 1400 km^2.

Furthermore, the district has 4,485 sensors and 446 gateways at the disposal of civil protection agencies.



(a) Aveiro District Map

(b) Aveiro Region Map

Figure 1.1: Aveiro Maps

1.2 Biggest Challenges

One of the biggest challenges we faced was keeping a complex system, with multiple functionalities, simple and intuitive to use without the need for prior knowledge on this specialized tech, such as the sensors and gateways.

1.3 Identification of Stakeholders

In the context of this project, "stakeholders" can be defined as follows:

- Dryad (Sensor Manufacturer)
- Firefighters
- SIRESP - Portuguese National Emergency and Security Networks Operator
- ANEPC - National Emergency and Civil Protection Authority
- City Council
- System Operators (from Civil Protection)

All of these entities play a crucial role in the process of fire monitoring and firefighting. Civil Protection agencies and firefighters rely on this interface to facilitate effective emergency responses and ensure public safety. Sensor and camera manufacturers contribute valuable technology that is essential for accurate data capture, enabling timely and precise detection. Local authorities have a vested interest in protecting their local areas and resources, and benefit from a tool that enhances their preparedness and risk management strategies.

Finally, system operators are integral to ensure smooth operations, maintenance, and real-time monitoring capabilities which, in turn, make it possible for all stakeholders to rely on accurate and up-to-date information.

1.4 Personas as Potential Users

In order to come up with some of the sketches shown in Chapter 2, we created two fictional personas, in this case, two fictional potential users of the system. In the end, we came up with the following:

Persona 1:

- Joaquim Soares (35 years old):
  - Civil Protection agent;
  - Lives with his wife and kids in Aveiro;
  - Joined GNR and received police training at the age of 20;
  - Worked as GNR in Aveiro's district during the wildfires of Summer of 2024. After this catastrophic experience, he volunteered to become a Civil Protection Agent in this new program to prevent and fight forest wildfires.

Persona 2:

- João Rodrigues (24 years old):
  - Has a degree in Management of Safety, Emergency, and Civil Protection;
  - Lives with his parents and sister in Aveiro;
  - Currently undertaking a post-graduation degree in Civil Protection, through online classes;
  - Works as an operations assistant for Civil Protection;
  - Has ambitions to climb the ranks in ANEPC by gathering experience in various fields.

Section 2

2.1 Outline of Implemented Features

Prior to proceeding with the sketch, it was necessary to define which panels would be utilized in the application. In accordance with the recommendations provided by the professor, the decision was made to create five panels. The following panels were created: Situation Panel, Log Panel, Cameras Panel, Resources Panel and Auxiliary Screens.

For each panel, an analysis was conducted to identify the most pertinent characteristics to be considered. In regard to the Situation Panel, it was determined that an essential preliminary step would be the utilization of a map of the district, in conjunction with the delineation of the locations of the fires and their respective conditions.

When considering the Log Panel, it was determined in advance that the ability to select, aggregate and filter data, such as contract or expand information, would be beneficial in facilitating the interpretation of the available information.

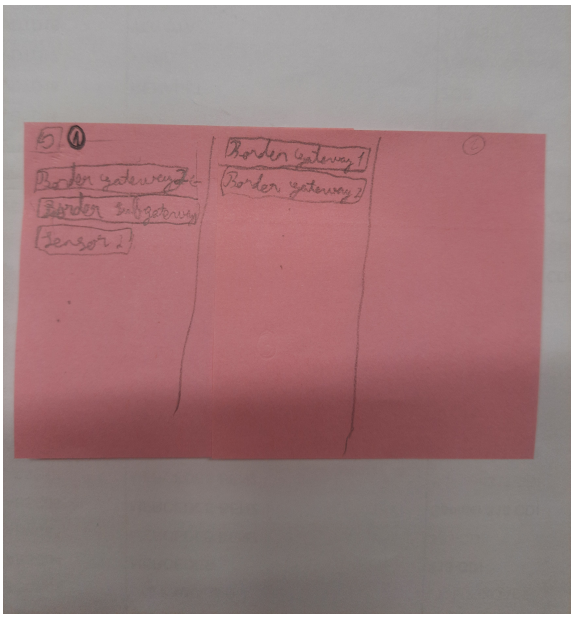
In relation to the Camera Panel, it was established that the panel would contain six cameras, and that it would be advantageous to have the ability to manipulate these, for example, by zooming in, panning left and right, and moving up and down. Furthermore, it was hypothesised that it would be advantageous to have the option of capturing an image of the visualisation currently being displayed by the camera.

When considering the Resources Panel, it is evident that the aspect of localization is of significant importance, as is the communication between the civil protection operator and the fire-fighting resources that would be in operation, including air, ground and human resources. These resources may include fire crews, tankers, reconnaissance vehicles, heavy or light bomber helicopters and seaplanes, among other.

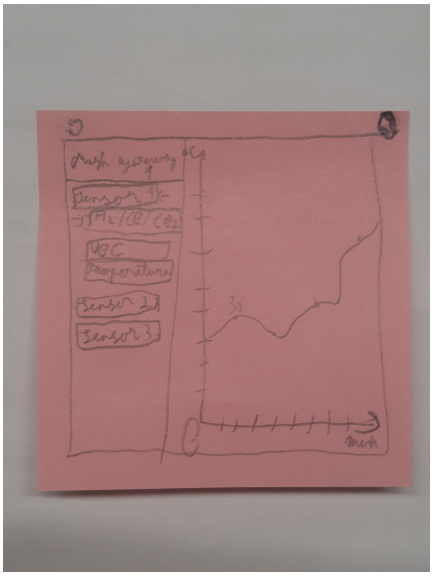
It is also essential that the Auxiliary Screens are capable of adapting to the specific functionalities required by each of the preceding panels. To illustrate, the ability to select, enlarge a camera or map, handle the panels or display pertinent information in greater detail would be beneficial.

In consideration of the preceding factors, the initial sketches were formulated, which are presented below in a systematic arrangement by panels.

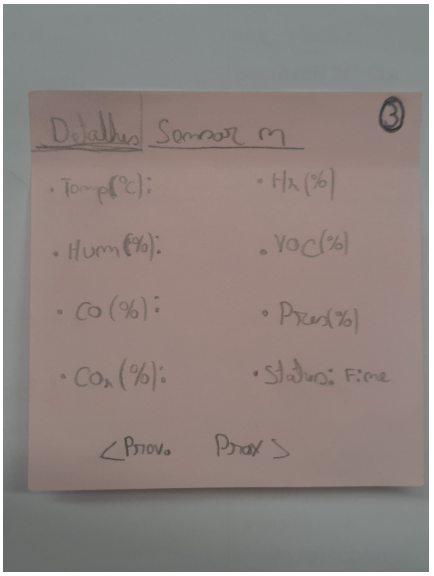
- **Situation Panel**:
  - Single:



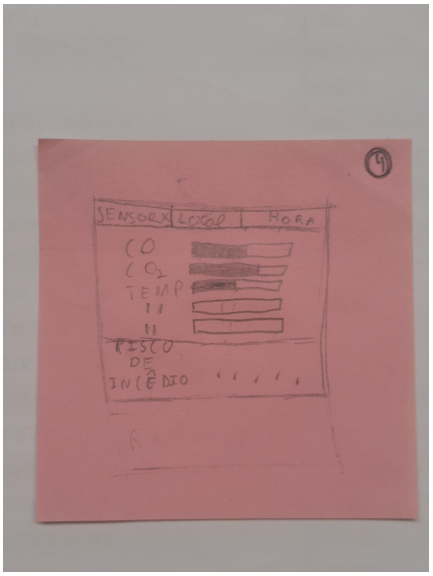
(a) Sketch 1



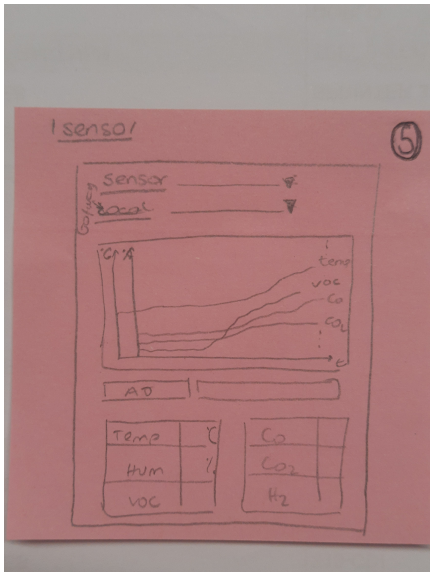
(b) Sketch 2



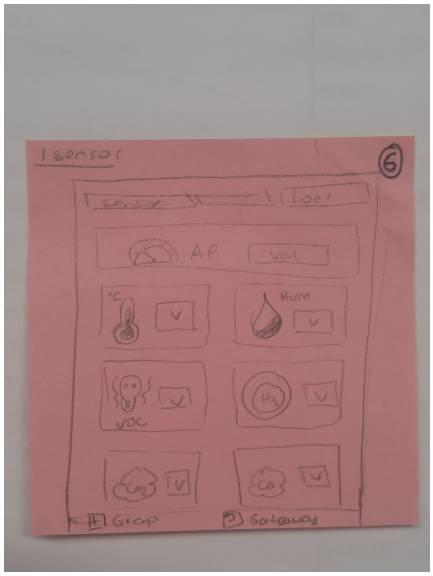
(c) Sketch 3



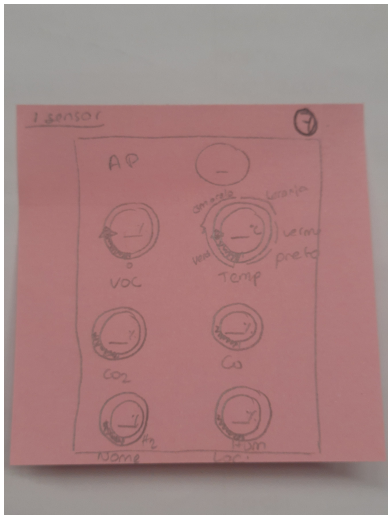
(d) Sketch 4



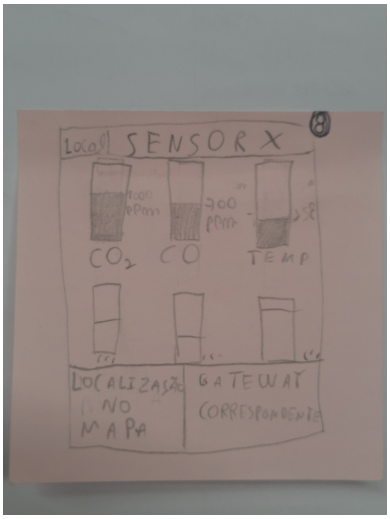
(e) Sketch 5



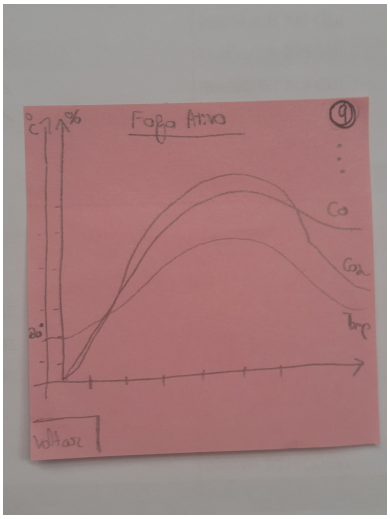
(f) Sketch 6



(g) Sketch 7



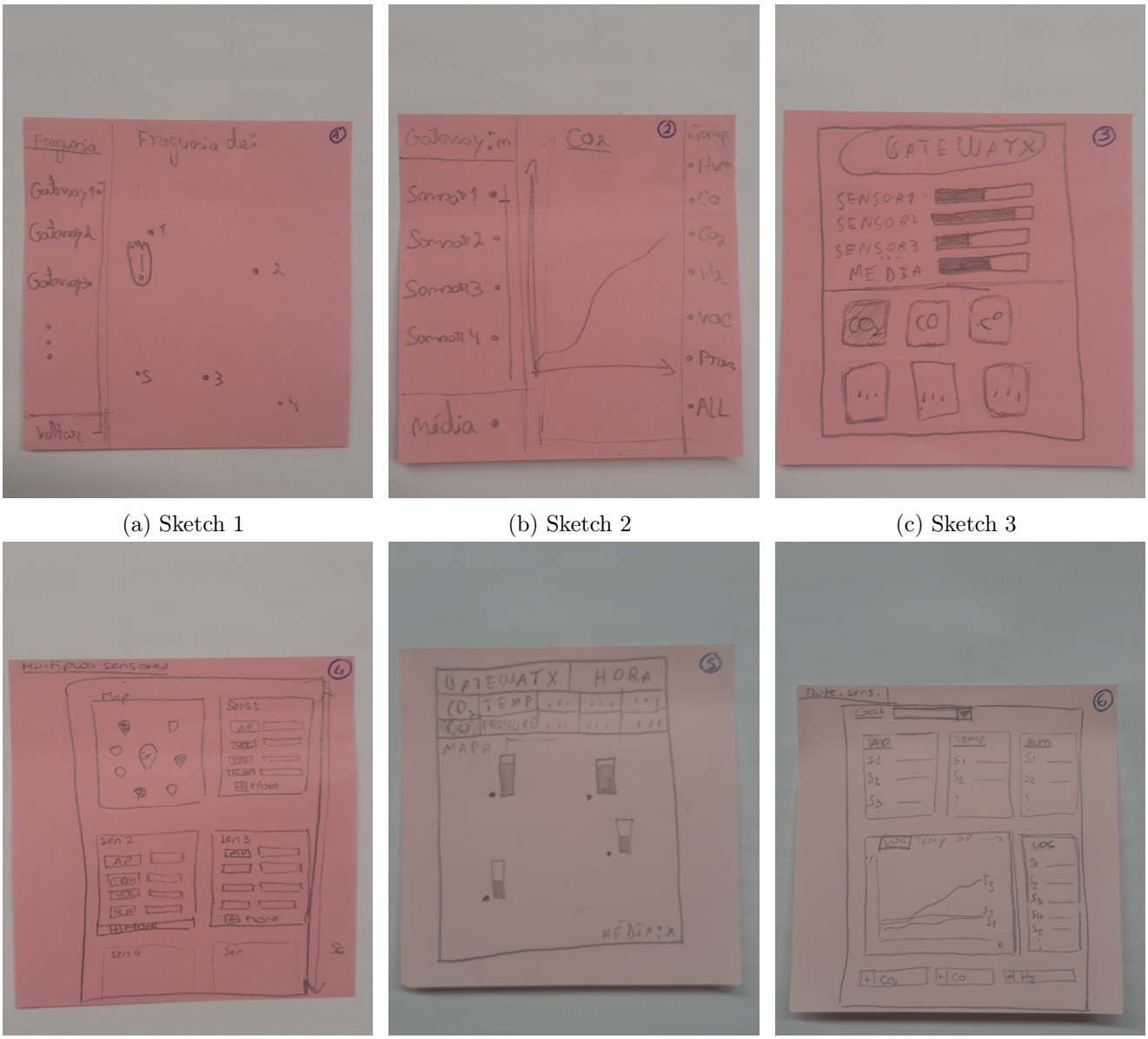
(h) Sketch 8



(i) Sketch 9

Figure 2.1: Single Situation Panel Sketches

– Multiple:

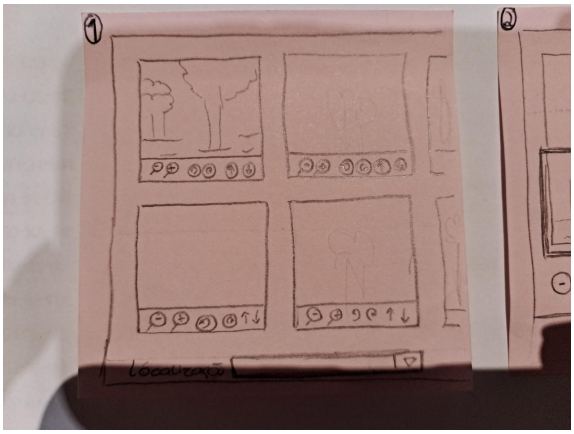


(a) Sketch 1 (b) Sketch 2 (c) Sketch 3

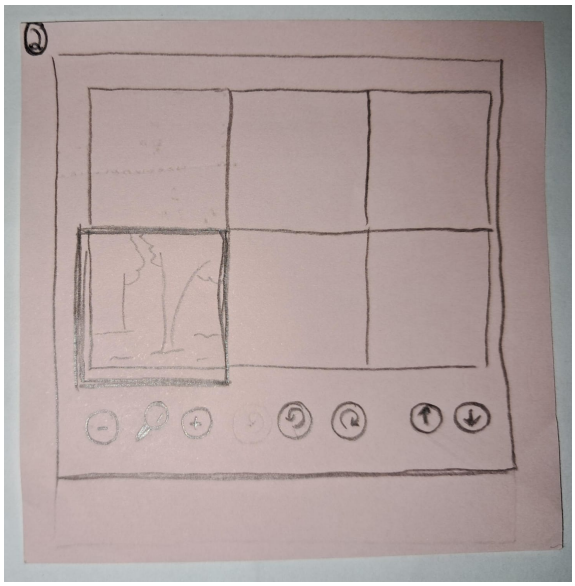
(d) Sketch 4 (e) Sketch 5 (f) Sketch 6

Figure 2.2: Multiple Situation Panel Sketches

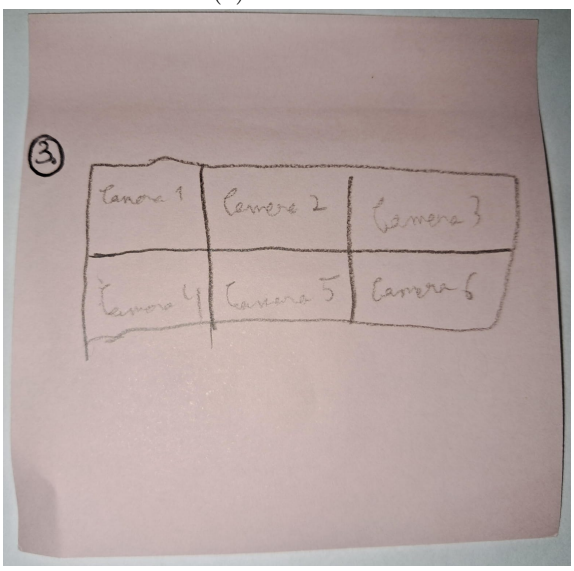
- **Camera Panel:**



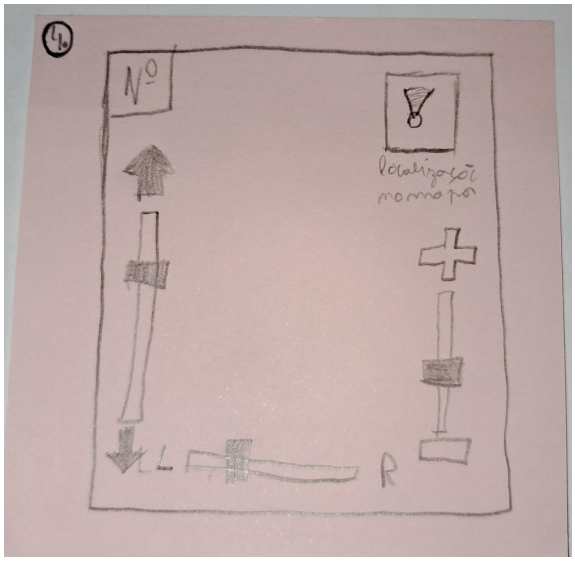
(a) Sketch 1



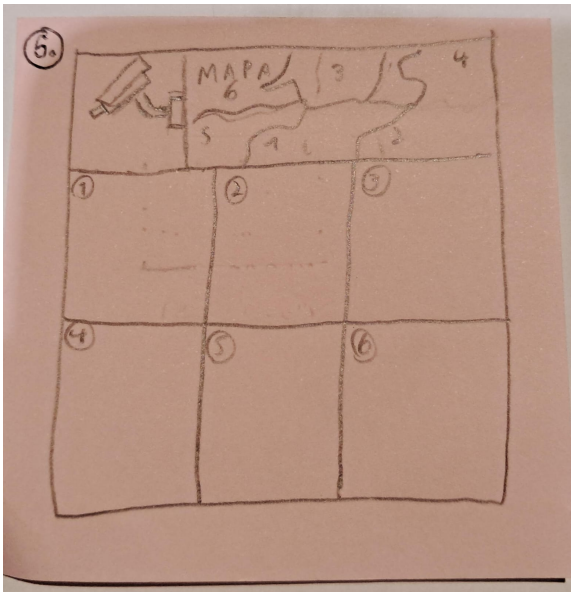
(b) Sketch 2



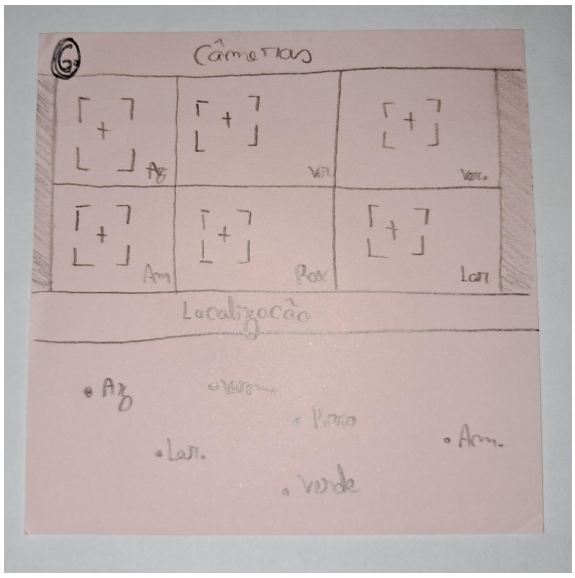
(c) Sketch 3



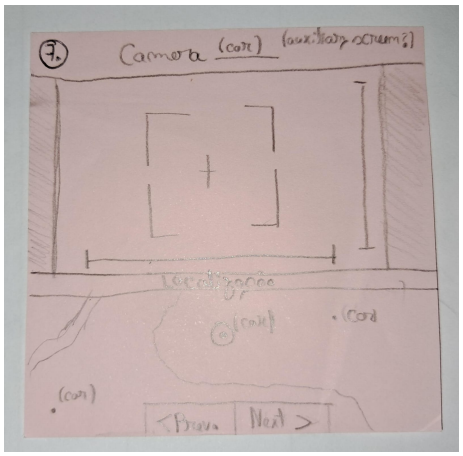
(d) Sketch 4



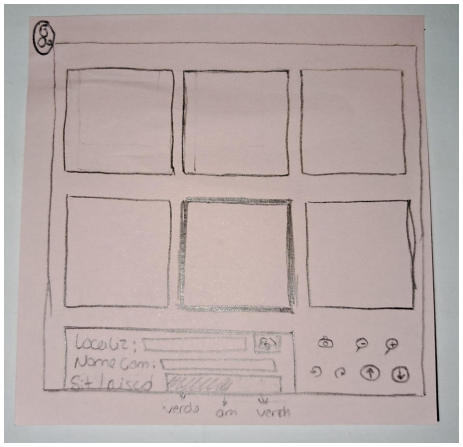
(e) Sketch 5



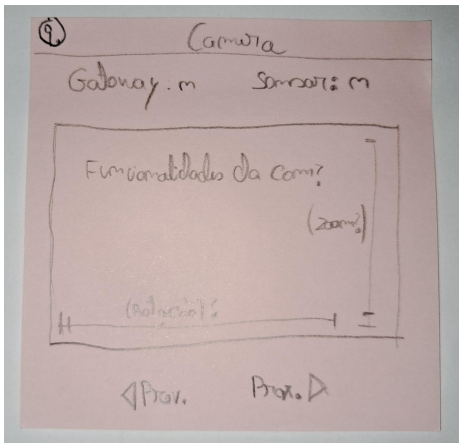
(f) Sketch 6



(g) Sketch 7



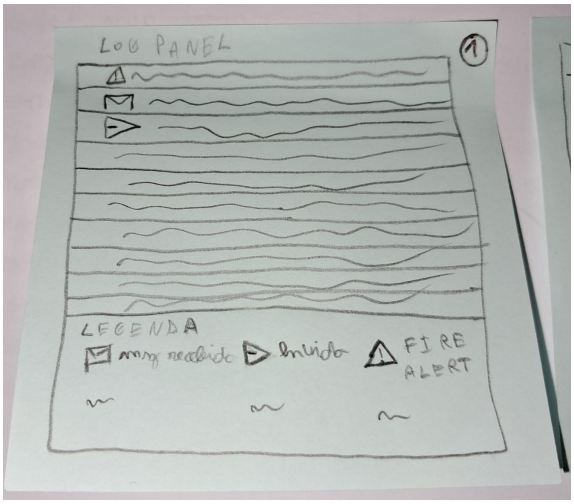
(h) Sketch 8



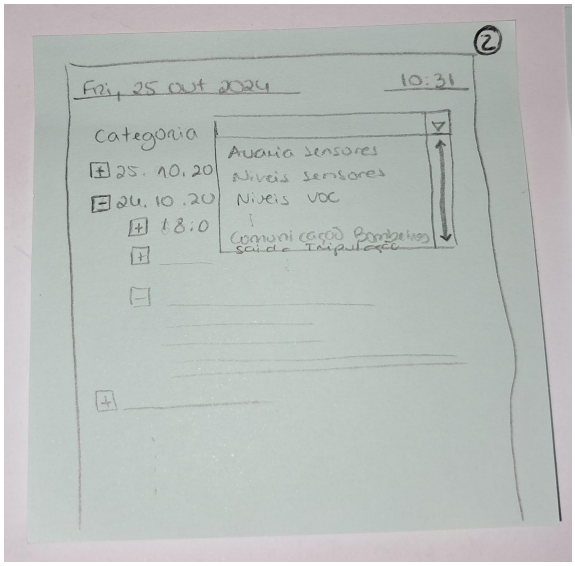
(i) Sketch 9

Figure 2.3: Camera Panel Sketches

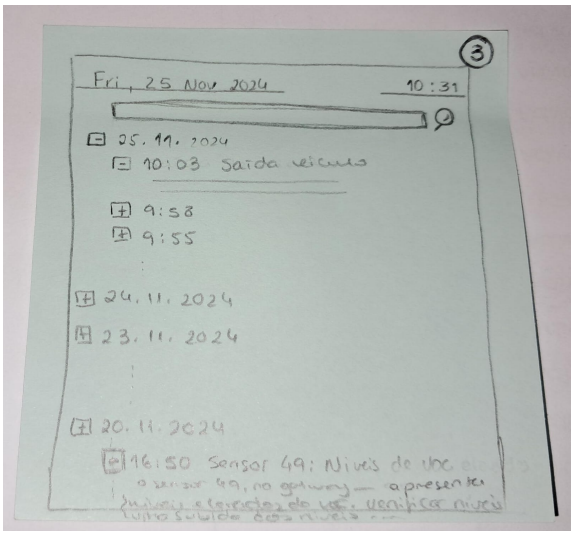
- **Log Panel:**



(a) Sketch 1



(b) Sketch 2



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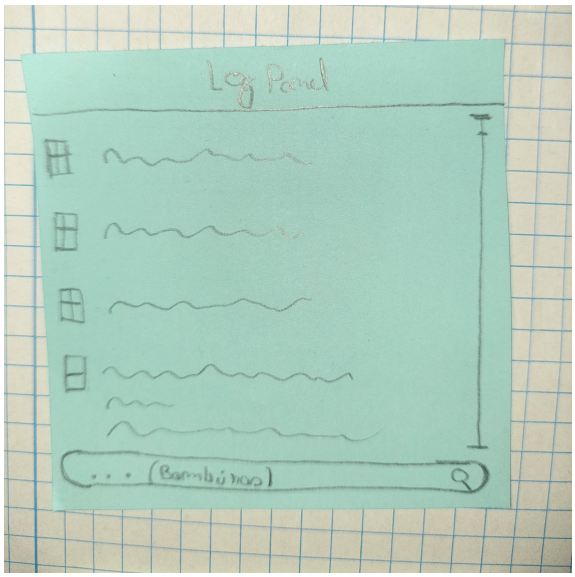
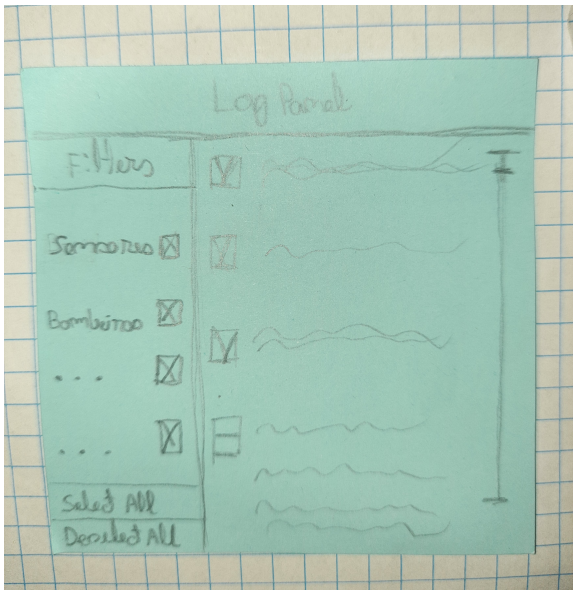


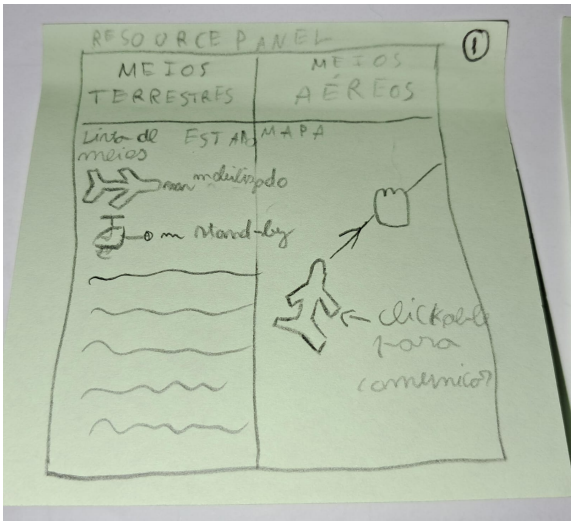
(d) Sketch 4



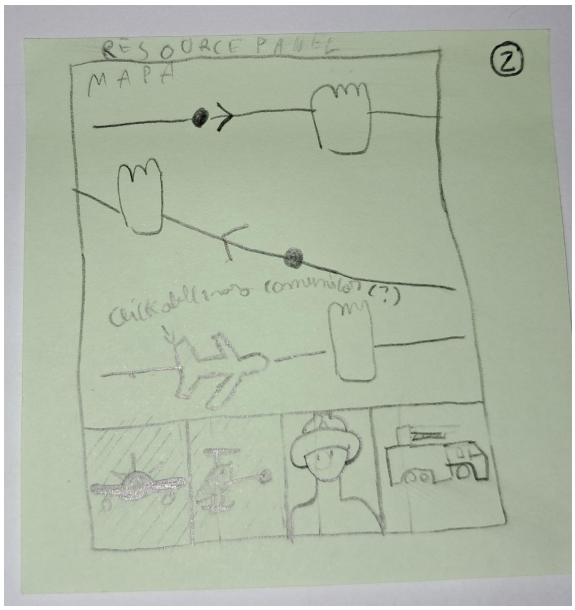
(e) Sketch 5

Figure 2.4: Log Panel Sketches

- **Resources Panel:**



(a) Sketch 1



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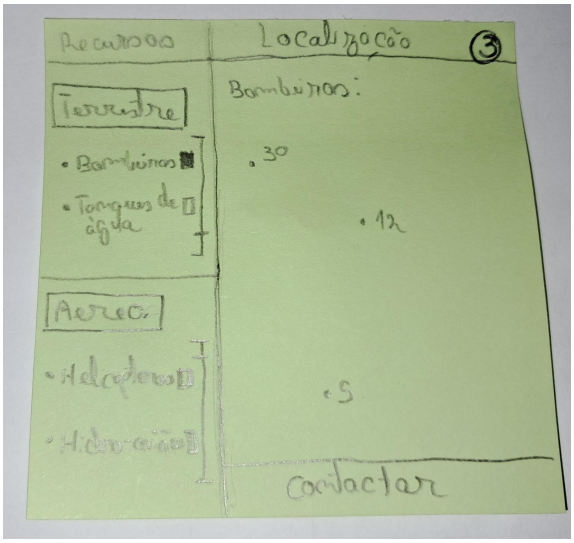

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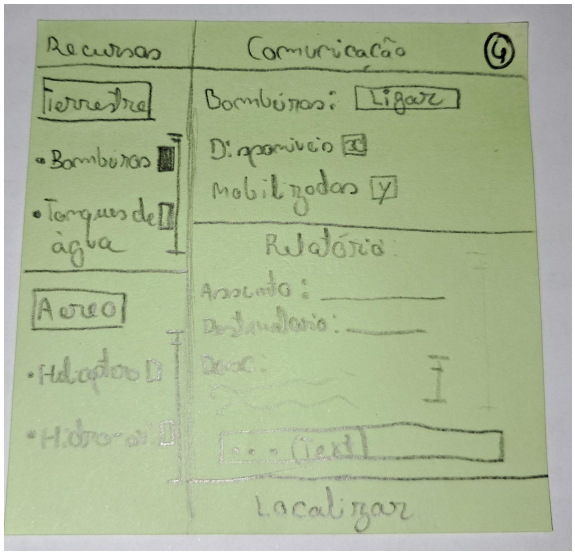
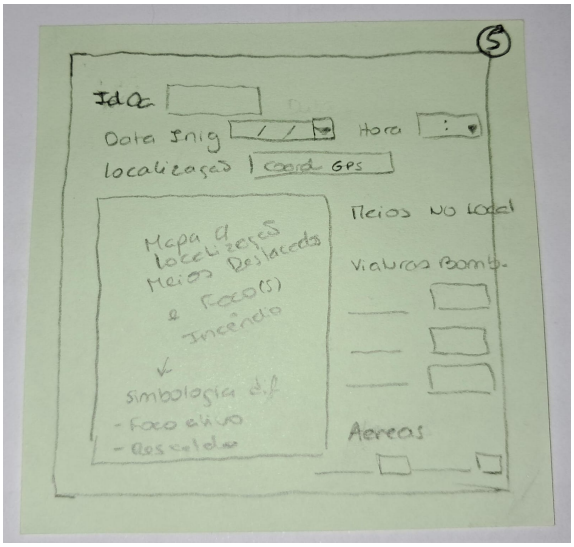
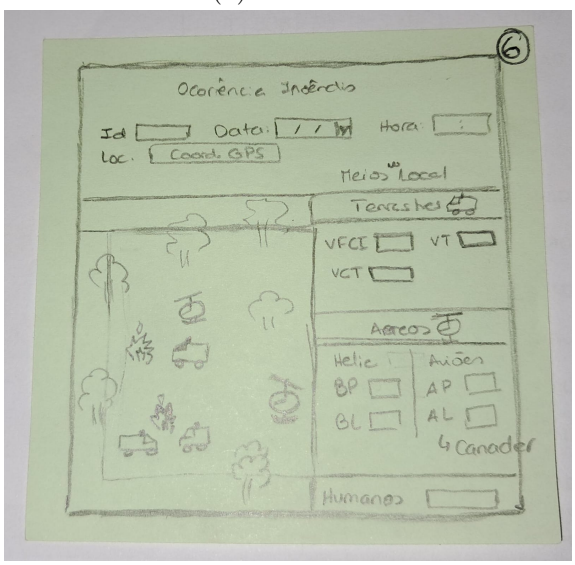


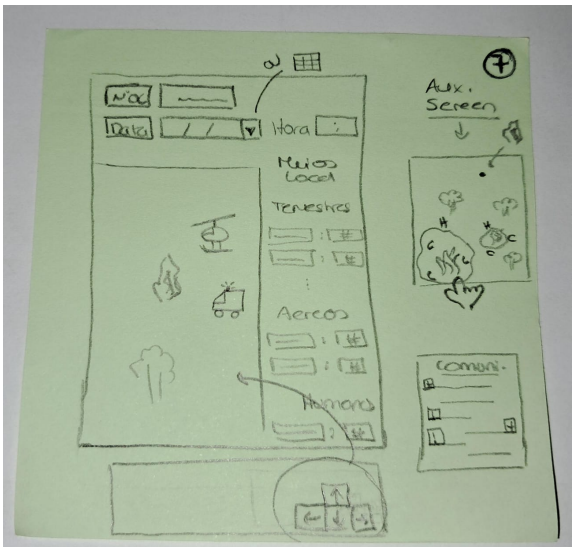
(d) Sketch 4



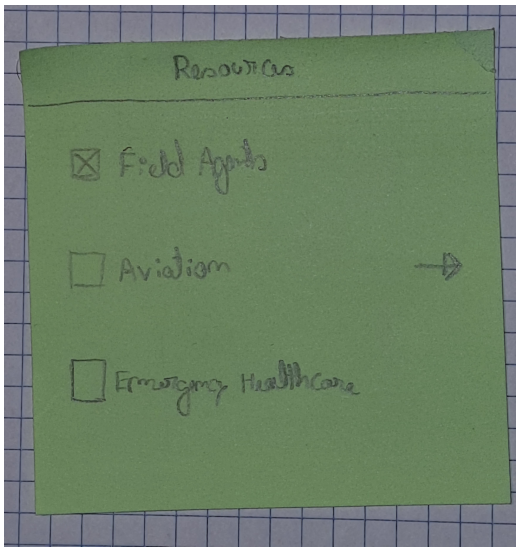
(e) Sketch 5



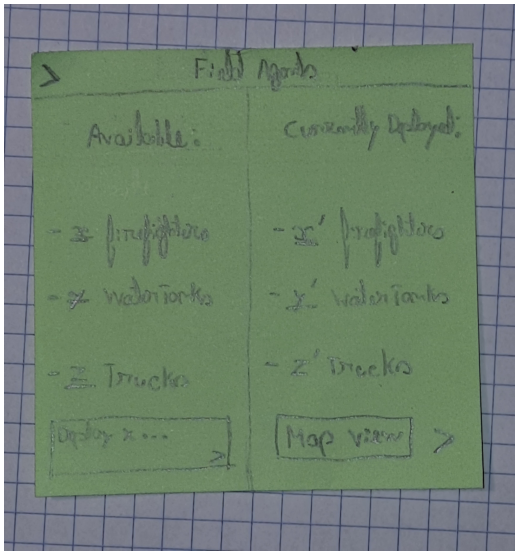
(f) Sketch 6



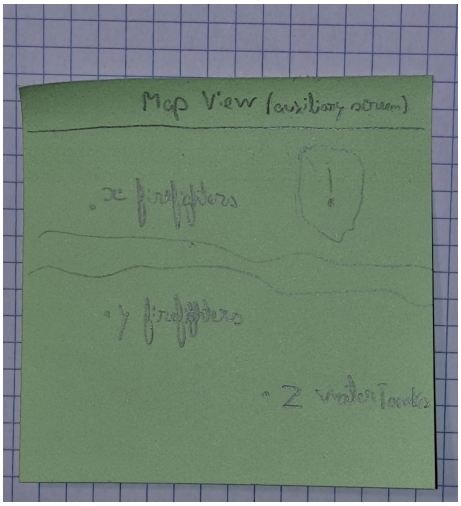
(g) Sketch 7



(h) Sketch 8a



(i) Sketch 8b



(j) Sketch 8c

Figure 2.5: Resources Panel Sketches

2.2 Metrics Used for Evaluation

In order to evaluate the preliminary sketches that were produced, it was collectively determined that each sketch would be assessed according to four distinct criteria.

The criteria were defined as follows:

1. Functionality;
2. Intuitiveness or clarity;
3. Organization;
4. Attractiveness/Design.

Once all members of the group had evaluated the sketches, we proceeded to construct a matrix based on the above-mentioned four criteria. In this manner, a ranking was

established, thereby facilitating discussion and progression in the process with regard to the most promising sketches.

2.3 Evaluation and Results

This section presents the evaluation grids for the initial sketches.

Cameras Panel

- Functionality:

	Sketch 1	Sketch 2	Sketch 3	Sketch 4	Sketch 5	Sketch 6	Sketch 7	Sketch 8	Sketch 9
Helena	2	4	2	4	4	4	4	4	4
Tomás	3	3	3	4	4	4	4	3	3
Rui	2	3	2	3	3	2	3	3	3
Sérgio	2	3	2	3	3	2	3	3	3
Total	**10**	**14**	**9**	**14**	**14**	**14**	**15**	**14**	**13**

- Intuitiveness:

	Sketch 1	Sketch 2	Sketch 3	Sketch 4	Sketch 5	Sketch 6	Sketch 7	Sketch 8	Sketch 9
Helena	3	4	2	4	3	3	4	4	4
Tomás	2	3	2	4	3	3	4	3	3
Rui	4	4	2	2	3	3	4	4	3
Sérgio	2	3	2	4	3	2	2	3	3
Total	**11**	**14**	**8**	**14**	**12**	**11**	**14**	**14**	**13**

- Organization:

	Sketch 1	Sketch 2	Sketch 3	Sketch 4	Sketch 5	Sketch 6	Sketch 7	Sketch 8	Sketch 9
Helena	3	4	3	3	4	4	4	4	4
Tomás	2	3	2	4	3	3	4	3	3
Rui	4	4	2	2	3	3	4	4	3
Sérgio	2	4	2	4	3	4	4	4	3
Total	**11**	**15**	**9**	**13**	**13**	**14**	**16**	**15**	**13**

- Attractiveness:

	Sketch 1	Sketch 2	Sketch 3	Sketch 4	Sketch 5	Sketch 6	Sketch 7	Sketch 8	Sketch 9
Helena	2	4	1	3	4	3	3	3	4
Tomás	2	3	1	3	4	3	4	3	3
Rui	4	4	1	2	4	3	3	4	3
Sérgio	2	3	1	4	3	2	3	3	3
Total	**10**	**14**	**4**	**12**	**15**	**11**	**13**	**13**	**13**

- Final Results:

	Sketch 1	Sketch 2	Sketch 3	Sketch 4	Sketch 5	Sketch 6	Sketch 7	Sketch 8	Sketch 9
Functionality	10	14	9	14	14	14	15	14	13
Intuitiveness	11	14	8	14	12	11	14	14	13
Organization	11	15	9	13	13	14	16	15	13
Attractiveness	10	14	4	12	15	11	13	13	13
Total	**42**	**57**	**30**	**53**	**54**	**50**	**58**	**56**	**52**

Here, we come to the conlusion that the top 3 sketeches are sketches 7, 2 and 8.

Log Panel

- Functionality:

	Sketch 1	Sketch 2	Sketch 3	Sketch 4	Sketch 5
Helena	4	4	4	4	4
Tomás	4	3	3	3	3
Rui	4	4	3	4	3
Sérgio	2	3	3	3	3
Total	**14**	**14**	**13**	**14**	**13**

- Intuitiveness:

	Sketch 1	Sketch 2	Sketch 3	Sketch 4	Sketch 5
Helena	4	4	4	4	4
Tomás	4	3	3	3	3
Rui	4	4	3	4	3
Sérgio	2	3	3	3	3
Total	**14**	**14**	**13**	**14**	**13**

- Organization:

	Sketch 1	Sketch 2	Sketch 3	Sketch 4	Sketch 5
Helena	4	4	3	3	4
Tomás	3	4	4	3	3
Rui	4	4	4	3	3
Sérgio	2	3	3	3	3
Total	**13**	**15**	**14**	**12**	**13**

- Attractiveness:

	Sketch 1	Sketch 2	Sketch 3	Sketch 4	Sketch 5
Helena	4	4	4	4	4
Tomás	4	3	3	3	3
Rui	4	4	3	4	3
Sérgio	2	3	3	3	3
Total	**14**	**14**	**13**	**14**	**13**

- Final Results:

	Sketch 1	Sketch 2	Sketch 3	Sketch 4	Sketch 5
Functionality	14	14	13	14	13
Intuitiveness	12	14	13	14	12
Organization	13	15	14	12	13
Attractiveness	11	16	14	12	13
Total	**50**	**59**	**54**	**52**	**51**

Here, we come to the conlusion that the top 3 sketeches are sketches 2, 3 and 4.

Rescources Panel

- Functionality:

	Sketch 1	Sketch 2	Sketch 3	Sketch 4	Sketch 5	Sketch 6	Sketch 7	Sketch 8
Helena	4	4	4	4	4	4	4	4
Tomás	3	4	3	2	3	4	4	3
Rui	3	3	3	4	4	4	4	3
Sérgio	2	3	3	3	3	3	3	4
Total	**12**	**14**	**13**	**13**	**14**	**15**	**15**	**14**

- Intuitiveness:

	Sketch 1	Sketch 2	Sketch 3	Sketch 4	Sketch 5	Sketch 6	Sketch 7	Sketch 8
Helena	4	4	4	4	4	4	4	4
Tomás	3	4	2	3	3	4	4	2
Rui	3	4	2	3	2	4	4	4
Sérgio	2	3	3	3	2	3	3	4
Total	**12**	**15**	**11**	**13**	**11**	**15**	**15**	**14**

- Organization:

	Sketch 1	Sketch 2	Sketch 3	Sketch 4	Sketch 5	Sketch 6	Sketch 7	Sketch 8
Helena	4	4	4	4	4	4	4	4
Tomás	3	4	3	3	4	4	4	3
Rui	4	4	4	2	4	4	4	3
Sérgio	2	3	3	3	2	3	4	3
Total	**13**	**15**	**14**	**12**	**15**	**15**	**16**	**15**

- Attractiveness:

	Sketch 1	Sketch 2	Sketch 3	Sketch 4	Sketch 5	Sketch 6	Sketch 7	Sketch 8
Helena	4	4	3	4	3	4	4	3
Tomás	3	4	2	2	3	4	4	2
Rui	3	4	2	2	3	4	4	2
Sérgio	2	3	3	2	3	3	3	3
Total	**12**	**15**	**10**	**10**	**12**	**15**	**15**	**10**

- Final Results:

	Sketch 1	Sketch 2	Sketch 3	Sketch 4	Sketch 5	Sketch 6	Sketch 7	Sketch 8
Functionality	12	14	13	13	14	15	15	14
Intuitiveness	12	15	11	13	11	15	15	14
Organization	13	15	14	12	15	15	16	13
Attractiveness	12	15	10	10	12	15	15	10
Total	**49**	**59**	**48**	**48**	**52**	**60**	**61**	**51**

Here, we come to the conlusion that the top 3 sketeches are sketches 2, 6 and 7.

Situation Panel

- Single:
  - Functionality:

Table 2.1: Functionality Results Table

	Sketch 1	Sketch 2	Sketch 3	Sketch 4	Sketch 5	Sketch 6	Sketch 7	Sketch 8	Sketch 9
Helena	2	3	3	3	3	4	3	3	3
Tomás	2	3	4	4	4	4	3	3	3
Rui	2	3	3	4	4	4	3	3	2
Sérgio	2	3	4	3	4	3	4	3	3
Total	**8**	**12**	**14**	**14**	**15**	**15**	**13**	**12**	**10**

  - Intuitiveness:

Table 2.2: Functionality Results Table

	Sketch 1	Sketch 2	Sketch 3	Sketch 4	Sketch 5	Sketch 6	Sketch 7	Sketch 8	Sketch 9
Helena	2	2	4	3	4	4	3	3	2
Tomás	2	2	3	3	4	4	2	3	2
Rui	2	2	3	4	4	4	2	3	2
Sérgio	3	2	4	2	4	4	4	2	4
Total	**9**	**8**	**14**	**12**	**16**	**16**	**11**	**11**	**10**

– Organization:

	Sketch 1	Sketch 2	Sketch 3	Sketch 4	Sketch 5	Sketch 6	Sketch 7	Sketch 8	Sketch 9
Helena	1	2	3	3	4	4	4	3	3
Tomás	1	2	4	3	4	4	3	3	2
Rui	1	2	2	3	4	4	3	3	3
Sérgio	2	2	4	3	4	4	4	2	3
Total	**5**	**8**	**13**	**12**	**16**	**16**	**14**	**11**	**11**

– Attractiveness:

	Sketch 1	Sketch 2	Sketch 3	Sketch 4	Sketch 5	Sketch 6	Sketch 7	Sketch 8	Sketch 9
Helena	1	3	3	3	3	4	4	4	4
Tomás	1	2	2	3	4	4	3	3	2
Rui	1	2	2	2	3	4	4	4	3
Sérgio	1	3	3	3	2	3	3	4	2
Total	**4**	**10**	**10**	**11**	**12**	**15**	**14**	**15**	**12**

	Sketch 1	Sketch 2	Sketch 3	Sketch 4	Sketch 5	Sketch 6	Sketch 7	Sketch 8	Sketch 9
Functionality	8	12	14	14	15	15	13	12	10
Intuitiveness	9	8	14	12	16	16	11	11	10
Organization	5	8	13	12	16	16	14	11	11
Attractiveness	4	10	10	11	12	15	14	15	12
Total	**26**	**38**	**51**	**49**	**59**	**62**	**52**	**49**	**43**

Here, we come to the conlusion that the top 3 sketeches are sketches 5, 6 and 7.

- Multiple:

	Sketch 1	Sketch 2	Sketch 3	Sketch 4	Sketch 5	Sketch 6
Helena	4	4	4	4	4	4
Tomás	2	3	3	3	3	4
Rui	2	3	4	4	3	4
Sérgio	4	3	3	3	2	3
Total	**12**	**13**	**14**	**14**	**12**	**15**

- Intuitiveness:

	Sketch 1	Sketch 2	Sketch 3	Sketch 4	Sketch 5	Sketch 6
Helena	4	4	4	3	3	4
Tomás	1	3	4	2	4	4
Rui	2	2	4	4	3	4
Sérgio	3	2	3	2	2	3
Total	**10**	**11**	**15**	**11**	**12**	**15**

- Organization:

	Sketch 1	Sketch 2	Sketch 3	Sketch 4	Sketch 5	Sketch 6
Helena	4	3	4	4	3	4
Tomás	1	2	4	3	2	3
Rui	1	2	4	3	2	4
Sérgio	3	2	3	2	2	3
Total	**9**	**9**	**15**	**12**	**9**	**14**

- Attractiveness:

	Sketch 1	Sketch 2	Sketch 3	Sketch 4	Sketch 5	Sketch 6
Helena	3	3	4	3	3	4
Tomás	1	2	3	3	2	3
Rui	1	1	4	3	2	4
Sérgio	4	3	3	2	2	2
Total	**9**	**9**	**14**	**11**	**9**	**13**

- Final Scores:

	Sketch 1	Sketch 2	Sketch 3	Sketch 4	Sketch 5	Sketch 6
Functionality	12	13	14	14	12	15
Intuitiveness	10	11	15	11	12	15
Organization	9	9	15	12	9	14
Attractiveness	9	9	14	11	9	13
Total	**40**	**42**	**58**	**48**	**42**	**57**

Here, we come to the conlusion that the top 3 sketeches are sketches 3, 4 and 6.

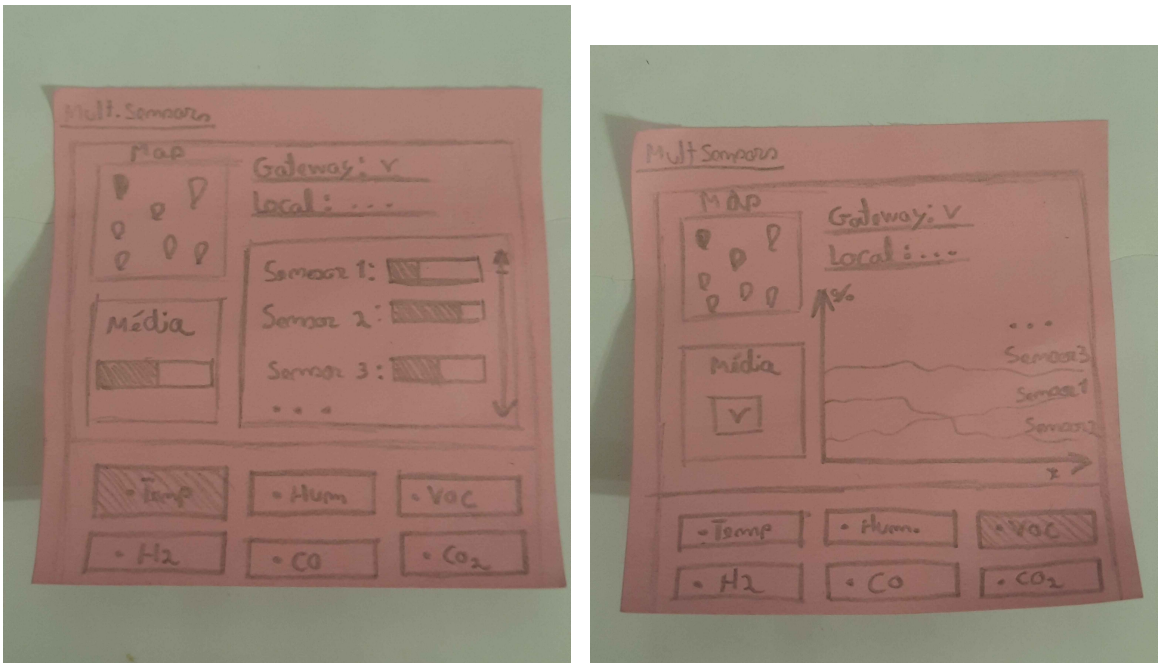
2.4 Iteration Process

To date, only one iteration has been conducted subsequent to the preliminary sketches. These sketches were developed on the foundation of the three most popular sketches from each panel.

It is our opinion that this process is not yet complete. It would be advantageous to engage in a discourse concerning the features and functionalities in question, subsequent to the evaluation, with a view to producing a new sketch for each of the panels.

Below are the most recent sketches:

- **Situation Panel:**
  - Multiple:



(a) Sketch 7 (b) Sketch 8

Figure 2.6: Recent Multiple Situation Panel Sketches

- **Log Panel:**

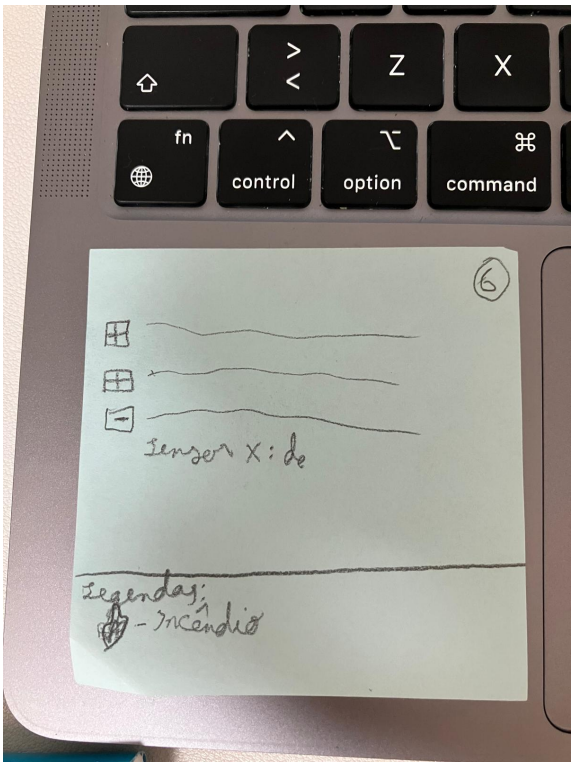


Figure 2.7: Recent Log Panel Sketch

- **Camera Panel:**

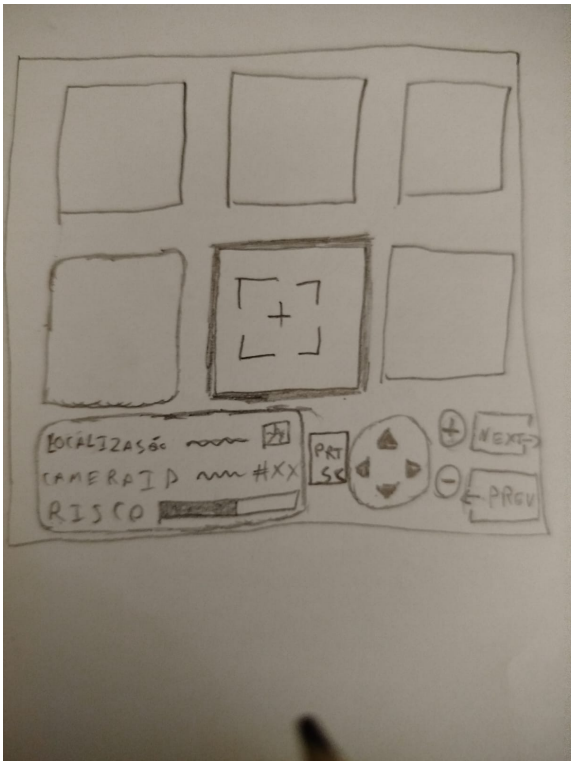


Figure 2.8: Recent Camera Panel Sketch

- **Resources Panel:**

Upon completion of the final schematics for all the panels, a dashboard will be developed. The current layout of the dashboard is as follows:

2.5 How to Interact with the Graphical Interfaces Created

For our Situation Panel we opted for two different approaches, based on the necessity of checking areas of the map through gateways or individual sensors.

Both ways allow the user to check for levels of air pressure, temperature, humidity, VOCs, H2, CO and CO2 detected by the sensors.

It can be done either through a simplified icon display for less details, or a graphical view to check the progress of the values through a time graph.

In the individual Sensor portion a user would typically choose a gateway and then a specific sensor to survey their current values.

For the Gateway portion it was an easy choice to include a portion of the screen to display the average of the values from all of the sensors in that gateway.

In addition, we also thought it would be more readable to display only the selected information at a time, since all of the sensors would be displayed at the same time, therefore the user would have to choose, at the bottom of the screen, which type of levels they want to check.

The concept of Log Panel is to provide a comprehensive and structured repository of all information pertaining to incidents, fire states, communications, and other pertinent data that may be relevant to the civil protection operator and shared with other stakeholders.

In this regard, the objective is to create topics containing keywords that can be expanded upon and to ensure that all pertinent information is visible, while unnecessary details are concealed.

The Camera Panel enables the user to monitor six cameras simultaneously, offering a range of functions for the management and analysis of the images captured. The user may select a camera by clicking directly on its window or by utilising the Next and Prev buttons to navigate between them. The directional controls facilitate the movement of the camera and the adjustment of the zoom, according to the user's requirements.

The panel displays information pertaining to the location, camera ID and risk level, as determined by the sensors, represented by a progress bar. The Prt Sc button enables the capture of an image of the selected camera, which may be employed for the purposes of recording and analysis.

A fundamental issue for the Resources Panel is the ability to visualise the map of the area where a fire is occurring, or even multiple occurrences in a given area of the district. We also want to be able to visualise not only the outbreaks on the map, but also the resources on the ground using GPS positions. We also want to have a range of relevant information available for managing the fire, such as the number and type of air and ground resources, as well as human resources on the ground.

Another fundamental aspect that we tried to optimise in this iteration was to highlight the communication button, which gives access to an auxiliary screen where we can elaborate further.

Section 3

3.1 Summary of the Situation After the First Assignment

3.1.1 Dashboard

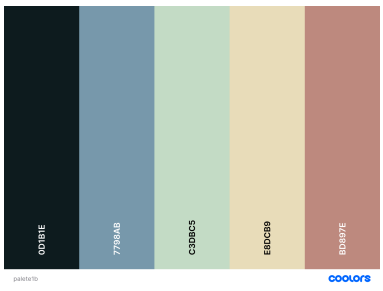
In the preceding report, no version incorporating any of the panel members was presented.

3.2 Detected Problems and Sketches in Low Fidelity

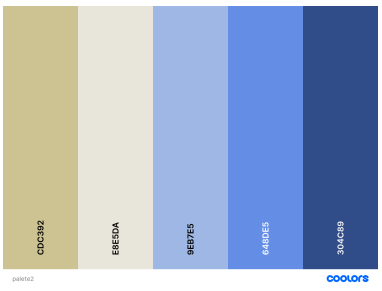
3.3 Visual Features

3.3.1 Choice of Color Palette

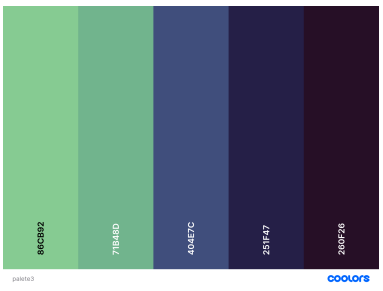
In order to create a colour palette for use in the prototype, the Coolors software was employed. Initially, 19 colour palettes were generated (named palettes, where x was the number between 1-8, 10-17 and 19-21), which are presented beneath.



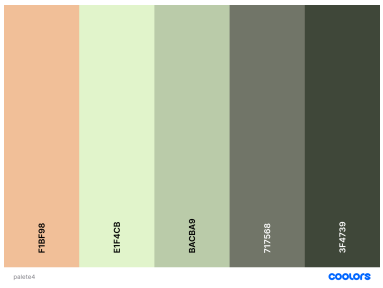
(a) Palette 1



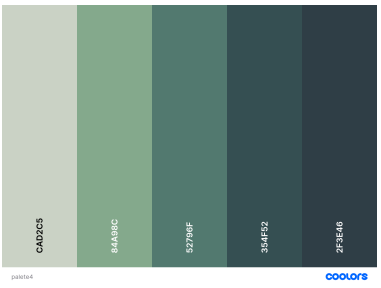
(b) Palette 2



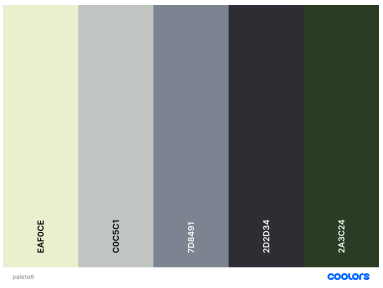
(c) Palette 3



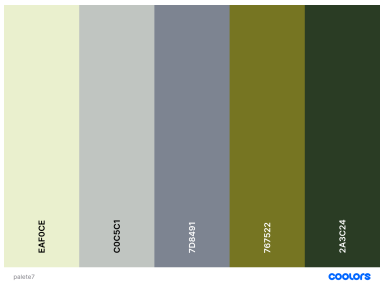
(d) Palette 4



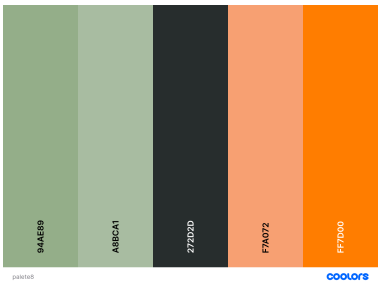
(e) Palette 5



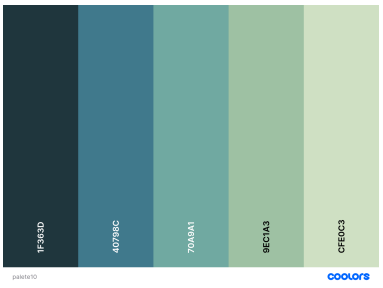
(f) Palette 6



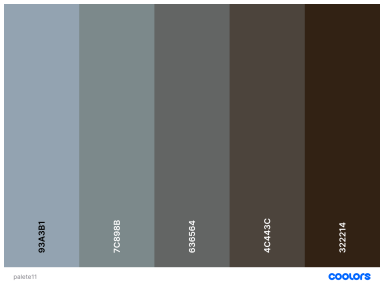
(g) Palette 7



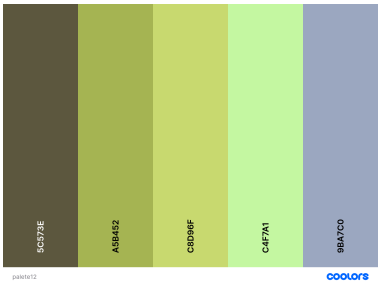
(h) Palette 8



(i) Palette 10

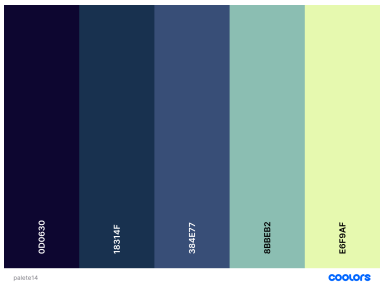


(j) Palette 11

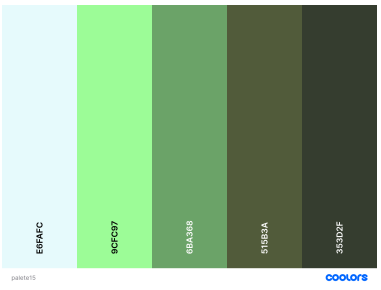


(k) Palette 12

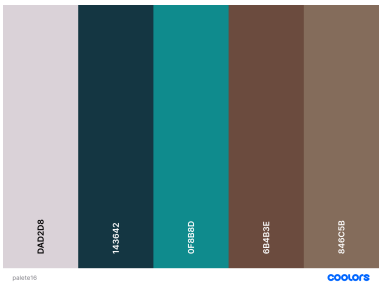
(l) Palette 13



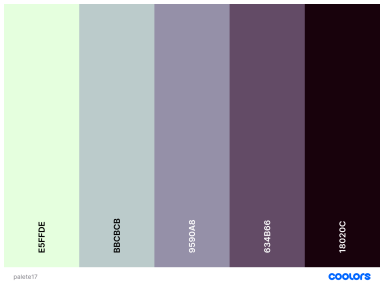
(m) Palette 14



(n) Palette 15

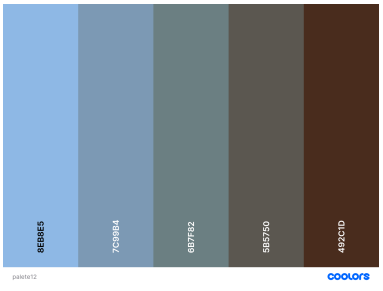


(o) Palette 16

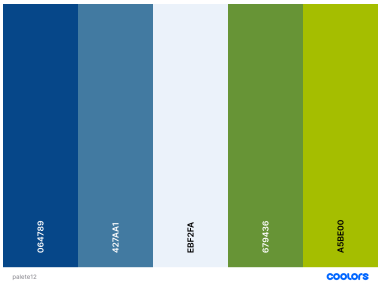


(p) Palette 17

(q) Palette 19



(r) Palette 20



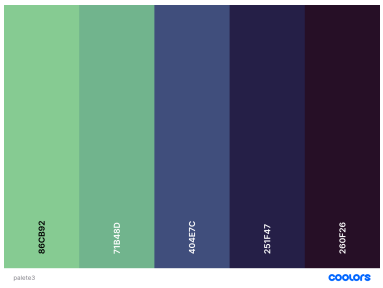
(s) Palette 21

Subsequently, each member of the group selected their five preferred palettes, as illustrated in the subsequent table.

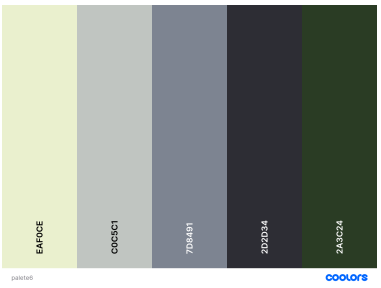
Table 3.1: Selected Palletes by Each Element of the Group

	Selected Palletes				
Helena	1	5	6	10	20
Rui	3	6	10	15	19
Sérgio	4	5	10	16	19
Tomás	3	5	10	15	20

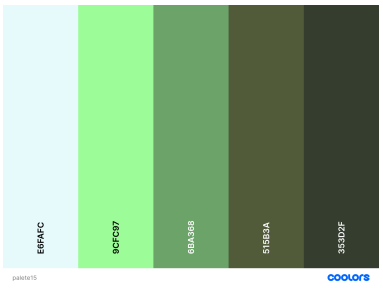
Consequently, the colour palettes were ranked as follows: Palette 10 received four votes, while Palette 5 received three. Additionally, Palettes 3, 6, 15, 19, and 20 were each assigned two votes.



(a) Palette 3

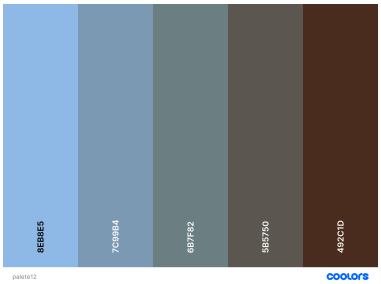


(b) Palette 6



(c) Palette 15

(d) Palette 19



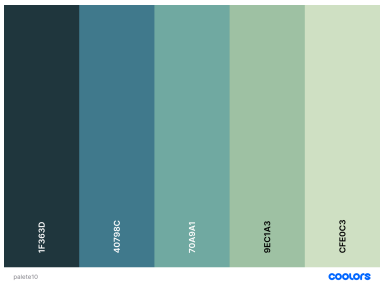
(e) Palette 20

To determine our top three selections, we employed the use of Microsoft Forms as a means of conducting a tiebreaker between the five palettes that were previously presented. To that end, we proceeded to order five palettes, with the understanding that the number five is the most preferred, followed by four, and so on. The results of this process are as follows:

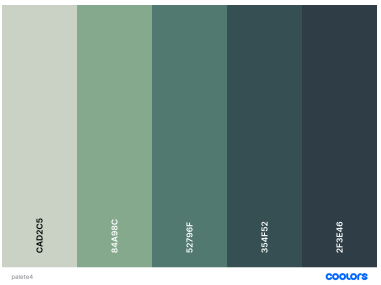
Table 3.2: Tiebreakers Between Palettes in $3^r d$ place from the Previous Voting

	Pallete 3	Pallete 6	Pallete 15	Pallete 19	Pallete 20
Helena	5	3	1	2	4
Rui	4	2	3	1	5
Sérgio	3	4	5	2	1
Tomás	5	2	3	4	1
Total	**17**	**11**	**12**	**9**	**11**

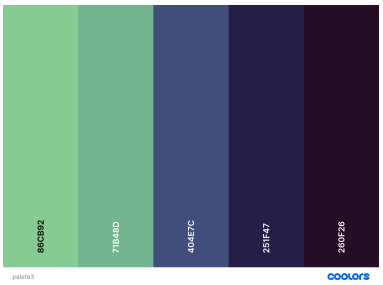
Palette 3 was therefore the most highly rated, thus forming the basis of our top three, which includes the following paletts: Palette 10, Palette 5 and Palette 3.



(a) Palette 10



(b) Palette 5



(c) Palette 3

3.4 Improvements

In order to make sure that our dashboard was suitable to the stakeholders mentioned in Section 2, we went through a cognitive walkthrough, which was divided in three charges:

- Outside of the group
  - Analyser –> Someone from another project group
- Inside of the group
  - Observer –> Writes down the analyser's performance
  - Facilitator –> Explains the procedures to the analyser

For the analyser part, we ended up with not one, but two analysers, whose names are the following:

- Francisco Passos
- Vicente Torres

3.5 Description of the Visible System Components

Section 4

4.1 Aspects of Human Interaction with the System

4.2 Sketches of Relevant Aspects in Graphical Interfaces

4.3 Description of the Usage of the Interfaces

4.4 Evaluations by Discount

4.5 Changes Made as a Result of the Evalutations

4.6 Overall Improvements Made

Conclusion

Concluding our first report we want to emphasize the many lives and goods that can be saved and protected by the streamlining of detection and prevention systems like the one we tried to sketch. During the Portuguese wildfires of 2024 it surely would have been of great value to have had one such system in place to detect the fires that broke out during those nights. Furthermore, we would like to emphasize that an important task such as protecting society can't indeed be trivialized and watered down so that it requires very little prior knowledge of the tools used. Much can still be improved to make the user experience even more accurate to the desired goal for our project, but we are proud of the ideas we collected and worked upon so that we will be able to make a prototype of our system.

Appendices

A.1 Information about fire vehicles and procedures during wildfires

To better understand how a firefighter operates, who is the first line of defence, vehicles and people, we collected information from volunteer firefighters.

Firefighters utilise a range of forest firefighting vehicles, which are categorised according to their specific function and capacity. To illustrate, the VTTUs are tank vehicles with a capacity of 12,000, 15,000 or 16,000 litres. These vehicles supply the smaller vehicles that combat fires, such as the VFCI (with a capacity of 3,000 litres) or VLCI. The VOPE is a reconnaissance vehicle that is used to observe and analyse the situation in order to establish or adjust the firefighting strategy. VECI vehicles are all-terrain vehicles and are the first to leave to fight the fire.

Upon reaching the ground, the firefighters establish communication with SIRESP, providing the coordinates of the location to the Operational Coordination Centre (OCC). The OCC is responsible for overseeing the entire situation and coordinating the deployment of additional resources or reallocation of existing ground, air, and human resources.

The information in question proved invaluable in the construction of the resource and log panels, as it enabled us to develop a comprehensive understanding of the subject matter.

Table A.1: Forest firefighting vehicles

Type	**Description**	**Brand**	**Model**
VECI	VECI02	Man(SEC)	T19F 19343 4x4
VECI	VECI04	Mercedes	BARIBI-1217-4X4
VFCI	VFCI01	Iveco	ML150E28WS
VLCI	VLCI05	Mercedes (SEC)	UNIMOG U5000
VLCI	VLCI07	Mitsubishi (SEC)	L200
VOPE	VOPE08	Toyota	Hilux
VOPE	VOPE01	Suzuki (Moto4)	LT-F250
VTTU	VTTU04	Volvo	FH12
VTTU	VTTU06	Volvo (SEC)	FL 10 4x2