WEEK 02 OCT 12 2025 -- OCT 18 2025

Seed Incubation Plant: Weekly Report

SUN	MON	TUE	WED	THU	FRI	SAT
12	13	14	15	16	17	18

	ANJANA	ASWATHEERTHA	ATHIRA	DANIEL
12			Project phase one report.	EMCU block diagram done.
13			UI for esp cam live feed.	Weekly report table can now auto adjust the height.
14	Collected details about the control of rail system		Implementing backend for getting live feed.	Report: introduction and overview done.
15			Implementing backend for getting live feed.	Report: merged in relevent parts of miniproject report.
16				Report: enclosure chapter done.
17				Report: thermal system chapter done.
18				Report: updated content here and there.

1.1 Weekly Objectives and Completion Status

Anjana — 0% Done

- □ Block diagram of rail mechanism.
- □ Cad design of components for rail mechanism.

Aswatheertha — 0% Done

- □

Athira — 75% Done

- ■ Phase 1 report.
- ◧ Live feed from esp cam.

Daniel — 20% Done

- ■ Phase 1 report - Figure.
- ■ Phase 1 report - Content.
- □ Front Panel.
- □ Front Side Panel 1.
- □ Front Side Panel 2.
- □ Electronics Bay Base.
- □ Electronics Bay Side Panel 1.
- □ Electronics Bay Side Panel 2.

1.2 Anjana

1.3 Aswatheertha

1.4 Athira

This report summarizes the progress made during the week on the development of the Seed Incubation Environmental Control App. The work focused on three main areas: generating the detailed Sync App report, developing the Flutter app with multiple screens, and initiating the integration of a live video feed from ESP32-CAM using TCP protocol.

1.5 Project Progress Overview

The main achievements this week were concentrated on consolidating the LaTeX-based project report, implementing the app's Home screen and supporting metric screens, and setting up the initial code infrastructure for receiving and displaying the live video feed from ESP32-CAM. Considerable effort was also dedicated to ensuring that all modules are compatible and scalable for future integration.

1.6 Sync App Report Generation

The report for the Seed Incubation Environmental Control App was structured into two major chapters to provide a clear, coherent narrative. Chapter one includes the overview, system design, project objectives, and detailed explanation of the MQTT communication protocol and working principle. Chapter two focuses on implementation details, software and hardware design, navigation flow, and potential future enhancements. All sections were elaborated with descriptive content and technical explanations, minimizing the use of bullet points to maintain professional report style. TikZ-based diagrams and space for app screenshots were included to visually demonstrate the architecture and interface design.

1.7 Flutter App Development

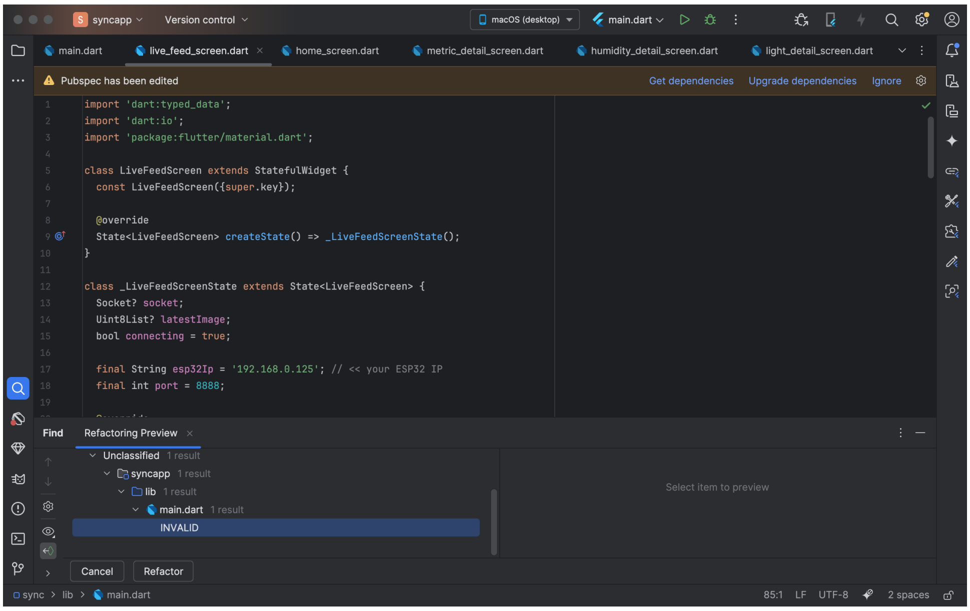
During the week, the Home Screen dashboard was implemented to allow seamless navigation to all metric screens, including temperature, humidity, light intensity, and air quality. Additional screens for settings, alerts, and system status were developed. Each screen is designed for clarity and real-time responsiveness, with smooth navigation transitions and consistent user interface elements.

1.8 Integration of Live Feed from ESP32-CAM

Preliminary development for integrating a live video feed using TCP was carried out. A dedicated `LiveFeedScreen` was implemented, which utilizes a Flutter `Texture` widget to render the video stream asynchronously. This ensures minimal lag and allows the feed to be displayed alongside the metric data on the dashboard. The code was structured to enable seamless integration with the existing Home screen and other metric detail screens.

1.8.1 Code Implementation

The TCP client code was designed to connect to the ESP32-CAM server, receive frame data continuously, and display it on the live feed screen. Error handling mechanisms were added to maintain connection stability. The following placeholders indicate where laptop screenshots of the implementation should be added to visually document the code and functionality:



```dart
import 'dart:typed_data';
import 'dart:io';
import 'package:flutter/material.dart';

class LiveFeedScreen extends StatefulWidget {
  const LiveFeedScreen({super.key});

  @override
  State<LiveFeedScreen> createState() => _LiveFeedScreenState();
}

class _LiveFeedScreenState extends State<LiveFeedScreen> {
  Socket? socket;
  Uint8List? latestImage;
  bool connecting = true;

  final String esp32Ip = '192.168.0.125'; // << your ESP32 IP
  final int port = 8888;

```

Figure 1.1: Screenshot of Flutter TCP client code for ESP32-CAM live feed

1.9 Technical Challenges and Solutions

During development, dependency version conflicts in Flutter packages were resolved to maintain compatibility. Handling the real-time video stream efficiently required restructuring asynchronous data processing to prevent UI freezes. Additionally, the app's codebase was organized modularly to allow straightforward integration of future features without disrupting existing functionality.

1.10 Next Steps

The immediate next steps include completing the live feed screen with fully stable connectivity, integrating the live feed into the Home Screen dashboard, testing end-to-end communication between the ESP32 sensors, actuators, and the mobile app, and implementing persistent data logging for both metrics and video stream to support future analytics and reporting.

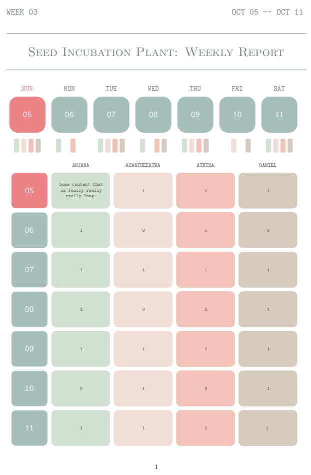
1.11 Conclusion

This week's work demonstrates significant progress in building a fully functional Seed Incubation Environmental Control App. The combination of detailed report generation, responsive Flutter screens, and preliminary live video feed integration sets a strong foundation for completing the app's development in the coming weeks.

1.12 Daniel

In this week, most of the work done were related with project phase one report and weekly report LaTeXtemplete and generator script.

1.12.1 Auto-adjusting Overview Table



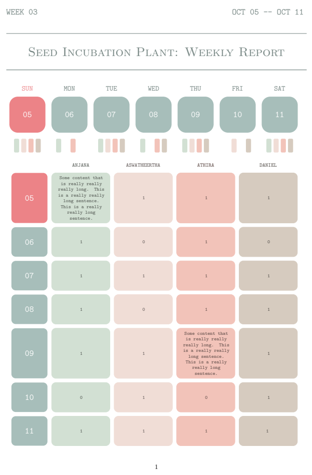
WEEK 03 OCT 05 -- OCT 11

Seed Incubation Plant: Weekly Report

SUN	MON	TUE	WED	THU	FRI	SAT
05	06	07	08	09	10	11

	ANJANA	ASWATHEERTHA	ATHIRA	DANIEL
05	Some content that is really really really long.	1	1	1
06	1	0	1	0
07	1	1	1	1
08	1	0	1	1
09	1	1	1	1
10	0	1	0	1
11	1	1	1	1

1



WEEK 03 OCT 05 -- OCT 11

Seed Incubation Plant: Weekly Report

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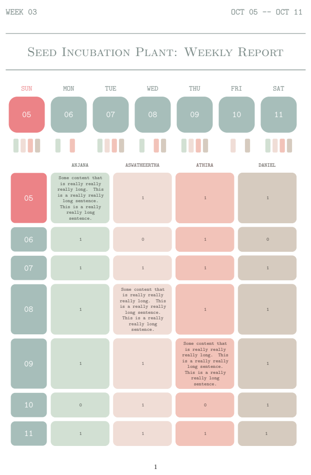
05	Some content that is really really really long. This is a really really long sentence. This is a really really long sentence.	1	1	1
06	1	0	1	0
07	1	1	1	1
08	1	0	1	1
09	1	1	Some content that is really really really long. This is a really really long sentence. This is a really really long sentence.	1
10	0	1	0	1
11	1	1	1	1

1



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06	1	0	1	0
07	1	1	1	1
08	1	Some content that is really really really long. This is a really really long sentence. This is a really really long sentence.	1	1
09	1	1	Some content that is really really really long. This is a really really long sentence. This is a really really long sentence.	1
10	0	1	0	1
11	1	1	1	1

1