UTM
UNIVERSITI TEKNOLOGI MALAYSIA

FYP 2 PRESENTATION | 2022/2023 SEMESTER 2

POWER PLANTS PERFORMANCE MONITORING SYSTEM

for PT PLN (Persero) UP3 Pamekasan

Thesis by :
Thoriqulhaq Jibril Al Qudsy

Video presentation link :
https://youtu.be/LEnOifXJgnI

Video demo link :
https://youtu.be/c_YFLOnoX4E

Acknowledgement

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INTRODUCTION

PROBLEM BACKGROUND

PT PLN (Persero) UP3 Pamekasan is a branch of PT PLN (Persero) located on Madura Island, precisely in Pameksan Regency, East Java. They responsible for distributing electricity access in the Madura Island area including small islands nearby. But due to the fact that there are still many areas that do not have access to electricity on Madura Island and the surrounding area, they plan to increase the number of power plants in order to spread electricity access to areas that do not yet have access to electricity. Unfortunately the process of monitoring the performance of power plants has not used a computerized system in its implementation, which is now still using a manual system. So that, innovation is needed immediately to anticipate some problems caused by the increase in the number of power plants.

PROJECT AIM

This project aims to develop an **automated monitoring system** of power plant performance for PT PLN (Persero) UP3 Pamekasan in a web-based approach that is able to speed up the process of data gathering, data checking and verification, data classification until data processing. So that, the monitoring process of power plant performance in PT PLN (Persero) UP3 Pamekasan will be more efficient and manageable.

PROJECT SCOPE

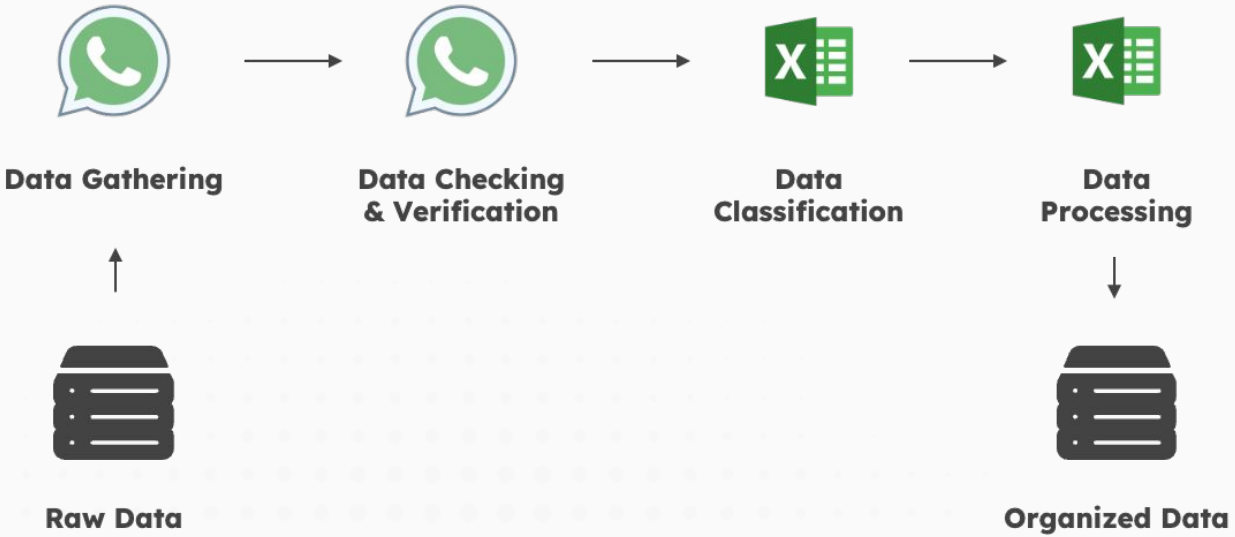
- The project scope only focuses on power plants in PT PLN (Persero) UP3 Pamekasan.
- Organized data will be presented as a bar chart, list data & downloadable excel document.
- The system can only be accessed by three different levels of users which are operator staff for every power plant, PIC staff for every power plant and system administrator with different authorized access.

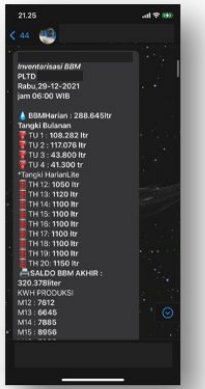
LITERATURE REVIEW

CASE STUDY

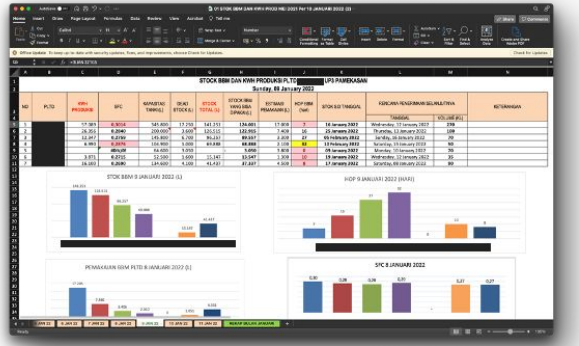
This project is studying about the monitoring activity of the power plants performance in PT PLN (Persero) UP3 Pamekasan. But, due to PT PLN (Persero) UP3 Pamekasan plans to increase the number of power plants. A system that **can handle the monitoring process with a larger number of power plants** is needed since some issues were discovered on the current system such as **inefficient** and **inconvenient** ways to monitor the power plant performance in PT PLN (Persero) UP3 Pamekasan.

CURRENT SYSTEM ANALYSIS





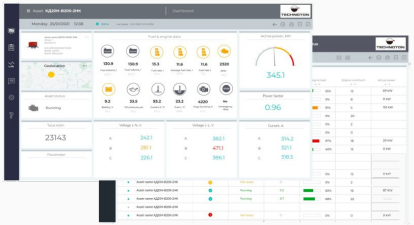
Raw Data Example



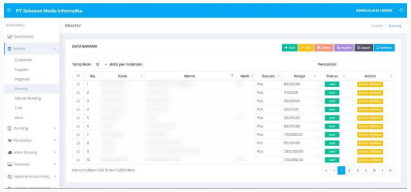
Organized Data Example

COMPARISON BETWEEN EXISTING SYSTEM

Avnet's Smart Diesel Generator Monitoring System



Technoton's Diesel Generator Monitoring System



Sekawan Media's Logistics Delivery Monitoring System

No	System Feature	S1	S2	S3
1	Cross-Platform Availability	No	Yes	Yes
2	Multiple User Role Type Access	No	No	Yes
3	Downloadable excel-based report	No	No	Yes
4	Displaying data in a chart form.	Yes	Yes	Yes
5	Centralized Database	Yes	Yes	Yes
6	User Data Management	No	No	No
7	Master Data Management	No	No	Yes
8	User Authentication	Yes	No	Yes
9	Admin Console	No	No	Yes
10	Data Verification / Approval	No	No	Yes

Note :

S1 - Avnet's Smart Diesel Generator Monitoring Solution System

S2 - Technoton's Diesel Generator Monitoring System

S3 - Sekawan Media's Logistics Delivery Monitoring System

TECHNOLOGY USED

MySQL

Laravel

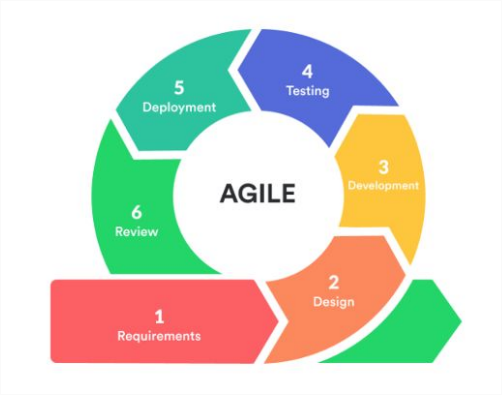
Tailwind

VueJS

InertiaJS

PrimeVue

SYSTEM DEVELOPMENT METHODOLOGY



METHODOLOGY CHOICE

With Agile Methodology, we can quickly implement any feedback from consumers in the next iteration. Whether it's about adding features or bug fixes. As a result, the quality of the software will improve and increase because it is more in line with consumer desires. In addition, if there is a lot of feedback, we can be flexible in choosing whether to make changes in each iteration. So, we don't have to follow a plan from start to finish. Also with agile, software development will be more predictable and we can also know the various expenses well. As a result, business risk will be reduced.

SYSTEM REQUIREMENT

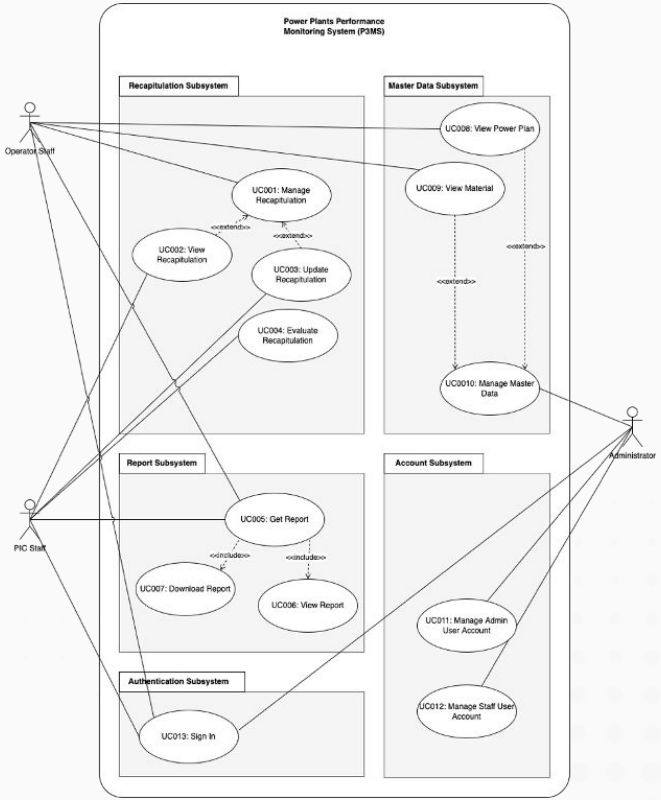
Hardware Requirements

- Intel Pentium 4 or later for Intel Processor, AMD Athlon or later for AMD Processor and Apple M1 or later for Apple Processor
- Minimum 2 GB RAM memory.
- Internet connection required

Software Requirements

- Windows 8 or later for Windows Operating System, macOS Sierra 10.12 or later for Mac Operating System and Ubuntu 14.04+ 64-bit for Linux Operating System.
- Google Chrome 54 or later, Microsoft Internet Explorer 11 or later, Mozilla Firefox version 48 or later and Apple Safari 15.4 or later

REQUIREMENT ANALYSIS AND DESIGN



USE CASE DIAGRAM

UC001 : Manage Recapitulation

UC002 : View Recapitulation

UC003 : Update Recapitulation

UC004 : Evaluate Recapitulation

UC005 : Get Report

UC006 : View Report

UC007 : Download Report

UC008 : View Power Plant

UC009 : View Material

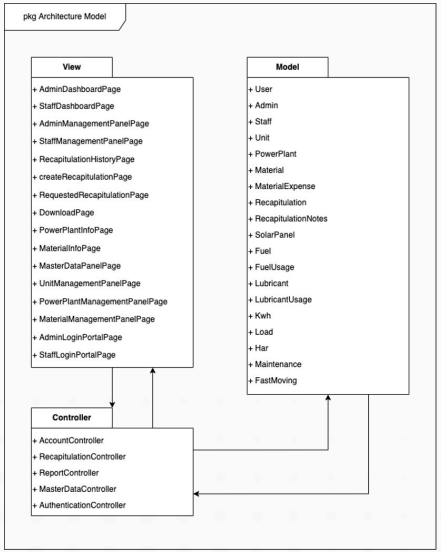
UC010 : Manage Master Data

UC011 : Manage Admin User Account

UC012 : Manage Staff User Account

UC013 : Sign In

SYSTEM ARCHITECTURE DESIGN



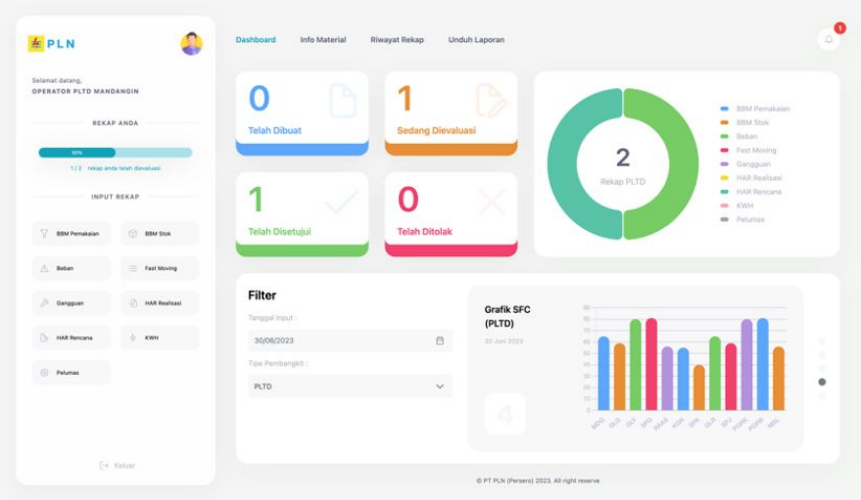
MVC DESIGN PATTERN

IMPLEMENTATION AND TESTING

INTERFACE OF SYSTEM

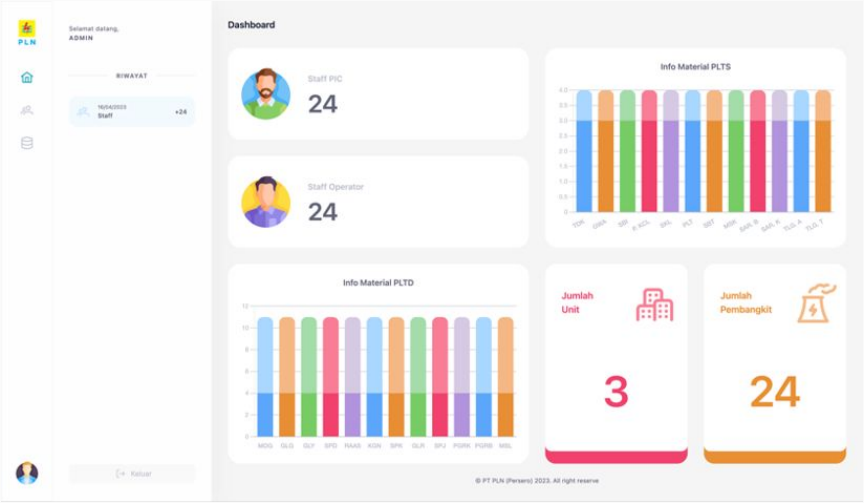
LOGIN PORTAL OF P3MS

INTERFACE OF SYSTEM



STAFF DASHBOARD OF P3MS

INTERFACE OF SYSTEM



ADMIN DASHBOARD OF P3MS

USER ACCEPTANCE TESTING RESULT

User Acceptance Testing Result		
No	Question	Average Answer
1	Is the system easy to understand and use?	4/5
2	Is the system interface designed to make it easy for users?	4/5
3	Is the main menu of the system helpful?	4/5
4	Is the system responsive in a timely manner?	3.5/5
5	Is the security of the stored data trustworthy?	3/5
6	Is the system fully utilized?	4/5

SYSTEM TEST

Tester Name	**:**	Putri (PT PLN (Persero) UP3 Pamekasan staff)
Date	**:**	24 June 2023
Module	**:**	Manage Recapitulation Module

Instruction	**Predicted Result**	**Result**
1. Login as operator staff. 2. Choose recapitulation type to be inputted. 3. Clicks on the button of selected recapitulation type to create. 4. Input all required fields on the recapitulation form. 5. Click on the “Simpan” button 6. Sign out.	1. Able to input all required information. 2. System able to give error message for miss or wrong input information. 3. Able to view the current new recapitulation.	Success

SYSTEM TEST

Tester Name	**:**	Avicenna (PT PLN (Persero) UP3 Pamekasan engineer supervisor)
Date	**:**	24 June 2023
Module	**:**	Manage Recapitulation Module

Instruction	Predicted Result	Result
1. Login as operator staff. 2. Click on the “Permintaan Rekap” navbar button. 3. Click the “Evaluasi” button on one of the recapitulations. 4. Start evaluating the recapitulation whether approved or rejected. 5. Save Evaluation Result. 6. Sign out.	1. Able to view selected recapitulation that need to be evaluated. 2. Able to make correction if there is minor mistake. 3. Able to give the recapitulation evaluation status. 4. Able to update the material stock quantity if the recapitulation type chosen is relate with material.	Success

CONCLUSION

ACHIEVEMENT OF PROJECT OBJECTIVE

- The system enables the admin to manage user including staff and admin itself in the manage user module.
- The admin can manage all master data including unit, power plant and material through the manage master data module.
- PIC staff could approve or reject created recapitulation through the system.
- The system can generate a report in form of excel from the recapitulation data that created by operator staff and already approved by PIC staff.
- Operator staff has ability to create and manage a recapitulation with ten available recapitulation type.

CHALLENGES

- The project has the potential to include a downloadable Excel feature, which may require the use of a third-party extension. This enhancement will allow users to generate Excel files directly from the system, providing a convenient way to export and manipulate data.
- To optimize system performance, file compression techniques can be employed to reduce the size of the build. This will help the system run faster, especially in areas with limited internet connectivity such as remote islands. Despite these optimization efforts, the system will still prioritize a user-friendly interface and experience.
- Efforts will be made to minimize the time taken for database indexing. Managing a single type of recapitulation often involves complex relationships between more than four tables simultaneously. Streamlining the indexing process will improve the overall efficiency of the system, reducing the time required for data retrieval and management.

SUGGESTION FOR FUTURE IMPROVEMENT

- Introduce a feature that allows users to upload evidence for each newly created recapitulation. This feature will enable users to provide supporting documentation or proof for the recapitulation, enhancing the accuracy and reliability of the data. Additionally, it will facilitate better record-keeping and auditing processes.
- Increase the implementation of email notifications to keep track of system activities and updates.
- Integrate a plugin or feature to schedule jobs, enabling the monitoring, automatic status updates, and data backup of the system. This helps ensure efficient system management and maintenance.

Thank You