SMART WATER MANAGEMENT

USING IOT

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DEVELOPMENT PART 2 :

Introduction:

Smart water management involves the intelligent planning, monitoring, and optimization of water-related processes to ensure the efficient and sustainable use of this precious

resource. It plays a pivotal role in environmental conservation, addressing water scarcity issues, and enhancing overall water quality. The integration of technology, data analytics, and proactive strategies is key to achieving smart water management goal

BLOCK   DIAGRAM :
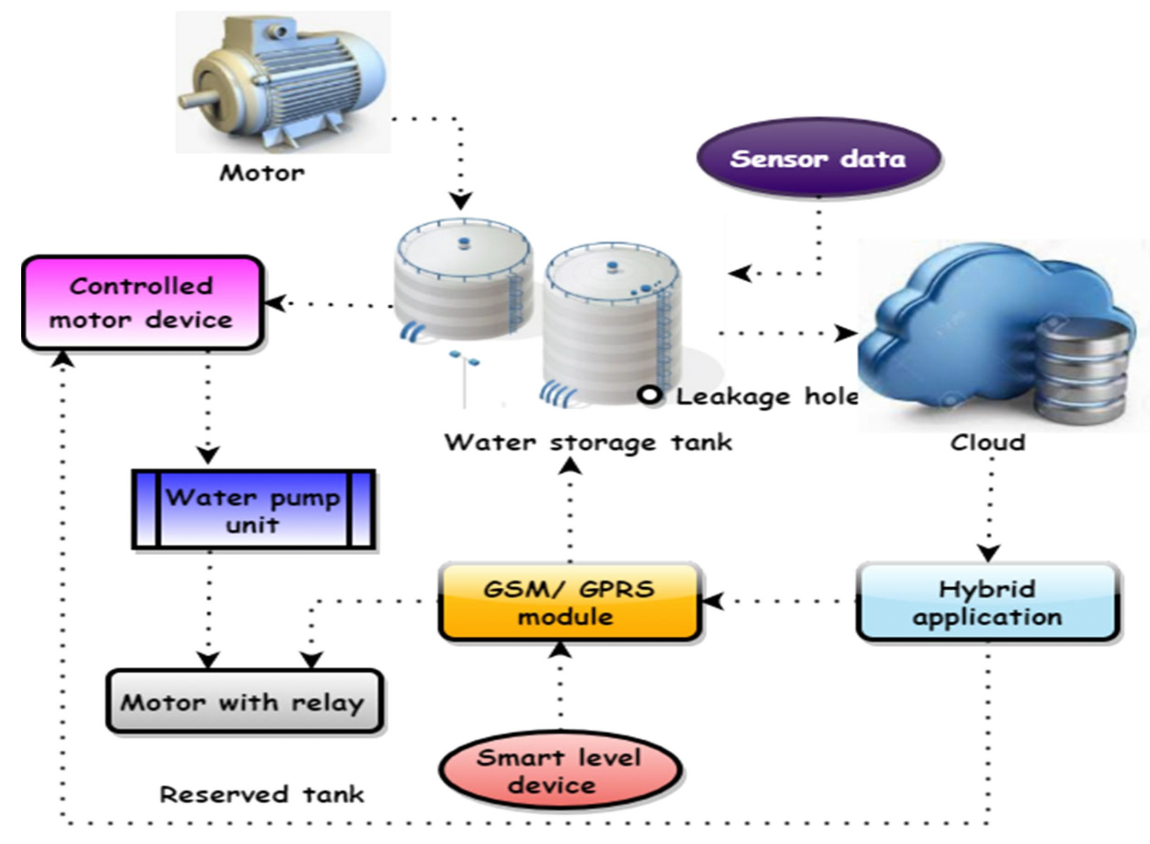
Defining Project Requirements:

Begin by clearly defining the objectives of your Smart Water Management project. What specific data are you looking to collect and analyze? What problems are you trying to solve? Understanding your project's goals is essential

BENEFITS OF SMART WATER SOLUTIONS
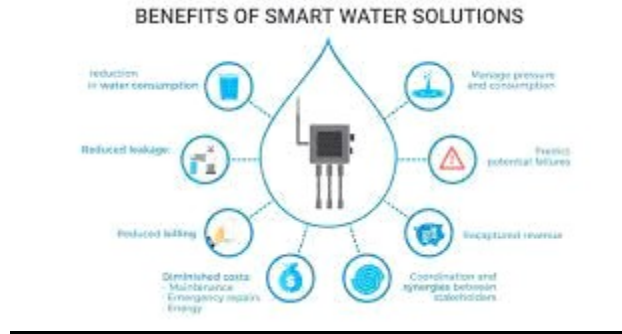
IoT Device Deployment:

Choose the appropriate IoT devices for your project. These devices should be capable of collecting, processing, and transmitting data to a central server or cloud platform.

Key Advantages of Smart Water Management using IoT

01 Automated Water Reading — Record water levels real-time at storage tanks/sumps

02 Automatic Power Control — Switch motor ON Off based on water levels

03 Pay as per Usage — Generate bills and know statics of water and usage

04 Real Time Level Monitoring — Check the quantity of water levels at tanks

05 Alert Notification — Check Water Quality Monitor consumption, inlet/outlet flow

06 Check Water Quality — Check for any harmful arsenic and report authorities

07 Cost Effective — Reduce huge operational expenditures and increased ROI in the upcoming years

08 Automated Reporting — Reduce manual errors and get Weekly reports & Forecast

09 NRW Management — Fight Non-Revenue Water with data

10 Demand & Supply of Water — Match demand-supply via demand forecasting

Data Analysis and Visualization:

Set up a data analysis platform that can receive data from your IoT devices and perform relevant analyses. Tools like Python libraries (e.g.,

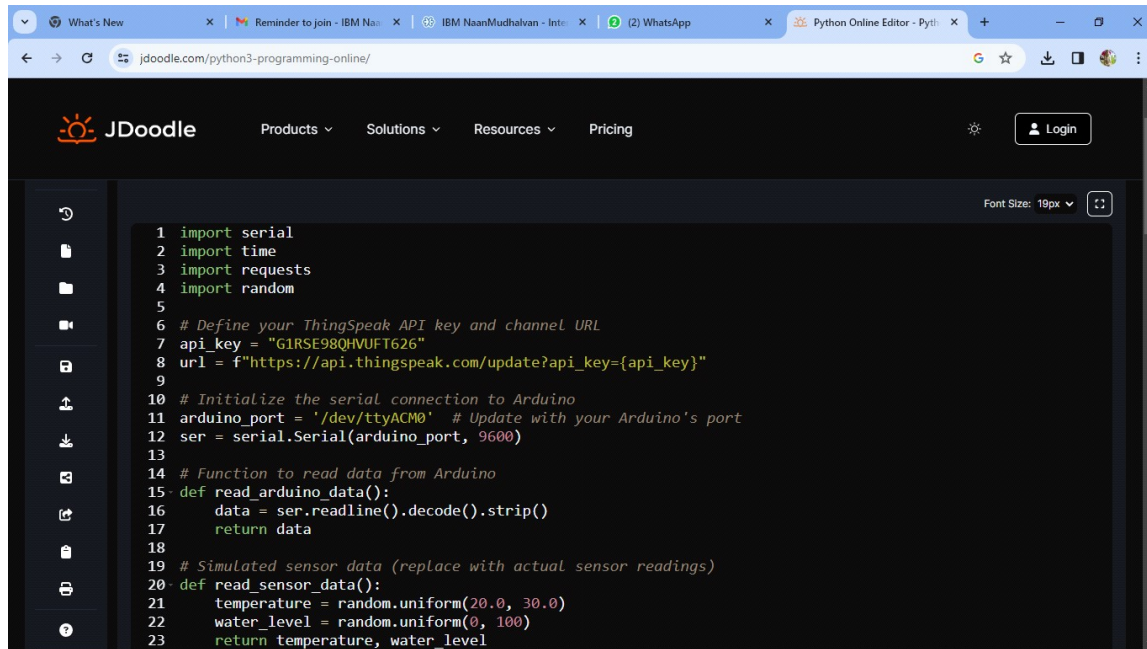Pandas, Matplotlib, Seaborn) can be used for data analysis and visualization.
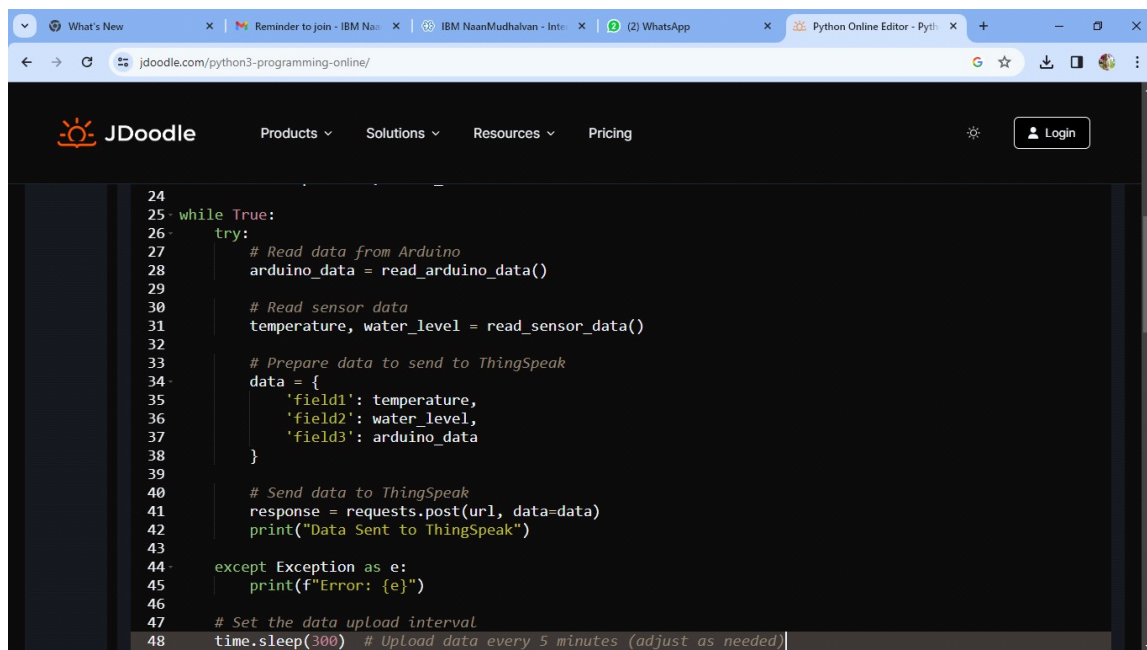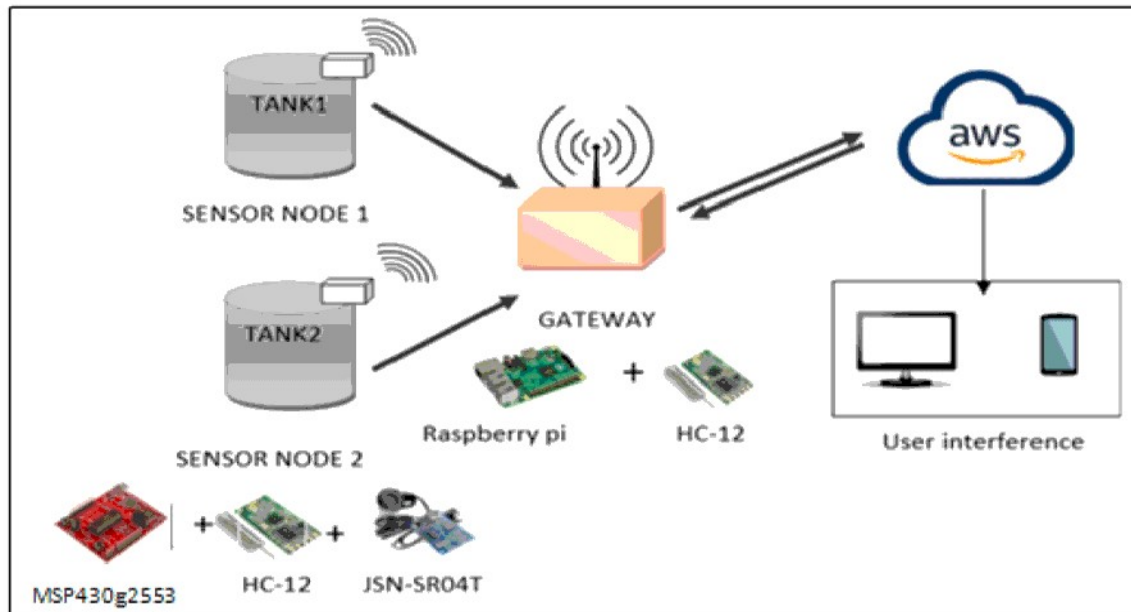

Remote Monitoring and Alerts:

Implement remote monitoring and alerting systems to notify relevant stakeholders when specific water parameters go beyond predefined thresholds. This can be done through emails, SMS, or mobile apps.

PYTHON PROGRAM :


```python
1   import serial
2   import time
3   import requests
4   import random
5
6   # Define your ThingSpeak API key and channel URL
7   api_key = "G1RSE98QHVUFT626"
8   url = f"https://api.thingspeak.com/update?api_key={api_key}"
9
10  # Initialize the serial connection to Arduino
11  arduino_port = '/dev/ttyACM0'  # Update with your Arduino's port
12  ser = serial.Serial(arduino_port, 9600)
13
14  # Function to read data from Arduino
15  def read_arduino_data():
16      data = ser.readline().decode().strip()
17      return data
18
19  # Simulated sensor data (replace with actual sensor readings)
20  def read_sensor_data():
21      temperature = random.uniform(20.0, 30.0)
22      water_level = random.uniform(0, 100)
23      return temperature, water_level
```



```python
24
25  while True:
26      try:
27          # Read data from Arduino
28          arduino_data = read_arduino_data()
29
30          # Read sensor data
31          temperature, water_level = read_sensor_data()
32
33          # Prepare data to send to ThingSpeak
34          data = {
35              'field1': temperature,
36              'field2': water_level,
37              'field3': arduino_data
38          }
39
40          # Send data to ThingSpeak
41          response = requests.post(url, data=data)
42          print("Data Sent to ThingSpeak")
43
44      except Exception as e:
45          print(f"Error: {e}")
46
47      # Set the data upload interval
48      time.sleep(300)  # Upload data every 5 minutes (adjust as needed)
```

OUTPUT :

Dear user, need your attention here. The
water tanks will be filled in 5450 seconds

📢📢 You can turn off the water motor by
the following ways:
👉 Direct API Request:
https://bit.ly/3ghdLbl
👉 Cloud Dashboard:
https://bit.ly/3AWkBLl
👉 Dedicated Web Application:
https://wheels4water.me

You can use any of the methods as per your
convenience and in case you forgot to switch
it off, it will be done on my own.

Save Water & i 🙏 🙏

2:36 PM