School of Engineering

Diploma in AI & Data Engineering

EGT209

Data Engineering Project

T2 - Group 2

[Envi-Optimizer]

Initial Project Plan

AY2024S1

1. Project Team Members

This Data Engineering Project Team consists of:

S/N	Module Group	Name	Admin Number	Role and Responsibilities (refer to the Gantt chart)
1	EGT209 – T2	Min Phyo Thura	233523A	Team Leader, Software++
2		Lim Jin Bin	221128Z	Member, Hardware++
3		Mohamad Habib	231880L	Member, Hardware++
4		Alexander Chan	230648A	Member, Hardware++

2. Project Overview

In today's advanced manufacturing facilities, a wide range of machinery is programmed to operate continuously, often alongside human workers. Unfortunately, this constant operation leads to indoor pollution, impacting the health of workers with heat and dust. Moreover, the machines themselves are affected by the changing environment, resulting in reduced efficiency.

The Envi-Optimizer project aims to address these challenges by developing a seamless data pipeline to support data-driven decision-making. This will optimize environmental factors on the shop floor for both users and equipment, promoting efficient use of energy and resources. The success of Envi-Optimizer depends on three main pillars:

- **Data**: Accurate collection and analysis of data will be carried out in five phases: collection, pre-processing, storage, exploration, and analysis.
- **Security**: Given the substantial resources invested in Envi-Optimizer, prioritizing data security is crucial to protect the collected sensor data and end results against malicious theft.
- **Enhancements**: To exceed stakeholder expectations, further enhancements to the project are suggested, such as monitoring of the intelligent control systems and cloud storage infrastructure.

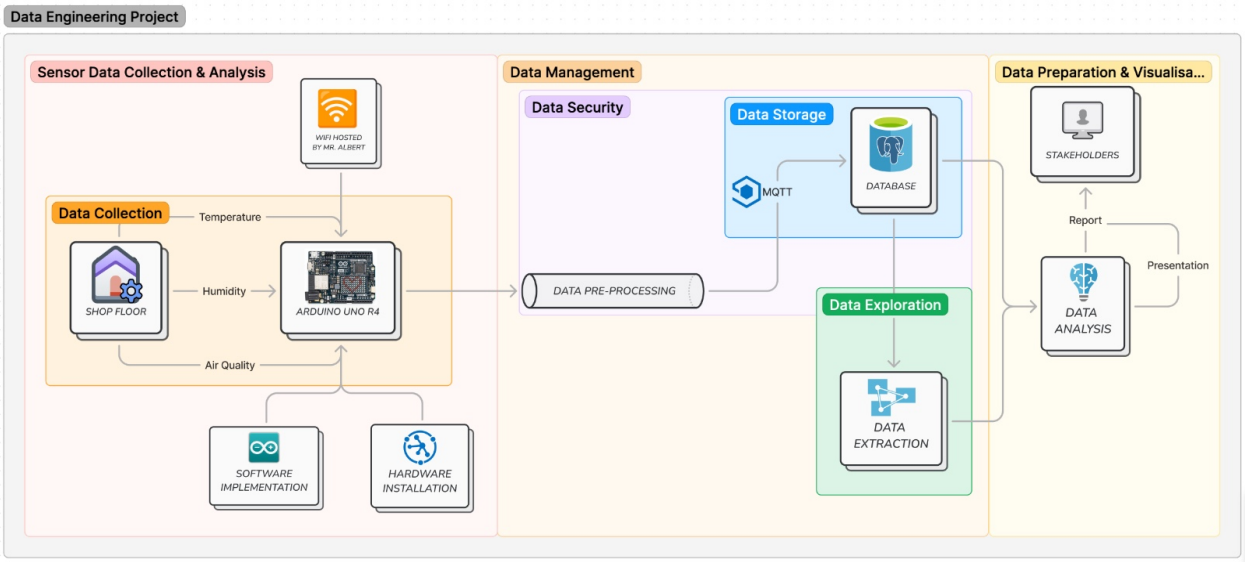

Figure 1: Design Architecture & Tools Used

3. Project Scope

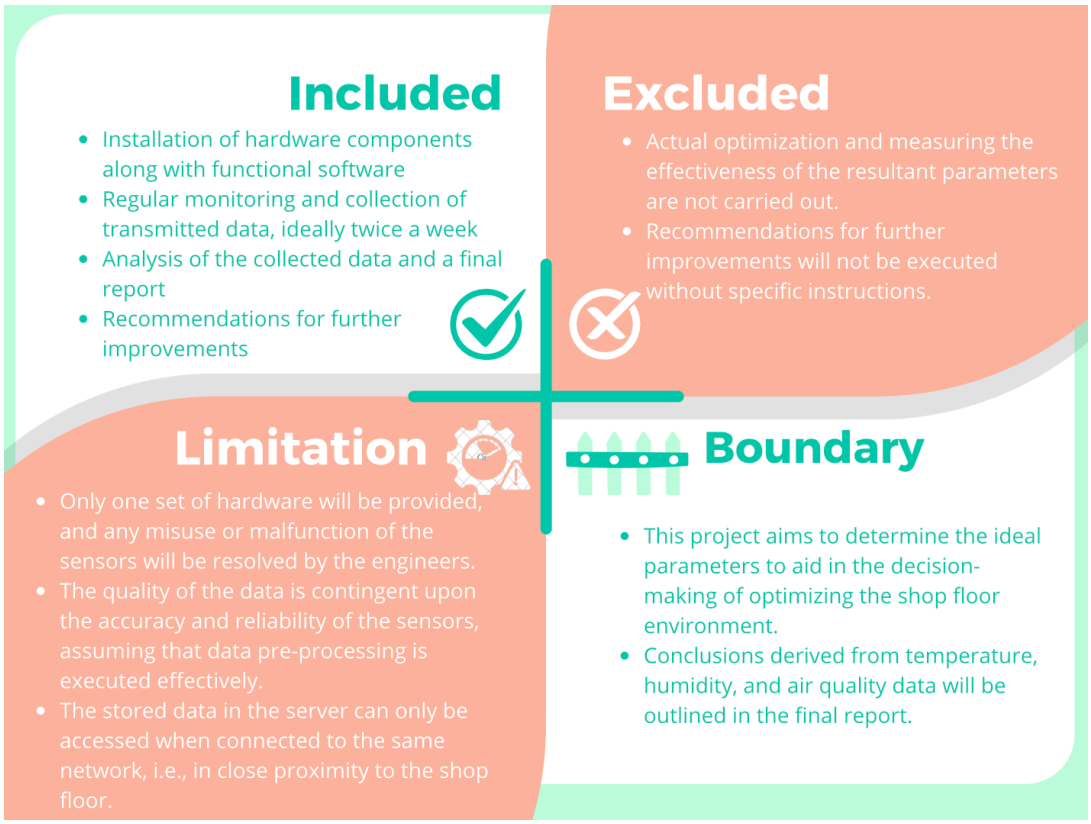

Figure 2: Project Scope

4. Project Deliverables

Milestone	Deliverables	Deadline
Initial Project Plan	A proposal with clear overview, outcomes and methodology	29 June 2024
Reliable Hardware	Accurate and reliable hardware	1 July 2024
Functional Software	Bug-free and documented program	1 July 2024
Data Extraction	CSV files retrieved from the data server	Twice a week
Data Exploration	Exploring patterns and finding anomalies	Twice a week
Data Analysis	A precise analysis that supports decision-making	26 July 2024
Final Report	A detailed report that highlights the results and outlines the weaknesses for efficient reproducibility	28 July 2024
Presentation	A data story to communicate with the stakeholders	3 Aug 2024

5. Project Timeline

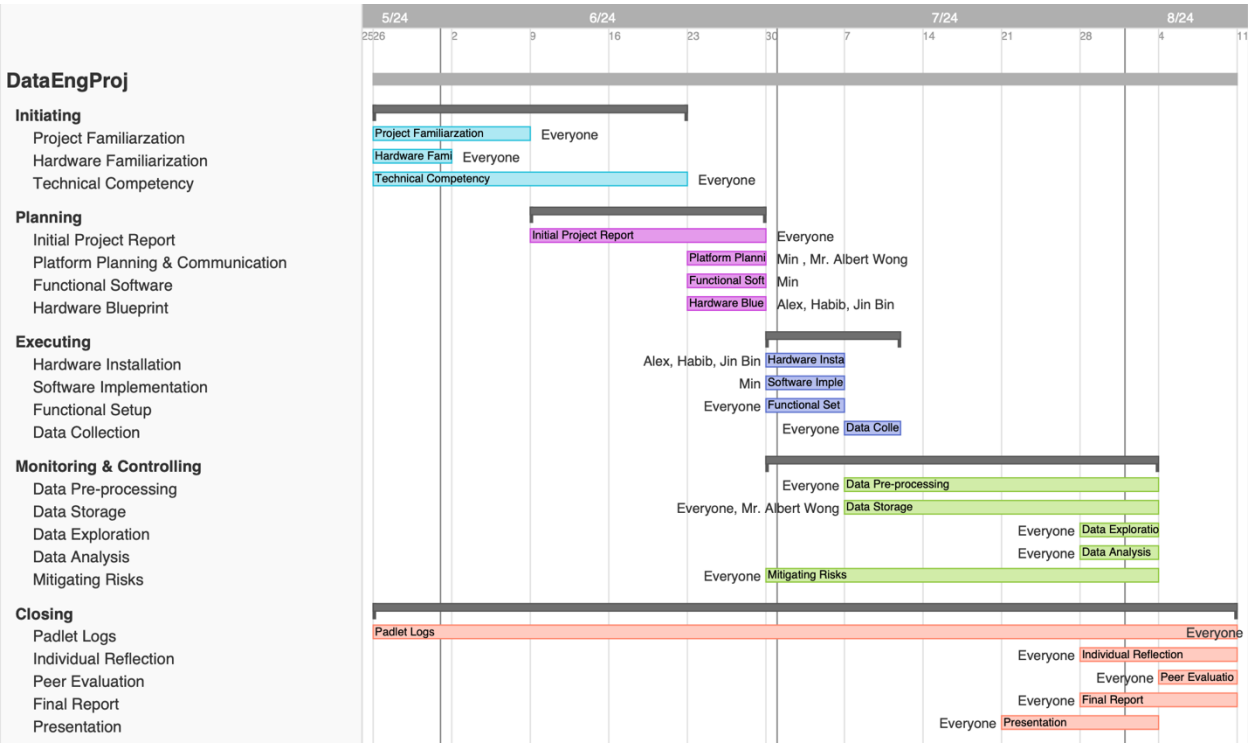

Figure 3: Project Timeline Gantt Chart

6. Risk Management

Potential Risks	Mitigation
Failing sensors	Monitor the data regularly, Prepare backup sensors
Software malfunctioned	Alert & debug ASAP
Wrongly stored data	Check the topic for transmitting and retrieving data, Clean and process the errors if possible
Delayed deadlines	Dynamically update the progress in Gantt Chart, Remind each other

7. Conclusion

Envi-Optimizer is a comprehensive data engineering project that optimizes collected temperature, humidity, and air quality data. The tasks involved require expertise in sensor data collection, data management, data analysis, and data visualization. It also requires strong leadership and project management skills.

This initial project plan aims to establish solid foundational practices for the overall project. The design architecture and tools used are mentioned exactly, and a Gantt chart alongside the project scope and deliverables is thoroughly planned out as well. The two main objectives are to perform *an extensive data analysis* that helps in the decision-making process for optimizing the shop floor environment and to maintain *a detailed project record* that reduces errors and inefficiencies in future projects.