

Sri Lanka Institute of Information Technology



Status Document II **R24-059**

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Software Engineering

DECLARATION

We declare that this is our own work and this project report does not incorporate without acknowledgement any material previously submitted for a degree or diploma in any other university or Institute of higher learning and to the best of our knowledge and belief it does not contain any material previously published or written by another person except where the acknowledgement is made in the text.

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.....11/09/2024.....

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Project Component and Current Status

Component: Coconut Oil Export Amount Predictive Model

Progress

The system primarily focuses on generating forecasts for coconut oil exports based on factors such as exporting country, demand, compound annual growth rate (CAGR) and inflation rate.

CAGR (Independent Variable)

The Compound Annual Growth Rate (CAGR) is calculated using the following equation:

$$CAGR = \left(\frac{\text{Final Value}}{\text{Initial Value}} \right)^{\left(\frac{1}{\text{Number of Years}} \right)} - 1$$

Figure 1: CAGR Equation

Where:

- Final Value: Final Value is the value at the end of the period.
- Initial Value: Initial Value is the value at the beginning of the period.
- Number of Years: Number of Years is the number of years over which the growth occurred.

Exported (Dependent Variable)

Export amounts are predicting as the below way.

- Values above or equal to 1000 are labeled as 'A'.
- Values between 950 and 1000 are labeled as 'B'.
- Values between 900 and 950 are labeled as 'C'.
- Values between 850 and 900 are labeled as 'D'.
- Values between 800 and 850 are labeled as 'E'.
- Values between 750 and 800 are labeled as 'F'.
- Values between 700 and 750 are labeled as 'G'.
- Values between 650 and 700 are labeled as 'H'.

- Values between 600 and 650 are labeled as 'T'.
- Values between 550 and 600 are labeled as 'J'.
- Values between 500 and 550 are labeled as 'K'.
- Values between 450 and 500 are labeled as 'L'.
- Values between 400 and 450 are labeled as 'M'.
- Values between 350 and 400 are labeled as 'N'.
- Values between 300 and 350 are labeled as 'O'.
- Values between 250 and 300 are labeled as 'P'.
- Values between 200 and 250 are labeled as 'Q'.
- Values between 150 and 200 are labeled as 'R'.
- Values between 100 and 150 are labeled as 'S'.
- Values below 100 are labeled as 'T'.

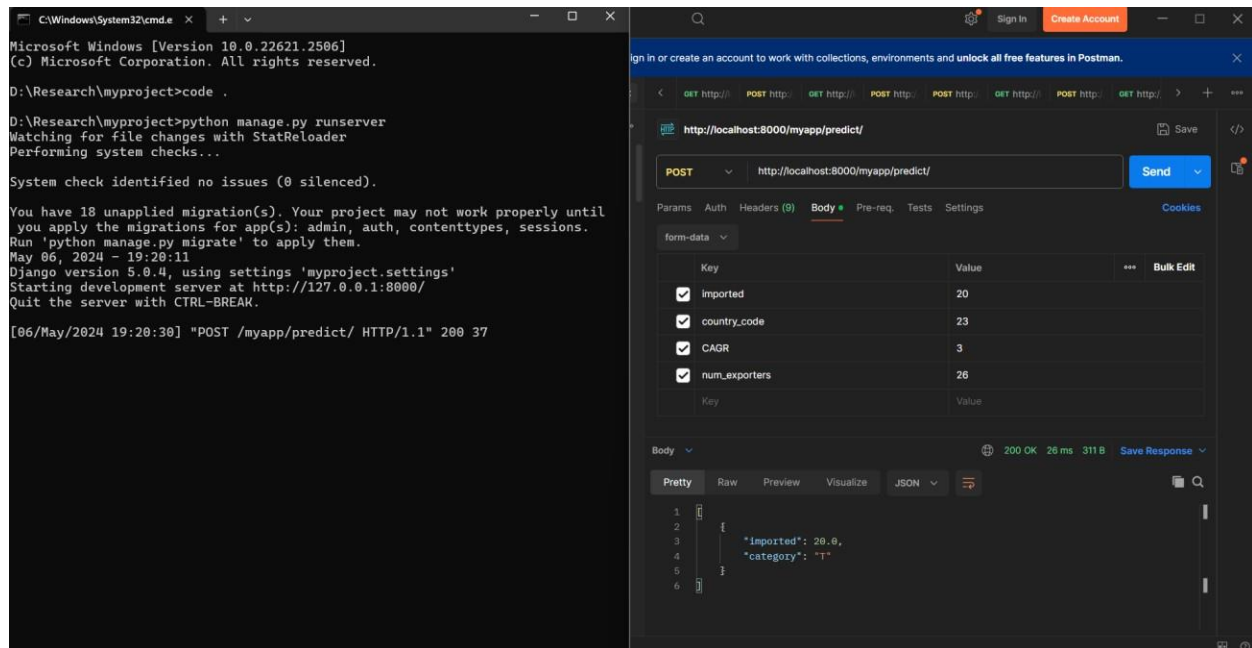


Figure 2: Predicting Exports to A Specific Country

Model Result

Logistic Regression => 0.9207650273224044

Decision Tree => 0.8633879781420765

Random Forest => 0.907103825136612

Best Model: RandomForestClassifier(n_estimators=50)

Best Model Score: 0.9016393442622951

Objectives

Main Objective

- Develop a Predictive Model to Predict Coconut Oil Demand

Sub Objectives

- Platform to identify the coconut oil trending countries.
- Community to interact between consumers and manufactures.
- Store to buy coconut oil.

Test Cases

Test Case 1: Successful Prediction Request

Test Case 1	Successful Prediction Form Submission
Scenario	The user fills in all fields in the prediction form and submits the data.
Precondition	The form must have input fields for inflation, CAGR_x, lkr_to_usd_exchange_rate, fire_sum, floods_count, coconut_oil_price_per_metric_ton, and num_exporters. The submit button should be enabled when all fields are filled.
Action	1. The user enters valid data in all form fields and clicks the submit button.
Expected Outcome	<ul style="list-style-type: none">• The form data is sent as a POST request to the /predict/ endpoint.• A loading spinner appears during the request.• After the response is received, the predicted

	category and SHAP values are displayed on the frontend, formatted neatly for the user to understand. <ul style="list-style-type: none"> • The submit button is re-enabled after the response.
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Test Case 2: Missing Field in Prediction Form Submission

Test Case 1	Missing Field in Prediction Form Submission
Scenario	The user attempts to submit the prediction form without filling in all the required fields.
Precondition	The form should have proper validation logic to ensure that all fields are filled before submission.
Action	1. The user leaves one or more fields blank and clicks the submit button.
Expected Outcome	<ul style="list-style-type: none"> • The form should not be submitted. • The frontend should display an error message (e.g., "Please fill in all required fields") next to the missing fields. • The submit button remains disabled until all fields are completed. • No API request is sent until all fields are validated.

Test Case 3: Invalid Input Data in Prediction Form

Test Case 1	Invalid Input Data in Prediction Form
Scenario	The user enters invalid data in one or more fields in the prediction form (e.g., entering text instead of numbers).
Precondition	The form should have front-end validation to restrict input types (e.g., number fields for numeric values).
Action	1. The user enters invalid data (e.g., letters in the inflation field) and clicks the submit button.
Expected Outcome	<ul style="list-style-type: none"> • The form displays an inline validation error, prompting the user to enter valid data (e.g., "Please enter a valid number"). • The form is not submitted until the user corrects the input. • No API request is sent until all input fields

	contain valid data.
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Test Case 4: Successful Google Trends Search

Test Case 4	Successful Google Trends Search
Scenario	The user enters a search term and selects a timeframe from a dropdown, then submits the Google Trends search form.
Precondition	The form must have an input field for <code>search_term</code> and an optional dropdown for selecting the <code>timeframe</code> .
Action	1. The user enters a valid search term (e.g., "coconut oil") and selects a timeframe (e.g., "today 3-m"), then clicks the submit button.
Expected Outcome	<ul style="list-style-type: none"> • A loading spinner appears, and the data is sent as a POST request to the <code>/google_trends/</code> endpoint. • Once the data is received, the frontend displays a table or chart showing interest by region based on the search term. • The submit button is re-enabled after the data is loaded.

Test Case 5: Empty Search Term for Google Trends

Test Case 5	Empty Search Term for Google Trends
Scenario	The user submits the Google Trends search form without entering a search term.
Precondition	The form should have a validation check to ensure that the <code>search_term</code> is not empty.
Action	1. The user leaves the search term field blank and clicks the submit button.
Expected Outcome	<ul style="list-style-type: none"> • The form should not be submitted. • The frontend should display an error message indicating that a search term is required (e.g., "Please enter a search term"). • No request is sent to the backend until the user enters a valid search term.

Input Parameters

Inflation:

Inflation

CAGR:

CAGR

LKR to USD Exchange Rate:

LKR to USD Exchange Rate

Fire Sum:

Fire Sum

Floods Count:

Floods Count

Coconut Oil Price per Metric Ton:

Coconut Oil Price per Metric Ton

Number of Exporters:

1

PREDICT

Organic Virgin Coconut Oil

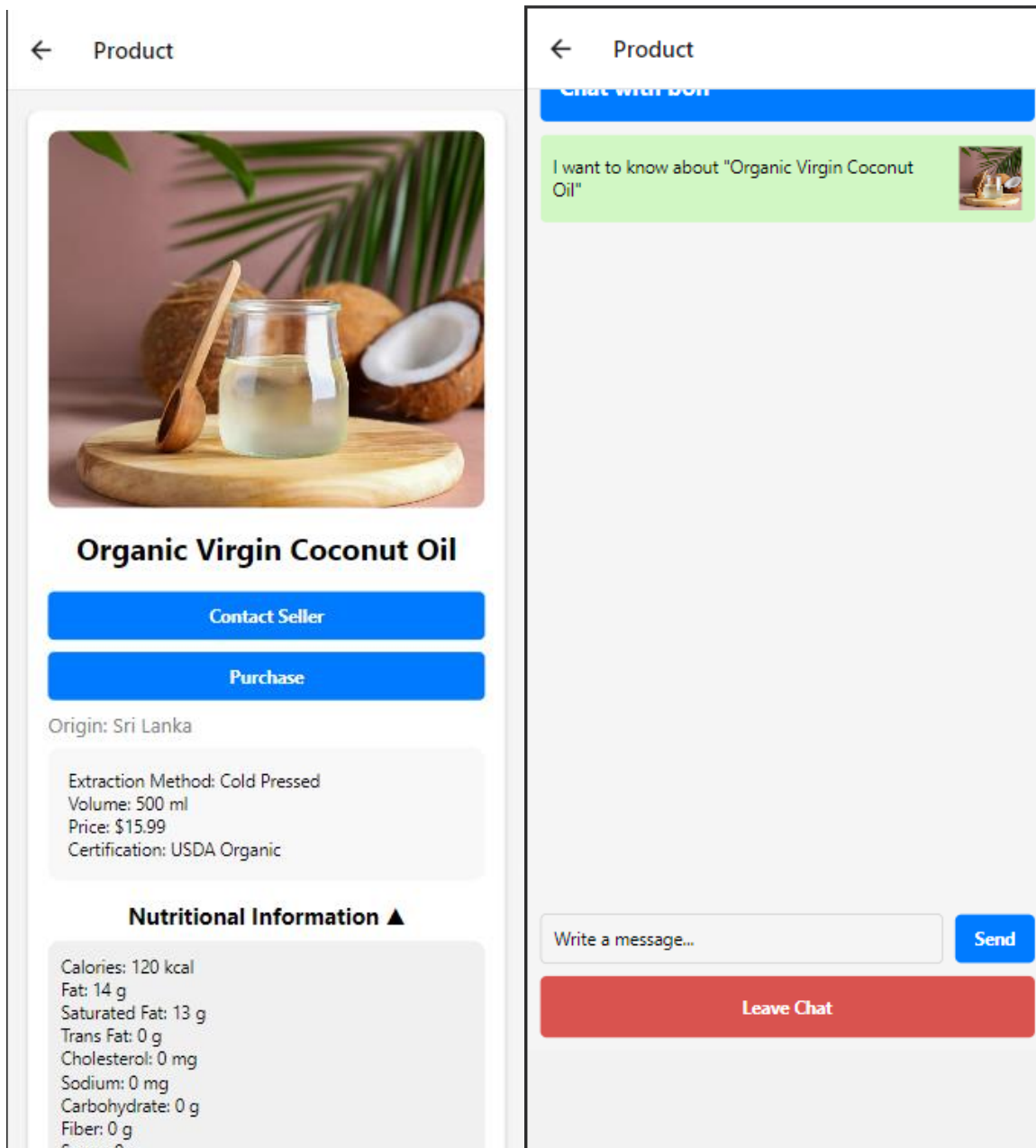
[View Product](#)

"Organic Virgin Coconut Oil"

[View Product](#)

Organic Virgin Coconut Oil





← CreateGroup

Create New Group

Group Name

Group Description

CREATE GROUP

← Chat

Lunuwila

Hello, I'm new to this group

Matara

hello

Marawila

hello

Mount Lavinia

sdsd

Matara

dvb
sd

Maleesha

Hello, I'm new to this group

Thushara (You)

Hello Maleesha

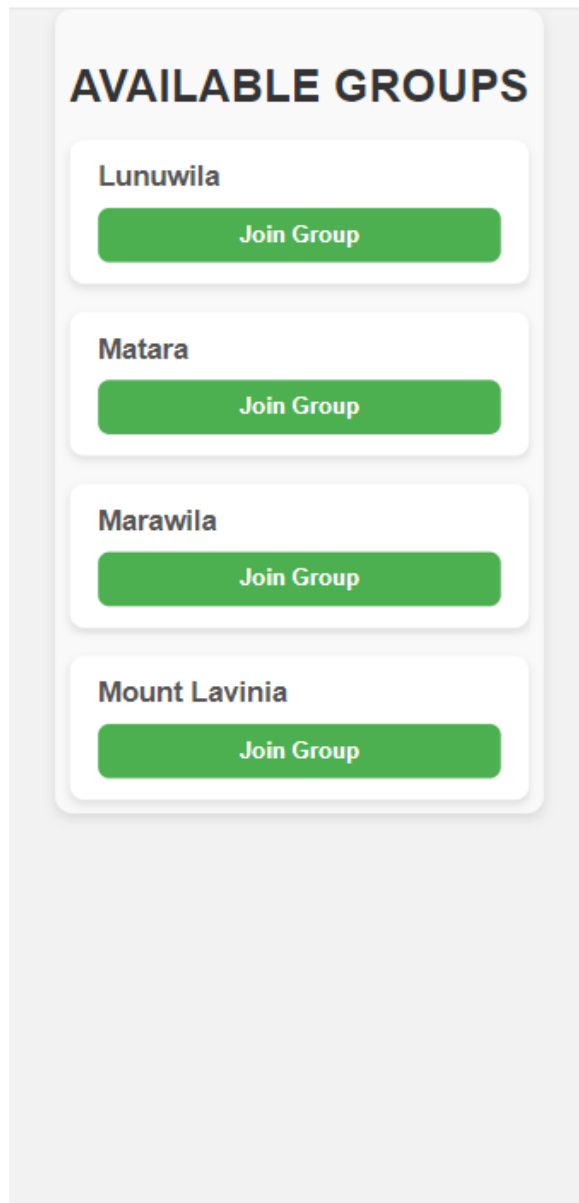
Thushara (You)

hello

Write a message...

Leave Group

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Team Communication

The team chose Microsoft Teams as their primary communication channel, forming a dedicated Team with all four group members. We also used Zoom to communicate with supervisors, provide updates, and receive comments on the project's progress. Regular team conversations were arranged to discuss, share knowledge, and plan.

The crew also used WhatsApp as an additional tool to stay in constant communication with their supervisors. This enabled timely updates and cooperation between the supervisor and co-supervisor, ensuring that everyone was informed and on the same page throughout the project.

Teams Channel

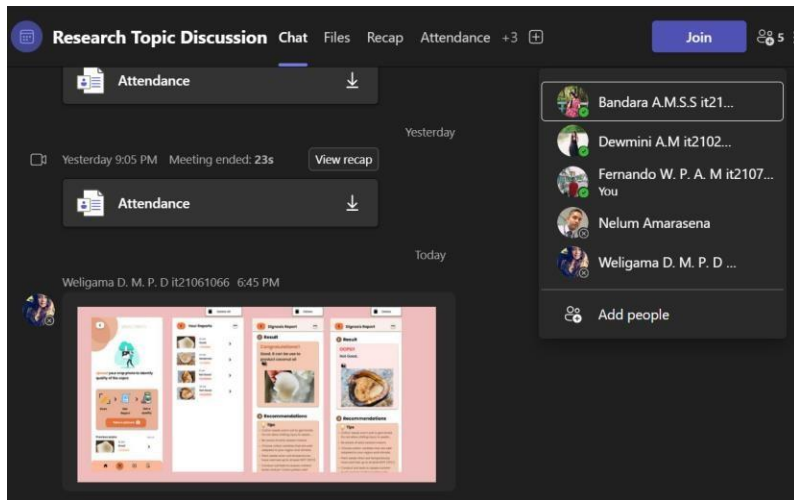


Figure 3: Teams Channel

Teams Calls with the Research Team

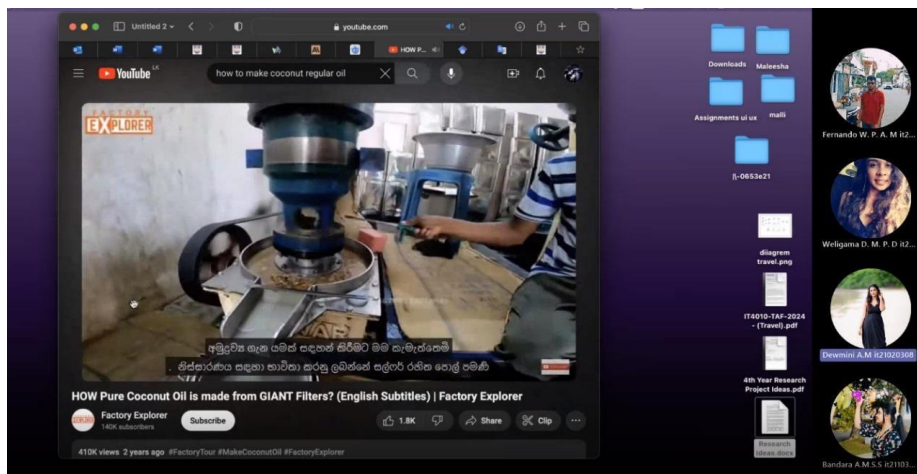


Figure 4: Teams Calls with the Team 1

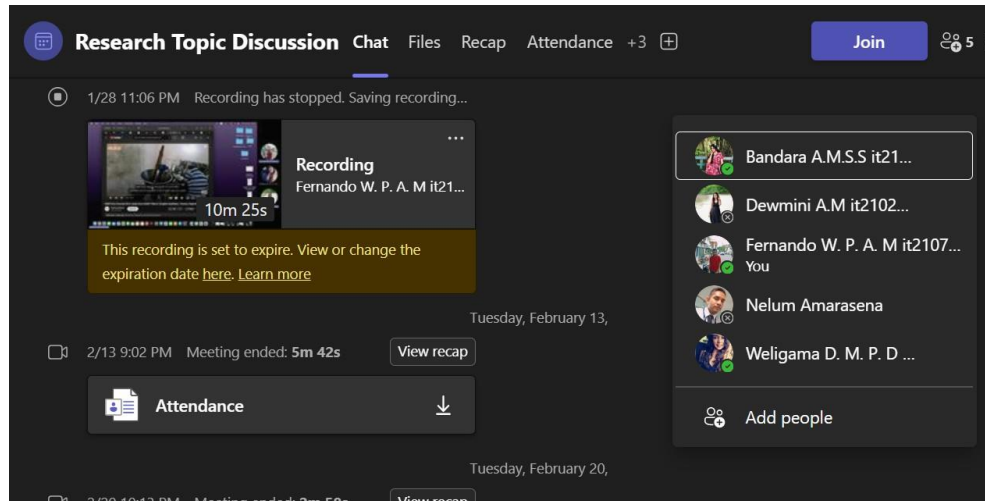


Figure 5: Teams Calls with the Team 2

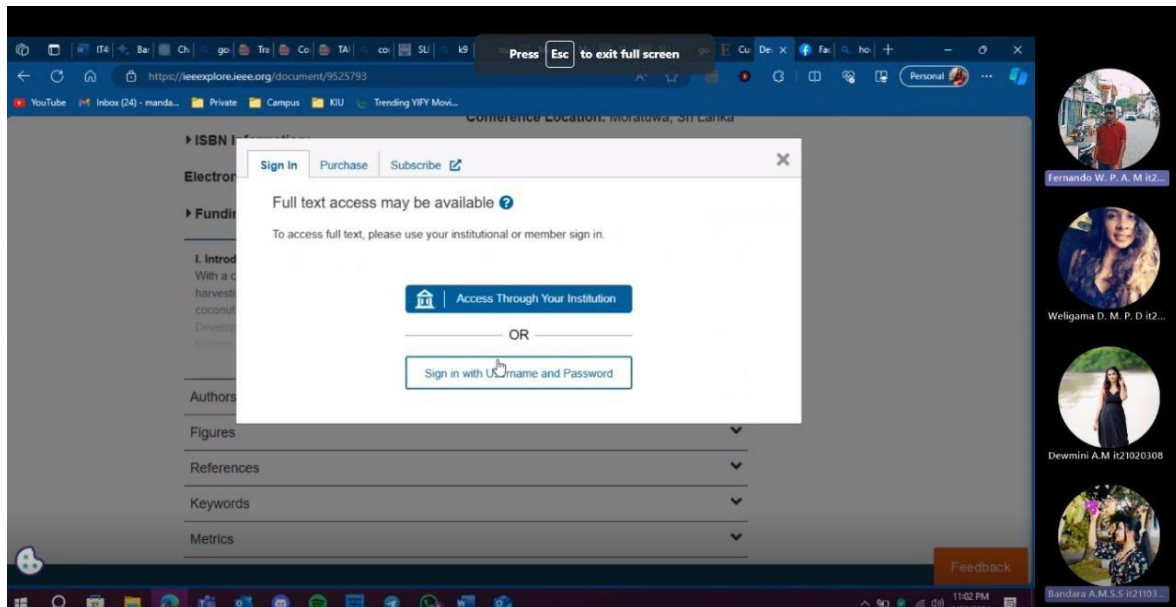


Figure 6: Teams Calls with the Team 3

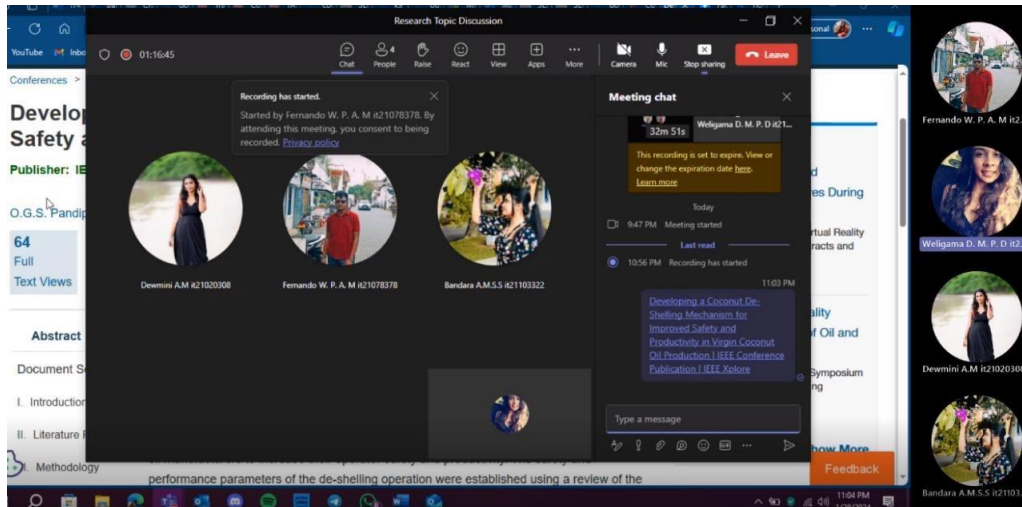


Figure 7: Teams Calls with the Team 4

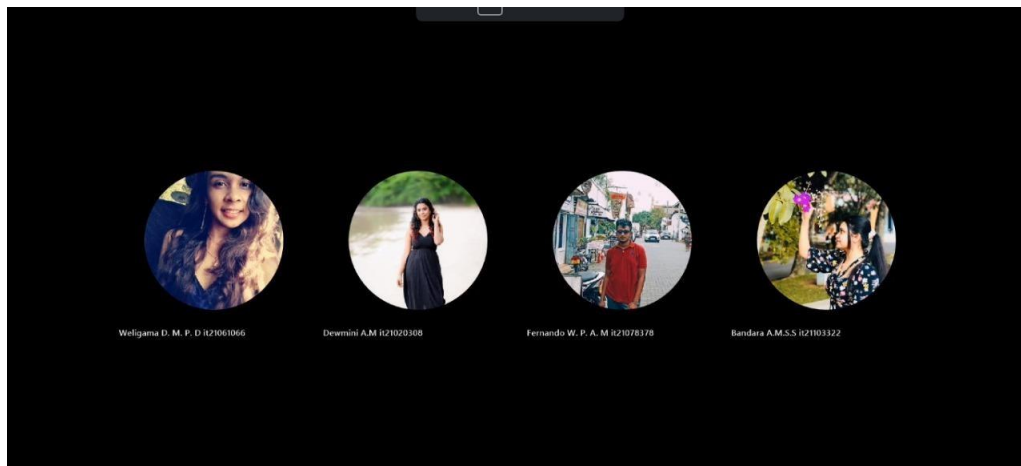


Figure 8: Teams Calls with the Team 5

Online Calls with Supervisors

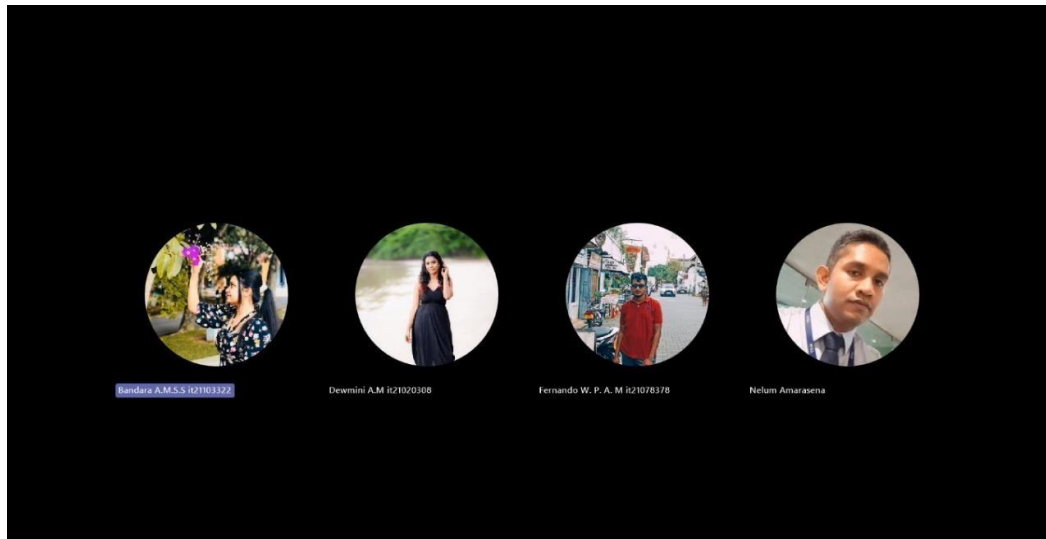


Figure 9: Teams Calls with Supervisors Example 1

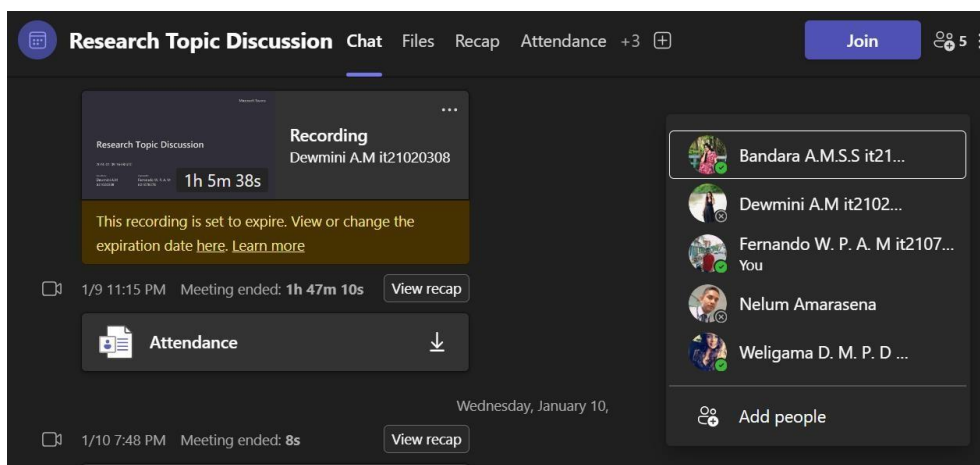


Figure 10: Teams Calls with Supervisors Example 2

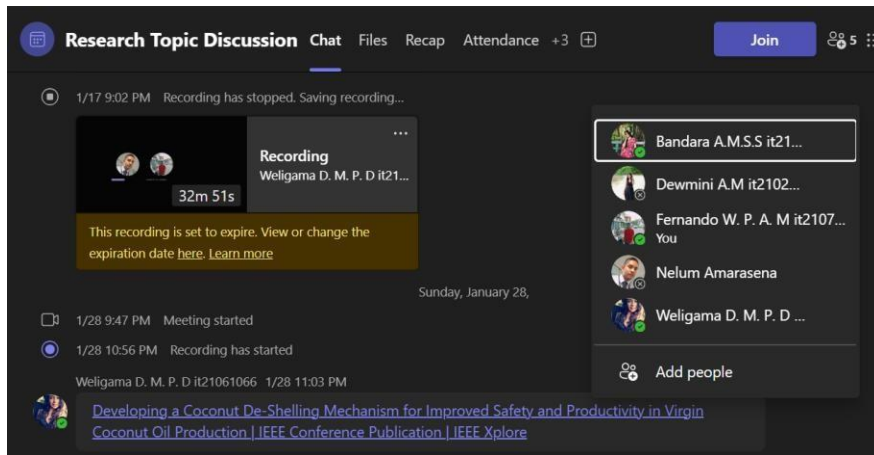


Figure 11: Teams Calls with Supervisors Example 3

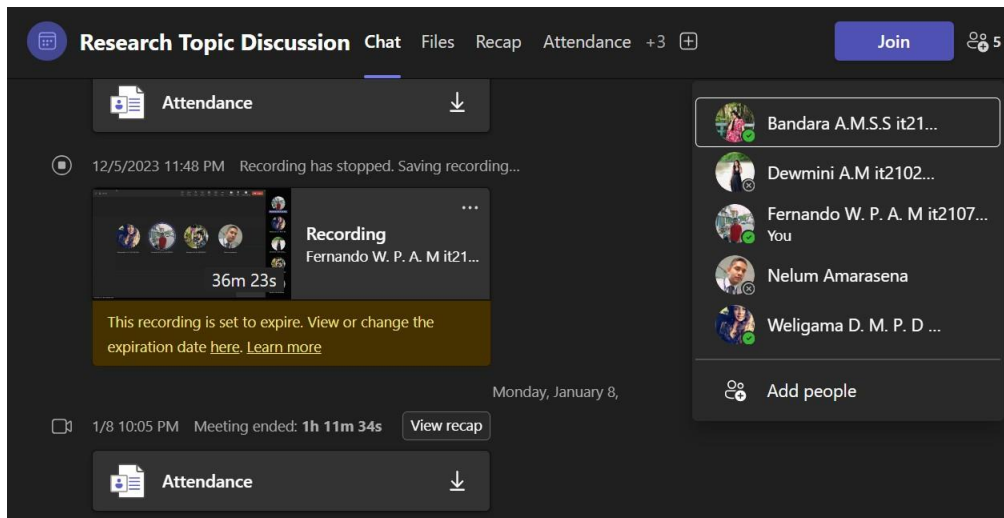


Figure 12: Teams Calls with Supervisors Example 4

Phone Calls with External Supervisor

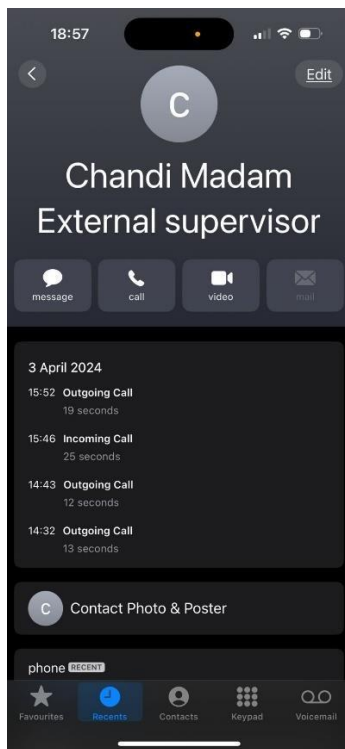


Figure 13: Phone Calls with External Supervisor

Phone Calls with CDA Officers

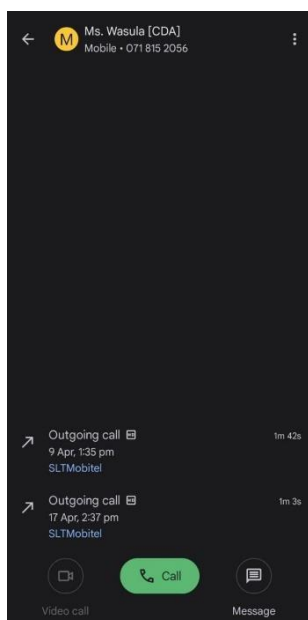
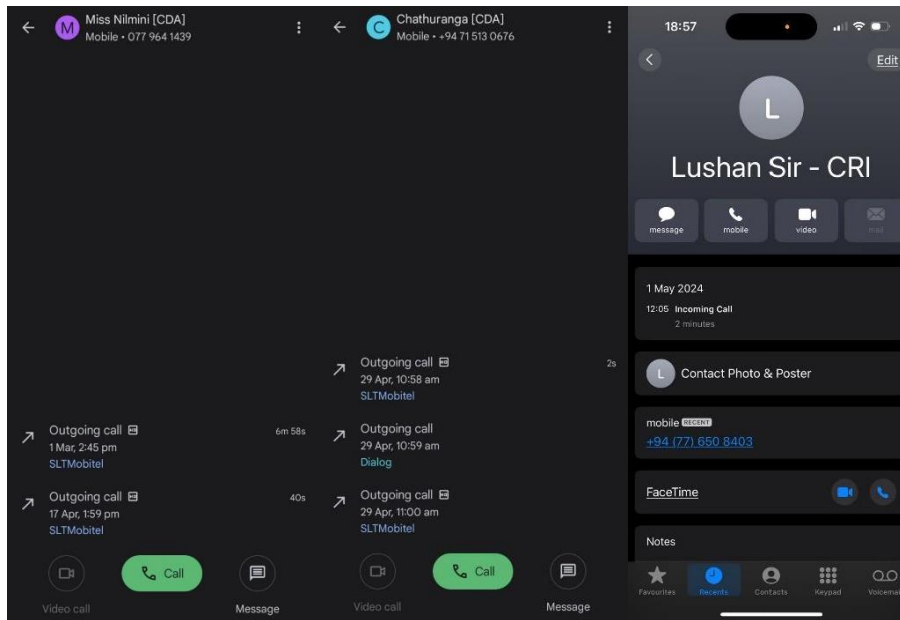


Figure 14: Phone Calls with CDA Officers



Physical Meetings with Group Members



Figure 15: Physical Meetings with Team Members 1

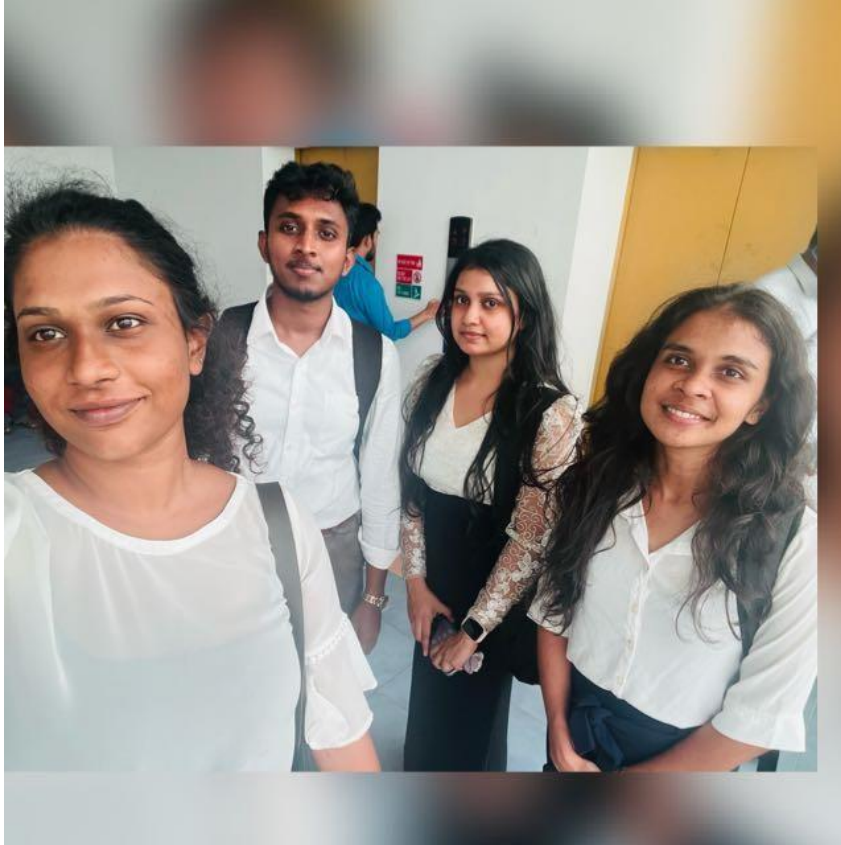


Figure 16 Physical Meetings with Team Members 2

WhatsApp Group Creation



Figure 17: WhatsApp Group

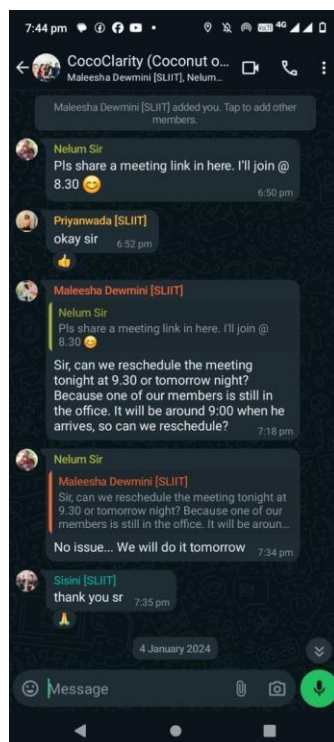


Figure 18: Whatsapp Group Creation

Project Timeline

A Gantt chart is a visual tool used in project management to show the timeline of a project. It displays the start and finish dates of the various elements of a project, such as tasks, milestones, and phases, as well as their dependencies.

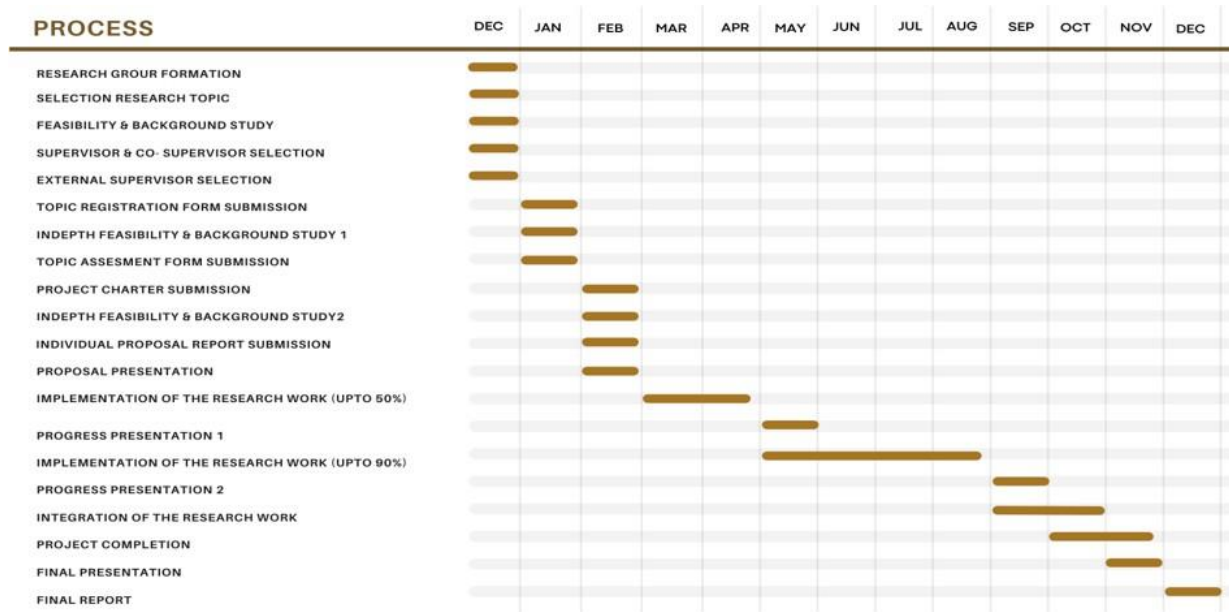


Figure 19: Gantt Chart

Work Break-Down

A work breakdown structure (WBS) is a structured breakdown of a project into smaller, more manageable parts. It is divided into distinct deliverables and tasks that help streamline project planning, execution and project management.

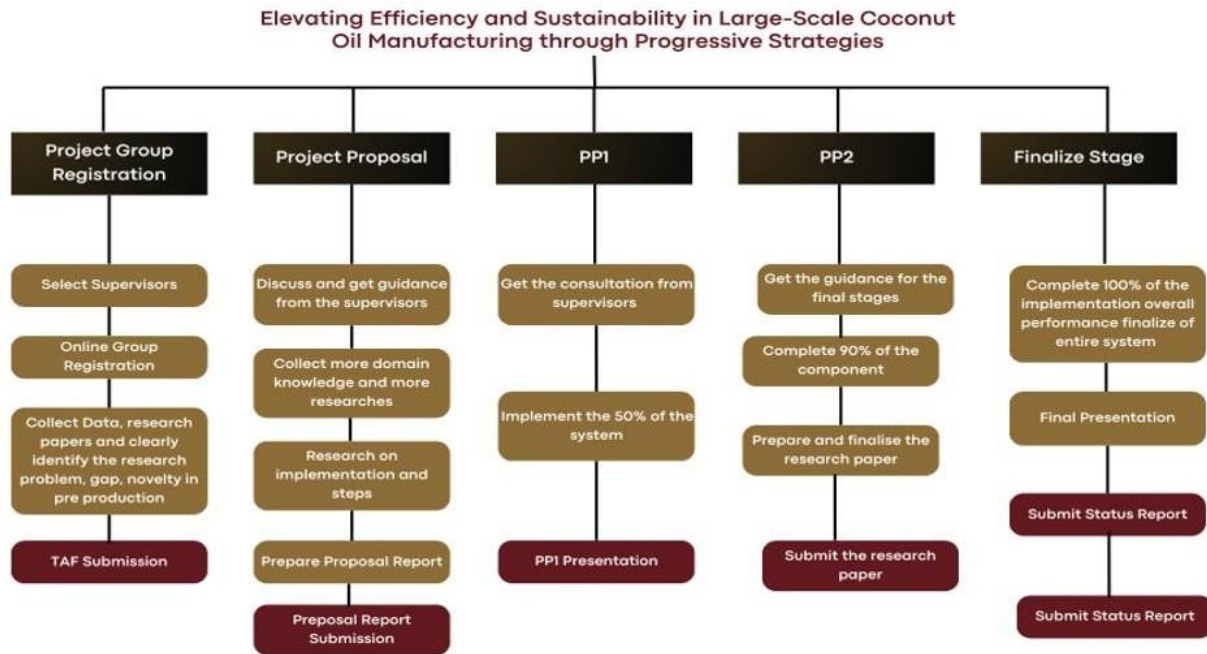


Figure 20: Work Break-Down Structure