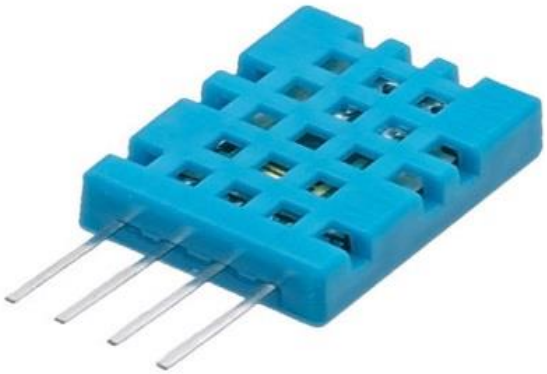
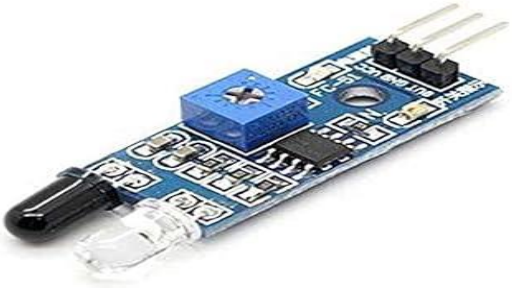
**Project Tittle: ENVIRONMENTAL MONITORING – IOT**

**Phase 2: INNOVATION**

**Sensors:**



1. DH11 sensor (Temperature and humidity sensor)



2.IR Flame sensor

3. MQ-2 Smoke sensor


4. MQ-7 Gas sensor

## Definition of sensor:

1.TEMPERATURE AND HUMIDITY SENSOR:

These sensors have been designed for various applications to measure the humidity as well as the temperature of the environment.

2.FLAME SENSORS:

A flame sensor is a safety device used in gas-burning furnaces and boilers to detect the presence of a flame.

3. SMOKE SENSORS:

Smoke alarms detect fires by sensing small particles in the air using a couple of different kinds of technologies. Once they detect those particles above a certain level, they signal the alarm to sound so that you and your family can get to safety and call 911. Smoke alarms save lives

4. GAS SENSOR:

A gas sensor is a device that can detect the presence and quantify the concentration of a specific gas in the atmosphere, such as water vapor (humidity), organic vapors, and hazardous gases.

## STEPS FOR FLOW CHART:

STEP1. Start: Define the purpose of environmental monitoring.

STEP2. Input Data: Gather data from sensors, satellites, or manual measurements.

STEP3. Data Processing: Clean, filter, and preprocess raw data for analysis.

STEP4. Analysis: Apply algorithms (e.g., machine learning) to detect patterns or anomalies.

STEP5. Decision Making: Interpret results and make decisions based on analysis outcomes.

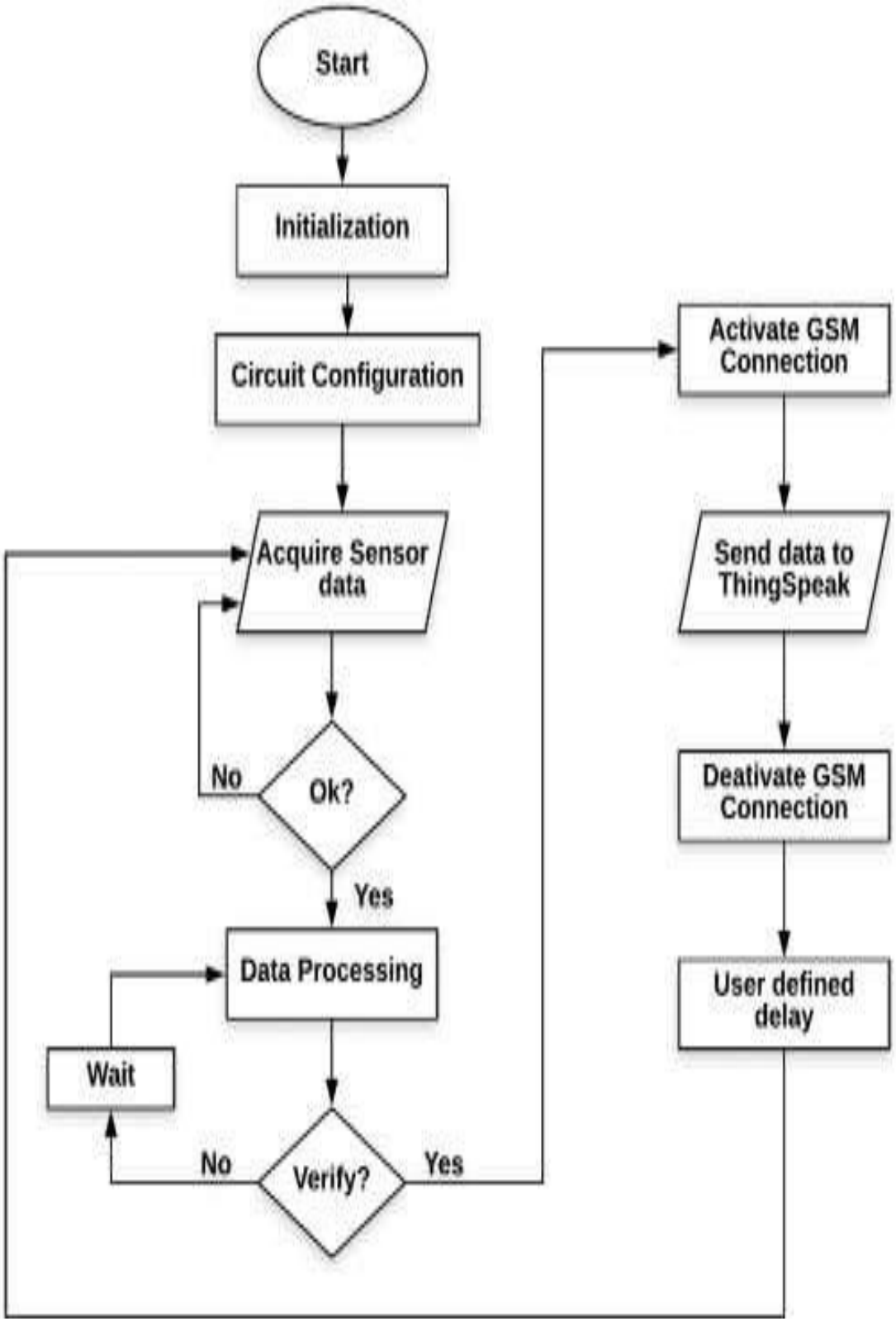
STEP6. Action: Implement environmental interventions or policies based on decisions.

STEP7. Output: Display results visually for stakeholders, policymakers, and public awareness.

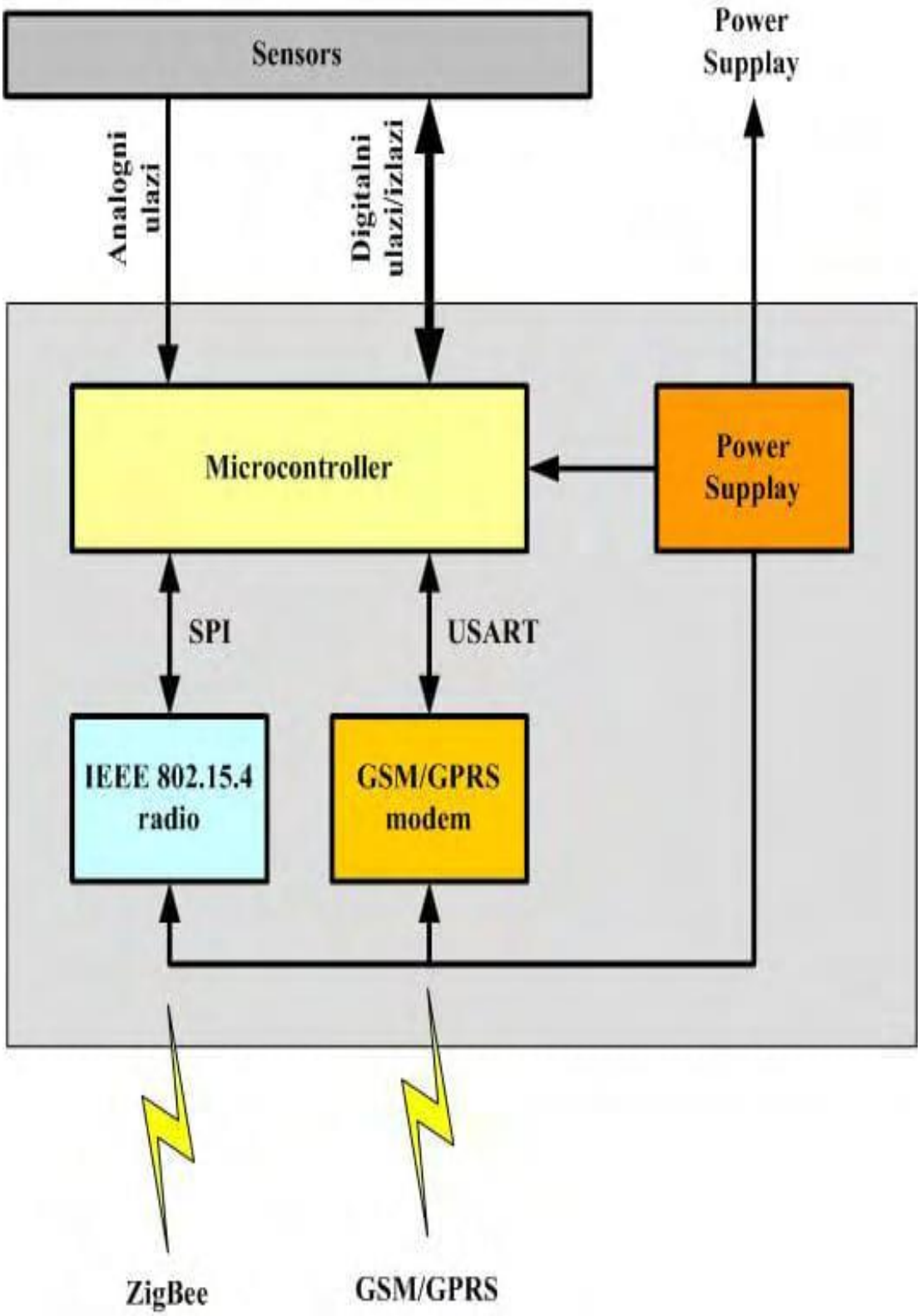
STEP8. Feedback Loop: Continuously monitor feedback to improve algorithms and data quality.

STEP9. End: Conclude monitoring process, but maintain readiness for future assessments.

FLOW CHART


Start
Initialization
Circuit Configuration
Acquire Sensor data
No
Ok?
Yes
Data Processing
Wait
No
Verify?
Yes
Activate GSM Connection
Send data to ThingSpeak
Deativate GSM Connection
User defined delay

## Block diagram:



**MICROPROCESSOR:**

A microcontroller is a compact integrated circuit designed to govern a specific operation in an embedded system. A typical microcontroller includes a processor, memory and input/output (I/O) peripherals on a single chip.

**SENSORS:**

1.TEMPERATURE AND HUMIDITY SENSOR

2.FLAME SENSORS

3. SMOKE SENSORS

4. GAS SENSOR

**GSM:**

Global System for Mobile Communications is a standard for mobile phones that ensures compatibility and seamless communication, enabling voice and data services worldwide.

## IEEE 802.15. 4

IEEE 802.15. 4 is a wireless networking standard developed for low-power, low-data-rate applications in Personal Area Networks (PANs) for IoT, embedded systems, and wireless sensor networks.

## Application:

- Monitoring Turbidity at Dredging Sites
- Monitoring Dissolved Oxygen at Hydropower Facilities
- Monitoring Scour at Bridges and Offshore Structures
- Temperature Profiling in Lakes
- Inland Lake Monitoring
- Stream and River Monitoring
- Flood Warning Systems