Wildfire Prevention and Fighting Dashboard Design

Helena Silva
up200803677@up.pt

Rui Costa
up202108271@up.pt

Sérgio Cardoso
up202107918@up.pt

Tomás Fontes
up202107382@up.pt

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Section 3

1.1 Summary of the Situation After the First Assignment

1.1.1 Dashboard

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

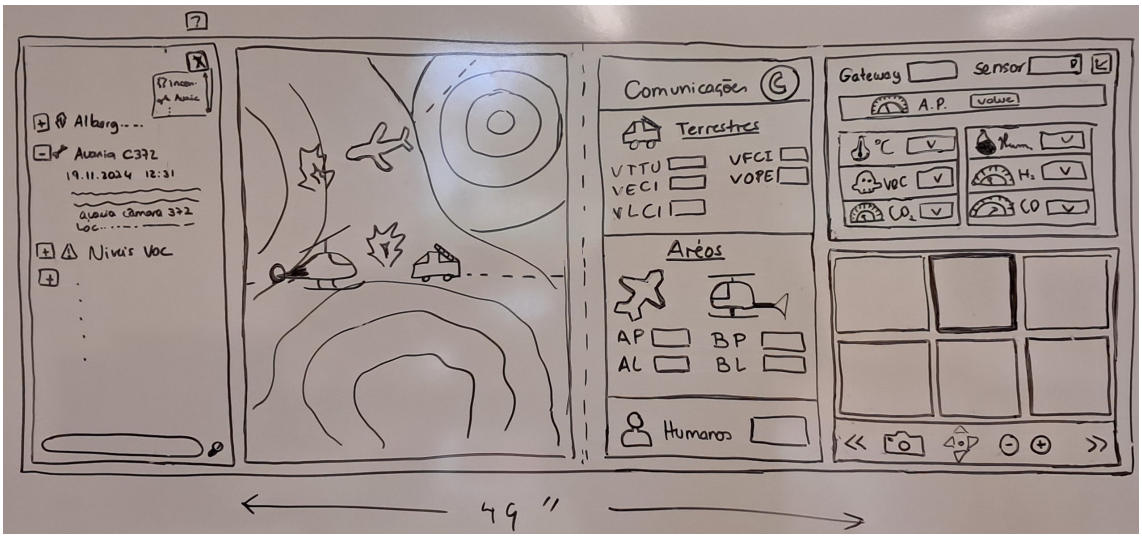


Figure 1.1: Dashboard

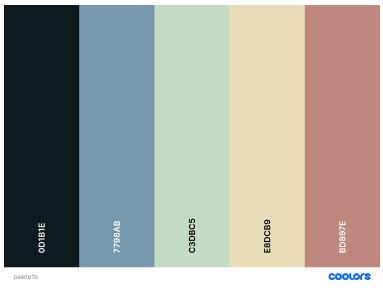
1.2 Detected Problems and Sketches in Low Fidelity

Some sketches were hard to understand, particularly some of the Cameras Panel sketches, like sketch 3.

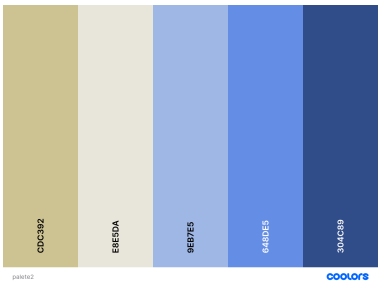
1.3 Visual Features

1.3.1 Choice of Color Palette

In order to create a colour palette for use in the prototype, the Coolors software (`https://coolors.co/`) 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.

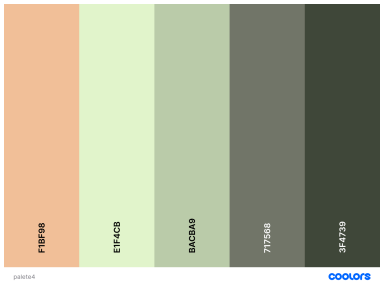


(a) Palette 1

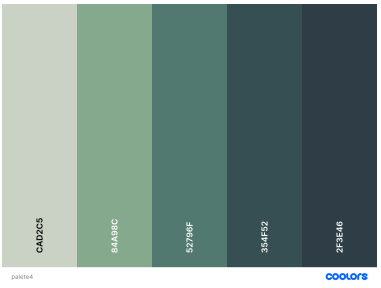


(b) Palette 2

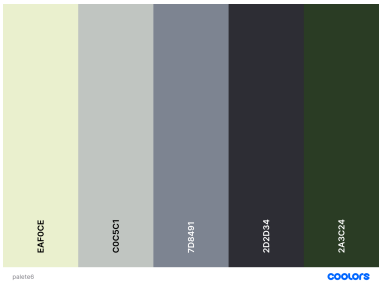
(c) Palette 3



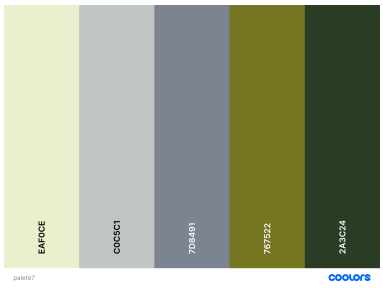
(d) Palette 4



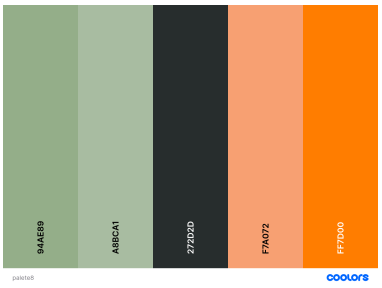
(e) Palette 5



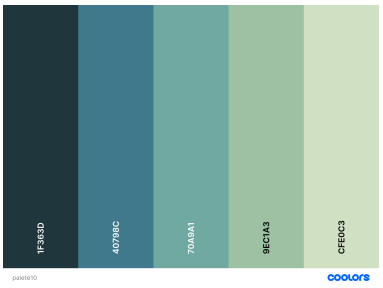
(f) Palette 6



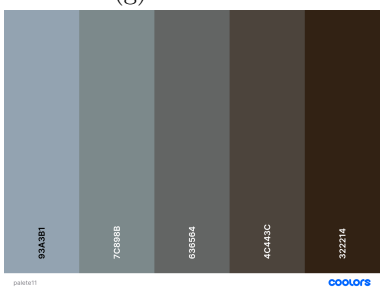
(g) Palette 7



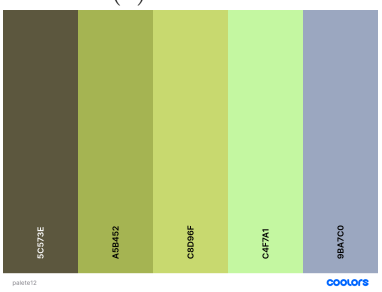
(h) Palette 8



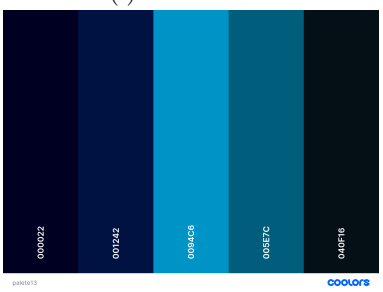
(i) Palette 10



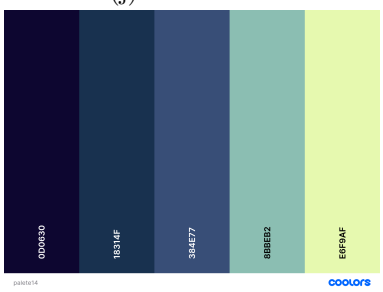
(j) Palette 11



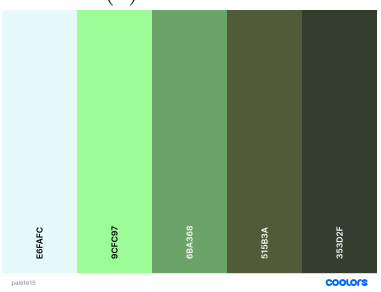
(k) Palette 12



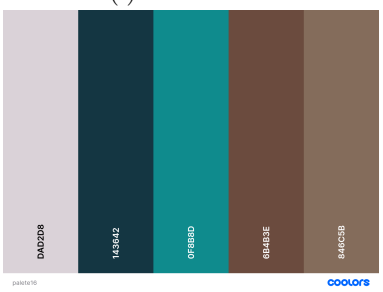
(l) Palette 13



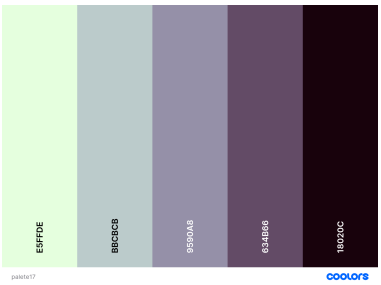
(m) Palette 14



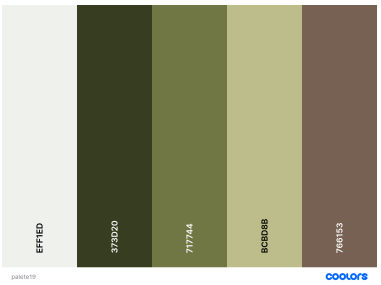
(n) Palette 15



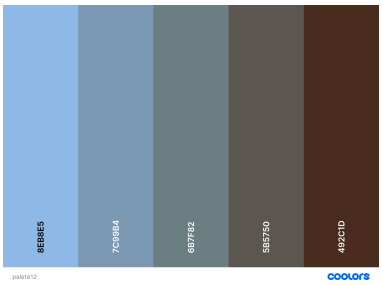
(o) Palette 16



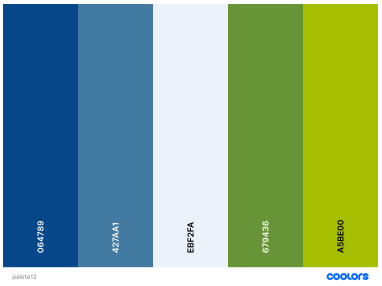
(p) Palette 17



(q) Palette 19



(r) Palette 20



(s) Palette 21

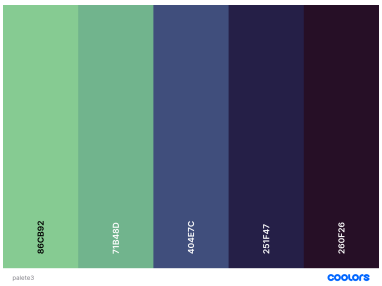
Figure 1.2: All the Colour Palettes Generated

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

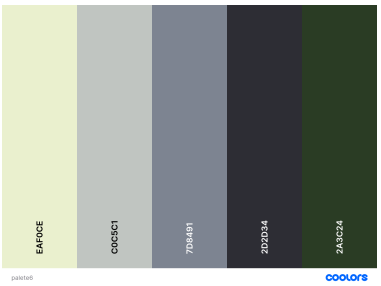
	Selected Palletes				
Helena	1	5	6	10	20
Rui	3	6	10	15	19
Sérgio	4	5	10	16	19
Tomás	3	5	10	15	20

Table 1.1: Selected Palletes by Each Element of the Group

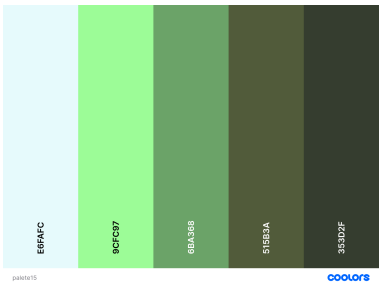
Consequently, the colour palettes were ranked as follows: Palette 10 received four votes, while Palette 5 received three. Additionally, Palettes 3, 6, 15, 19, and 20 were each assigned two votes.



(a) Palette 3

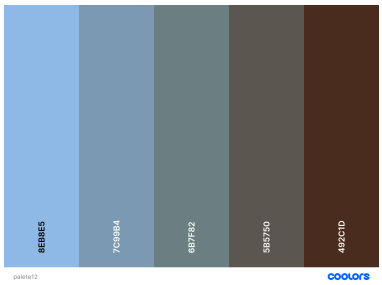


(b) Palette 6



(c) Palette 15

(d) Palette 19



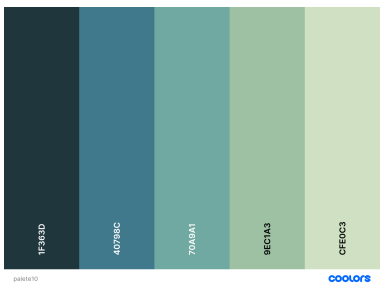
(e) Palette 20

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:

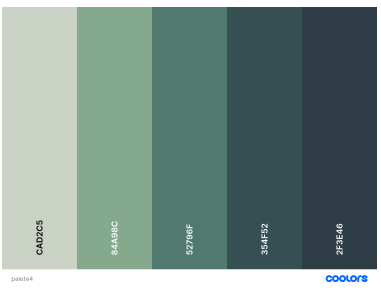
	Pallete 3	Pallete 6	Pallete 15	Pallete 19	Pallete 20
Helena	5	3	1	2	4
Rui	4	2	3	1	5
Sérgio	3	4	5	2	1
Tomás	5	2	3	4	1
Total	**17**	**11**	**12**	**9**	**11**

Table 1.2: Tiebreakers Between Palettes in 3rd place from the Previous Voting

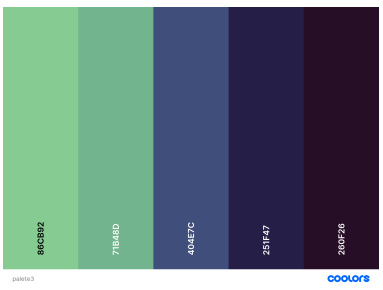
Palette 3 was therefore the most highly rated, thus forming the basis of our top three, which includes the following paletts: Palette 10, Palette 5 and Palette 3.



(a) Palette 10 - First ranked



(b) Palette 5 - Second ranked



(c) Palette 3 - Third ranked

Figure 1.4: The Three Highly Ranked Palettes

After all of these rankings were done, we then borrowed the color codes of the first ranked palette, Palette 10 as we mentioned (1F363D, 40798C, 70A9A1, 9EC1A3 and CFE0C3) and used them in Figma (`https://www.figma.com`), a web application focused on user interface (UI) and user experience (UX) design, in order to replicate the dashboard shown in 1.1.1.

1.4 Improvements

As we were developing the final dashboard which will be discussed in 1.5, we felt the need to add new colors to the chosen palette, like EFFFE3, due to certain conflicts with the map.

1.5 Description of the Visible System Components

So, the final dashboard is made up of the following:

- Log Panel: showcases real-time alerts
- Map:
- Resources Panel: enlists the number of resources available on the chosen local area
- Situation Panel: has the sensors's status
- Cameras Panel: gives the user the possibility to alternate between camera angles

Section 4

2.1 Cognitive Walkthrough

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 the Group
  - Analyser –> Someone from another project group
- Inside 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

Each analyser was given two missions: "An alarming levels alert shows up. Verify." and "There is a fire taking place in Albergaria-a-Velha. Investigate.". Each mission was ranked from 0 to 2 (from "Bad" to "Great"), according to the analyser's performance.

2.1.1 Mission Description and Their Solutions

- **Mission 1:** An alarming levels alert shows up. Verify.

  Solutions:

  - Log Panel:
    - Localize alert.
    - Collect data for investigation.
  - Situation Panel:
    - Sensor changing.
    - Verify the values.

        * Change to graphic panel.

- **Mission 2:** There is a fire taking place in Albergaria-a-Velha. Investigate.

  Solutions:

  - Map:
    * Select the fire gateway.
  - Cameras Panel:
    * Observe the fire's scale.
  - Resources Panel:
    * Communicate with the means.
    * Send more resources.

2.1.2 Results

	Mission 1		Mission 2	
	N. Errors	Results	N. Errors	Results
Francisco Passos	2	2	2	1
Vicente Torres	1	2	2	2
Medium	1.5	2	2	1.5

Table 2.1: Results Table

2.1.3 Detected Problems and Sketches in Low Fidelity

2.1.4 Conclusions

So, we come to the conclusion that

2.1.5 Changes

2.1.6 Sketches of Relevant Aspects in Graphical Interfaces

2.2 Heuristic Evaluation

2.3 Changes Made as a Result of the Evalutations

2.4 Overall Improvements Made

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