

Train Detection & Alert System

Status Document – 02



B.Sc. (Hons) Degree in Information Technology

Specialized Data Science

Department of Information Technology

Group: 23-302

Amarasinghe C D – IT20187064

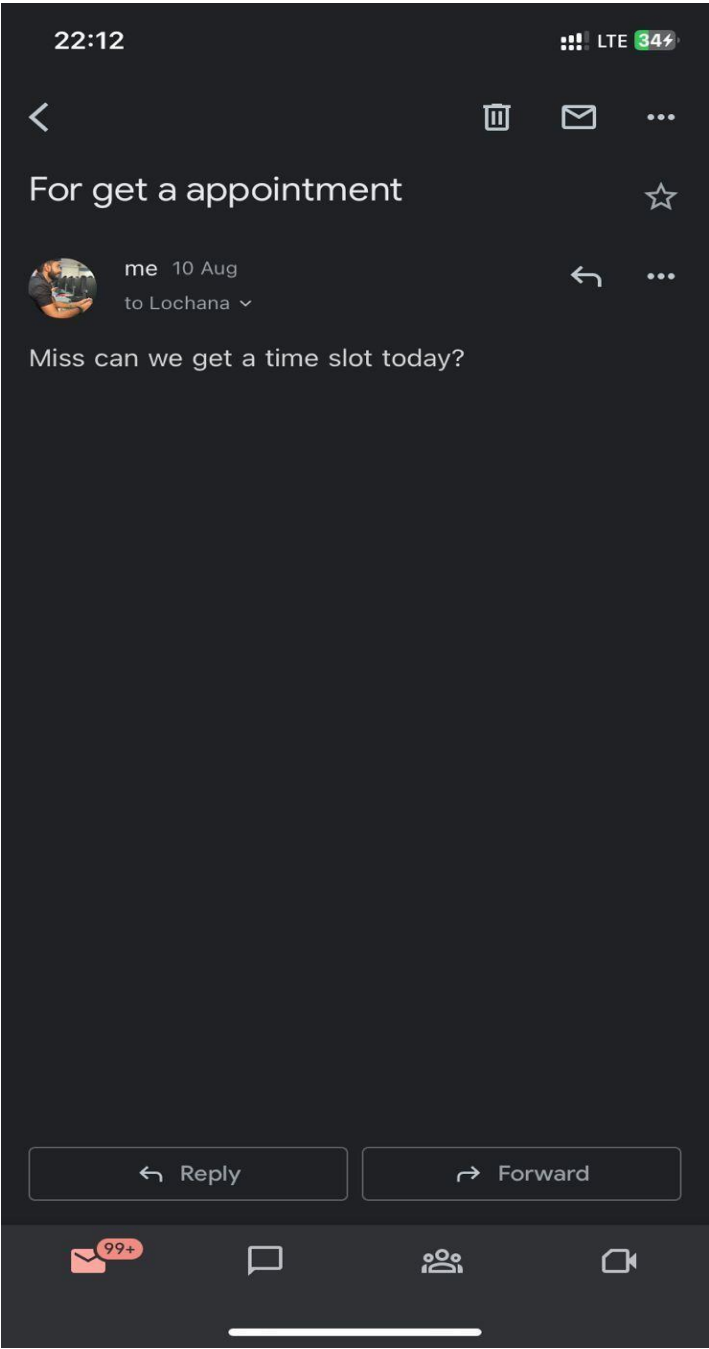
Submission Date: 07/09/2023

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1. Communication with Supervisors

1.1. Visiting the Supervisor and the co-supervisor regularly.



16:51

LTE 72



Re: For Research Progress Meeting

Inbox



Lochana Rajamanthri 24 May

to me ▾



Dear Vihan,

Come and meet me at 9.30 am.

Best Regards,
Lochana Rajamanthri

Lecturer| SLIIT Business School | SLIIT |
www.sliit.lk/business<<http://www.sliit.lk/business>>

Phone: +94(0)11 754 4801 - Ext 4614 | Email:
lochana.r@sliit.lk

[cid:9b4528d7-0575-4a0d-a6eb-94d7daa594e6]
<<https://www.facebook.com/fobsliit/>>

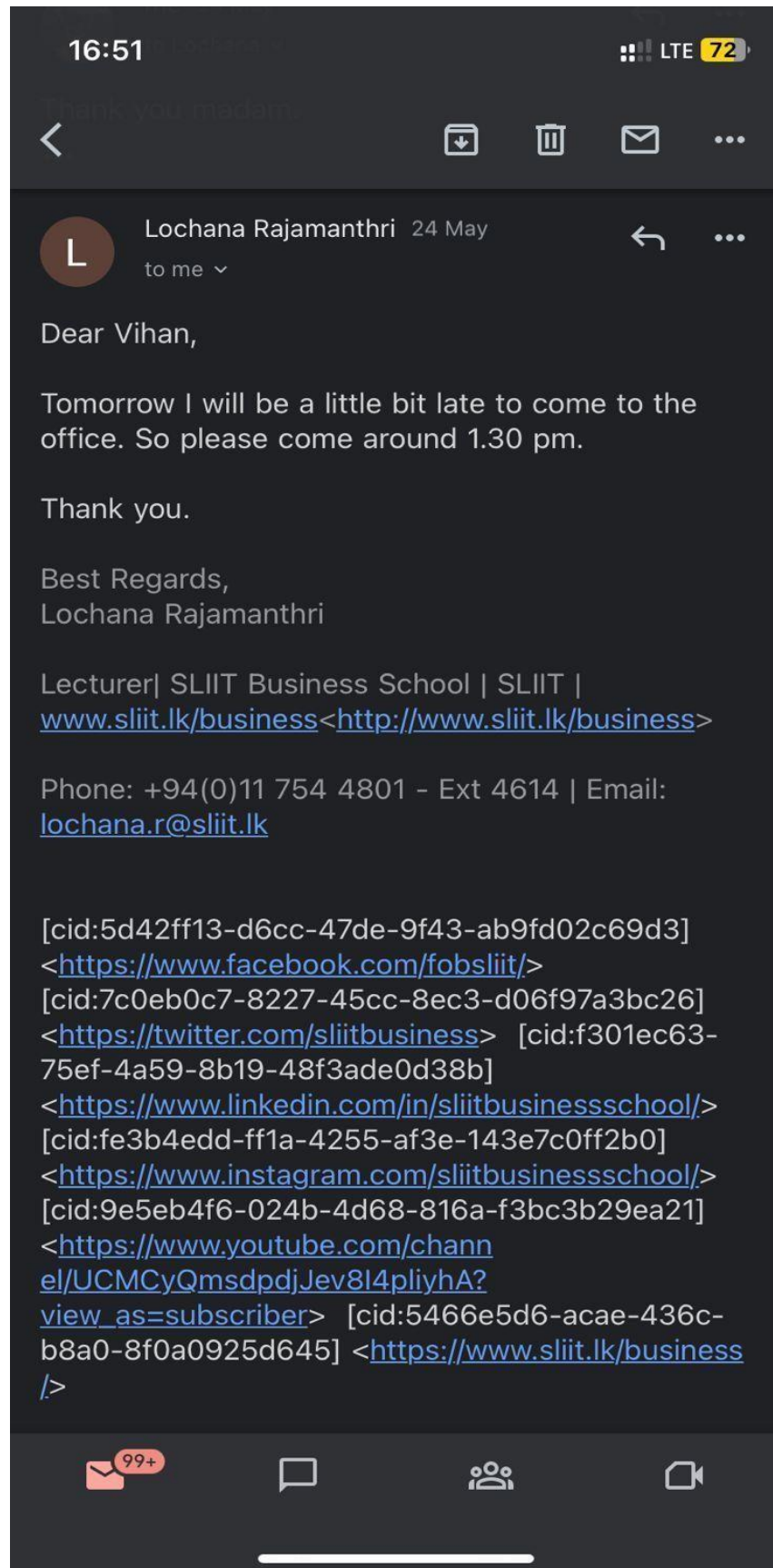
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<<https://twitter.com/sliitbusiness>> [cid:a3a1ef60-

5cde-4fb5-9e86-9e82f00f0e45]
<<https://www.linkedin.com/in/sliitbusinessschool/>>

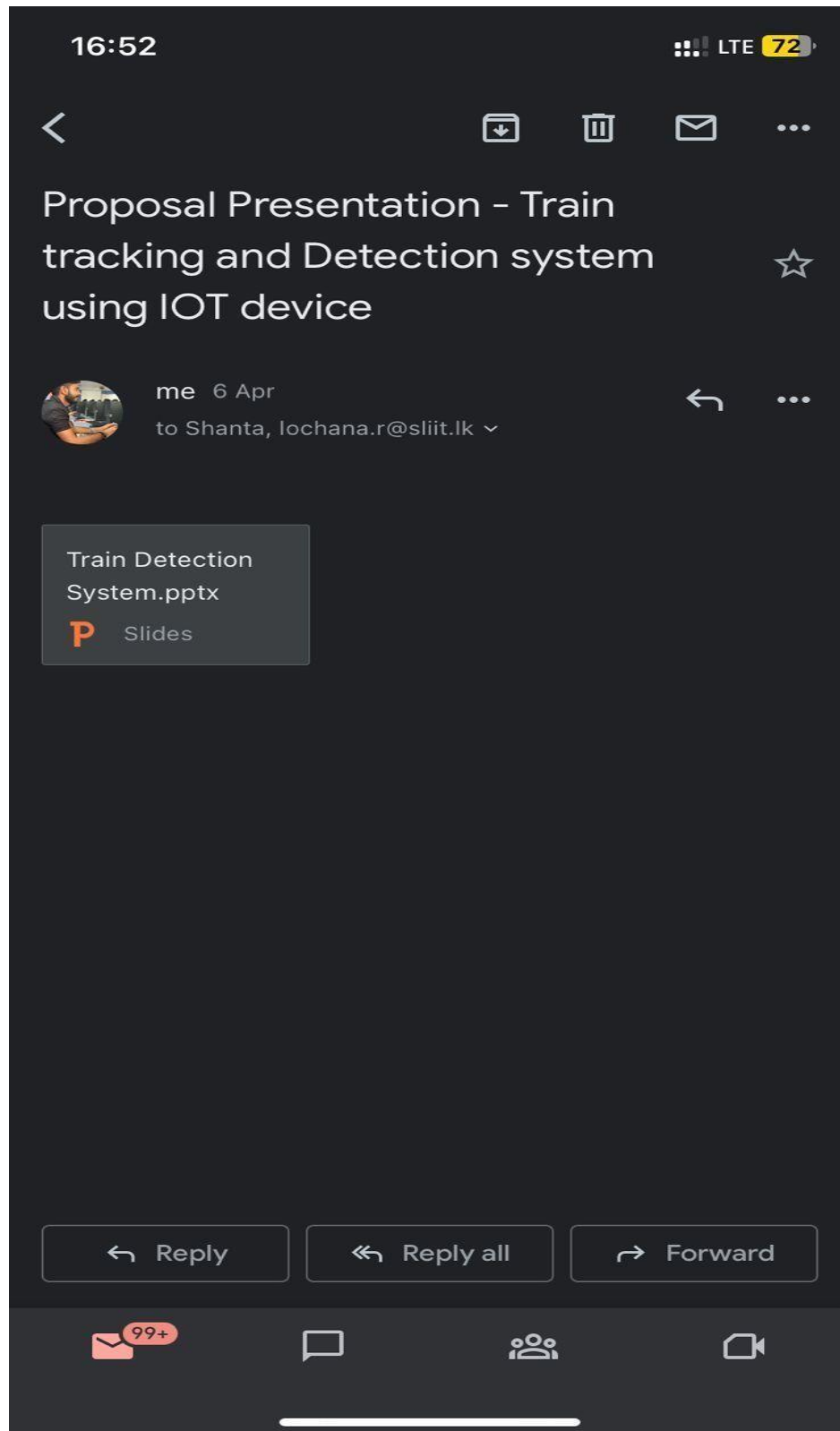
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<<https://www.instagram.com/sliitbusinessschool/>>

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<https://www.youtube.com/channel/UCMCyQmsdpdjJev8I4pliyhA?view_as=subscriber> [cid:edacb115-b90c-4a24-ba1c-db7d8105dfbd] <<http://www.sliit.lk/business>>





1.1. Sending research project-related files to the Supervisor and Co-supervisor



16:52

LTE 72



Train Tracking and Detection System for Citizens



me 14 Mar

to Shanta, lochana.r@sliit.lk



Train Tracking and Detection S...



zip

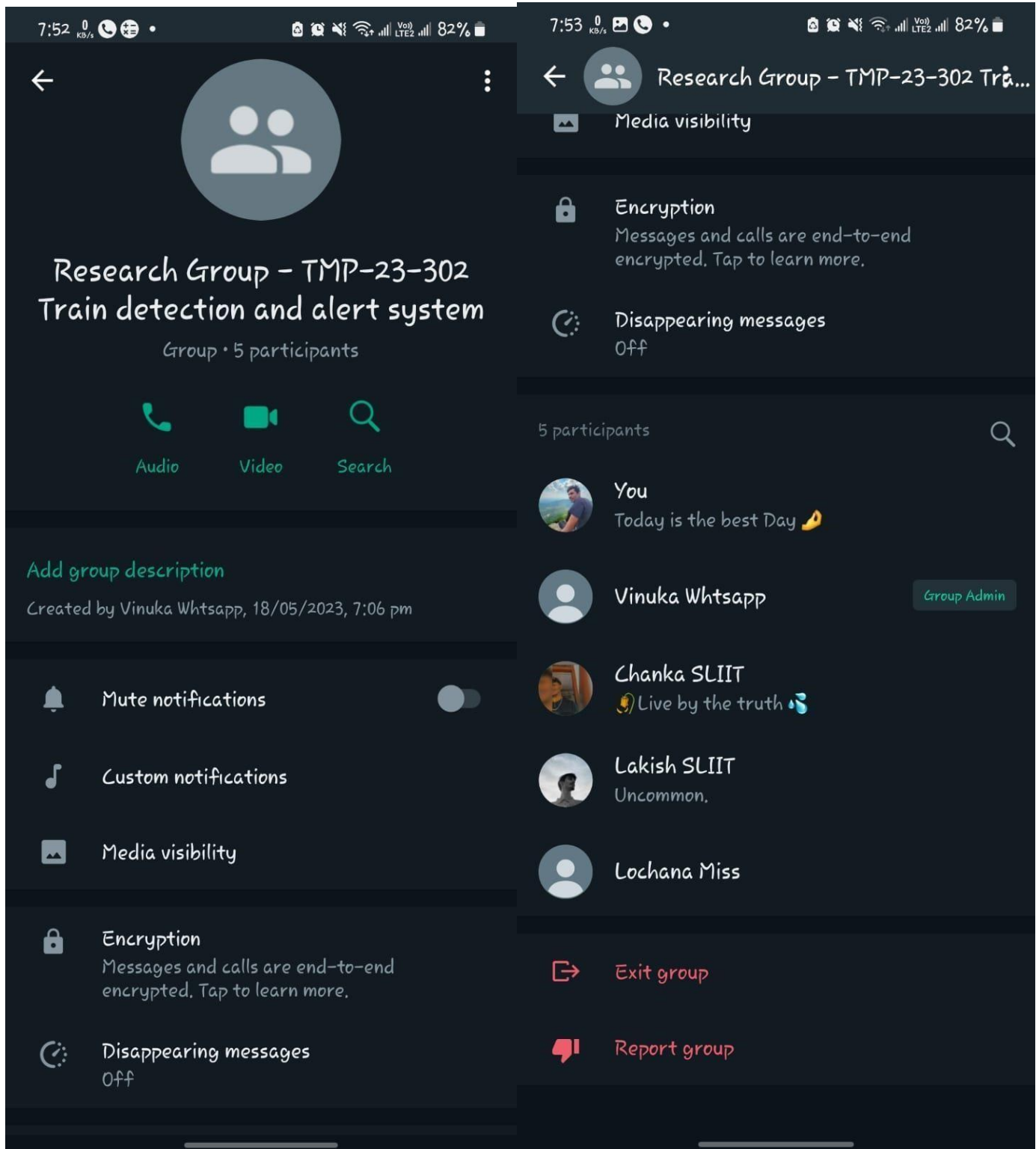
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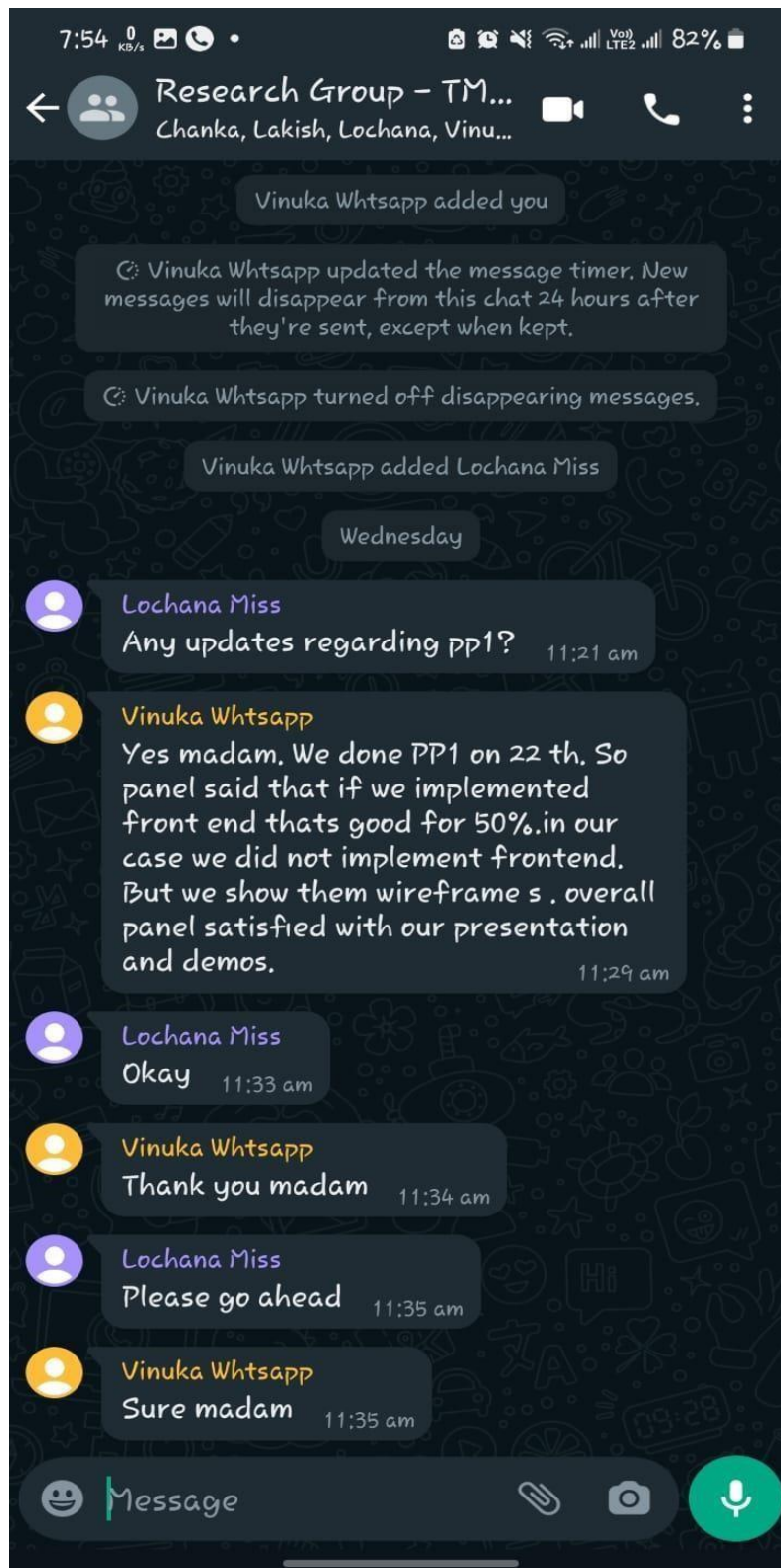
Forward



1.2. Create a WhatsApp Group with supervisor and co-supervisor

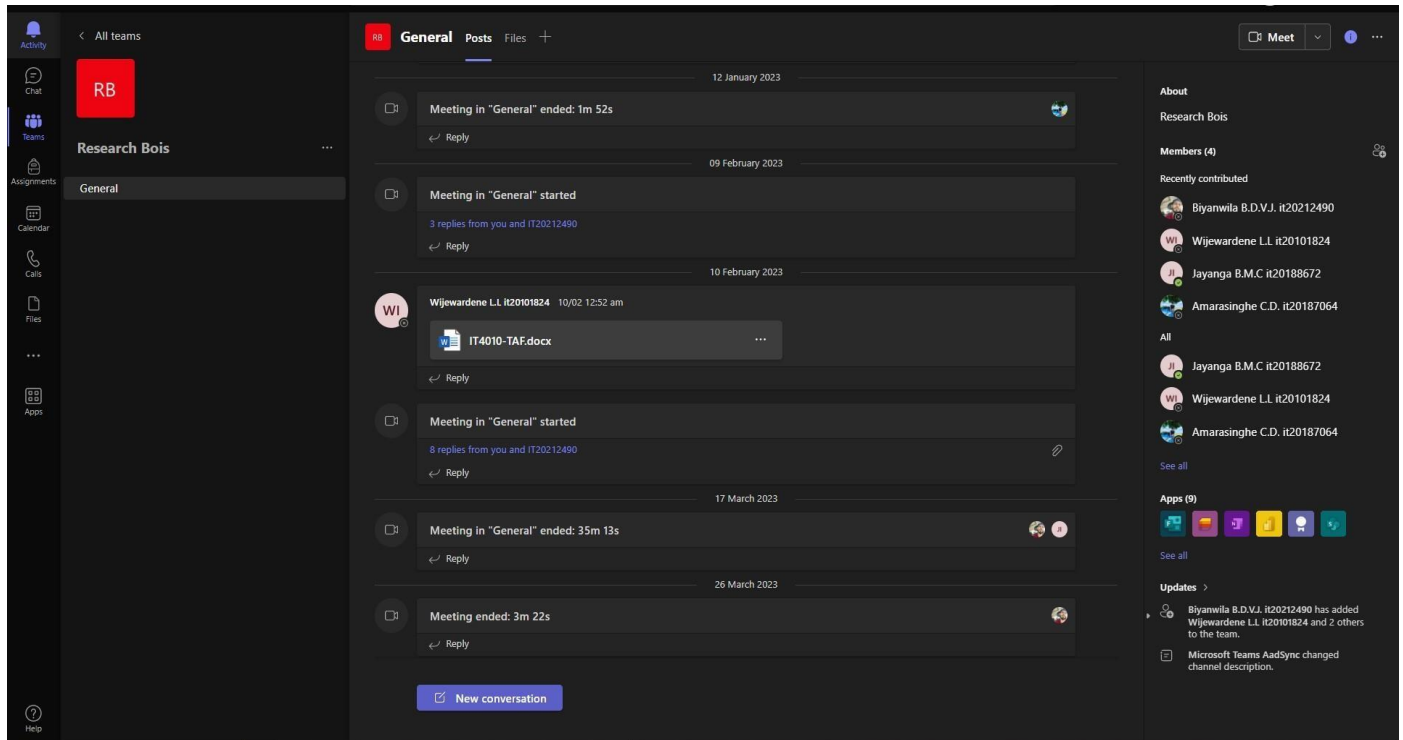


1.3. Share ideas with supervisor through WhatsApp chats.

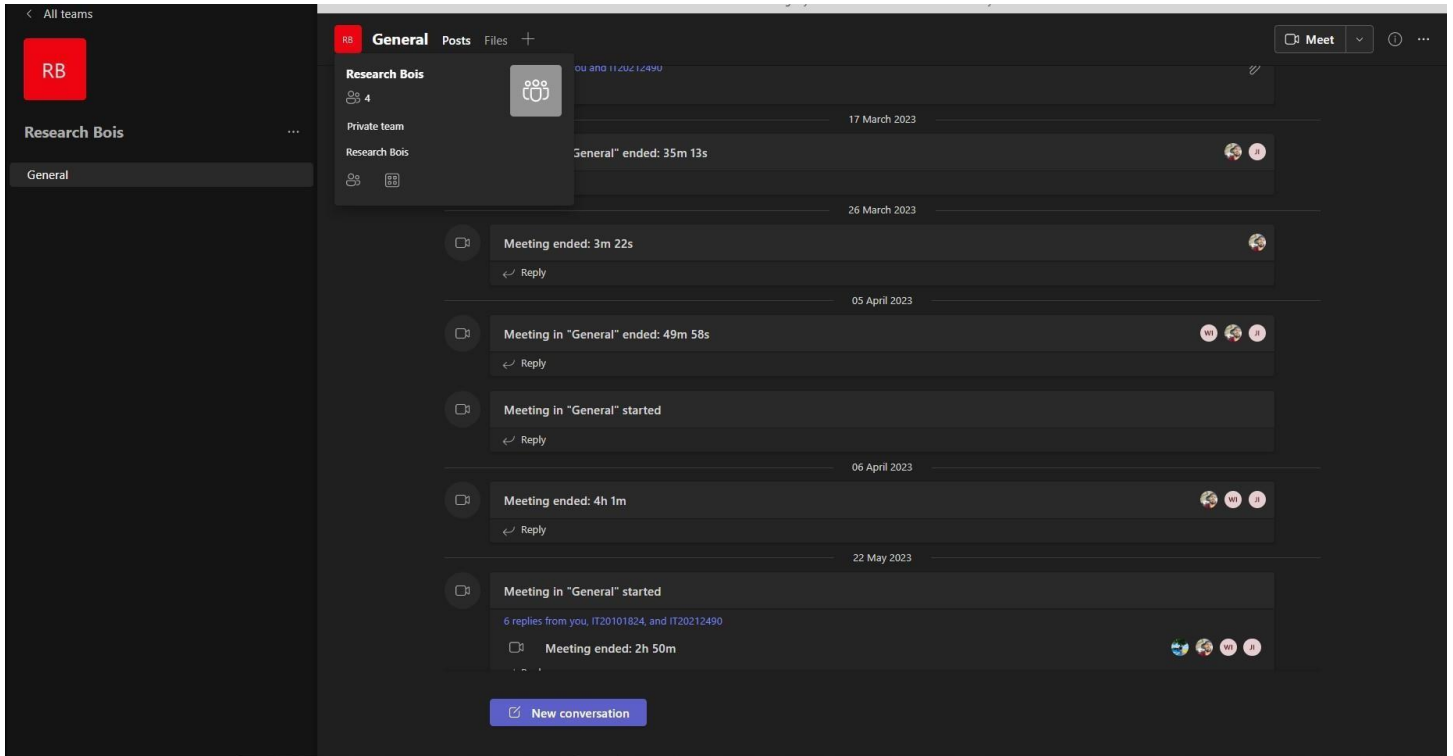


2. Research Group

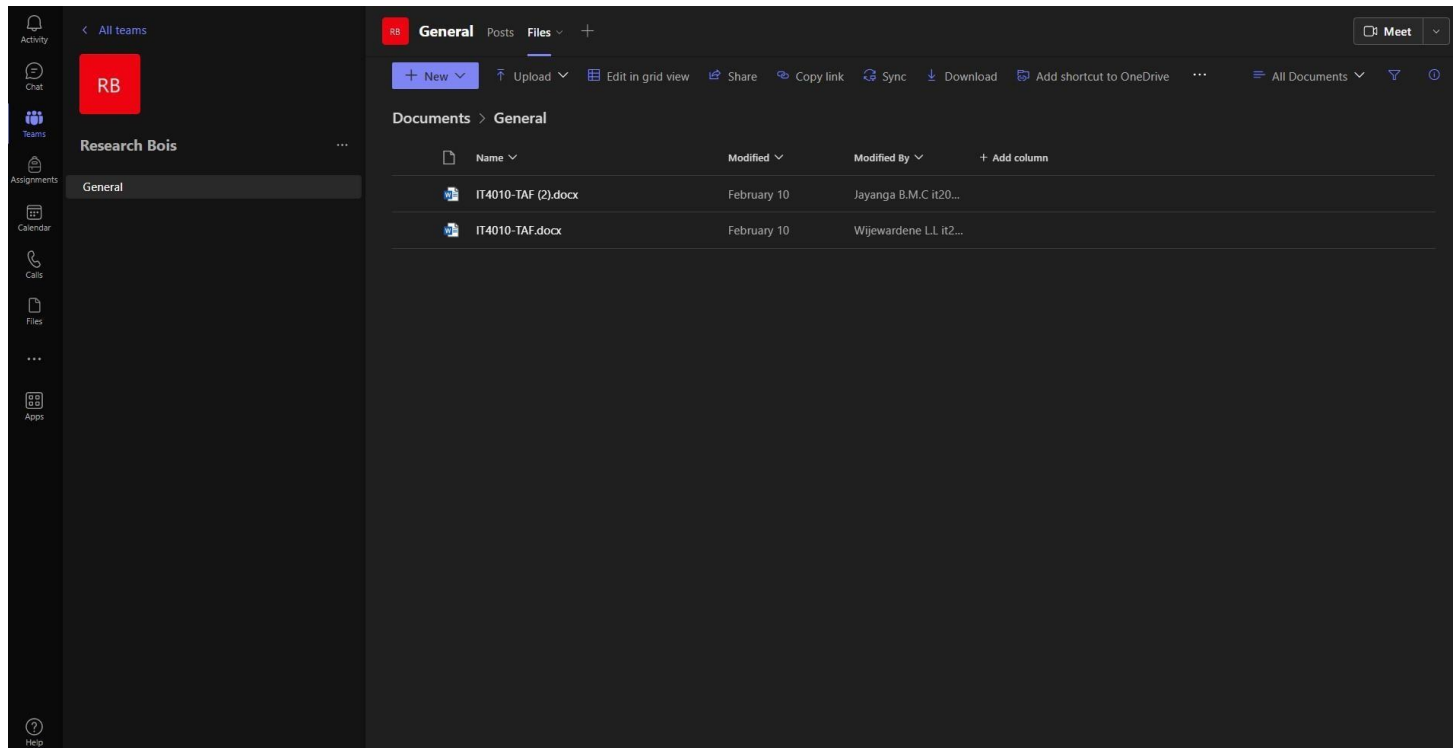
2.1. Create a MS team group with team members.



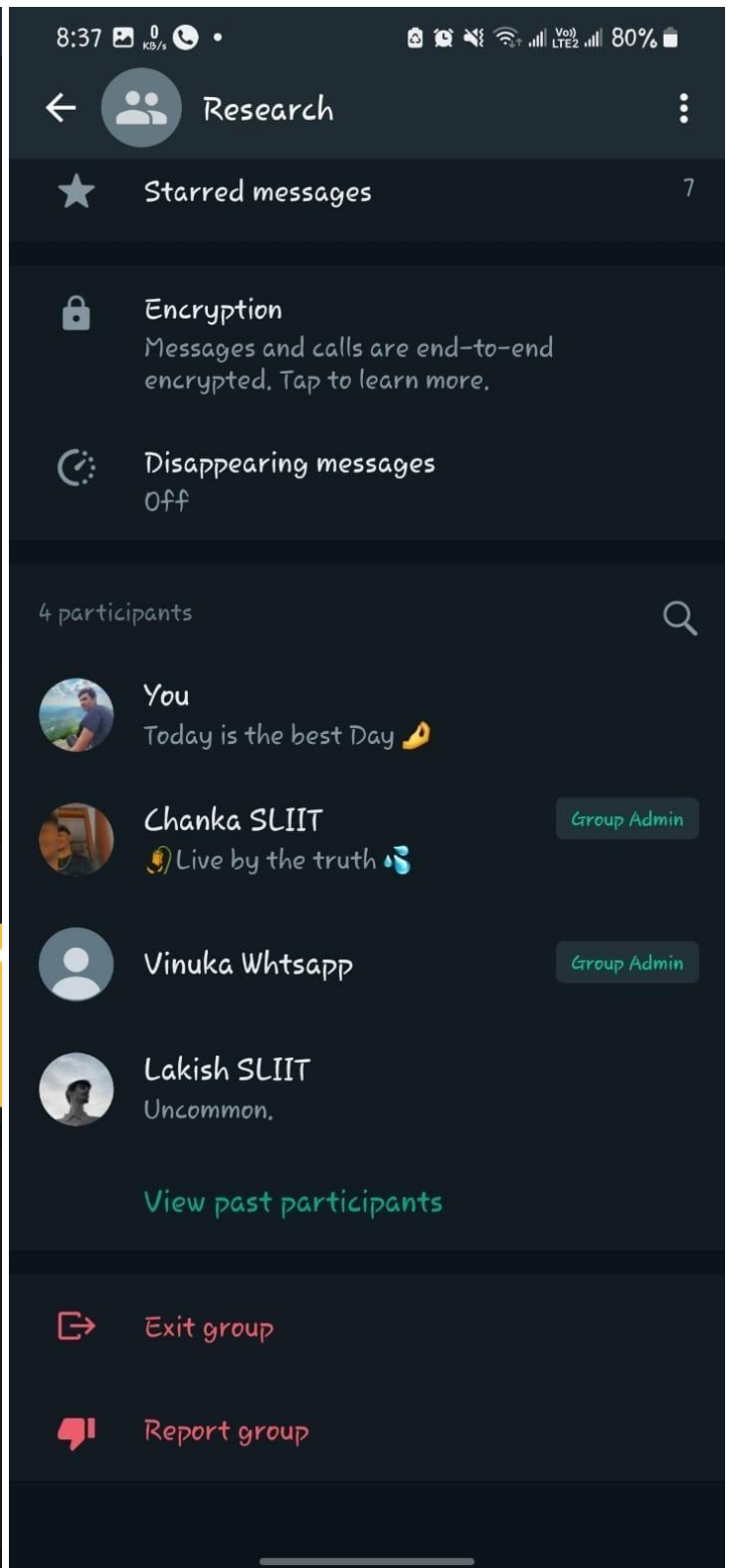
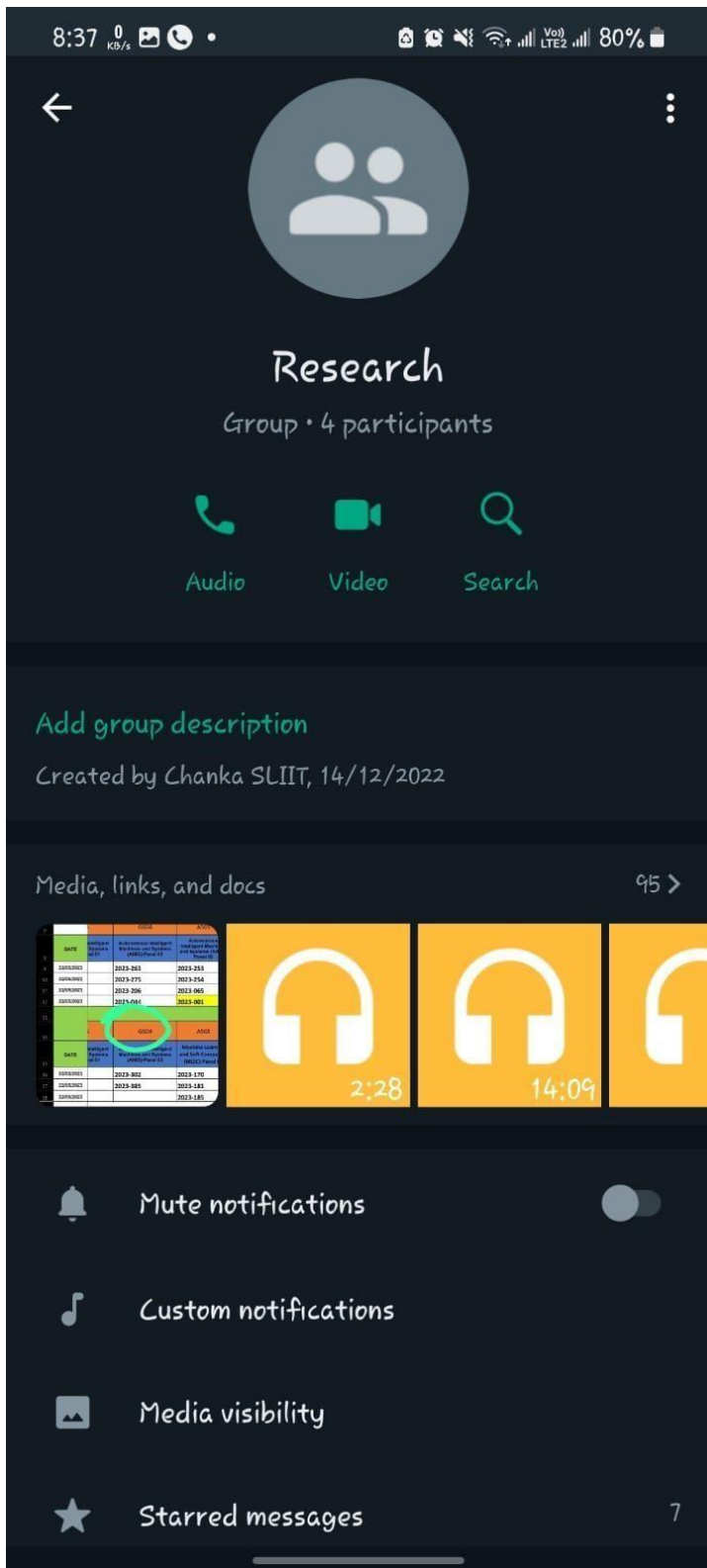
2.2. MS teams meetings with members.



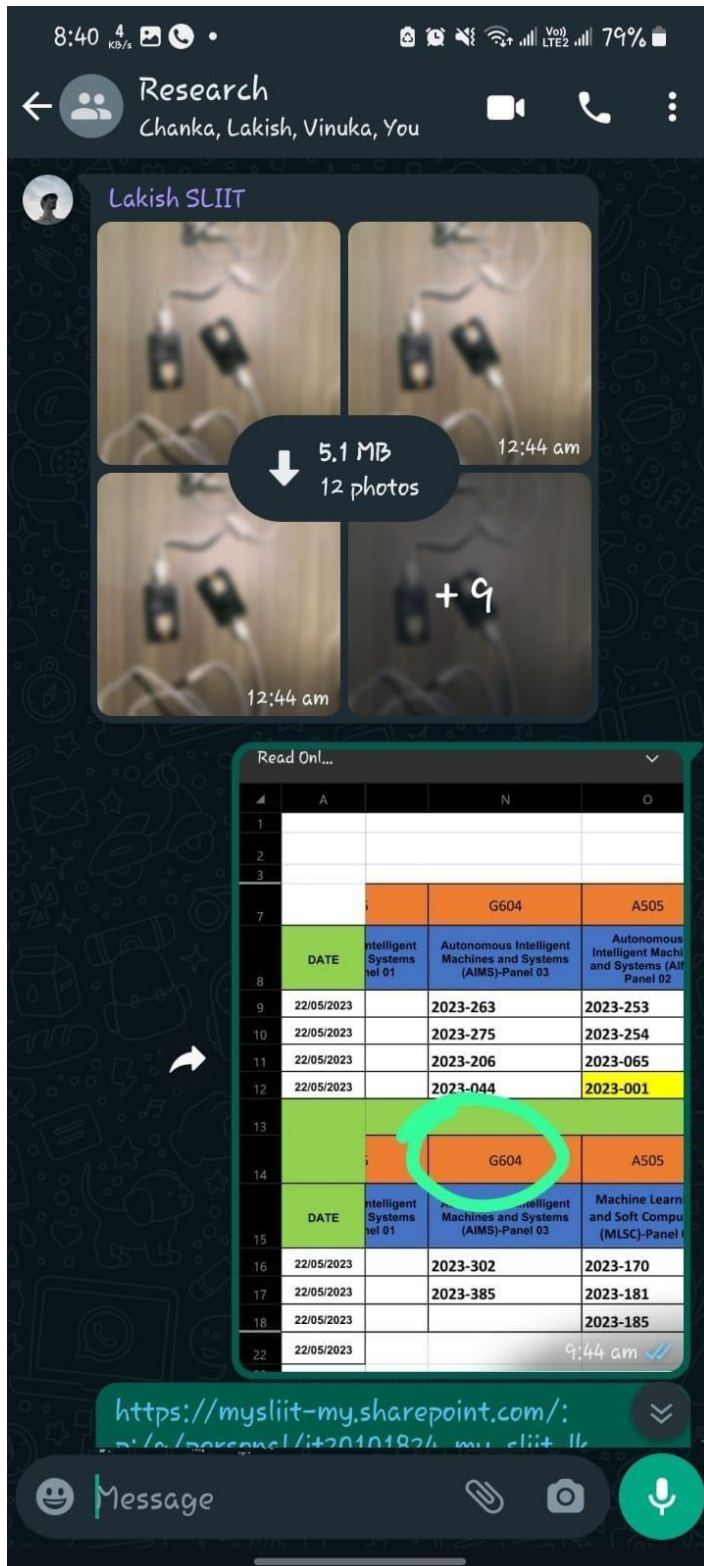
2.3. MS teams files



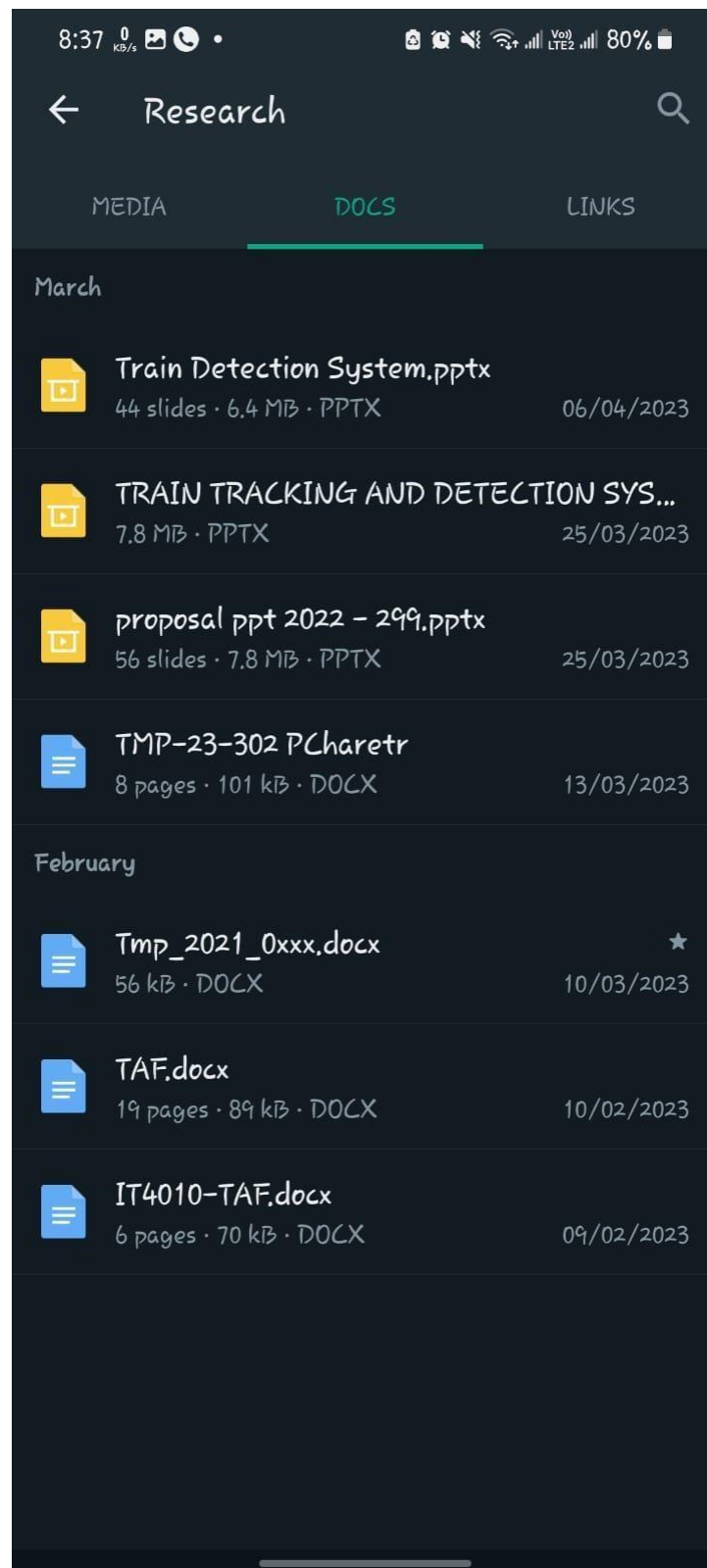
2.4. Create a WhatsApp group with team members.



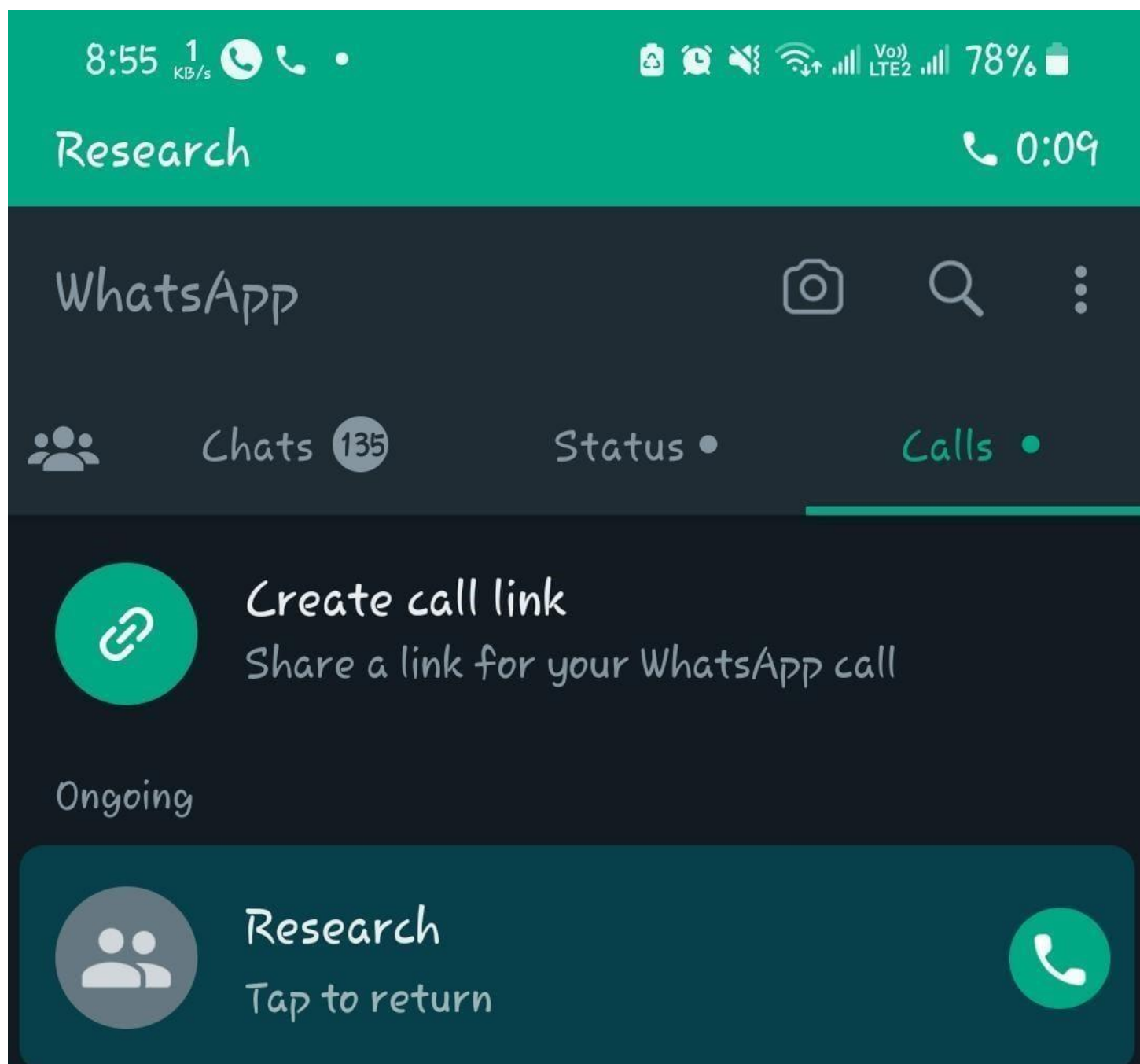
2.5. Chat in WhatsApp group with group members



2.6. Files shared in WhatsApp group with group members



2.7. WhatsApp group calls.



3. Update CDAP Cloud Submissions

SharePoint

Search this library

CDAPSubmissionCloud

Private group

Not following

2 members

New

Upload

Share

Copy link

Sync

Add shortcut to OneDrive

Download

Export to Excel

Automate

Integrate

All Documents

2023RegCloud > 23-302-Students

| Name | Modified | Modified By | File Size |
|--------------------------------------|----------|-------------|-----------|
| 1. Project Proposal | April 20 | CDAP SUIT | 2 items |
| 2. Status Document 1 | April 20 | CDAP SUIT | 5 items |
| 3. Progress Presentation - 1 | April 20 | CDAP SUIT | 2 items |
| 4. Research Paper | April 20 | CDAP SUIT | 5 items |
| 5. Progress Presentation - 2 | April 20 | CDAP SUIT | 3 items |
| 6. Final Report & Presentation | April 20 | CDAP SUIT | 2 items |
| 7. Status Document 2 | April 20 | CDAP SUIT | 2 items |
| 8. Website | April 20 | CDAP SUIT | 1 item |
| 9. Log Book | April 20 | CDAP SUIT | 3 items |
| Marking Schemes | April 20 | CDAP SUIT | 1 item |
| Project Registration Documents | April 20 | CDAP SUIT | 5 items |
| Panel Comments for the Students.xlsx | July 2 | CDAP SUIT | 47.8 KB |

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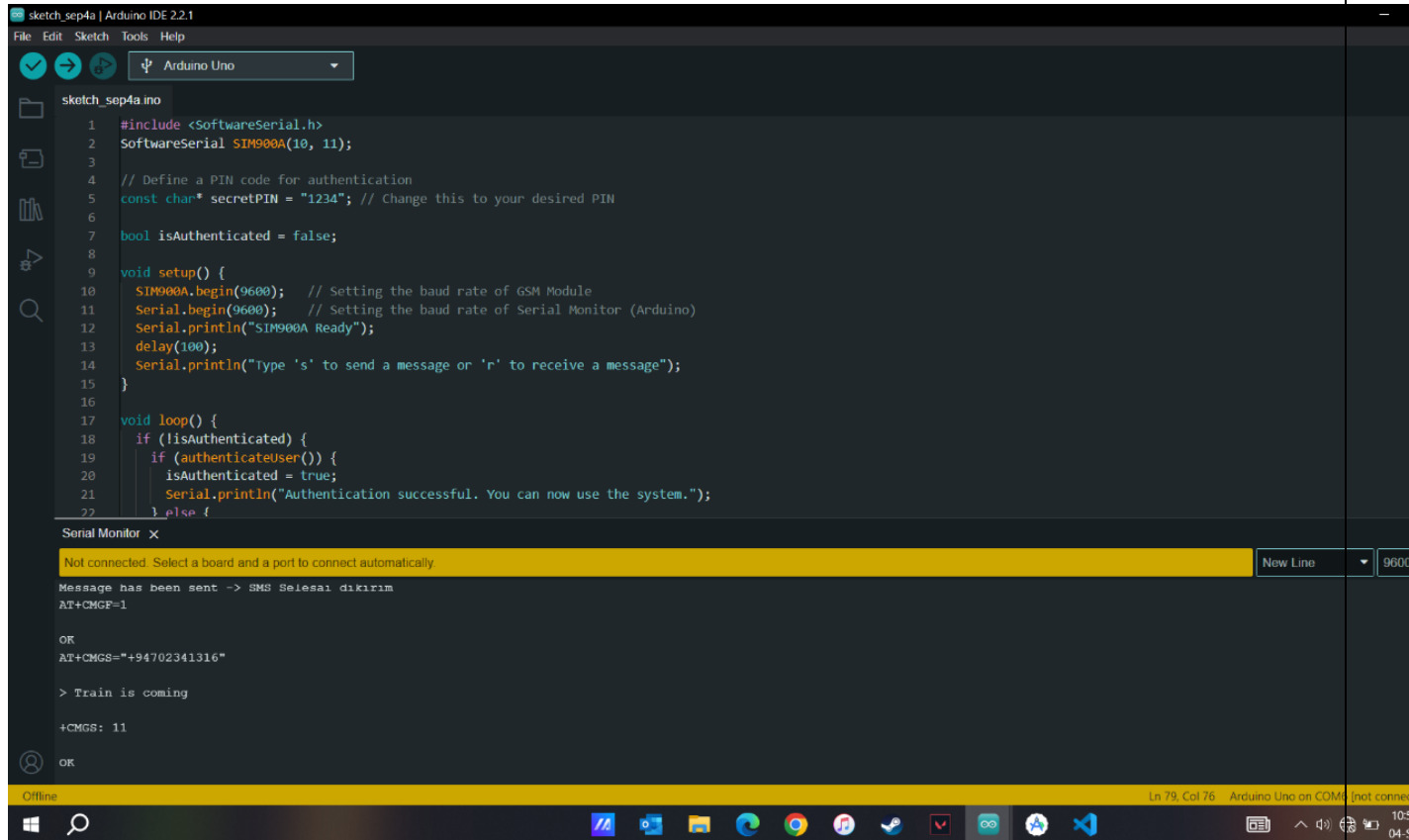
4. Completed 90% of the Research Project

4.1 Main Arduino code

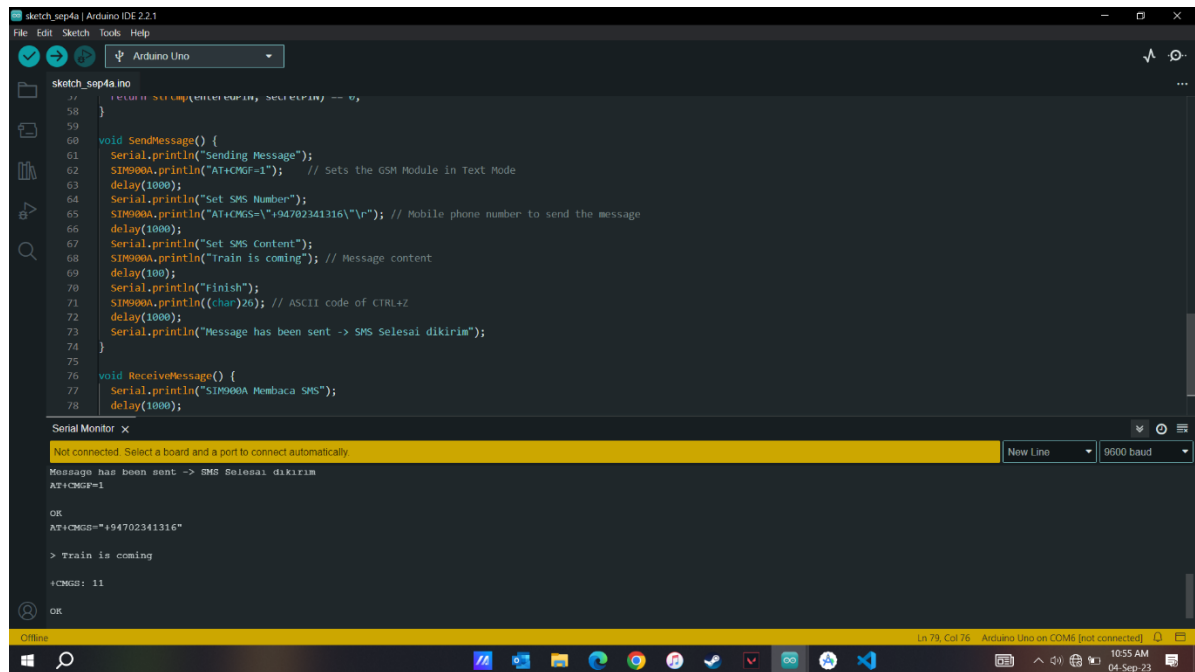

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File Edit Selection View Go Run Terminal Help
main.py 7 Train_move.ipynb car.ipynb
EXPLORER
SIM
  __pycache__
  label_encoder.pkl
  lat_model.pkl
  lon_model.pkl
  main.py 7
  vehicle_prediction_model.pkl
OUTLINE
TIMELINE
@ 4 42
Ln 72, Col 1 Spaces: 4 UTF-8 CRLF Python 3.11.5 64-bit 10:53 AM 04-Sep-23
```

```
114 def is_user_within_range(user_location, center, radius_km=2):
115     return distance.distance(center, user_location).km <= radius_km
116
117 @app.post("/check_user_distance/")
118 async def check_user_distance(user_location: dict):
119     try:
120         lat = user_location["latitude"]
121         lon = user_location["longitude"]
122         user_point = Point(lat, lon)
123     except KeyError:
124         raise HTTPException(status_code=400, detail="Latitude and longitude must be provided in the request.")
125
126     if is_user_within_range(user_point, center):
127         if is_user_passing_road(user_point, roads):
128             db.child("Train_near_to_car").child("alarm").set(1)
129             print(f"User at {user_point} is passing the road point")
130         else:
131             print(f"User at {user_point} is not passing the road point")
132         return {"message": f"User at {user_location} is now in 2km range"}
133     else:
134         return {"message": f"User at {user_location} is outside the 2km range"}
135
136
137 @app.post("/vehicle_prediction/")
138 async def vehicle_prediction_endpoint(data: dict):
139     try:
140         ID = data["ID"]
141         time_of_day = data["Time of Day"]
142     except KeyError:
143         raise HTTPException(status_code=400, detail="Both 'ID' and 'Time of Day' must be provided in the request.")
144
145     new_data = {'ID': [ID], 'Time of Day': [time_of_day]}
146
147     new_df = pd.DataFrame(new_data)
148
149     new_df['Time of Day'] = loaded_encoder.transform(new_df['Time of Day'])
```

4.2 OTP Authentication



4.3. Sending message Authentication



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sketch_sep4a | Arduino IDE 2.2.1
File Edit Sketch Tools Help
sketch_sep4a.ino
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59 //
60 void SendMessage() {
61   Serial.println("Sending Message");
62   SIM900A.println("AT+CMGF=1"); // Sets the GSM Module in Text Mode
63   delay(1000);
64   Serial.println("Set SMS Number");
65   SIM900A.println("AT+CMGS="+94702341316+"\r"); // Mobile phone number to send the message
66   delay(1000);
67   Serial.println("Set SMS Content");
68   SIM900A.println("Train is coming"); // Message content
69   delay(100);
70   Serial.println("Finish");
71   SIM900A.println((char)26); // ASCII code of CTRL+Z
72   delay(1000);
73   Serial.println("Message has been sent -> SMS Selesai dikirim");
74 }
75
76 void ReceiveMessage() {
77   Serial.println("SIM900A Membaca SMS");
78   delay(1000);
79 }
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