



**DON BOSCO INSTITUTE OF TECHNOLOGY**  
**DEPARTMENT OF ELECTRONICS AND TELECOMMUNICATION**



BE Project: Progress Seminar II

**DEVELOPING A CONTAINER GPS TRACKING SYSTEM**  
**TO ENHANCE SUPPLY CHAIN SECURITY**

**INDUSTRY COLLABORATION PROJECT: QDNET TECHNOLOGIES PVT. LTD.**

**Group Members:** Group No. 4

GSM

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GPS

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# OVERVIEW

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# INTRODUCTION

- The proposed project aims to develop a container GPS tracking system that will help prevent theft and improve the security of the supply chain
- With the use of GPS technology, the system will enable companies to track the location of their containers in real-time and receive alerts if any unauthorized activity is detected
- By implementing this system, businesses can safeguard their precious shipments, ensure seamless logistics, and elevate overall customer satisfaction



## PROBLEM STATEMENT

Develop and implement a low-power container GPS tracking system for real-time monitoring and tracking of container locations and preventing theft to enhance supply chain security and ensure safe transportation of goods.

# OBJECTIVES

- To create a reliable GPS tracking solution for shipping containers
- Set up UART-GSM communication to send collected data to the server
- Efficiently designing and fabricating the PCB
- To design an closed circuit system for alerting any theft attempt
- To optimize power consumption to extend the tracking system's battery life
- To create data analysis algorithms for processing and interpreting GPS data on a web server

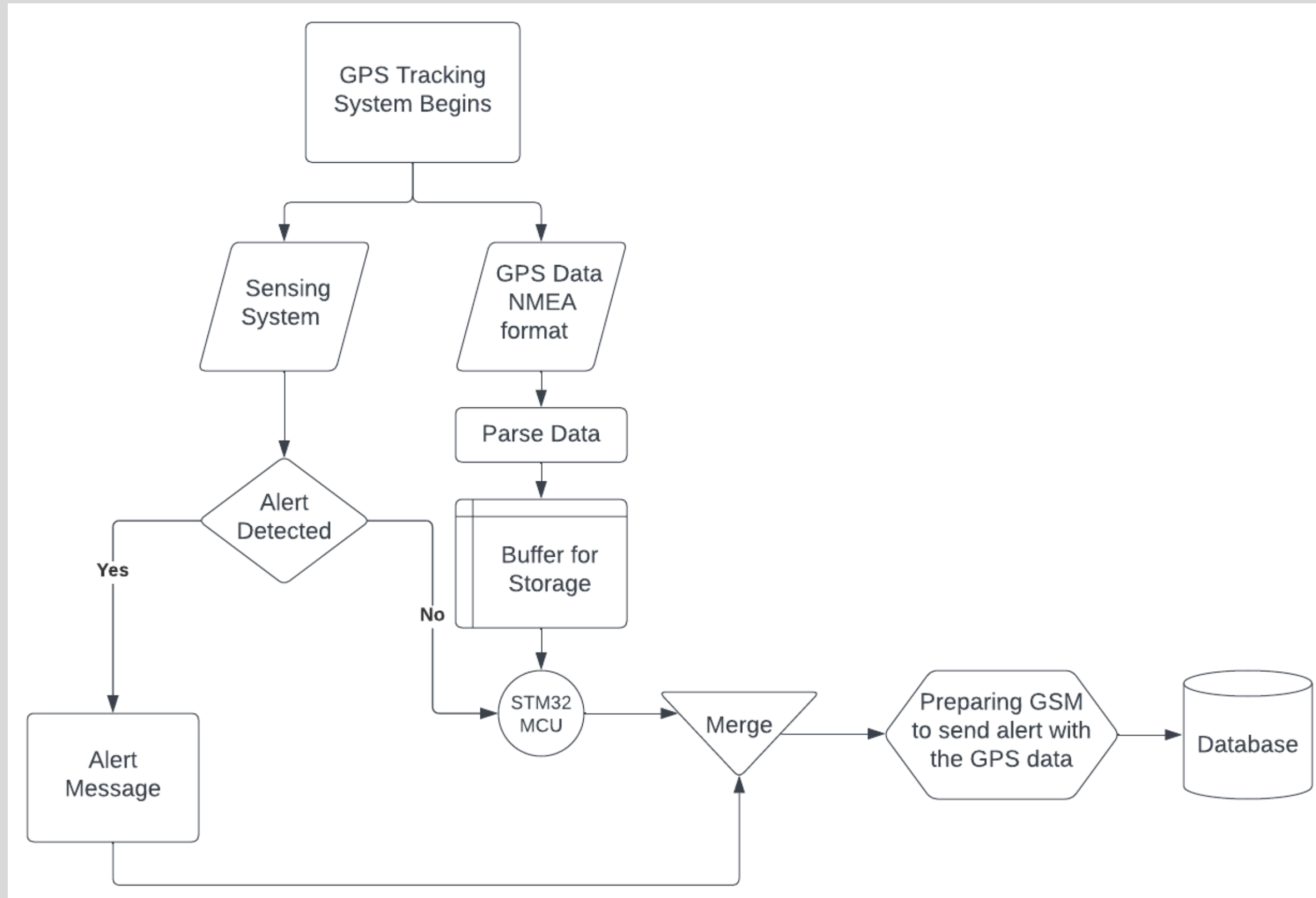
# OUTCOMES

- Improved Real-Time Visibility
- To enhance supply chain security
- Reduced Theft and Loss
- Minimum Power requirement
- Publication of Paper

# METHODOLOGY

- 1) Initialize GPS module
- 2) Establish UART communication between GPS and STM32 microcontroller
- 3) Retrieve data in the form of NMEA sentences and convert it into a suitable format
- 4) Initialize GSM module with AT commands
- 5) Establish UART communication between GSM and STM32 microcontroller
- 6) To send the collected data from STM32 to the server via GSM
- 7) Repeat steps 3 to 7 at hourly intervals for continuous tracking and updating

# APPROACH & ANALYSIS OF PROJECT

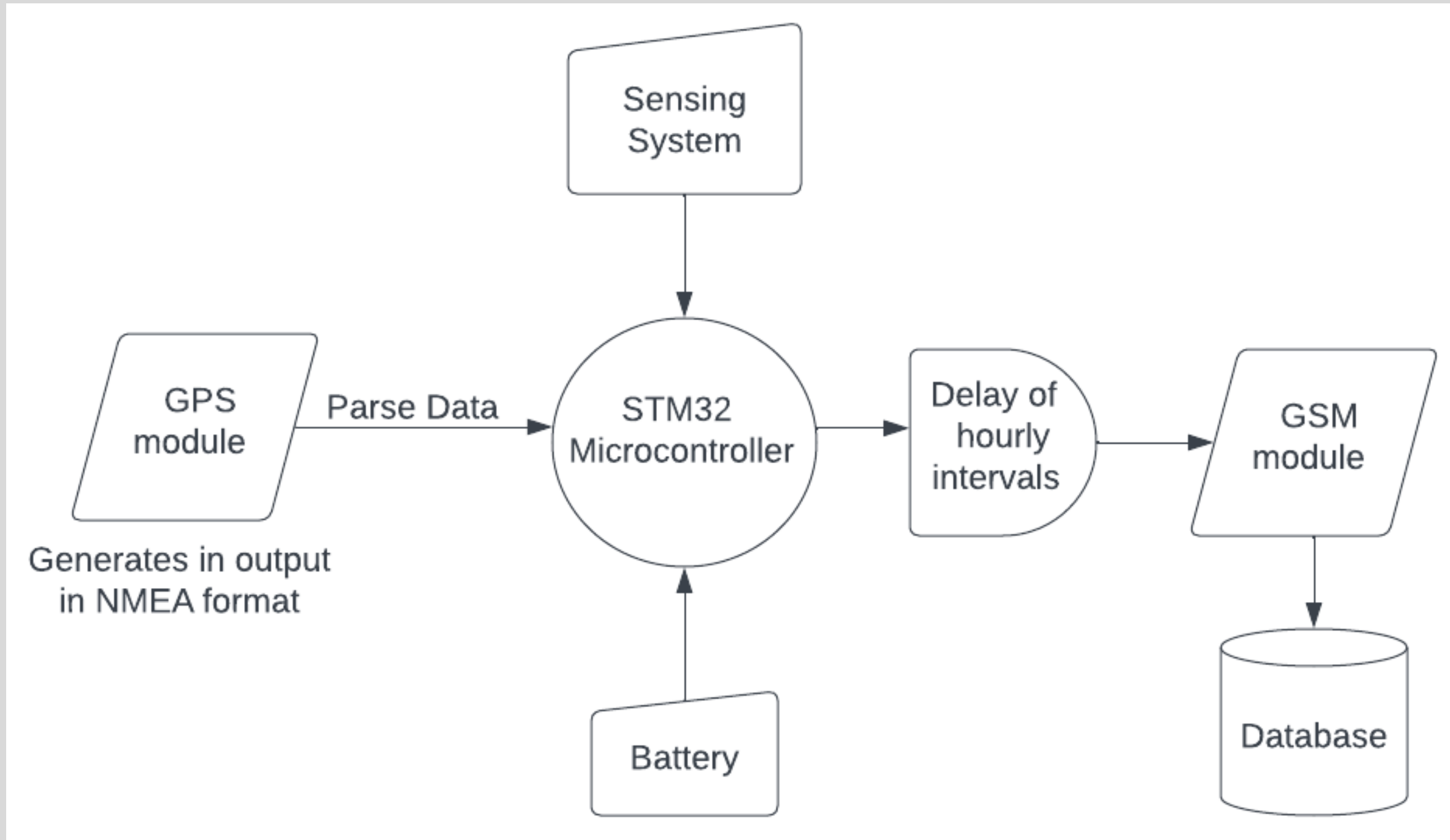




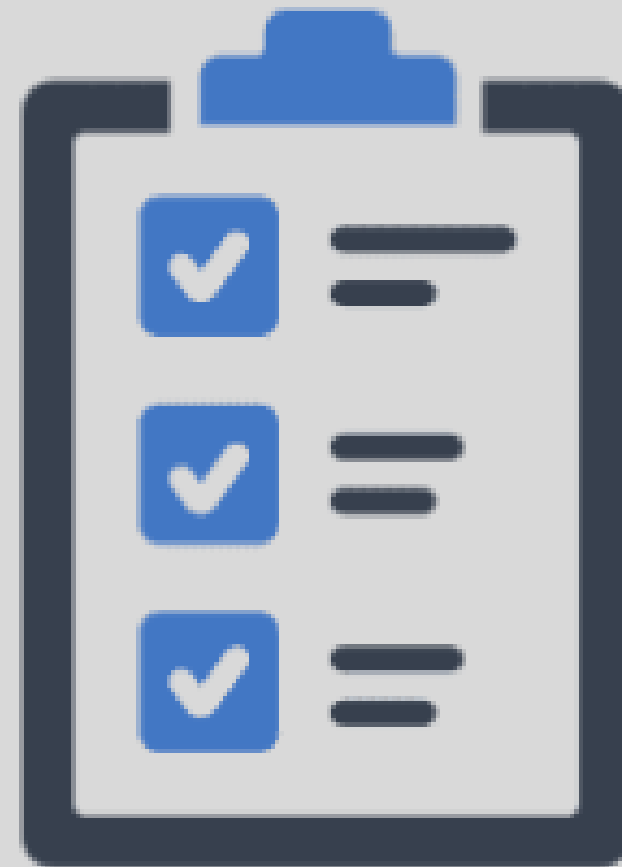
# ANALYSIS OF PROJECT

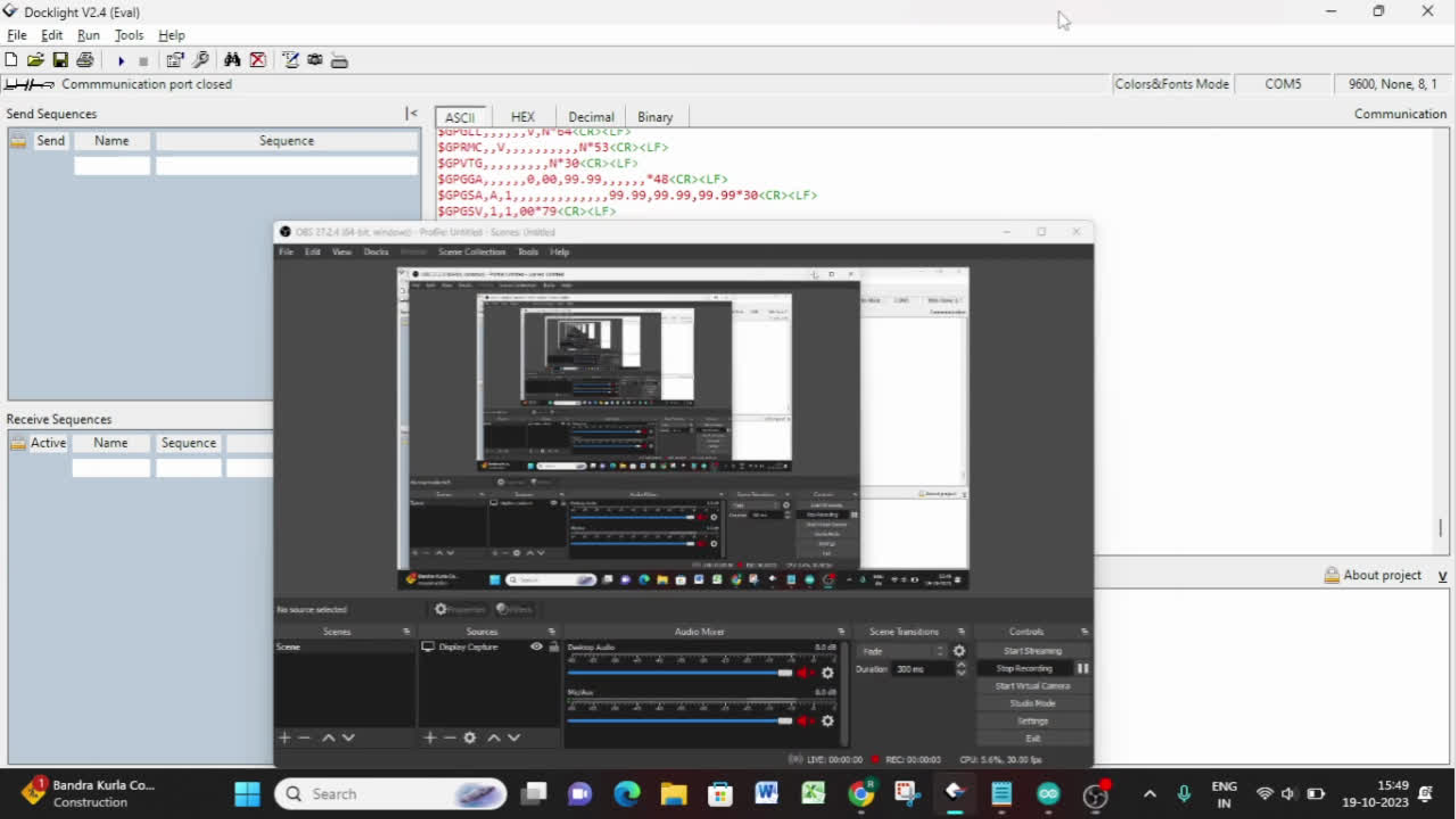
- The system's behavior depends on factors like traffic for location updates
- It has provisions to prevent false alerts during traffic delays
- Geofencing allows setting virtual boundaries for alerts when the container deviates from its route
- Modules can enter low-power mode during extended stationary periods to save power
- Motion sensors act as a security measure to detect break-in attempts when the container is stationary

# BLOCK DIAGRAM

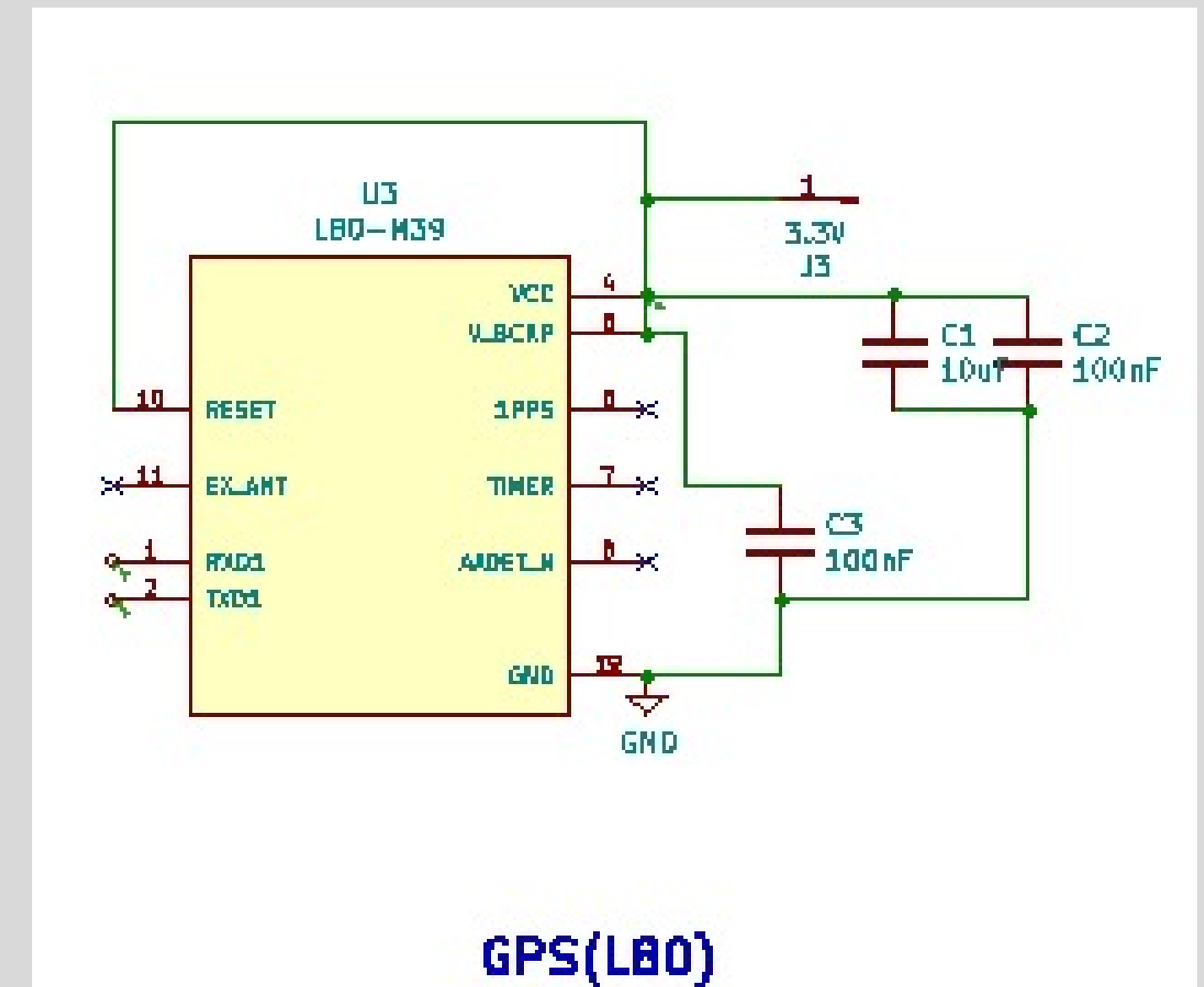
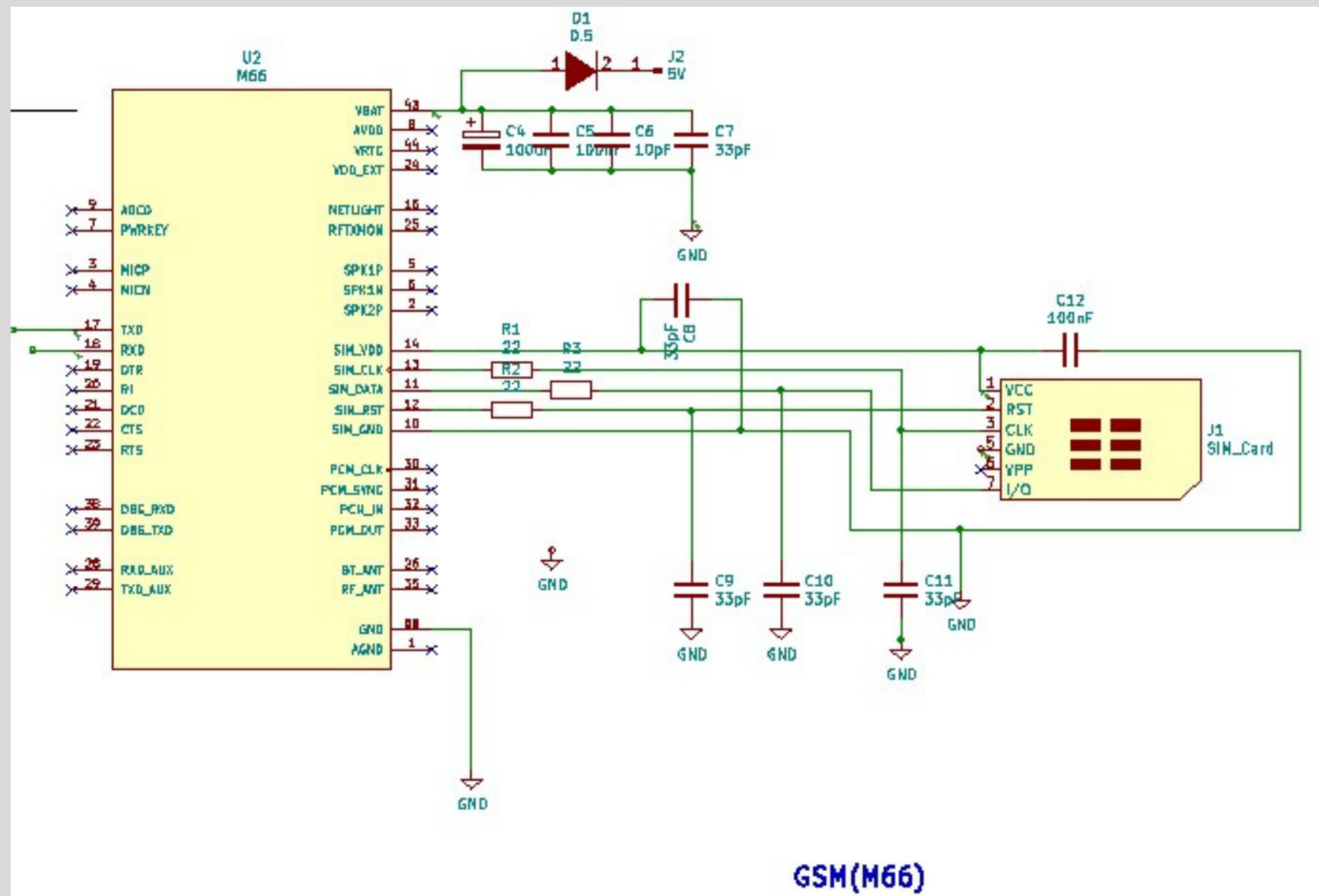


# TARGET ACCOMPLISHED





# SCHEMATICS



Software: Kicad

# TIMELINE / GANTT CHART

Task	June	July	August	Sept	Oct	Nov	Dec	Jan	Feb
Literature Survey									
Finalising and working on GSM and GPS modules									
Testing the GSM and GPS modules									
Serial communication through STM32									
Designing Circuit diagram, schematics									
Layout and fabrication									
Testing									
Paper Publication									

# **BILL OF MATERIALS**

<b>Components</b>	<b>Quantity</b>	<b>Price (Rs.)</b>
GSM (M66) module	1	1,549.04
GPS (L80) module	1	450
STM32F302R8	1	912.91
Fabrication cost	1	10,000

# REFERENCES

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*Thank You*