ElectroCap
Mid-Program Pitch Deck

TÉCNICO LISBOA

Digital Wine Temperature Control

David Antunes (103826)

Gonçalo Almeida (103174)

Henrique Póvoa (102109)

Henrique Simões (103125)

Miguel Lopes (103729)

Miguel Velo (103759)

Team

David Antunes

Gonçalo Almeida

Henrique Póvoa

Henrique Simões

Miguel Lopes

Miguel Velo
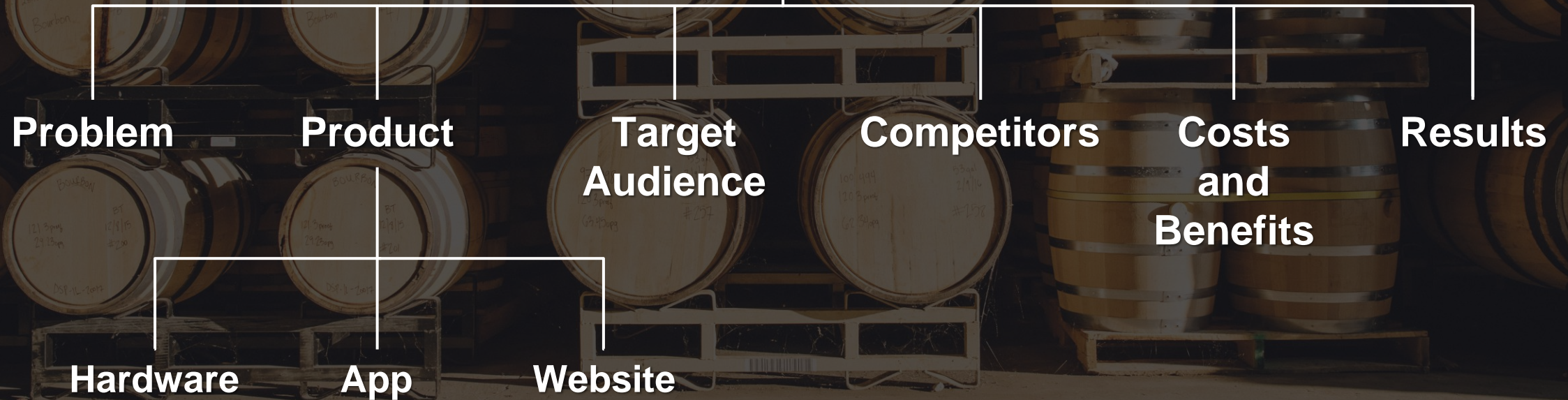
Advisers and Mentor

Professor Marcelino Santos

Francisco Simplício

Introduction

What we'll talk about?

- Problem
- Product
  - Hardware
  - App
  - Website
- Target Audience
- Competitors
- Costs and Benefits
- Results

Problem

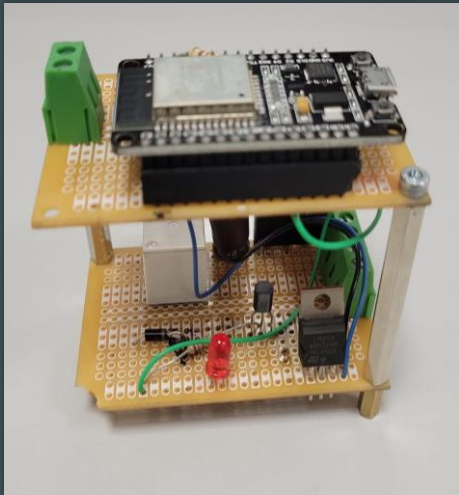- **Temperature control and monitoring** are **crucial** in wine production;

- Only few wineries rely on localized temperature measurements;

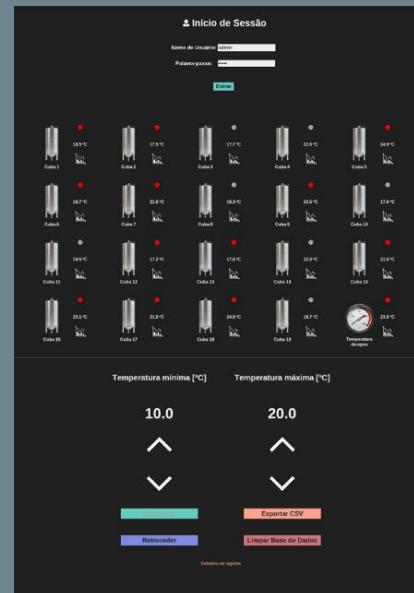- Usually is necessary **new electrical system installation** when expansion is needed.
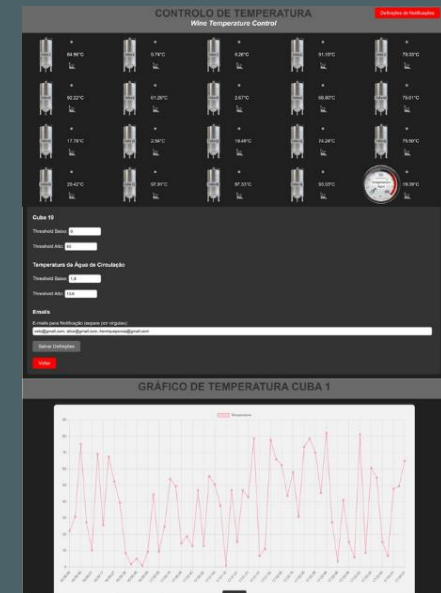
Our Product

## Hardware

Winery App

Website

Hardware

A Our product effectively monitors and controls wine temperature during fermentation.

B For **monitoring**, we use a **PT1000** resistance sensor, renowned for its long-term **precision**, **stability** and **repeatability**.

C For **control**, we utilize the robust **ESP32** microcontroller, which offers extensive resources for **reliable performance**.
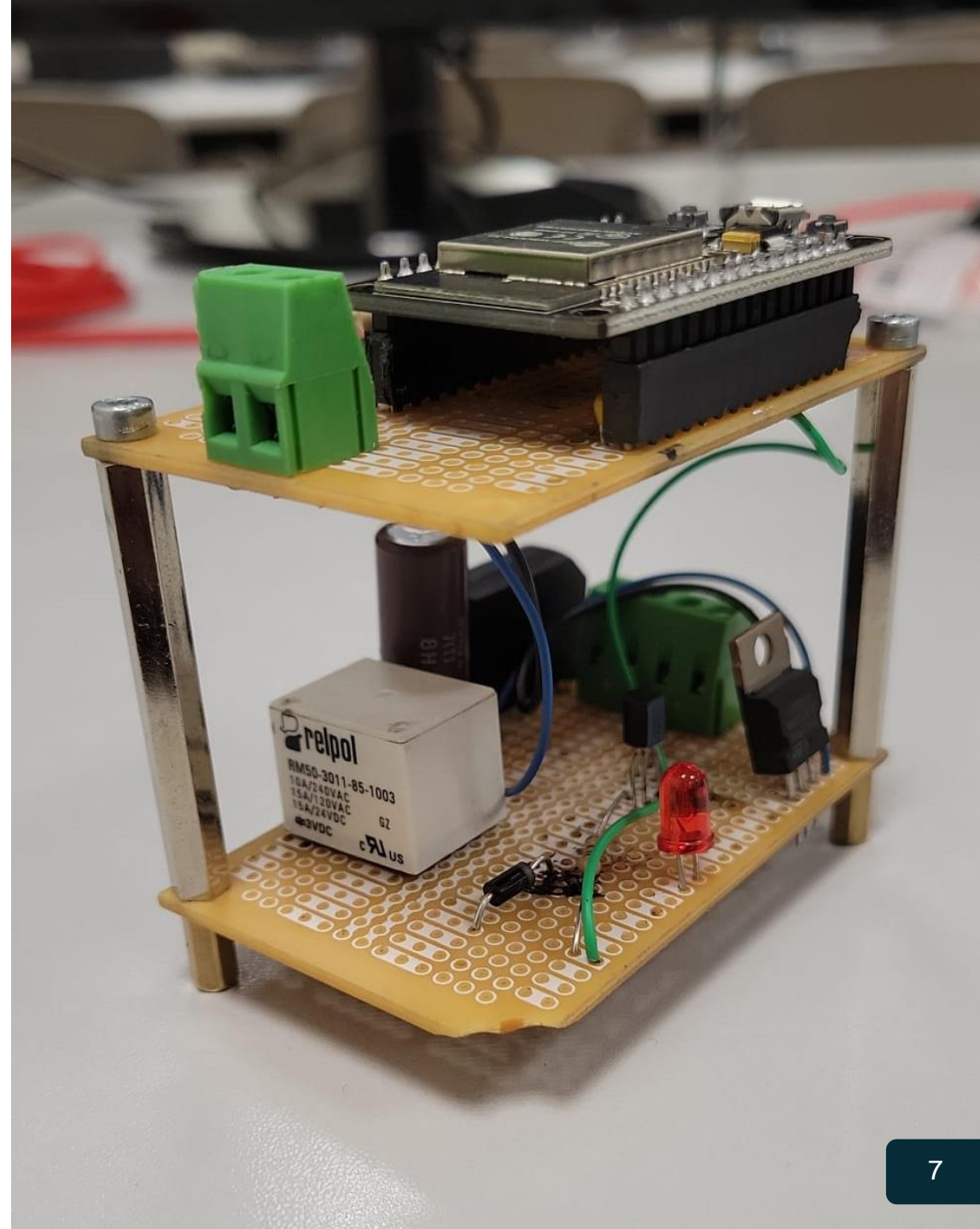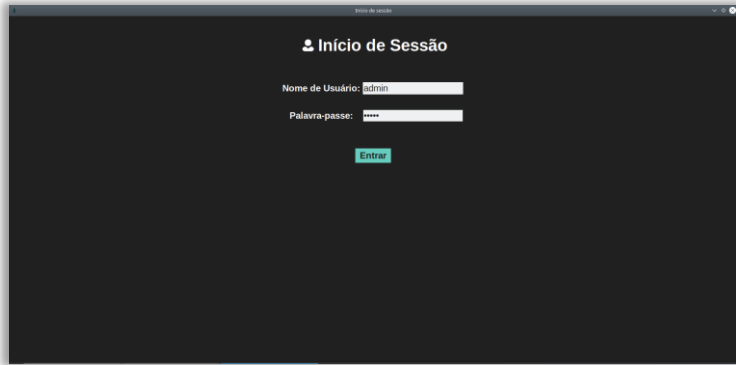
Winery App

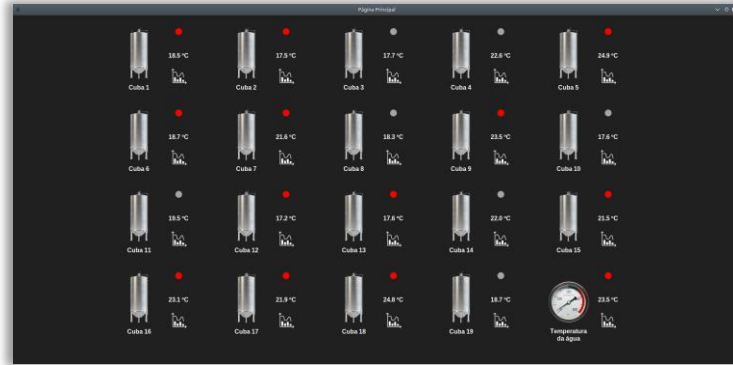The implemented **app** plays a vital role in **controlling** wine temperatures!

1. Login Page

🍷The app features **encrypted** login for secure access;

🍷It **records** each user for accountability.

2. Main Page

🍷The app allows users to **view** the **status** of each electrovalve;

🍷Users can **monitor** the **current temperature** of each wine vat;

🍷Users can **access** to each vat's **temperature history** through the database.

3. Temperature Page

🍷Provides the capability to independently **set temperature limits** for each vat;

🍷Users can **export CSV files**, **clean the database** and **view register reports**.
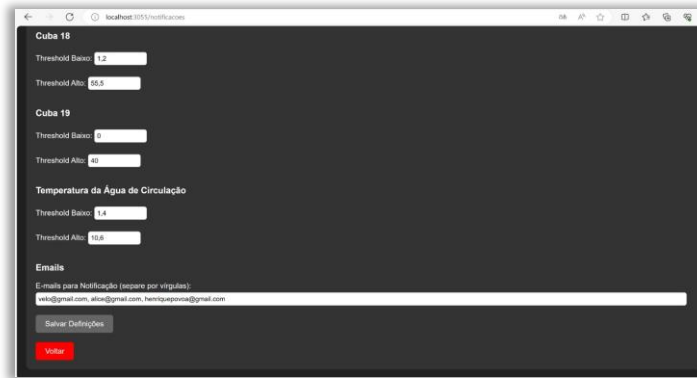
Website

1. Main Page

⚜ Users can **check** each vat's temperature via website;

⚜ The implemented interface **mirrors** the app, fostering an ecosystem for an **intuitive** and **cohesive** user experience.

2. Notifications

⚜ Users can **set up email notifications** for when temperatures exceeded defined limits;
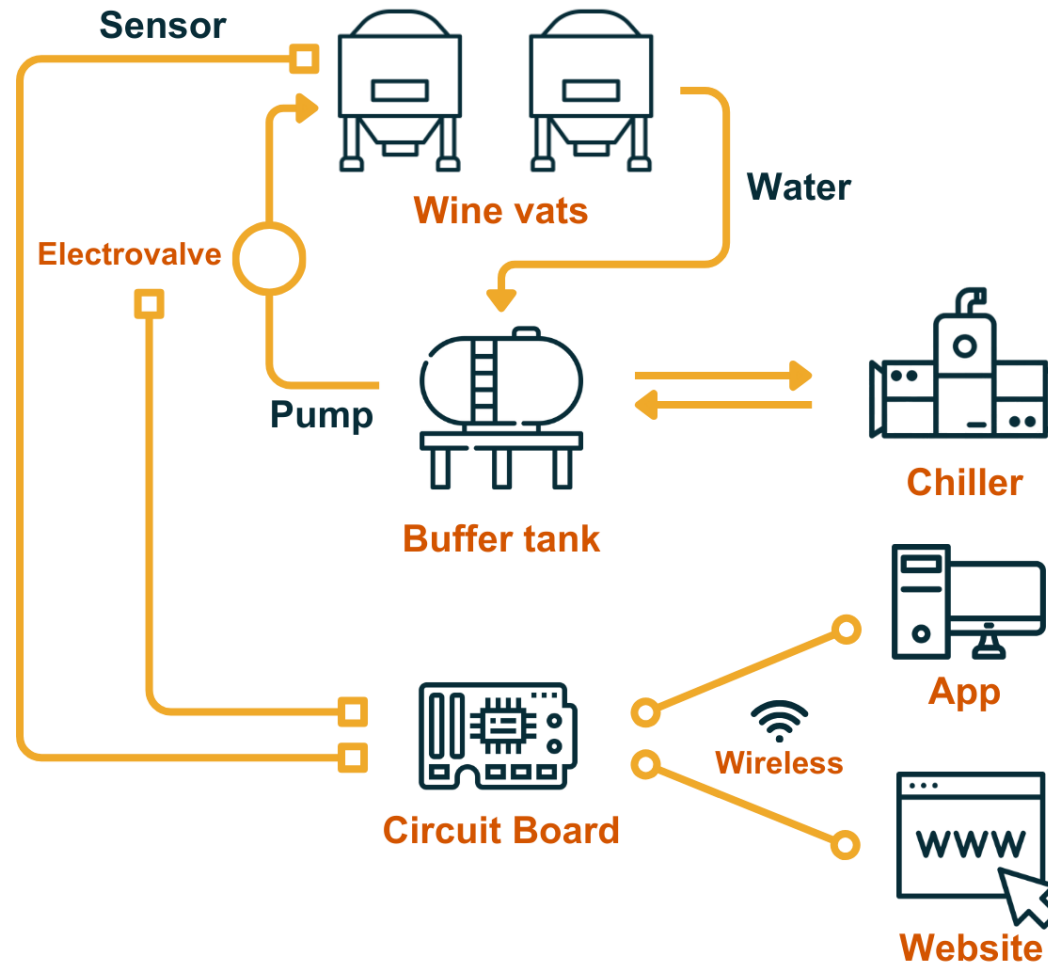
3. History Graphs

⚜ Users can access graphs with the **temperature history** for each vat;

⚜ It's an important feature for **data analysis** for future insights.

How Does The Ecosystem Work

When the temperature of the wine vat reaches its limits, the **sensor** sends a signal to the **circuit board**, prompting it to **open** the **electrovalve**.

The **water** from the vats refrigeration system is directed to the **buffer tank** to undergo the **cooling process**.

The circuit board communicates **wirelessly** with the app and website.

Target Audience

- **Winery owners**;

- Wine production **engineers**;

- **Technicians** and **researchers** in Oenology;

- They can leverage our monitoring and control system to **enhance** the production **efficiency** and **studies**.

Competitors

- Our team, unlike industry giants such as **Omron** and **Siemens**, specializes in understanding the unique needs of the **winemaking sector**.

- Our expertise in wine production and electrical modulation enables us to provide **customized solutions** that optimize **performance** and **efficiency** within the industry.

Costs and Benefits

- The **initial investment** and **installation** are the **primary costs**;

- The **materials** used to produce our product offer **excellent cost-benefit value**;

- Our product **eliminates** the need for infrastructure **changes** during maintenance or expansion.

- **Key benefits include:** enhanced **precision**, **control**, and **efficiency**; a **secure** and user-friendly app and website; effective **data management**; significant **long-time savings**.

Members Contribution

Hardware

Construction and Testing

Miguel Velo

Communication with the App and Website

Miguel Lopes

Winery App

Implementation and Design

Gonçalo Almeida

Implementation and Communication

Henrique Simões

Website

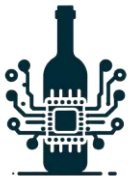**Implementation and Design**

Henrique Póvoa

Implementation and Communication

David Antunes

Technical Challenges

Following the initially **defined timeline** throughout the project.

Creating a seamlessly integrated ecosystem with flawless operation.

Turning the envisioned circuit into a functional one. While the overall concept was straightforward, integrating all elements proved to be complex.

Achieved Results

1 We **succesfully** demonstrated the benefits of advanced temperature monitoring and control in wine production.

2 Our **primary goal** was achieved as we successfully concluded the project, creating an interconnected ecosystem capable of wireless communication with **precision**, **stability**, and **security**.

3 These attributes contribute to a more **efficient** and **effective** wine production process, resulting in **higher quality** products and long-term **cost savings** for wineries.

Digital Wine Temperature Control

Demo day video:

Or click here.

More about our project at:

Or click here.

With the partnership of:

ADEGA DA
MORGADA