SMART LOGISTICS

Optimizing Supply Chain Operations

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MQTT Broker

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USP of our Project

Business Oppurtunities

Future Endeavors

- Predictive Maintenance
- Cargo Damage Monitoring
- Security Monitoring
- Environmental Monitoring
- Energy Harvesting

Node Red

Model Flowchart

PRESENTING THE MODEL

Our Team

1) Viswesh (IIITDMK)
2) Gargeya (IIITDMK)
3) Jayavanth (IIITDM
4) Dhanush (IIITDMK
5) Eswar (GPREC)
6) Sujan (IIITDMK)
7) Ramakrishna (IIITDM


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LOGISTICS
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- Lack of real-time monitoring and optimization tools causes suboptimal routes, higher maintenance costs, and cargo risks.
- Implementing smart truck technologies is essential to improve efficiency, safety, and sustainability in transportation operations.

Solution

- Real-time consignment data provided.
- Reed sensor used for container door status (open/closed) monitoring.
- Engine health monitored using sound sensor.
- Temperature of transported package checked with DHT11 sensor.

About MQTT

Publisher (ESP32):

ESP32: Generates and sends messages to the MQTT broker based on predefined conditions or events.

Broker and Gateway (Raspberry Pi):

Raspberry Pi: Acts as an intermediary server and gateway, facilitating communication between publishers and subscribers while managing external network connections.

Subscriber (Organizations):

Organizations: Subscribe to specific topics, receiving pertinent messages to monitor relevant information for their operations.

MQTT Broker

The broker gets messages from publishers and sends them to subscribers who are interested in specific topics. It makes sure messages are delivered correctly, following the chosen quality level.

QoS Levels

Level-0: At most once
Level-1: At least once
Level-2: Exactly once

Uses

- Internet of Things
- Home automation
- Industrial automation
- Telemetry and remote

Real-Time Examples

- Smart home systems
- Industrial Iot
- Weather monitoring
- Fleet management

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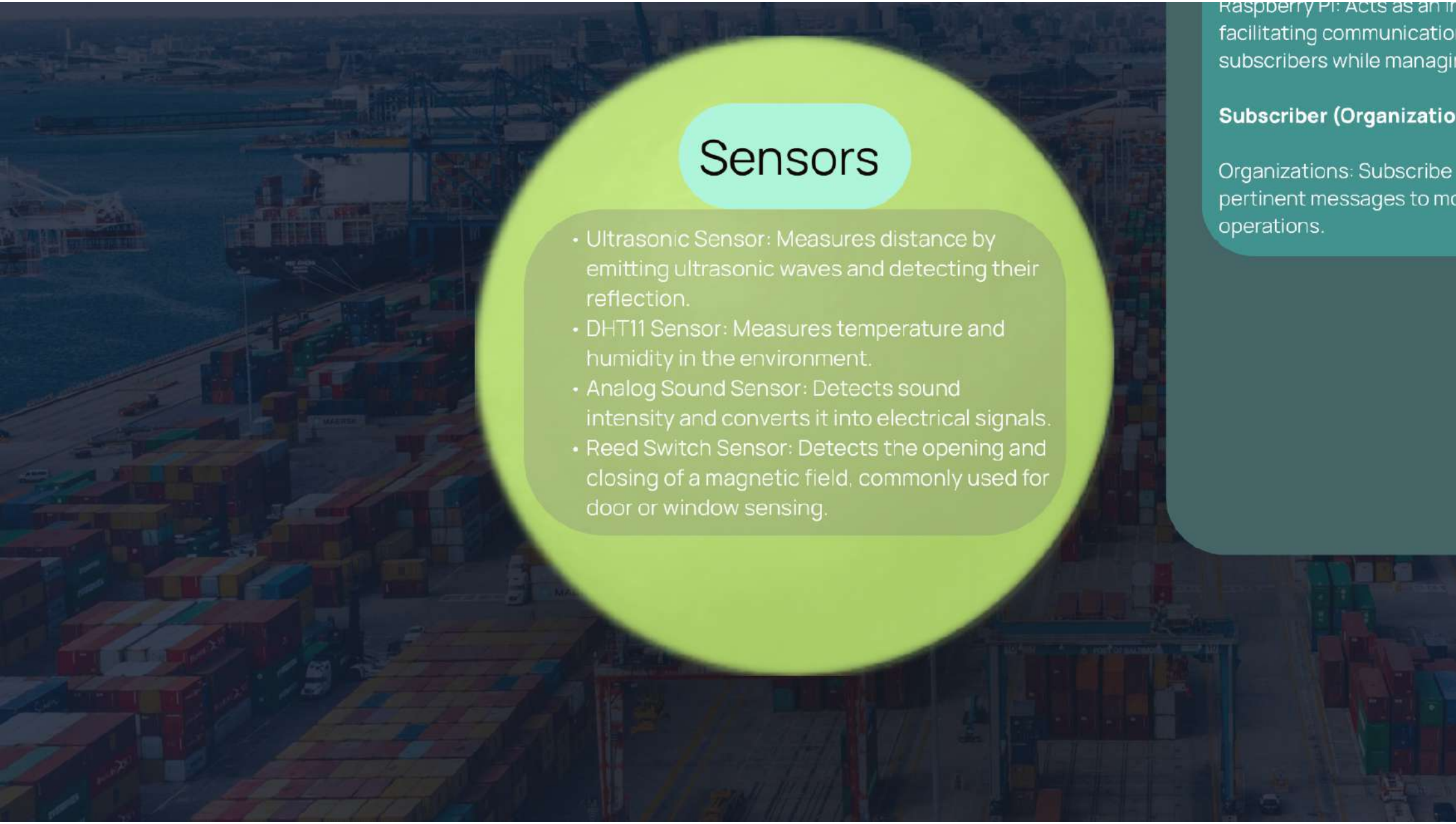

Sensors

- Ultrasonic Sensor: Measures distance by emitting ultrasonic waves and detecting their reflection.
- DHT11 Sensor: Measures temperature and humidity in the environment.
- Analog Sound Sensor: Detects sound intensity and converts it into electrical signals.
- Reed Switch Sensor: Detects the opening and closing of a magnetic field, commonly used for door or window sensing.

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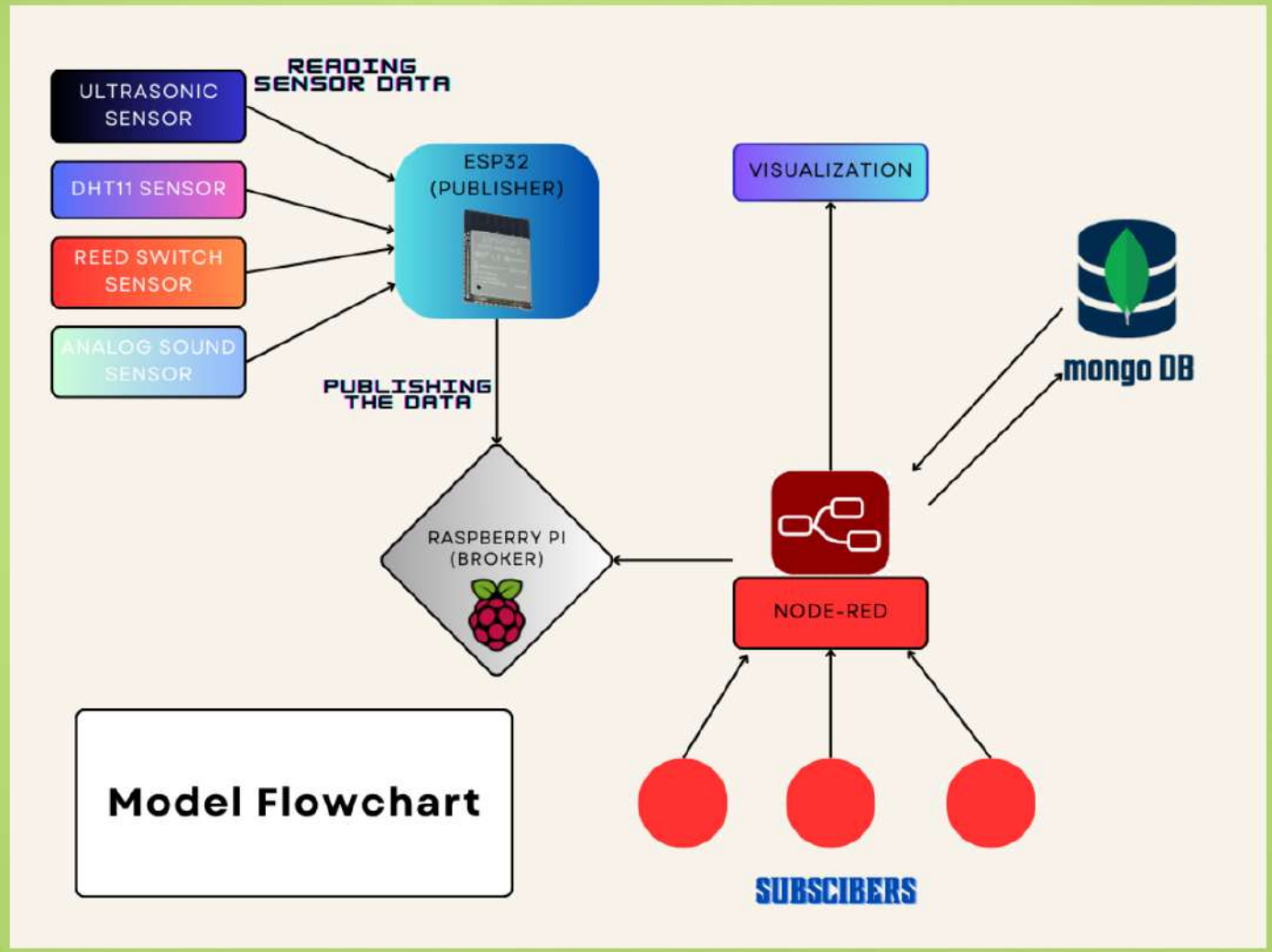

READING SENSOR DATA
ULTRASONIC SENSOR
DHT11 SENSOR
REED SWITCH SENSOR
ANALOG SOUND SENSOR
ESP32 (PUBLISHER)
PUBLISHING THE DATA
RASPBERRY PI (BROKER)
VISUALIZATION
mongo DB
NODE-RED
SUBSCIBERS
Model Flowchart

Node-Red

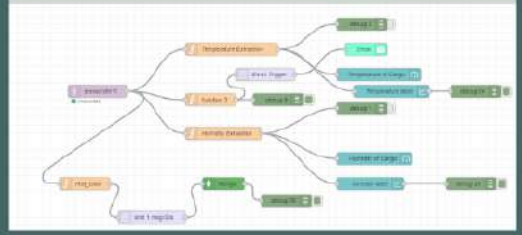
Node-RED:

- Node-RED is a user-friendly, open-source tool for visual programming.
- Developed by IBM Emerging Technology and the open-source community.
- Features a browser-based editor for creating complex flows by connecting different nodes.
- Ideal for IoT projects due to its versatility and extensive range of nodes.
- Simplifies development with a visual programming approach, enabling quick prototyping and testing.

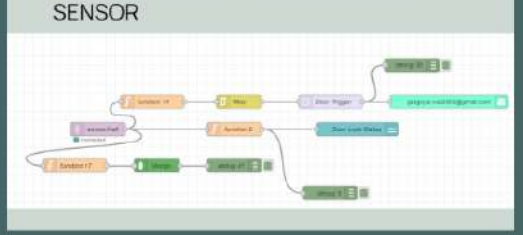
Node-RED as a Dashboard:

- Node-RED serves as a powerful dashboard for IoT projects.
- Enables visualization of real-time data from connected devices and sensors.
- Facilitates monitoring of system status and control of devices remotely.
- Offers a user-friendly interface for easy interaction and management of IoT systems.

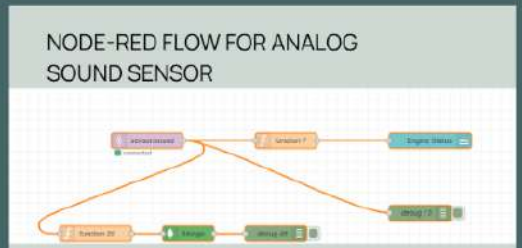
NODE-RED FLOW FOR DHT11 SENSOR



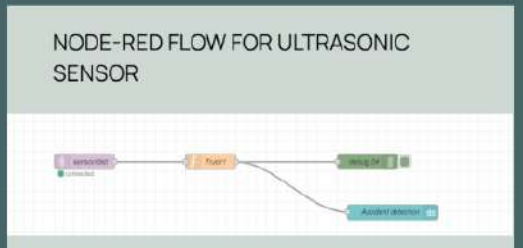
NODE-RED FLOW FOR REED SWITCH SENSOR



NODE-RED FLOW FOR ANALOG SOUND SENSOR



NODE-RED FLOW FOR ULTRASONIC SENSOR



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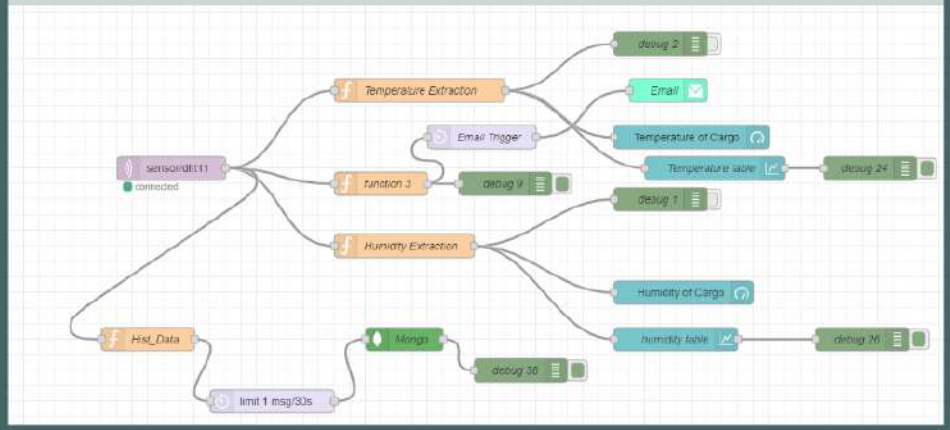

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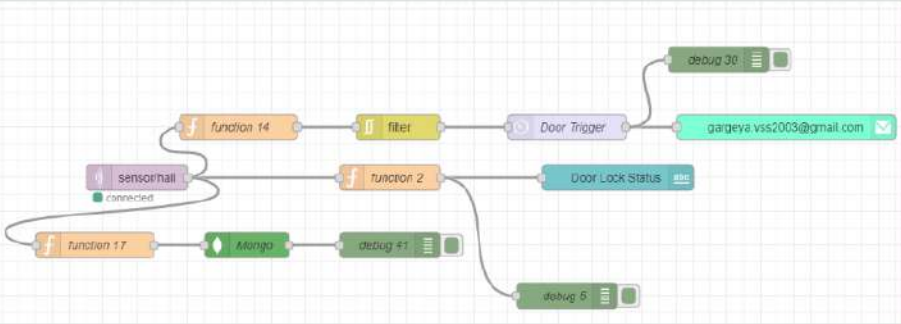
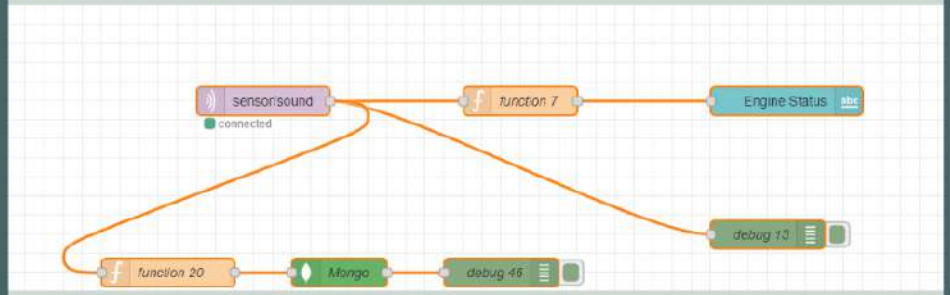


NODE-RED FLOW FOR ANALOG SOUND SENSOR



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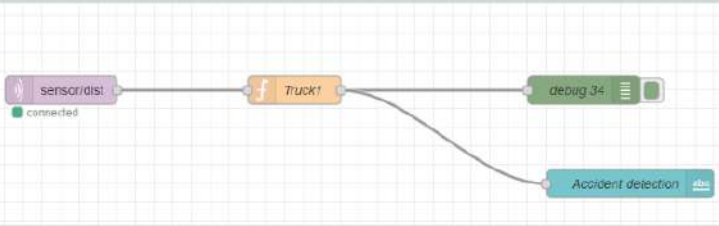

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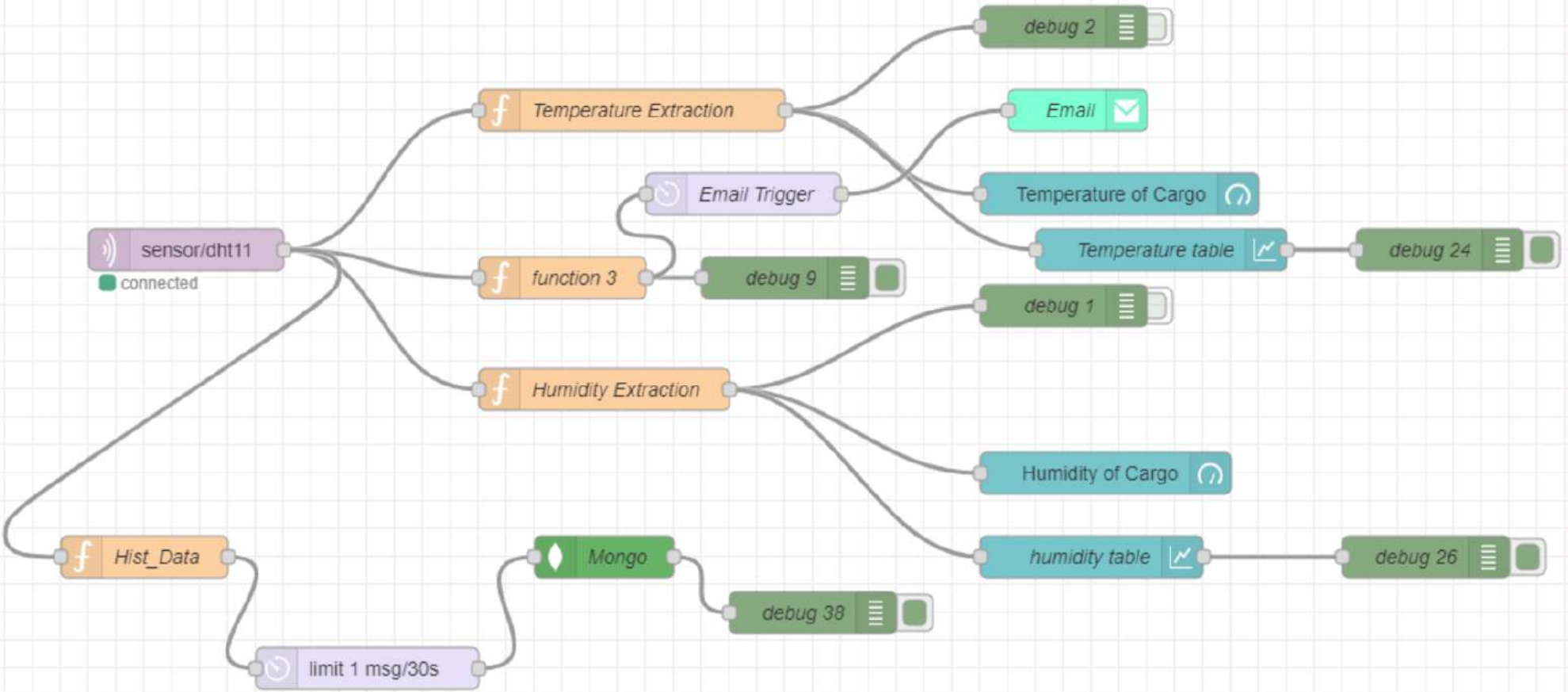

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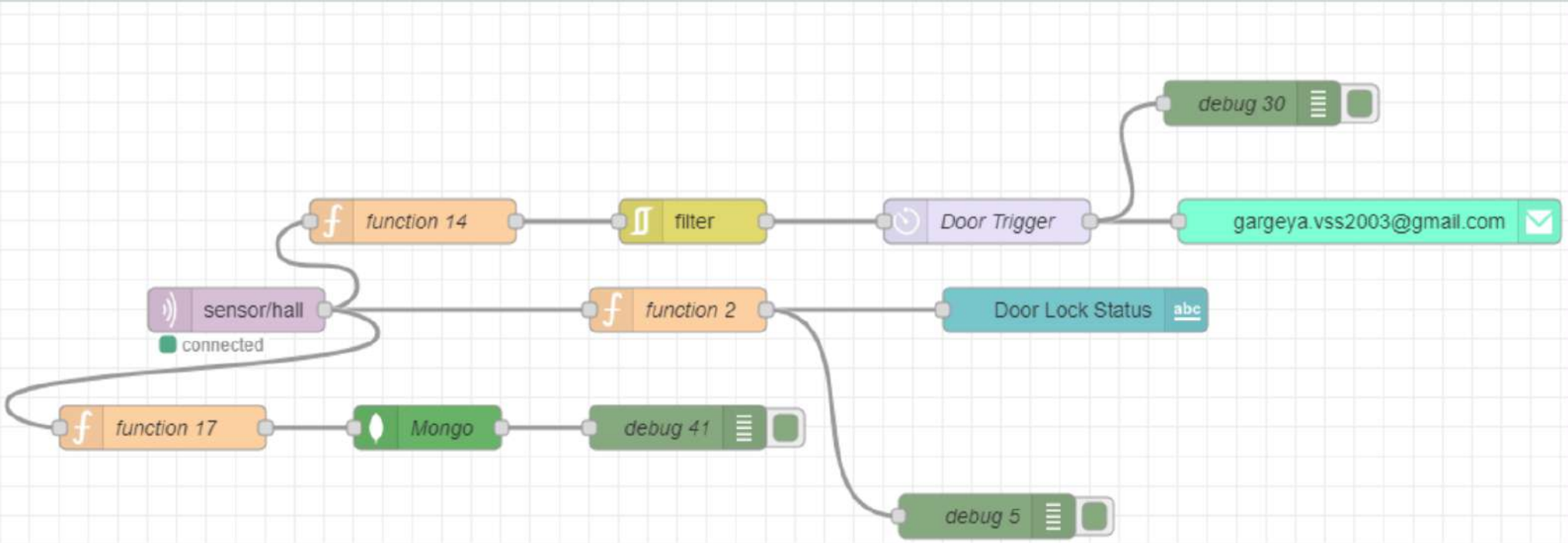

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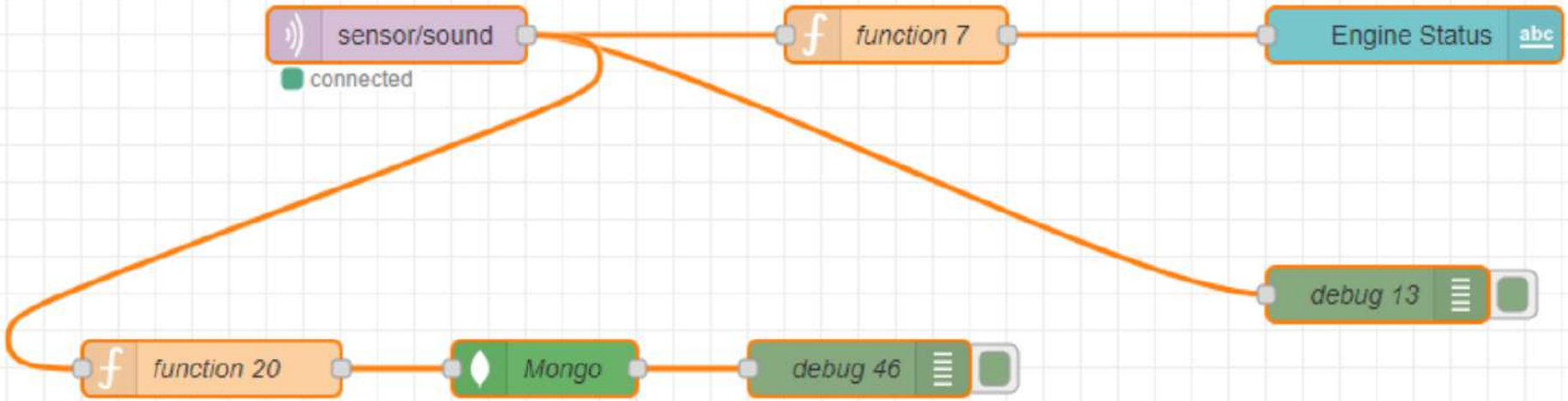

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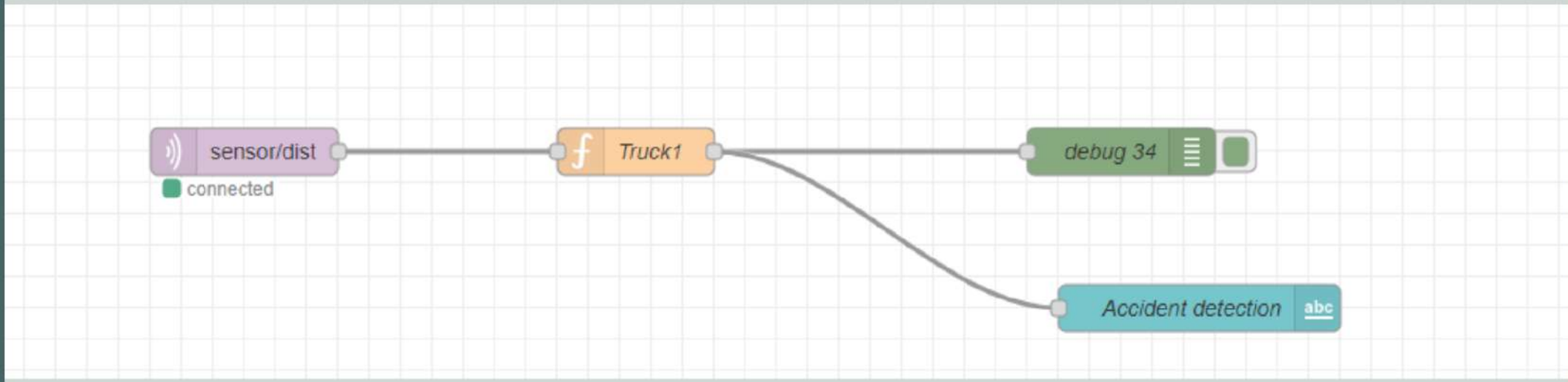


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Target Audience

- Logistics Companies: Food transporters, Environmental cargo carriers
- Third-Party Logistics (3PL) Providers: Outsourced logistics services
- Technology Providers and Solution Integrators: Smart logistics developers


USP of our Project
Real - time Environmental monitoring
Predictive Maintenance Capabilities
Enhanced Security Features
Providing efficiency, safety, and transportation operations
Business Oppurtunities
• IoT Device Development
• Data Analytics and Predictive Analytics and also Data selling
• Last-Mile Delivery Solutions

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SPARK

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