



The Bombay Salesian Society's  
**Don Bosco Institute of Technology**  
[ **ENGINEERING COLLEGE** ]



(Approved by AICTE & Affiliated to University of Mumbai)

DEPARTMENT OF ELECTRONICS AND TELECOMMUNICATION

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

INDUSTRY COLLABORATION PROJECT: QDNET TECHNOLOGIES PVT. LTD.

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# MOTIVATION

- During Covid-19, transportation halted except for shipping containers for emergency goods.
- Global shipping crucial for international trade, valued at \$10 billion in 2024.
- Industry growth faces security and asset control challenges.
- Emphasis on safety and security due to risks like theft and tampering.



## PROBLEM STATEMENT

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

# INTRODUCTION

- The proposed project aims to develop a container GSM-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 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

# 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 create data analysis algorithms for processing and interpreting GPS data on a web server

# OUTCOMES

- Improved tracking difficulty
- To enhance supply chain security
- Reduced theft and loss
- Using data analysis for real-time monitoring

# ETHICAL AWARENESS

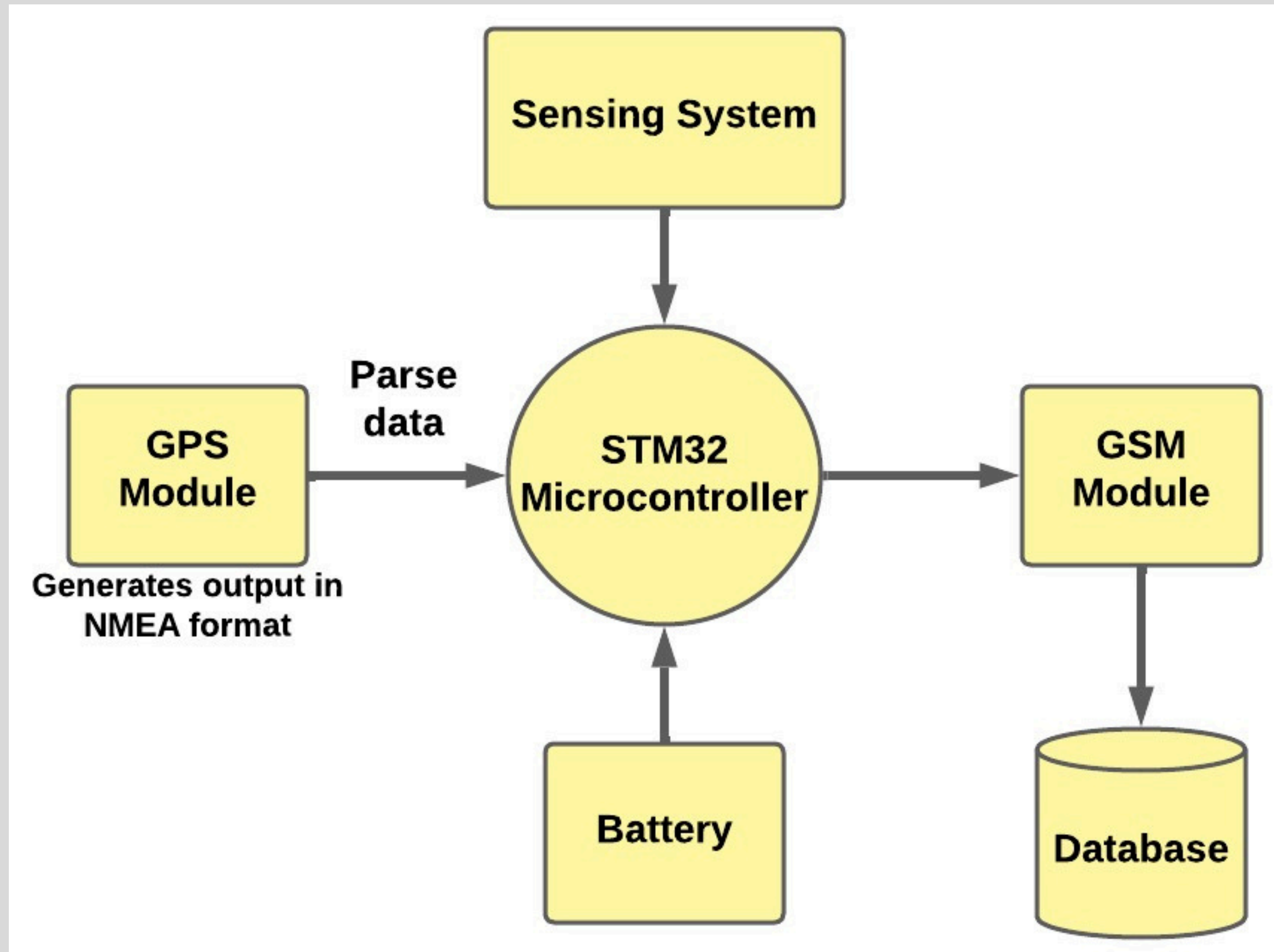
When using content for a project, ethical awareness is crucial to ensure responsible and respectful behavior

Key points that we kept in mind:

- Consent and Privacy
- Appropriate Use
- No Pirated Software
- Integrity and Honesty
- Avoid Plagiarism



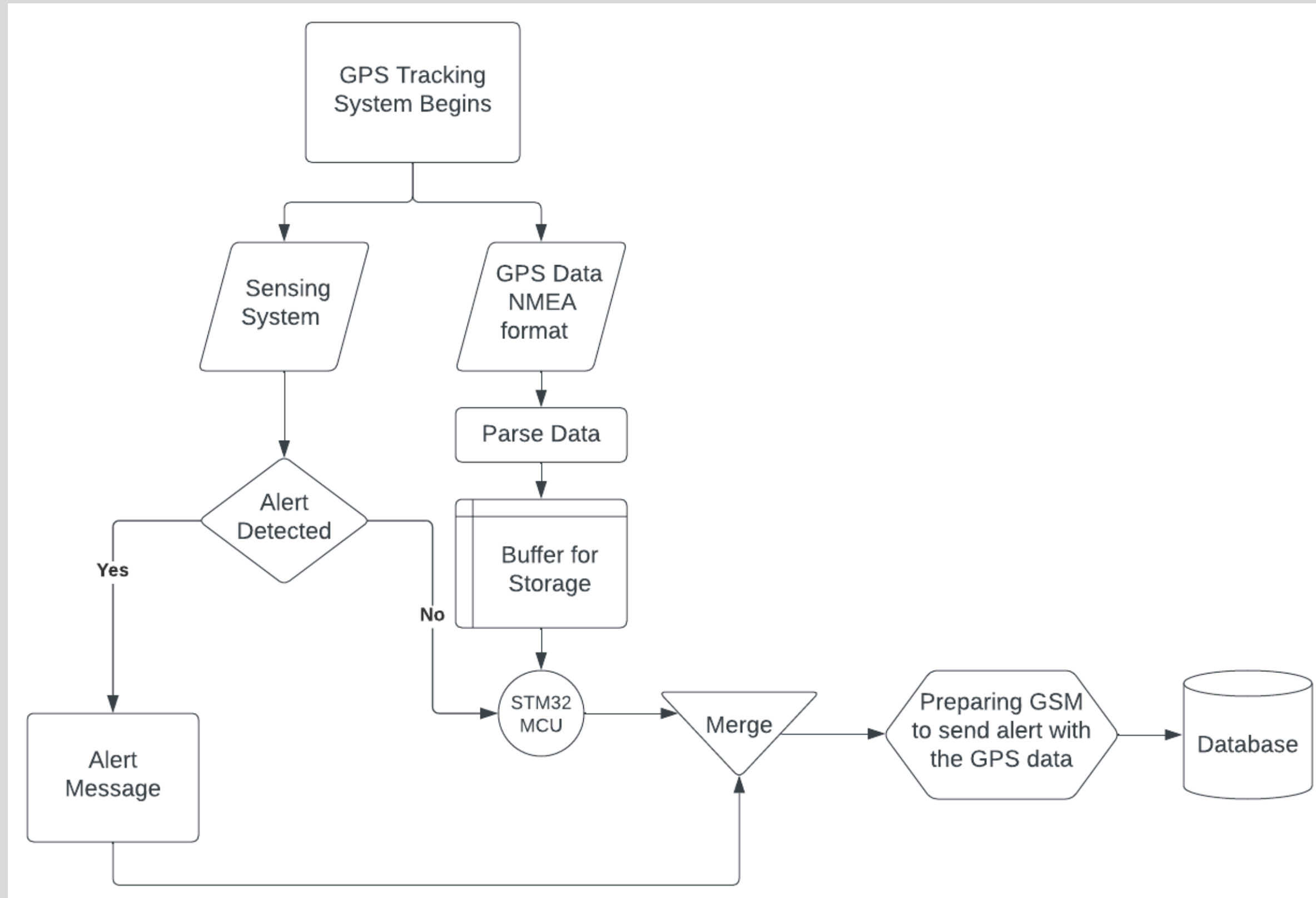
# BLOCK DIAGRAM



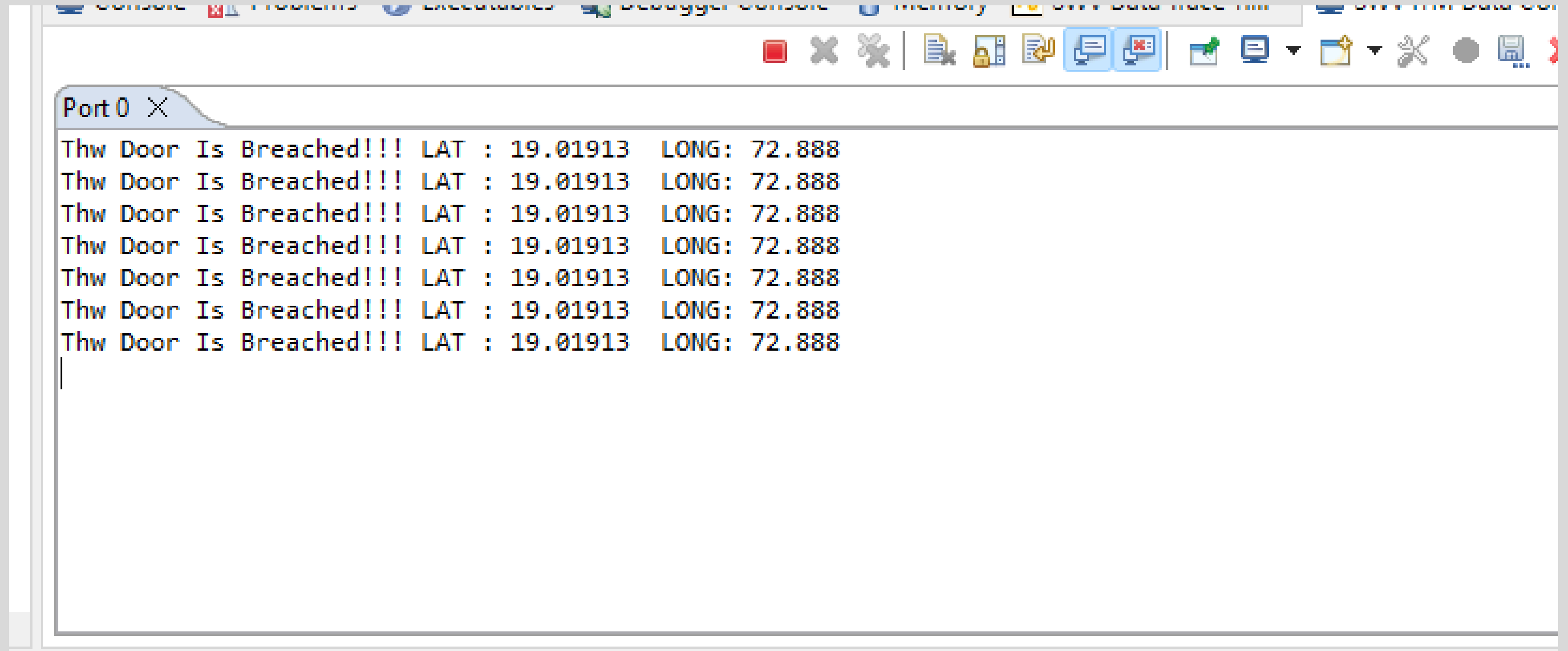
# METHODOLOGY

- 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 OF PROJECT



# TESTING



# TESTING



# FUTURE PLANS

- Connection establishment through STM32
- Testing and fabricating the PCB
- Power optimization
- Data Transmission
- Database management

# CONCLUSION

- We were able to establish connection between STM32 microcontroller board and the modules individually.
- The connection between GSM and STM32 consists of sending and receiving of data, here it's message format in form of strings.
- The connection between STM32 and GPS consisted of getting the data of latitude, longitude and time for the exact location and getting the output at the serial monitor.

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*Thank You*