REVOLUTIONIZING REMOTE HEALTH MONITORING: AUTONOMOUS DETECTION OF CARDIAC ABNORMALITIES WITH CUSTOMIZED DIETARY PLANNING

R24-019

Status Document Report

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Sri Lanka

May 2024

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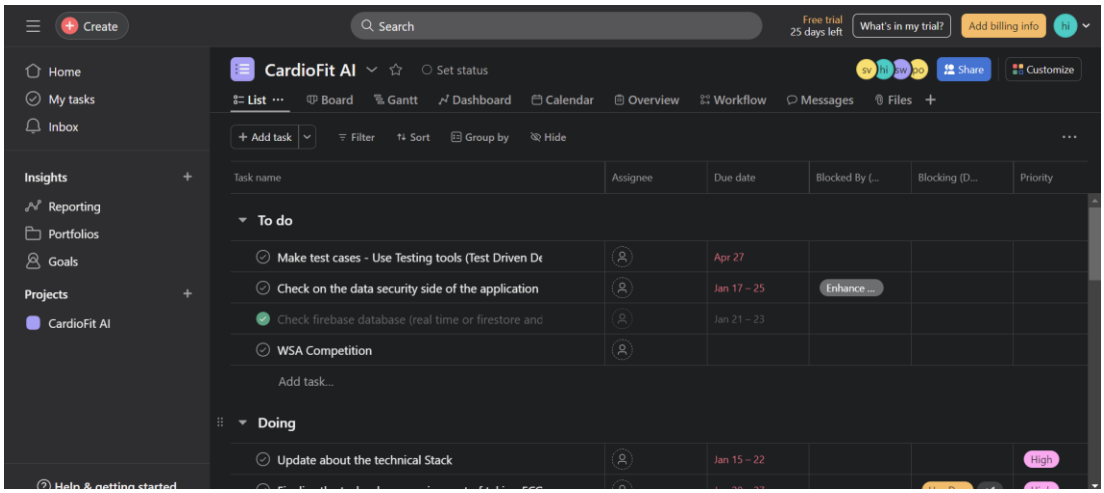

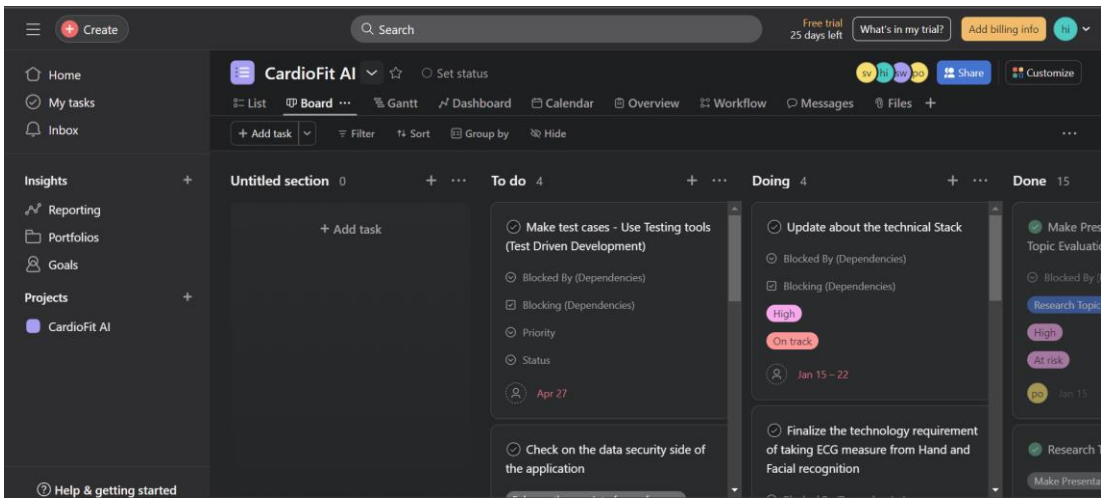

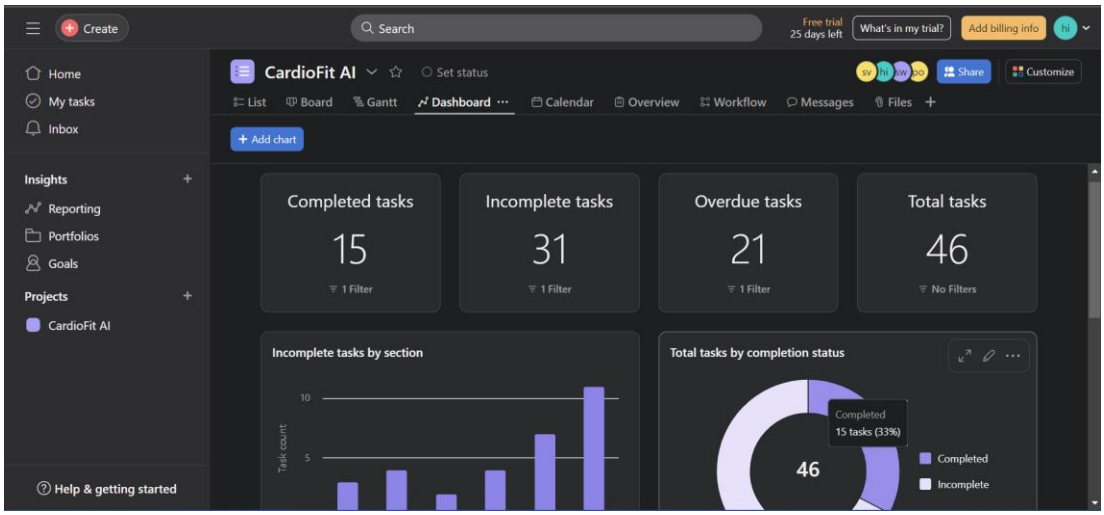
Create
Search
Free trial
25 days left
What's in my trial?
Add billing info
Home
My tasks
Inbox
Insights
Reporting
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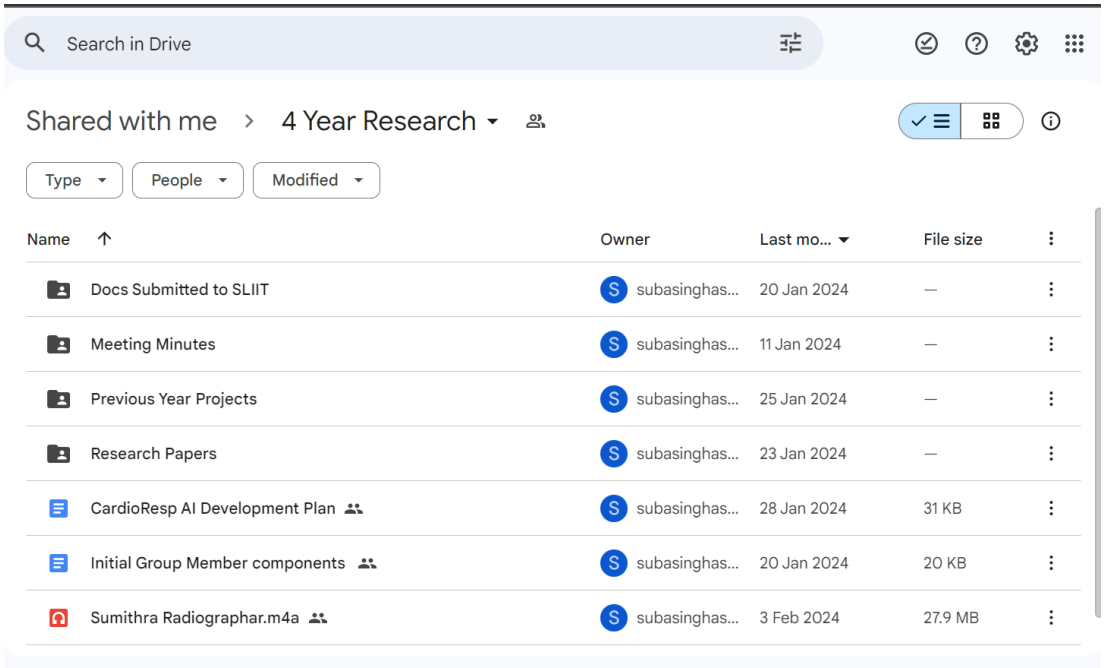
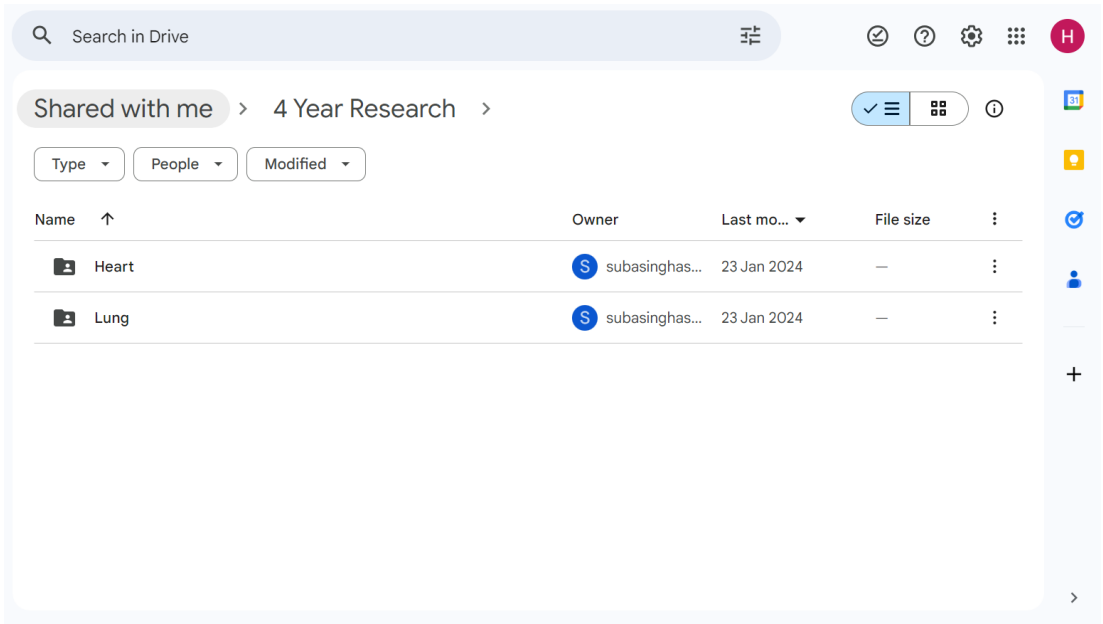
Projects
CardioFit AI
Help & getting started
CardioFit AI
Set status
Share
Customize
List
Board
Gantt
Dashboard
Calendar
Overview
Workflow
Messages
Files
Add chart
Completed tasks
15
1 Filter
Incomplete tasks
31
1 Filter
Overdue tasks
21
1 Filter
Total tasks
46
No Filters
Incomplete tasks by section
Task count
10
5
Total tasks by completion status
Completed
15 tasks (33%)
46
Completed
Incomplete

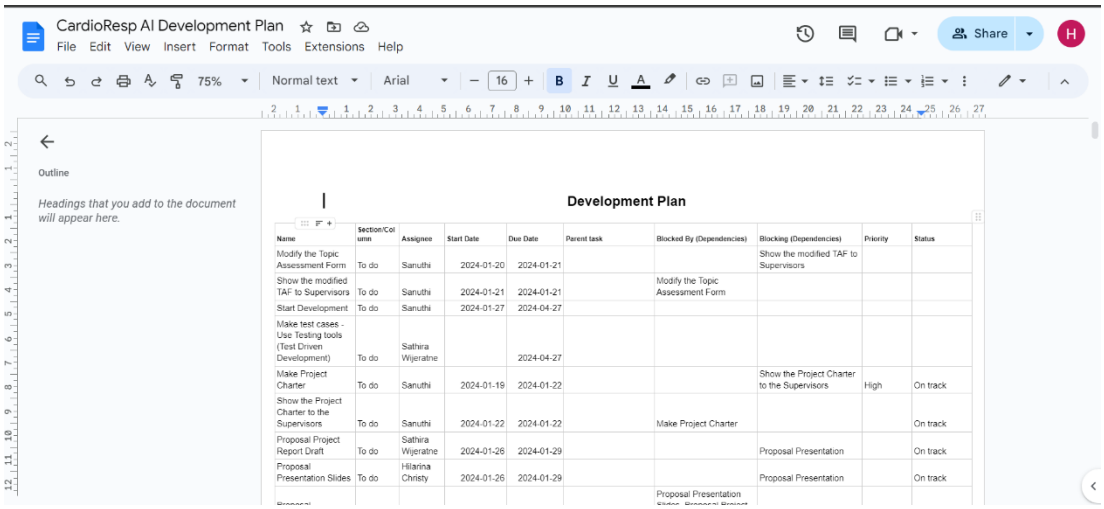
2. SCREENSHOTS OF GOOGLE DRIVE FOLDERS



Home Page of Drive Foder

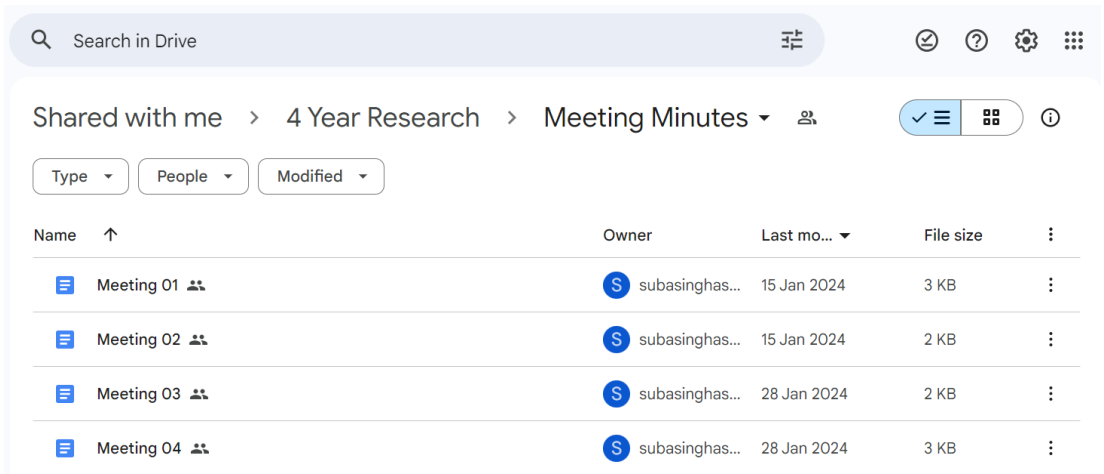


Reference Research papers maintained separately.



Name	Section/Column	Assignee	Start Date	Due Date	Parent task	Blocked By (Dependencies)	Blocking (Dependencies)	Priority	Status
Modify the Topic Assessment Form	To do	Sanuthi	2024-01-20	2024-01-21			Show the modified TAF to Supervisors		
Show the modified TAF to Supervisors	To do	Sanuthi	2024-01-21	2024-01-21		Modify the Topic Assessment Form			
Start Development	To do	Sanuthi	2024-01-27	2024-04-27					
Make test cases - Use Testing tools (Test Driven Development)	To do	Sathira Wijeratne		2024-04-27					
Make Project Charter	To do	Sanuthi	2024-01-19	2024-01-22			Show the Project Charter to the Supervisors	High	On track
Show the Project Charter to the Supervisors	To do	Sanuthi	2024-01-22	2024-01-22		Make Project Charter			On track
Proposal Project Report Draft	To do	Sathira Wijeratne	2024-01-26	2024-01-29			Proposal Presentation		On track
Proposal Presentation Slides	To do	Hilarina Christy	2024-01-26	2024-01-29			Proposal Presentation		On track

Development Plan



Meeting Minutes maintained in separate folders.

3. SCREENSHOTS OF THE MEETING MINUTES

Meeting 01	Date : 10.01.2024
Time	10.00 pm
Participant	Pramadhi Sir, Sanuthi Vihansa, Sathira Dinal, Hilarina Melani, Poorna Prabathiya
Discussion Focus	Brainstorming and breaking down of the components.

ECG (Challenge)
(Poorna and Sathira)

1. Identification of cardiac rhythm through facial analysis
2. Identification of cardiac rhythm through the analysis of both hands(palms)
    i. Pressure identification
    ii. Temperature detection

Target

1. Cardiac Abnormality pre identifications- 10
2. Generate a 3D model of heart for augmented reality / virtual reality

Expected non functional requirements

Meeting 02	Date : 15.01.2024
Time	10.30 pm
Participant	Dr.Dilshan De Silva, Pramadhi Sir, Sanuthi Vihansa, Sathira Dinal, Hilarina Melani, Poorna Prabathiya
Discussion Focus	Research Progress Update session

1. Poorna was instructed to research whether it is possible to get ECG using dry electrodes.
2. Sathira was instructed to find more about a methodology to get ECG using face recognition.
3. Sathira was asked to check on the research which states about a possibility to generate ECG using the iris of the eye.
4. Sanuthi and Hilarina has to search about getting an x ray out of a digital camera
5. Hilarina and Sanuthi to check about the lung defects that could be identified via an x-ray of a patient.
6. Make the topic evaluation presentation slides by 17.01.2024
7. The entire team was instructed to give an update about their researched domain by

Meeting 03	Date : 18.01.2024
Time	10.30 pm
Participant	Dr.Dilshan De Silva, Mr. Pramadhi Atapattu, Sanuthi Vihansa, Sathira Dinal, Hilarina Melani, Poorna Prabathiya
Discussion Focus	Project Topic Evaluation Presentation Slide Review

1. Re-modification of slides was requested.
2. Essential points on how we need pitch the product was taught
3. Presentation points of each member were modified and additional points were suggested.

Meeting 04	Date : 20.01.2024
Time	10.30 am
Participant	Mr. Pramadhi Atapattu, Sanuthi Vihansa, Sathira Dinal, Hilarina Melani, Poorna Prabathiya
Discussion Focus	Research Methodology Doubt

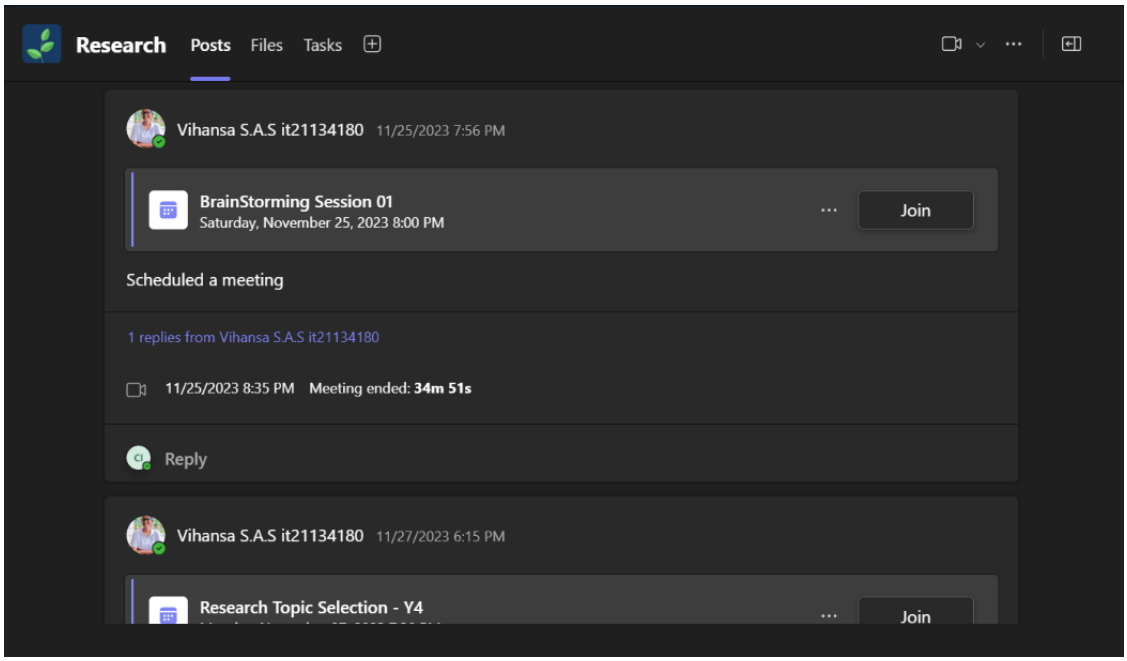
1. All members were given time until 27.01.2024 to find more researched relevant for the domain
2. Doubt on how X - Ray image could be generated from a consumer camera was discussed.

Meeting 05	Date : 28.01.2024
Time	11.30 am
Participant	Dr.Dilshan De Silva, Mr. Pramadhi Atapattu, Sanuthi Vihansa, Sathira Dinal, Hilarina Melani, Poorna Prabathiya
Discussion Focus	Progress update - Research update

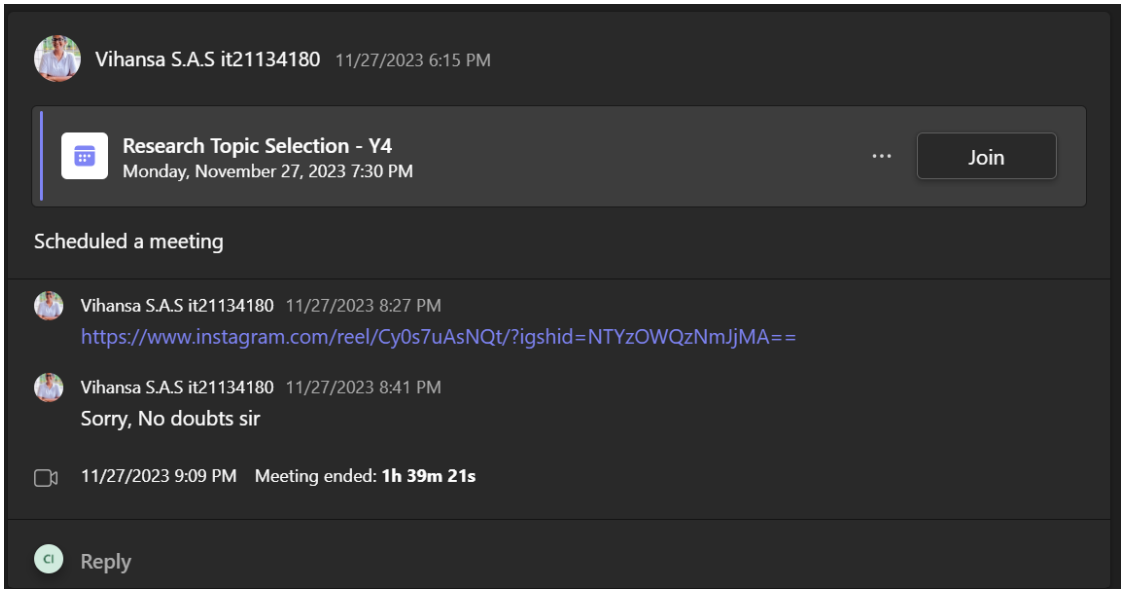
1. hilarinamelani21@gmail.com Sanuthi Subasingha was advised to meet a radiologist to discuss further regarding the lung X ray part
2. Poorna`s and Sathira`s obtaining ECG from palm and facial recognition was discussed.
3. Sathira was asked to do a detailed finding of the research paper.
4. Meeting to be scheduled for Sathira and Poorna to discuss the ECG generation.
5. It was instructed to process the topic assessment form as it is and upload the document.

4. SCREENSHOTS OF THE TEAMS MEETING HISTORY

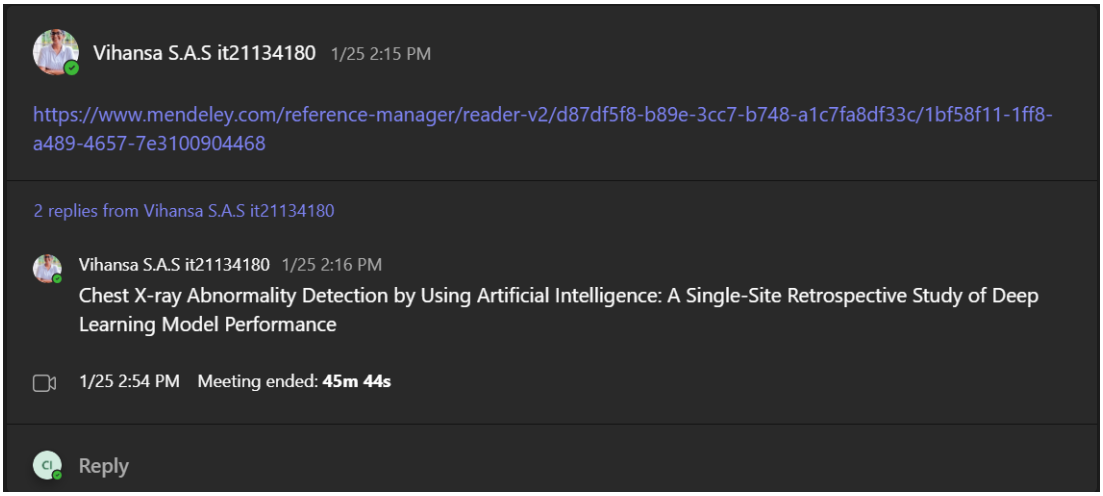
The initial set of brainstorming sessions on how each of the members were going to analyze and finalize their components were held.



Following which we had the meetings with our supervisor, with the intention of asking for suggestions and requesting what needs to be added accordingly.

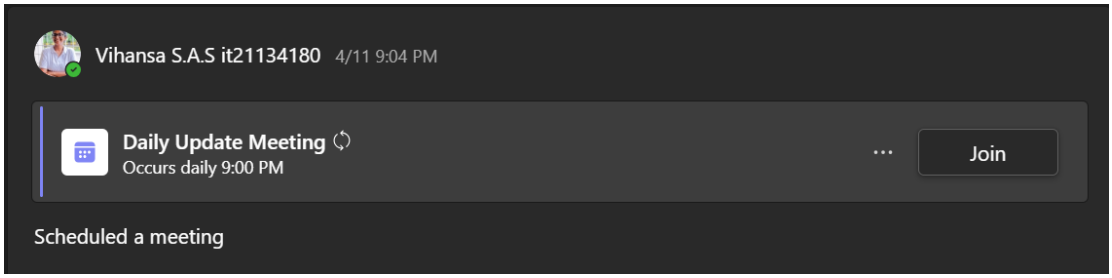


Possible sources of information of each member was gathered, and was discussed in a weekly meetings.

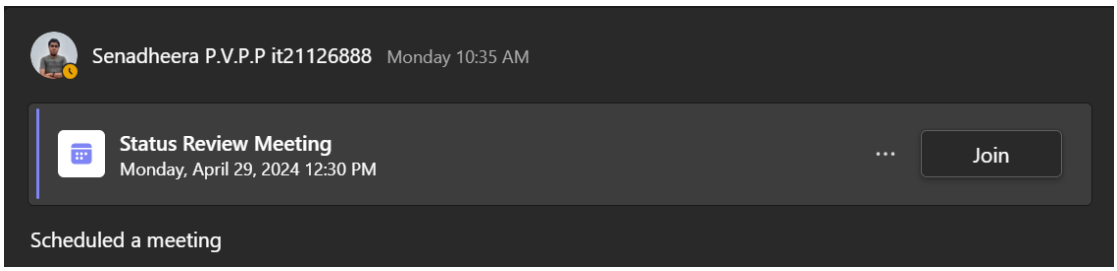


We also had code review meetings weekly, to ensure that everyone is fully aware of the functionalities developed and the pace of progress of each member. In this case, since everyone is on the same page, decision making and awareness of things was at the same scope or level. This also ensured that standards followed by the group technically improves.

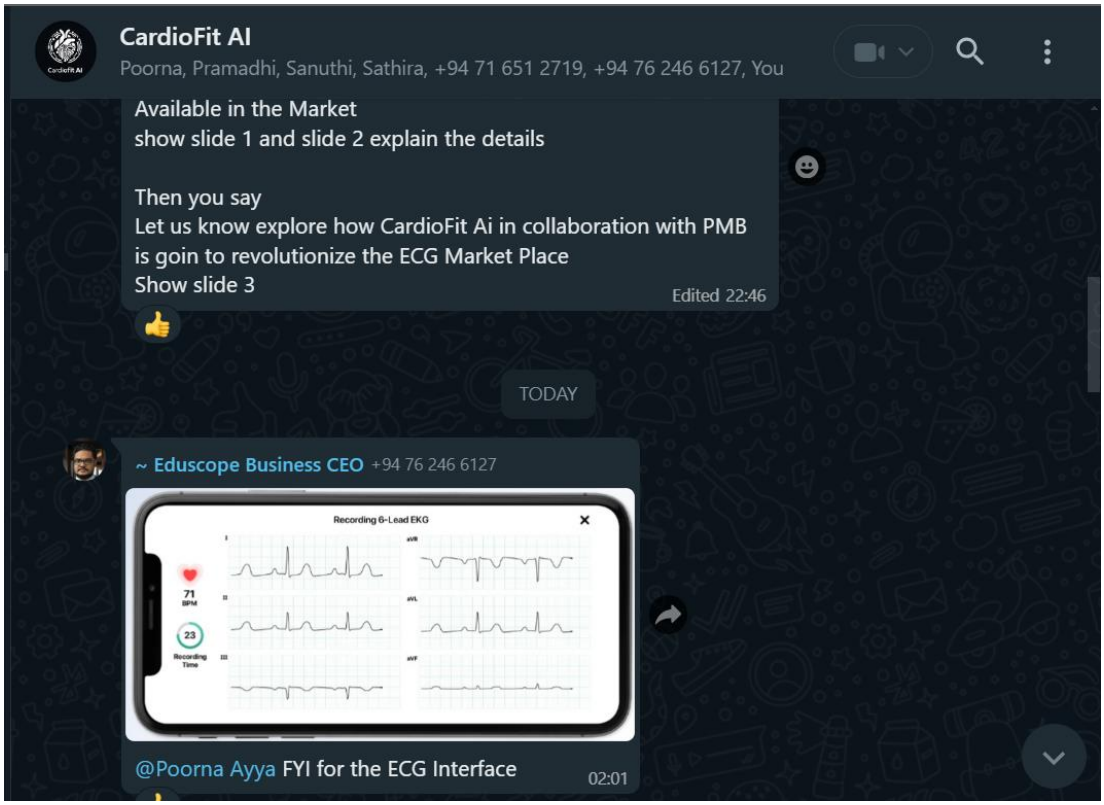
Furthermore, we also had daily update meetings where, all the members gather in a planned time of the day and share their progress of update. Any sort of blockers they had confronted the day before, and how it was resolved will be discussed. Possible suggestions by group members would also be provided, with the intention of progressing faster and better.

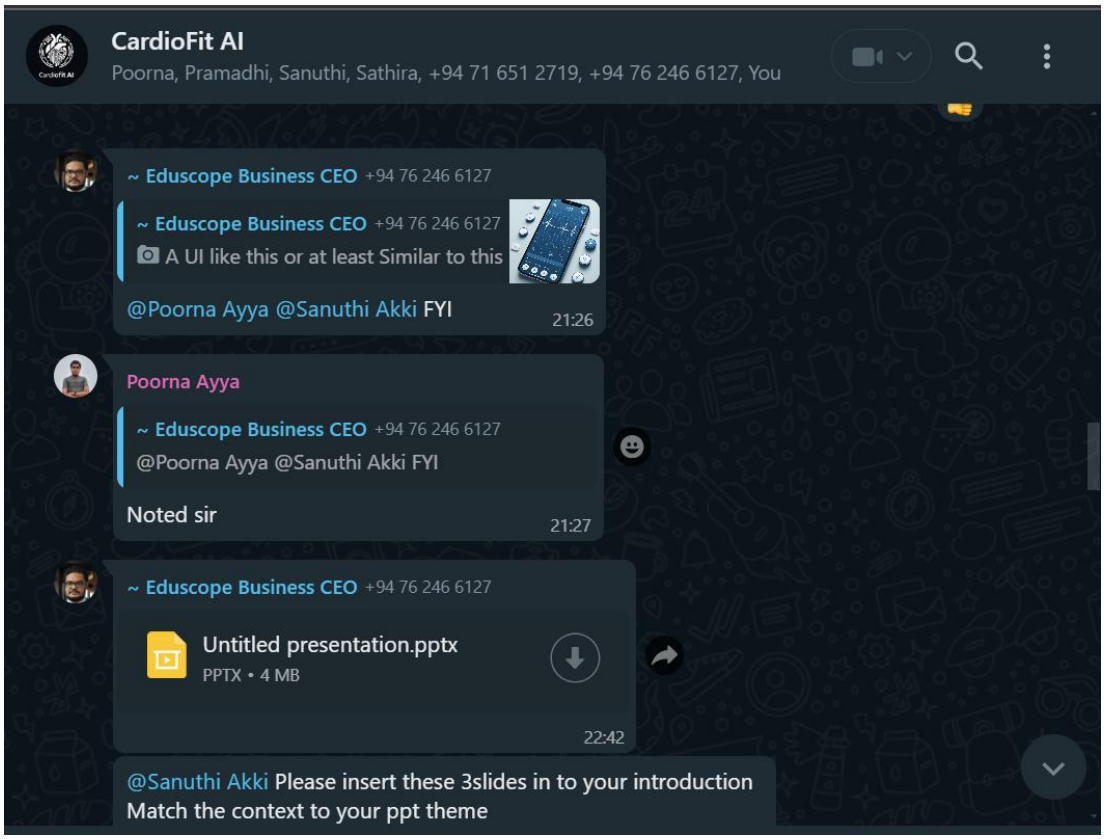


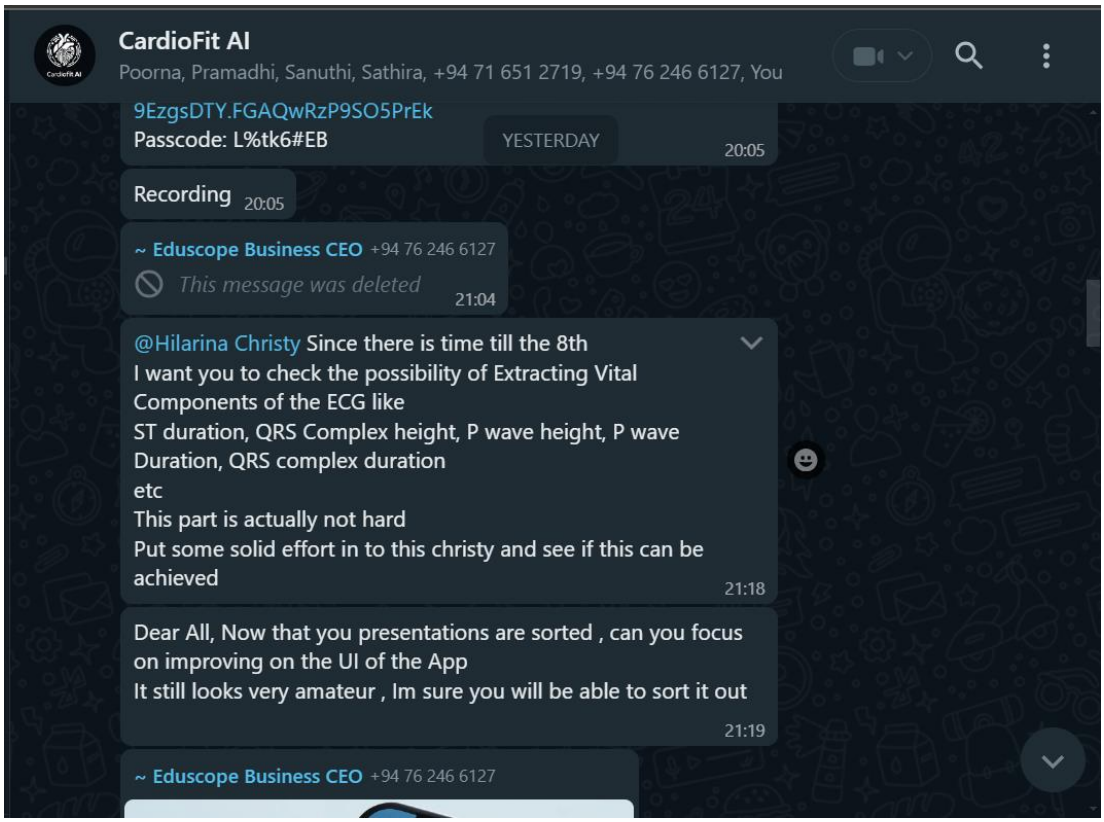
Status Review Meetings were also scheduled, as shown in the figure below.

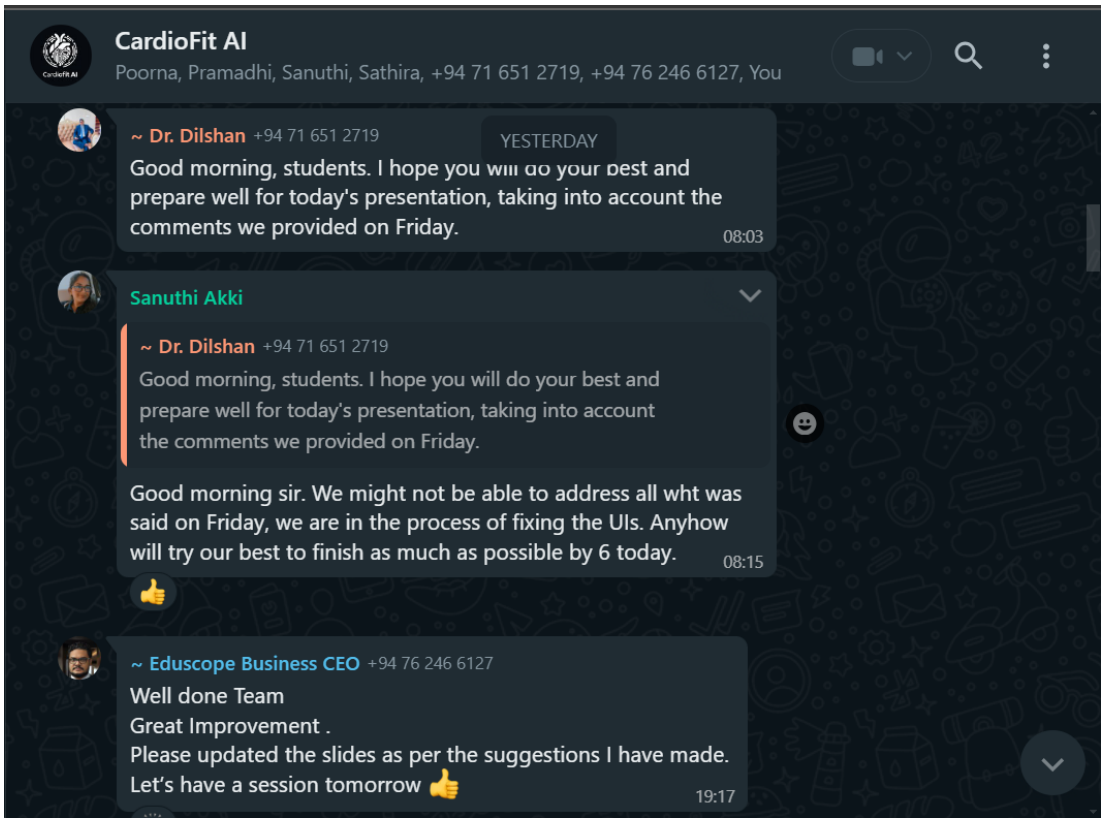


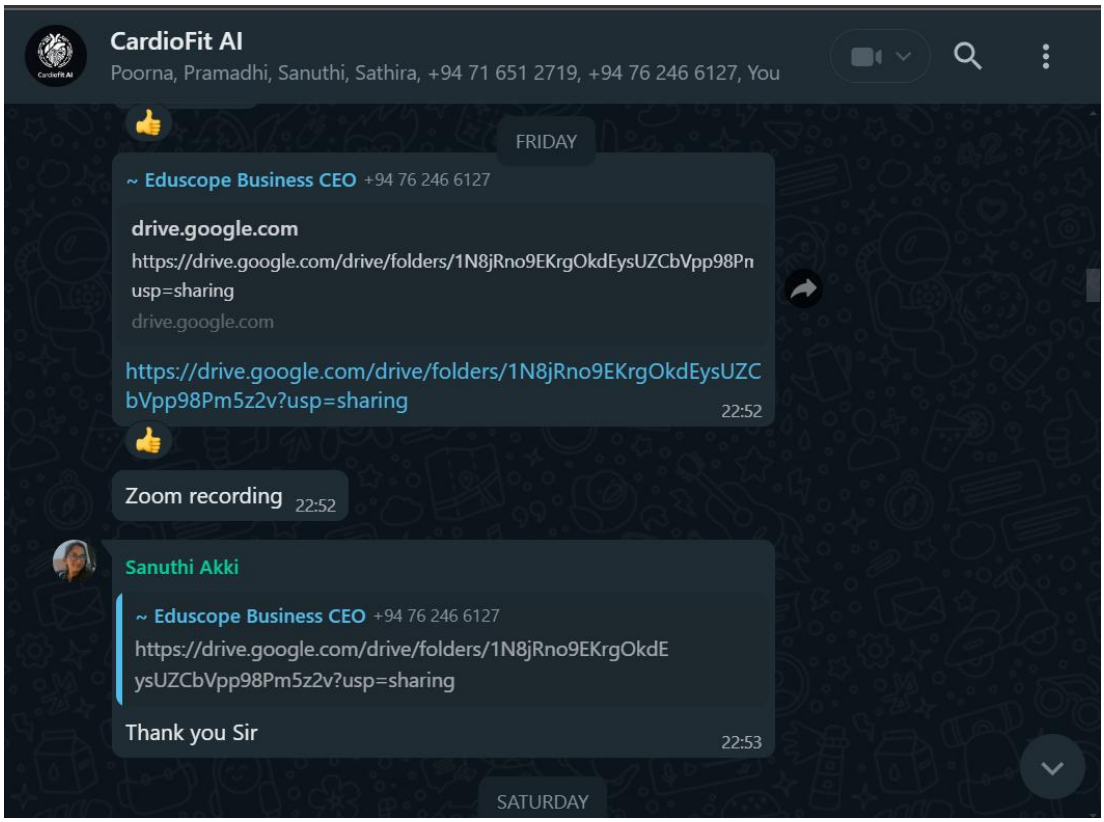
5. SCREENSHOTS OF THE WHATSAPP GROUP

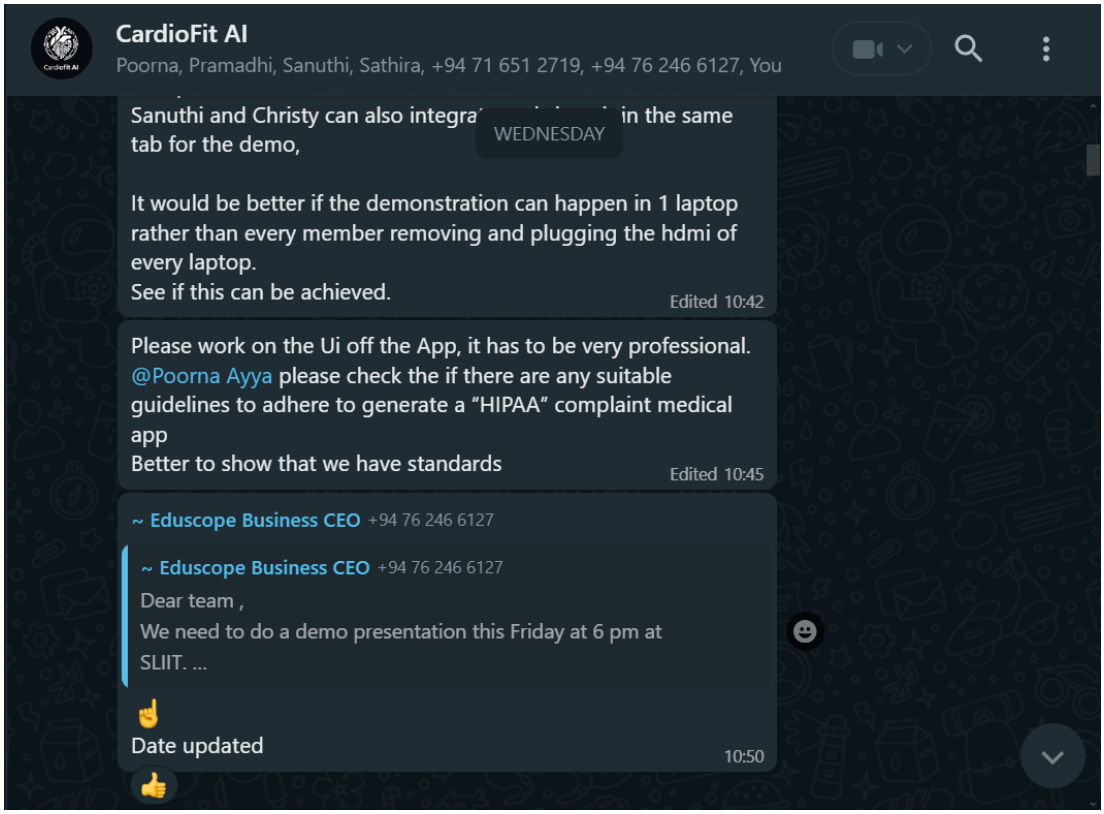




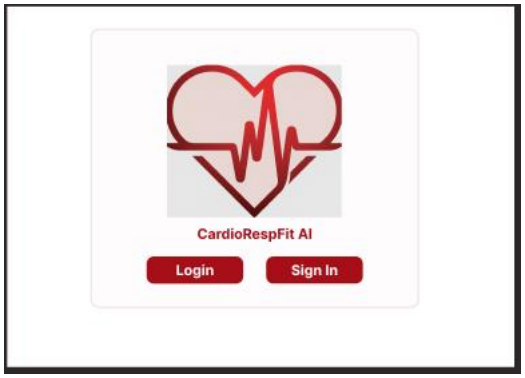

CardioFit AI
Poorna, Pramadhi, Sanuthi, Sathira, +94 71 651 2719, +94 76 246 6127, You
9EzgsDTY.FGAQwRzP9SO5PrEk
Passcode: L%tk6#EB
YESTERDAY
20:05
Recording 20:05
~ Eduscope Business CEO +94 76 246 6127
This message was deleted
21:04
@Hilarina Christy Since there is time till the 8th
I want you to check the possibility of Extracting Vital Components of the ECG like
ST duration, QRS Complex height, P wave height, P wave Duration, QRS complex duration
etc
This part is actually not hard
Put some solid effort in to this christy and see if this can be achieved
21:18
Dear All, Now that you presentations are sorted , can you focus on improving on the UI of the App
It still looks very amateur , Im sure you will be able to sort it out
21:19
~ Eduscope Business CEO +94 76 246 6127

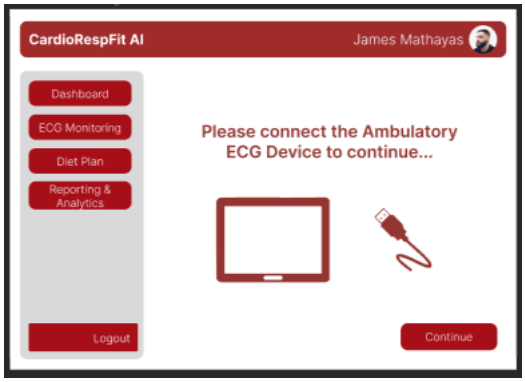

CardioFit AI
Poorna, Pramadhi, Sanuthi, Sathira, +94 71 651 2719, +94 76 246 6127, You
~ Dr. Dilshan +94 71 651 2719
YESTERDAY
Good morning, students. I hope you will do your best and prepare well for today's presentation, taking into account the comments we provided on Friday.
08:03
Sanuthi Akki
~ Dr. Dilshan +94 71 651 2719
Good morning, students. I hope you will do your best and prepare well for today's presentation, taking into account the comments we provided on Friday.
Good morning sir. We might not be able to address all wht was said on Friday, we are in the process of fixing the UIs. Anyhow will try our best to finish as much as possible by 6 today.
08:15
~ Eduscope Business CEO +94 76 246 6127
Well done Team
Great Improvement .
Please updated the slides as per the suggestions I have made.
Let's have a session tomorrow
19:17

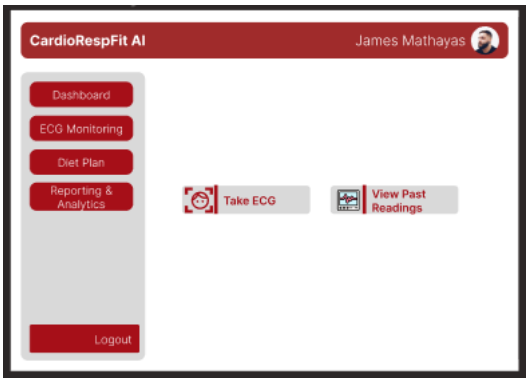

CardioFit AI
Poorna, Pramadhi, Sanuthi, Sathira, +94 71 651 2719, +94 76 246 6127, You
FRIDAY
~ Eduscope Business CEO +94 76 246 6127
drive.google.com
https://drive.google.com/drive/folders/1N8jRno9EKrgOkdEysUZCbVpp98Pn
usp=sharing
drive.google.com
https://drive.google.com/drive/folders/1N8jRno9EKrgOkdEysUZC
bVpp98Pm5z2v?usp=sharing
22:52
Zoom recording 22:52
Sanuthi Akki
~ Eduscope Business CEO +94 76 246 6127
https://drive.google.com/drive/folders/1N8jRno9EKrgOkdE
ysUZCbVpp98Pm5z2v?usp=sharing
Thank you Sir
22:53
SATURDAY

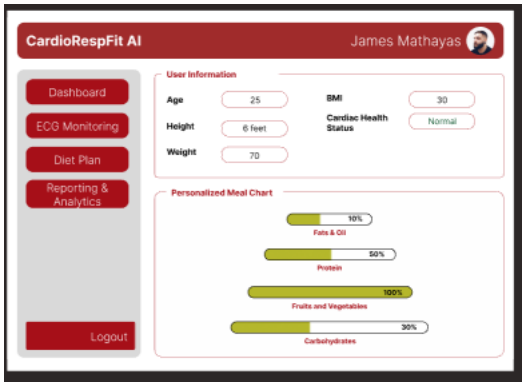

CardioFit AI
Poorna, Pramadhi, Sanuthi, Sathira, +94 71 651 2719, +94 76 246 6127, You
Sanuthi and Christy can also integra in the same
tab for the demo,
WEDNESDAY
It would be better if the demonstration can happen in 1 laptop
rather than every member removing and plugging the hdmi of
every laptop.
See if this can be achieved.
Edited 10:42
Please work on the Ui off the App, it has to be very professional.
@Poorna Ayya please check the if there are any suitable
guidelines to adhere to generate a "HIPAA" complaint medical
app
Better to show that we have standards
Edited 10:45
~ Eduscope Business CEO +94 76 246 6127
~ Eduscope Business CEO +94 76 246 6127
Dear team ,
We need to do a demo presentation this Friday at 6 pm at
SLIIT. ...
Date updated
10:50

6. FIGMA PROTOTYPE DESIGNING









...

7. EVIDENCE FOR DEVELOPMENT

Run All | Code | Draft Session off (run a cell to start)

+ Code + Markdown

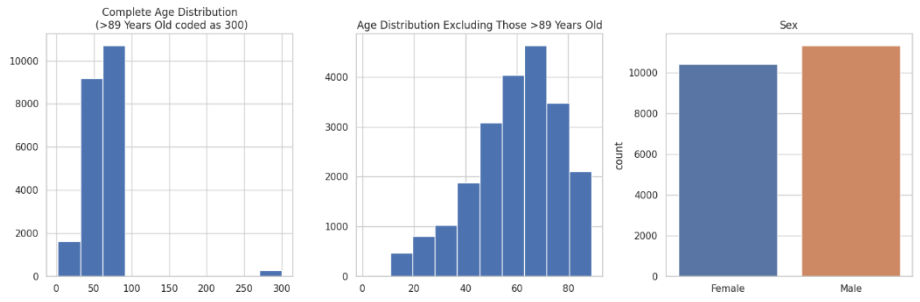
[2]:

```
def plot_loss(history, model_name):
    num_epochs = len(history.history['accuracy'])
    plt.figure(figsize=(6,4))
    plt.plot(range(num_epochs), history.history['loss'], label='training')
    plt.plot(range(num_epochs), history.history['val_loss'], label='validation')
    plt.title(model_name+" Training History: Loss", y=1.02)
    plt.xlabel("Epoch")
    plt.ylabel("Loss")
    plt.legend()
    plt.savefig(model_name +"_loss.png")
    plt.show();


def plot_accuracy(history, model_name):
    num_epochs = len(history.history['accuracy'])
    plt.figure(figsize=(6,4))
    plt.plot(range(num_epochs), history.history['accuracy'], label='training')
    plt.plot(range(num_epochs), history.history['val_accuracy'], label='validatic
    plt.title(model_name+" Training History: Accuracy", y=1.02)
```

Run All | Code | Draft Session off (run a cell to start)

```
        axs[1].hist(x=characteristics[char][characteristics.age < 300])
        axs[0].set_title('Complete Age Distribution\n (>89 Years Old coded as 300
        axs[1].set_title('Age Distribution Excluding Those >89 Years Old')
    else:
        sex = ['Male' if x == 0 else 'Female' for x in characteristics[char]]
        sns.countplot(x=sex, ax=axs[2])
        axs[2].set_title('Sex')
plt.tight_layout()
```



Run All | Code | Draft Session off (run a cell to start)

[8]:

```
# Count the occurrences of each diagnosis code
diagnosis_counts = code_summary.count()

# Sort the counts in descending order to find the top 20 most common diagnoses
top_20_diagnoses = diagnosis_counts.sort_values(ascending=False).head(20)

# Display the top 20 most common diagnoses
print(top_20_diagnoses)
```

```
SR       16748
NORM      9514
ABQRS     3327
IMI       2676
ASMI      2357
LVH       2132
NDT       1825
LAFB      1623
AFIB      1514
ISC_      1272
PVC       1143
IRBBB     1118
STD_      1009
```

Run All | Code | Draft Session off (run a cell to start)

[15]:

```
record = wfdb.rdrecord('/kaggle/input/ptbxl-electrocardiography-database/WFDB/HR0
signal = record.p_signal.T

# Plot the ECG signal using ecg-plot
ecg_plot.plot(signal, sample_rate=record.fs, title="ECG Signal, Record 1", show_l
```