PROJECT REPORT

REAL TIME RIVER WATER QUALITY MONITORING AND CONTROL SYSTEM

TEAM ID : PNT2022TMID07790

TEAM MEMBERS
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1:
Intoduction:
Wireless communication developments are creating new sensor capabilities. The current developments in the field of sensor networks are critical for environmental applications. Internet of Things (IoT) allows connections among various devices with the ability to exchange and gather data. IoT also extends its capability to environmental issues in addition to automation industry by using industry 4.0. As water is one of the basic needs of human survival, it is required to incorporate some mechanism to monitor water quality time to time. Around 40% of deaths are caused due to contaminated water in the world. Hence, there is a necessity to ensure supply of purified drinking water for the people both in cities and villages. Water Quality Monitoring (WQM) is a cost-effective and efficient system designed to monitor drinking water quality which makes use of Internet of Things (IoT) technology. In this paper, the proposed system consists of several sensors to measure various parameters such as pH value, the turbidity in the water, level of water in the tank, temperature and humidity of the surrounding atmosphere. And also, the Microcontroller Unit (MCU) interfaced with these sensors and further processing is performed at Personal Computer (PC). The obtained data is sent to the cloud by using IoT based ThinkSpeak application to monitor the quality of the water.
1.1:
Project Overview :
- River water quality can be monitored by the web application.
- Can be able to know if there are any dust particles present in the water.

● The PH level of the water can be monitored.
● Water temperature can be monitored.
● Alerting the authorities if the water quality is not good so that they can go and announce the localities not to drink that water.

1.2:
Purpose:
● Results are used to pinpoint any changes or trends that appear in water bodies over a period of time. These can be short of long term developments.

● Regularly monitoring water quality is a crucial part of identifying any existing problems, or any issues that could emerge in the future. For example, data has been used to reveal that over the past few years, increases in fertilisers used for food production had increased global nitrogen pollution in rivers by up to 20%.

● When designing and developing pollution prevention and management strategies data collected from water quality monitoring efforts is hugely helpful. With 70% of untreated industrial waste dumped straight into water systems, pollution management is a must.

● Today governments, communities and businesses are required to meet a range of water quality goals. Monitoring data is used to determine whether or not pollution regulations are being complied with.

● From oil spills and radiation leaks to floods and mass erosion, water quality monitoring data is a must when developing emergency strategies.

2.LITERATURE SURVEY PNT2022TMID07790

PAPER 1:
TITLE 1: River Water Quality Robot Embedded with Real-Time Monitoring System: Design and Implementation
AUTHOR: Mohd Amirul Aizad M. Shahrani;Safaa Najah Saud Al-Humairi;Nurul Shahira Mohammad Puad;Muhammad Asyraf Zulkipli.
DESCRIPTION: New sensor capabilities and implementations are being developed by wireless communication. For environmental applications, recent developments in sensor networking are essential. The Things Internet (IOT) allows links between different devices to share and collect data. In addition to automation, IOT expands its capabilities by using Industry 4.0 to resolve environmental concerns. Since water is one of the fundamental requirements of human survival and life underwater, some mechanism is necessary to occasionally control water quality. This paper proposed an autonomous robot occupied with real-time multi sensory (pH, temperature,

voltage and garbage level) for better water quality. The data were recorded using sensors and transmitted via Wi-Fi to a designed MIT inventor mobile application and stored in the cloud to monitor the water quality. The river water robot is also attached to a self-power generator using a solar cell and wind turbines. Based on the obtained results, it was found that the pH of the tested river water in the range of 2-4.6, which considered to be highly acidic. In conclusion, the designed robot had shown significant functionality in the real-time receiving and transmitted data with no human interfering required.
Published in: 2021 IEEE 12th Control and System Graduate Research Colloquium (ICSGRC)

PAPER 2:
TITLE: Floating Robot Control System for Monitoring Water Quality Levels in Citarum River
AUTHOR: Reza Putra Pratama; Angga Rusdinar; Ig. Prasetya Dwi Wibawa
DESCRIPTION : Water is the primary need of every living thing, with the availability of water for living things, it is very helpful for daily needs. Especially river water in Indonesia has been heavily polluted, the pollution can come from industrial, household, agricultural and fishery waste. Therefore, the purpose of this research was to make a robotic solution to monitor river water quality regularly and can be monitored in real-time. The results obtained from this test were spherical robots and for fuzzy logic controller systems use 5 membership functions for yaw parameters with a sensor reading angle limit value [-90°, 90°]. For the pitch parameter, there were 3 membership functions with the limitation of sensor reading angle value [-32°, 32°]. There is a moving average as a filter to process the reading value of the gyroscope with a sample value of 10 times the reading because the response was following the actual reading and minimal noise. Dispatched of robot control commands can be sent and received in real-time. Haversine Formula calculation results had an accuracy of 92.67076% compared to the calculation of the distance from google maps.
Published in : 2019 IEEE International Conference on Internet of Things and Intelligence System (IoTaIS)

PAPER 3:
TITLE: Design of IoT-Based River Water Monitoring Robot Data Transmission Model Using Low Power Wide Area Network (LPWAN) Communication Technology
AUTHOR: Rahayu Dwi Lestari; Angga Rusdinar; Muhammad Ary Murti; Gilang Tawaqal; Dongho Lee
DESCRIPTION:
River water monitoring system was one of the efforts as a contribution to control the pollution and/or damage of the Citarum watershed in Indonesia based on Presidential Decree Number 15 of 2018. Monitoring

of Citarum River water quality is essential because it is to know its condition. Despite that, regular monitoring requires water samples to be taken to the laboratory to be tested. Therefore it was not real-time and wasteful of energy. In this paper, a design of IoT-based river water quality monitoring-system using LPWAN communication technology will be proposed so that monitoring points on the Citarum watershed can be monitored in real-time and the results of monitoring data will be stored in the server for data logging. A test about communication range was performed with four nodes and one gateway with LoRa transceiver paired with Arduino boards, as LPWAN communication method, to be able to exchange information in terms of hardware and implement network mesh topologies to widen monitoring points in terms of software. It is shown from the test result that the communication range for the transmission between node to node or node to gateway reaches a maximum of 500 m close on the surface of the water.
Published in: 2019 IEEE International Conference on Internet of Things and Intelligence System (IoTaIS)

PAPER 4:
TITLE: Evaluation and Analysis of Goodness of Fit for Water Quality Parameters Using Linear Regression Through the Internet-of-Things-Based Water Quality Monitoring System
AUTHOR: Harish H. Kenchannavar; Prasad M. Pujar; Raviraj M. Kulkarni; Umakant P. Kulkarni
DESCRIPTION:
Freshwater is the planet's most important natural resource and is prone to pollution, making it necessary for real-time monitoring. The Internet-of-Things (IoT)-enabled water quality monitoring (WQM) system enabled real-time monitoring of freshwater resources. The WQM uses physicochemical parameters, such as temperature, pH, dissolved oxygen, electrical conductivity, biochemical oxygen demand, nitrate, and total dissolved solids to control the water quality. The advent of IoT had proven its effectiveness in capturing, studying, and continuously transmitting environmental data in real time. Mineral-rich watersheds experienced the exploitation of available resources in and around rivers, leading to urgent real-time monitoring of river water. The operation pollutes the water by mixing different types of toxic waste, namely, urban,

industrial, and agricultural, making it unusable for human activities. In India, the traditional method of taking samples from the site, bringing them to the laboratory, and performing the analysis of the samples was in practice, it took a day or two to get results and it does not happen in real time, causing water-borne diseases among inhabitants of watersheds. This article attempted to assess the water quality of the Ghataprabha river. Water samples were took from the river via the WQM system from identified sampling points and subjected to linear regression analysis to estimate the relationships and goodness of fit between the parameters. Once the parameter relationship was known, a one-way ANOVA was applied to the water samples and the water quality is analyzed using the ANOVA hypothesis. Additionally, the river data set can be used to train the WQM system.

Published in: IEEE Internet of Things Journal

PAPER 5:

TITLE:

Design and modelling of cable suspended sonde for water quality monitoring

AUTHOR: Gayathri Surendran; Ganesha Udupa; G. J. Nair

DESCRIPTION:

Quality of water bodies was measured for environmental monitoring, irrigation and potable water. The depth of water bodies like river, lake, well and pond, varies between 3m to 10m. In the recommended system, water qualities, namely, pH, turbidity and temperature are logged automatically from a floating platform and the data is transmitted to the shore for further analysis. The sensor box was suspended by a cable from the floating platform and an automatic winch mechanism is used for lowering the box for vertical profiling. Two Arduino microcontrollers are used for data collection, wireless transmission and winch control. Mathematical modelling of displacement of the sensor box due to flow is done using fluid dynamic equations. Depth of the sensor box was obtained from the ultrasound sensors. Communication from the sensor box to the platform is done through serial interface and the data is transmitted from the platform to the shore via bidirectional WiFi. The system is capable of measuring, logging and profiling water quality at different locations and providing it in near real time for assessing environmental impact.

Published in: 2017 International Conference on Intelligent Computing, Instrumentation and Control Technologies (ICICICT)

PAPER 6:

TITLE :River Water Quality Monitoring and Simulation Based on Web GIS

AUTHOR: Niu Maojing

DESCRIPTION:

With the progress of industry, river pollution is becoming more and more serious. Web GIS technology was used to monitor and simulate the river water quality, achieved the goal of controlling water environment condition in real time and dynamically. Moreover, Web GIS has the advantages of map visualization and network transmission, which could be used to complete the task of water quality monitoring and simulation on different sites, improving work efficiency remarkably.

Published in: 2016 Sixth International Conference on Instrumentation & Measurement, Computer, Communication and Control (IMCCC).

PAPER 7:

TITLE: Predictive power management for a solar-powered off-grid surface water quality monitoring system

AUTHOR: Raja Rehan Khalid; Angelika Meyer; Josef Meiers; Horst P. Beck; Georg Frey

DESCRIPTION:

The paper investigates the mobile real time measuring station incorporating renewable energies to monitor the surface water quality. This type of measuring stations are designed to establish the Water Framework Directive (WFD) perceived by European Commission. The core goal in the discussed work was to attain self-reliance by the mobile monitoring station, by maximized the use of renewable source energy and limit the utilization of energy produced by conventional ways. To attain such goal, further enhancement was achieved in such system by realizing Power Management System (PMS) incorporating predictive controls, to overcome the fluctuating behaviour for automated data collection for surface water quality and power failure in renewable energy system. To include the prediction within the measuring station PMS, Support Vector

Machines (SVM) as a machine learning method was considered. The paper also presents architecture for predictive power management system for real time measuring station as a case study model.
Published in: 2016 IEEE 11th Conference on Industrial Electronics and Applications (ICIEA)

PAPER 8:
TITLE: Real Time Wireless Monitoring and Control of Water Systems Using Zigbee 802.15.4
AUTHOR: Saima Maqbool; Nidhi Chandra
DESCRIPTION:
In this paper we have shown how to monitor the water level of water systems such as water tanks, rivers, ground water table, and bore wells remotely. It had also shown that how to control the working of pump automatically and remotely. It can also be used to remotely monitor the flood areas wirelessly and information can be sent to mobile wirelessly. This project is designed to monitor the water level with the help of water level sensors, Zigbee 802.15.4, 74HC14 inverter and GSM technology. Furthermore, it can monitor the quality of water with the help of water quality sensors such as turbidity sensor and dissolved oxygen sensor. In this monitoring system, sensors monitor the water level, dissolved oxygen, turbidity, temperature and pH level of the water at some predefined sensing interval. This approach would help in reducing the water overflow and home power consumption.
Published in: 2013 5th International Conference and Computational Intelligence and Communication Networks

PAPER 9:
TITLE: Development and Application of Mobile Water Level Monitoring Based on Multi-sensor Integration
AUTHOR: Hongmei Zhang; Weiliang Tao; Ming Cao
DESCRIPTION:
According to the current status of water level monitoring of inland river, this paper presented and designed a multi-sensor integrated dynamic

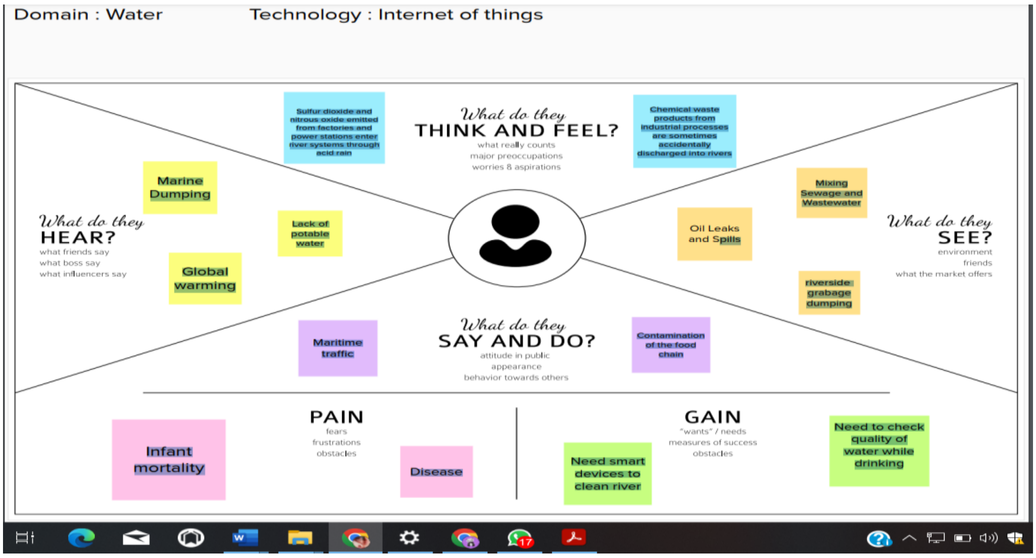
system for mobile water level measurement, which was based on CORS(continuous operational reference system) GPS(global positioning system), GPRS(general packet radio service), PDA(personal digital assistant) technology as well as a post processing platform. The system design, signal quality control and data processing are researched in detail. This system had been used for an actual experiment. The results show that this system has high stability, reliability and flexibility. It was a very-well supplement for the present water level monitoring based on water-level stations.
Published in: 2010 International Conference on Electrical and Control Engineering

PAPER 10:
TITLE: A demonstration of wireless sensing for long term monitoring of water quality
AUTHOR: Fiona Regan; Antoin Lawlor; Brendan O Flynn; J. Torres; R Martinez-Catala; C. O'Mathuna; John Wallace
DESCRIPTION:
At a time when technological advances are providing new sensor capabilities, novel network capabilities, long-range communications technologies and data interpreting and delivery formats via the World Wide Web, we never before had such opportunities to sense and analyse the environment around us. However, the challenges exist. While measurement and detection of environmental pollutants can be successful under laboratory-controlled conditions, continuous in-situ monitoring remains one of the most challenging aspects of environmental sensing. This paper describes the development and test of a multi-sensor heterogeneous real-time water monitoring system. A multi-sensor system was deployed in the River Lee, County Cork, Ireland to monitor water quality parameters such as pH, temperature, conductivity, turbidity and dissolved oxygen. The R. Lee comprises of a tidal water system that provides an interesting test site to monitor. The multi-sensor system set-up is described and results of the sensor deployment and the various challenges are discussed.
Published in: 2009 IEEE 34th Conference on Local Computer Networks

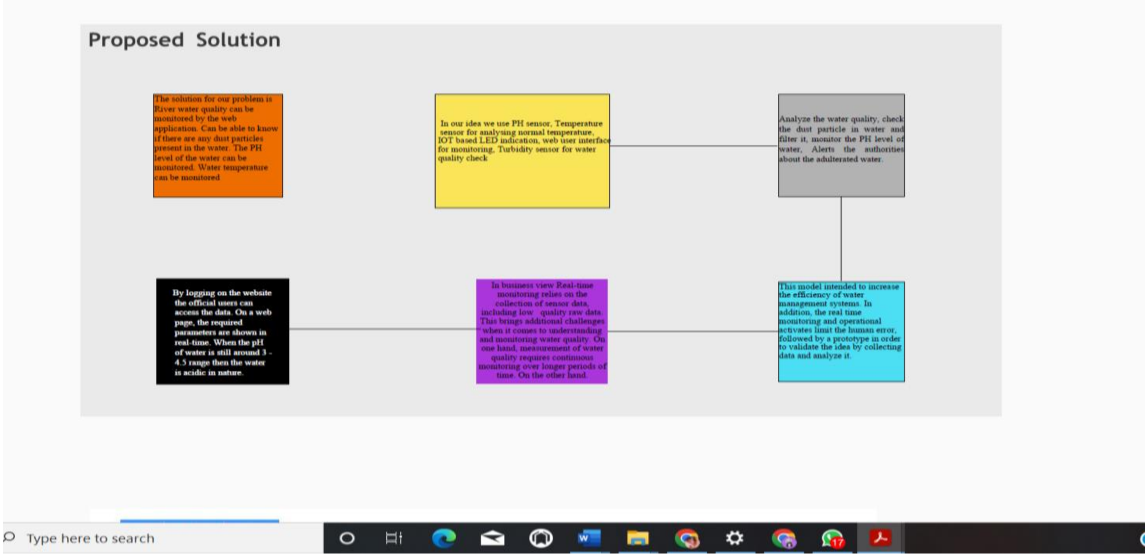
3.IDEATION AND PROPOSED SOLUTION

3.1 Empathy Map Canvas

An empathy map is a simple, easy-to-digest visual that captures knowledge about a user's Behaviours and attitudes.
It is a useful tool to helps teams better understand their users.
Creating an effective solution requires understanding the true problem and the person who is experiencing it. The exercise of creating the map helps participants consider things from the user's perspective along with his or her goals and challenges.



3.2 Ideation and Brainstorming

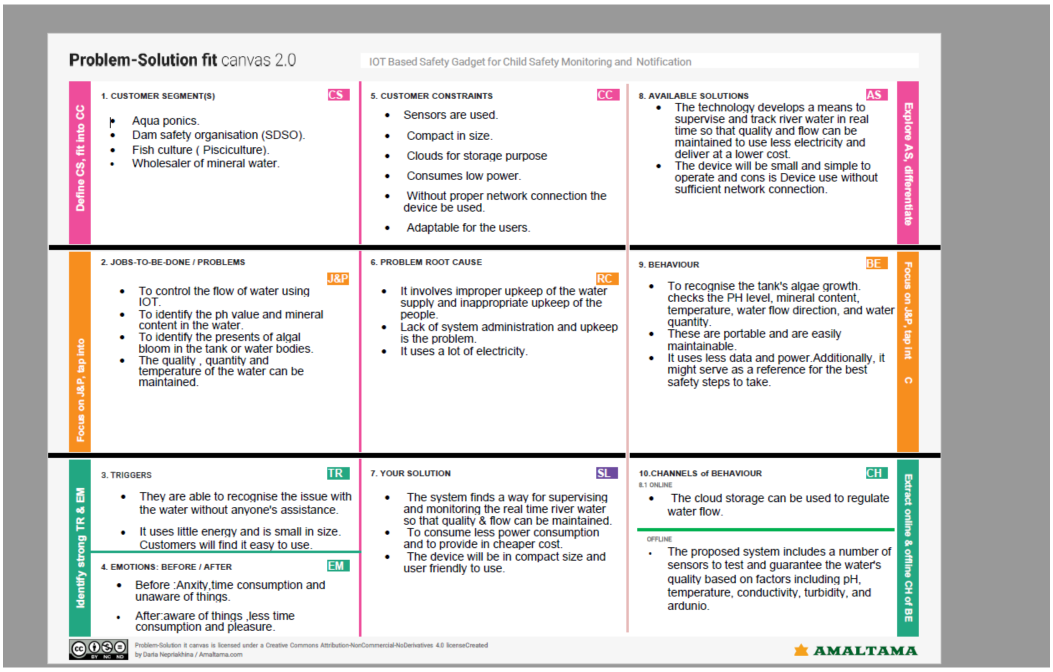


3.3 PROPOSED SOLUTION

S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	The solution for our problem is River water quality can be monitored by the web application. Can be able to know if there are any dust particles present in the water. The PH level of the water can be monitored. Water temperature can be monitored.
2.	Idea / Solution description	In our idea we use PH sensor, Temperature sensor for analysing normal temperature, IOT based LED indication, web user interface for monitoring, Turbidity sensor for water quality check.
3.	Novelty / Uniqueness	Analyze the water quality, check the dust particle in water and filter it, monitor the PH level of water, Alerts the authorities about the adulterated water.
4.	Social Impact / Customer Satisfaction	By logging on the website the official users can access the data. On a web page, the required parameters are shown in real-time. To determine the quality of water, the pH sensor and EC sensor is put into a container which is filled with tap water and 34 drops of acidic is mixed to it. When the pH of water is still around 3 - 4.5 range then the water is acidic in nature. And the surrounding temperature still between 32 to 34 degrees. The waters conductivity is 7 to 9 micro Siemens/ centimeter. The total Dissolved Solids are 0.67*electrical conductivity which is measured from the graph.

5.	Business Model (Revenue Model)	In business view Real-time monitoring relies on the collection of sensor data, including low-quality raw data. This brings additional challenges when it comes to understanding and monitoring water quality. On one hand, measurement of water quality requires continuous monitoring over longer periods of time. On the other hand, in many cases the data describing the status or quality of the water has various restrictions when it comes to access privileges. Therefore, there is a need to be able to provide information to different parties, with different privileges and over extended periods of time.
6.	Scalability of the Solution	This model intended to increase the efficiency of water management systems. In addition, the real time monitoring and operational activates limit the human error, followed by a

3.4 PROPOSED SOLUTION FIT



Problem-Solution fit canvas 2.0

IOT Based Safety Gadget for Child Safety Monitoring and Notification

Define CS, fit into CC

1. CUSTOMER SEGMENT(S) CS

- Aqua ponics.
- Dam safety organisation (SDSO).
- Fish culture (Pisciculture).
- Wholesaler of mineral water.

5. CUSTOMER CONSTRAINTS CC

- Sensors are used.
- Compact in size.
- Clouds for storage purpose
- Consumes low power.
- Without proper network connection the device be used.
- Adaptable for the users.

8. AVAILABLE SOLUTIONS AS

- The technology develops a means to supervise and track river water in real time so that quality and flow can be maintained to use less electricity and deliver at a lower cost.
- The device will be small and simple to operate and cons is Device use without sufficient network connection.

Explore AS, differentiate

Focus on J&P, tap into

2. JOBS-TO-BE-DONE / PROBLEMS J&P

- To control the flow of water using IOT.
- To identify the ph value and mineral content in the water.
- To identify the presents of algal bloom in the tank or water bodies.
- The quality , quantity and temperature of the water can be maintained.

6. PROBLEM ROOT CAUSE RC

- It involves improper upkeep of the water supply and inappropriate upkeep of the people.
- Lack of system administration and upkeep is the problem.
- It uses a lot of electricity.

9. BEHAVIOUR BE

- To recognise the tank's algae growth. checks the PH level, mineral content, temperature, water flow direction, and water quantity.
- These are portable and are easily maintainable.
- It uses less data and power.Additionally, it might serve as a reference for the best safety steps to take.

Focus on J&P, tap int C

Identify strong TR & EM

3. TRIGGERS TR

- They are able to recognise the issue with the water without anyone's assistance.
- It uses little energy and is small in size. Customers will find it easy to use.

4. EMOTIONS: BEFORE / AFTER EM

- Before :Anxity,time consumption and unaware of things.
- After:aware of things ,less time consumption and pleasure.

7. YOUR SOLUTION SL

- The system finds a way for supervising and monitoring the real time river water so that quality & flow can be maintained.
- To consume less power consumption and to provide in cheaper cost.
- The device will be in compact size and user friendly to use.

10.CHANNELS of BEHAVIOUR CH

8.1 ONLINE

- The cloud storage can be used to regulate water flow.

OFFLINE

- The proposed system includes a number of sensors to test and guarantee the water's quality based on factors including pH, temperature, conductivity, turbidity, and ardunio.

Extract online & offline CH of BE

AMALTAMA

4. REQUIREMENTS

4.1 FUNCTIONAL REQUIREMENTS

Functional Requirements: Following are the functional requirements of the proposed solution

. FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	**User Requirements**	River Water Protection pH,Turbitidy ,Humidity and Temperature
FR-2	**User Registration**	Manual Registration Registration through webpage Registration through Form Registration through Gmail
FR-3	**User Confirmation**	Confirmation Via Email Confirmation Via OTP Confirmation Via Phone
FR-4	**Payment Options**	Cash on Delivery Net Banking/UPI Credit/Debit/ATM Card
FR-5	**Product Delivery and Installation**	Door Step delivery Free Installation
FR-6	**Product Feedback**	Through GoogleForms Through Phone calls Through Webpage

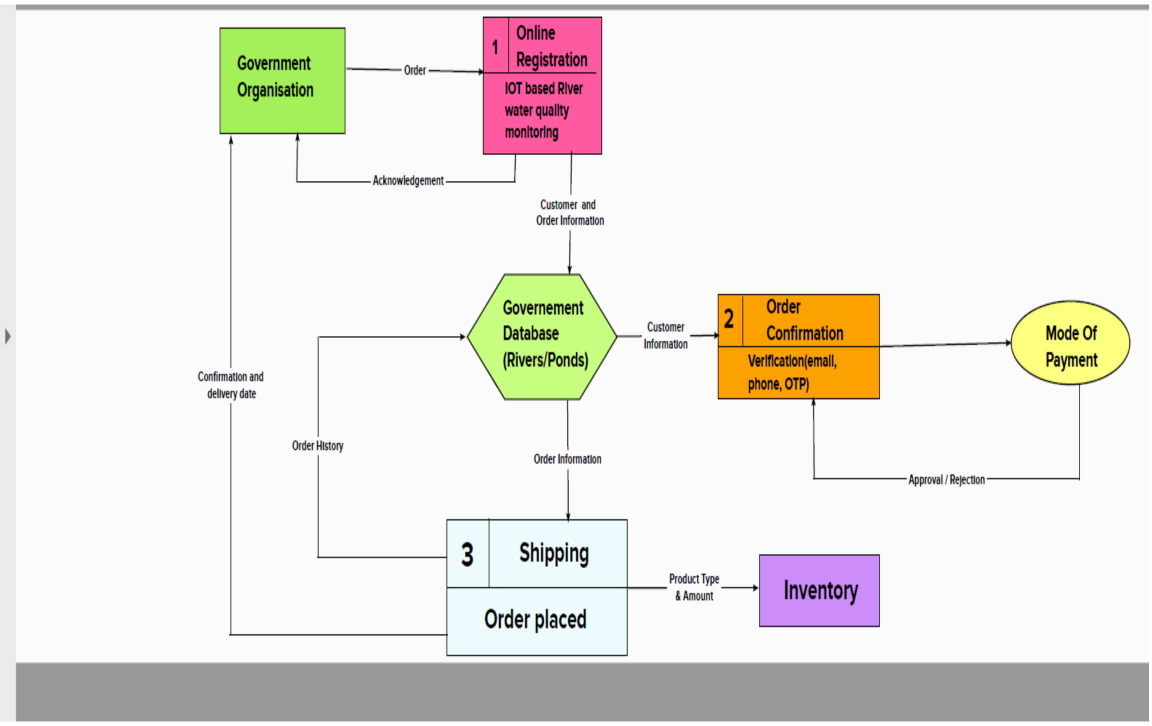
4.2Non-functional Requirements:

Following are the non-functional requirements of the proposed solution.

FR No.	Non-Functional Requirement	Description
NFR-1	**Usability**	Have a clear and self-explanatory manual. Easier to use Even an illiterate farmer have to use the product without any difficulties
NFR-2	**Security**	Application has to be secured with 2 step authorisation Passwords and passkeys will be assigned as per the users need.
NFR-3	**Reliability**	Hardware requires a regular checking and service Software may be updated periodically Immediate alert is provided in case of any system failure
NFR-4	**Performance**	The application must have a good user interface It should have a minimal energy requirement It has to save water and energy
NFR-5	**Availability**	All the features will be available when the user requires. It depends on the need of the farmer and the customization the user has done.
NFR-6	**Scalability**	The product has to cover all the space of land irrespective of the size or area of a farm field

5.PROJECT DESIGN

5.1.DATA FLOW DIAGRAM



5.2 Solution & Technical Architecture

Solution architecture is a complex process – with many sub-processes – that bridges the gap between business problems and technology solutions. Its goals are to:

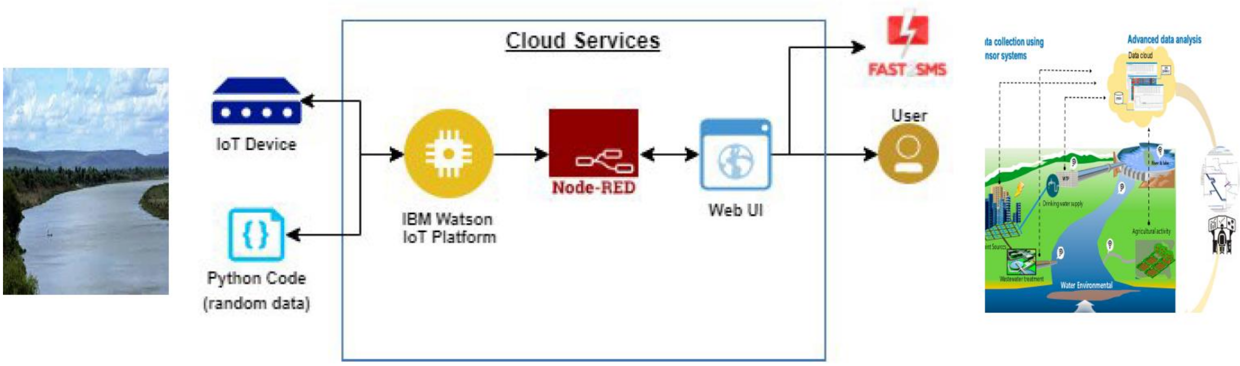
1. Find the best tech solution to solve existing business problems.

2. Describe the structure, characteristics, behaviour, and other aspectsof the software to projectstakeholders.

3. Define features,development phases, and solution requirements.

4. Provide specifications according to which the solution is defined, managed,and delivered.

IOT BASED REAL TIME RIVER WATER QUALITY MONITORING AND CONTROL SYSTEM



SPRINT 1

PROJECT DEVELOPMENT PHASE

PROJECT DEVELOPMENT (SPRINT-1)

Team ID : PNT2022TMID07790

Project Name Project : Real Time River Water Monitoring and Control system

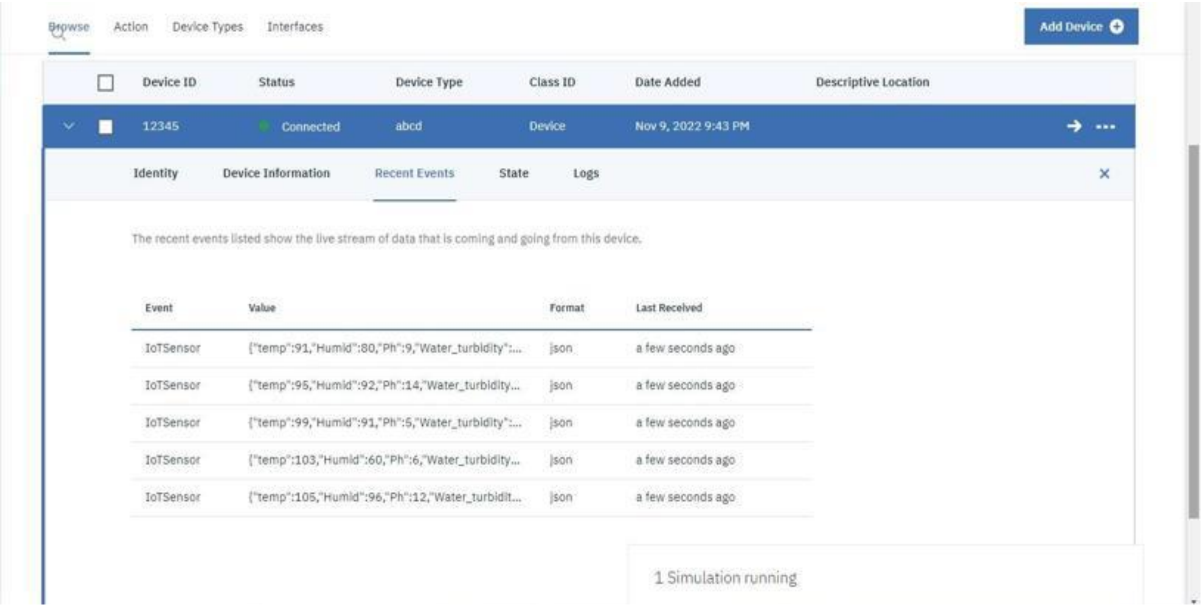
PYTHON CODE:

```
import time

import sys

import ibmiotf.application

import ibmiotf.device

import random

#Provide your IBM Watson Device Credentials organization =
"84708c"

deviceType = "abcd"

deviceId = "12345"

authMethod = "token"

authToken = "12345678"

def myCommandCallback (cmd):

   print ("Command received: %s" % cmd.data['command'])
status=cmd.data['command']

    if status== "motoron":
```

```
      print ("motor is on")
   elif status == "motoroff":
       print ("motor is off")
  else:
      print ("please send proper command")
try:
deviceOptions = {"org": organization, "type": deviceType, "id": deviceId,
"auth-method":authMethod, "auth-token":authToken} deviceCli= ibmiotf.device.Client (deviceOptions)

#..
except Exception as e:
print ("Caught evention connecting device: %s" % str(e)) sys.exit()
```

```
deviceCli.connect() while True:

temp=random.randint (90,110)

Humid=random.randint (60,100)

Ph=random.randint (0,14)

Water_turbidity=random.randint (15,60)

data = {'temp' : temp, 'Humid': Humid, 'Ph' : Ph, 'Water_turbidity' :
Water_turbidity}

def myonPublishCallback():

print ("Published Temperature = %s C" % temp, "Humidity = %s
%%" % Humid,"Ph = %s" % Ph,"Water Turbidity = %s NTU" %
Water_turbidity, "to IBM Watson")

success = deviceCli.publishEvent("IoTSensor", "json", data, qos=0,
on_publish = myonPublishCallback)

if not success:

          print("Not connected to IOTF")

         time.sleep (10)

         deviceCli.commandCallback = myCommandCallback
deviceCli.disconnect()
```

OUTPUT:



SPRINT 2

PROJECT DEVELOPMENT PHASE

PROJECT DEVELOPMENT (SPRINT-2)

Team ID : PNT2022TMID07790

Project Name Project : Real Time River Water Monitoring and Control system

AIM:

To create device in the IOT Watson Platform and Configure Node Red Services.

REQUIREMENT:

IBM cloud, IBM IOT WATSON PLATFORM,NODE RED SERVICES.

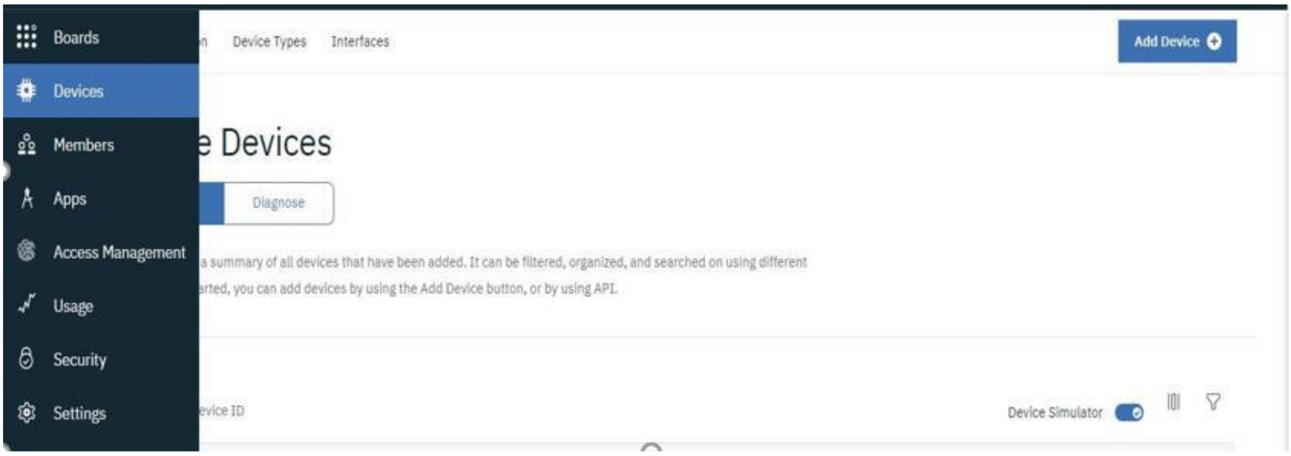
WORKFLOW:

STEP 1:

Log on to IBM cloud and create IBM Watson IOT Platform from IBM cloud Dashboard.

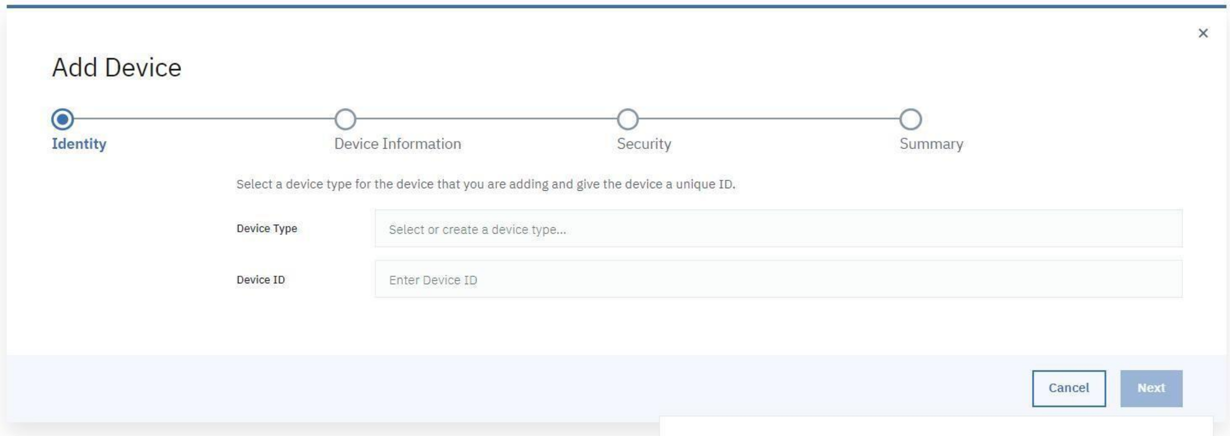
STEP 2:

After Creating IBM Watson IOT Platform,create an Organization (ex.84708c ID: 84708c Bluemix Free)



STEP 3:

Create an device IBM IOT PALTFORM.



TYPE THE REQUIRED FIELDS (TYPE: ESP32 , ID: 1234) GIVE AUTH-TOKEN.

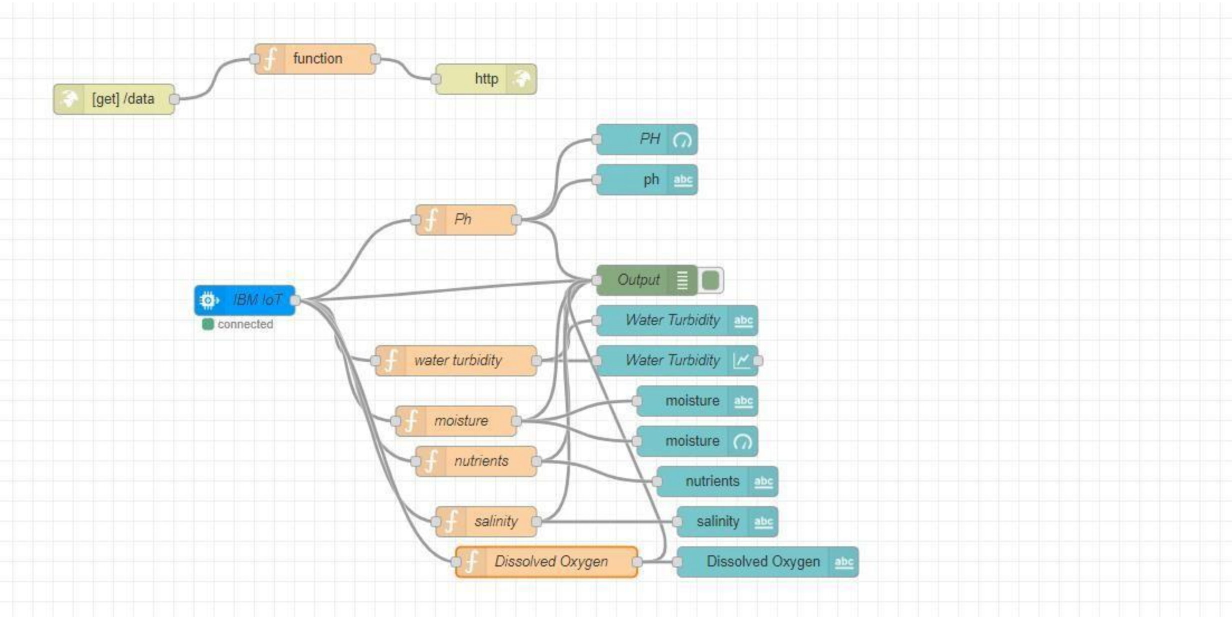
STEP 4:

NODE RED SERVICE

- INSTALL IBM IOT IN MANGE PALETTE.
- INSTALL NODE RED DASHBOARD.

STEP 5:

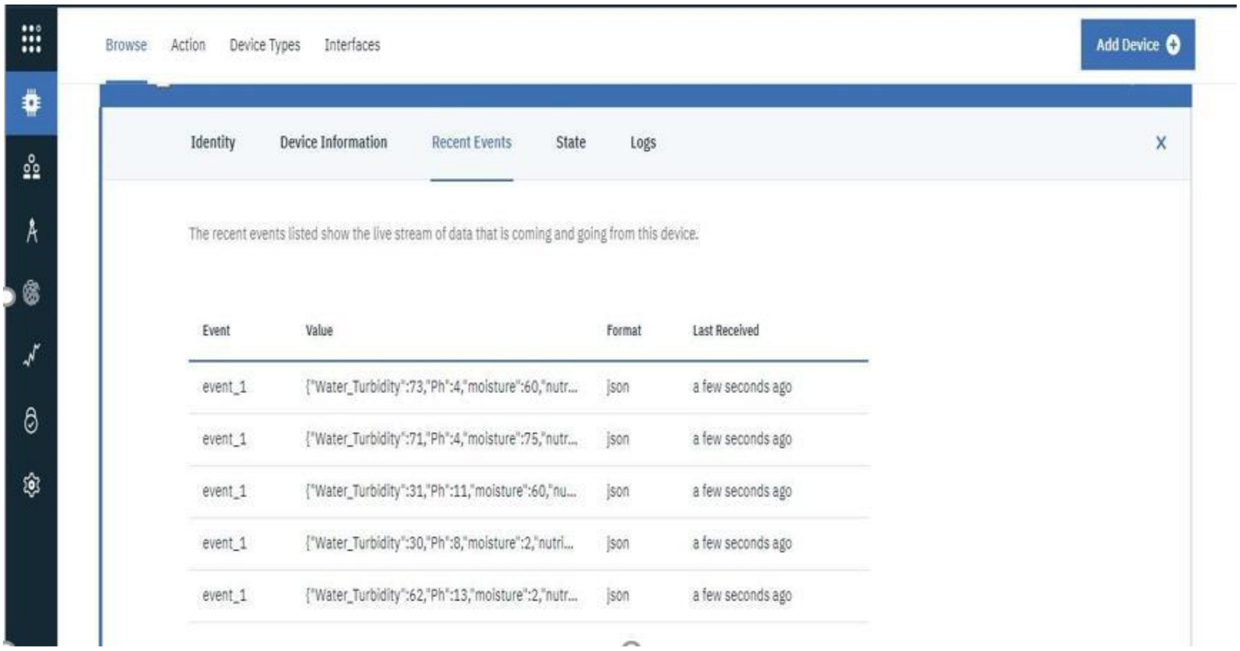
Configuring the corresponding nodes

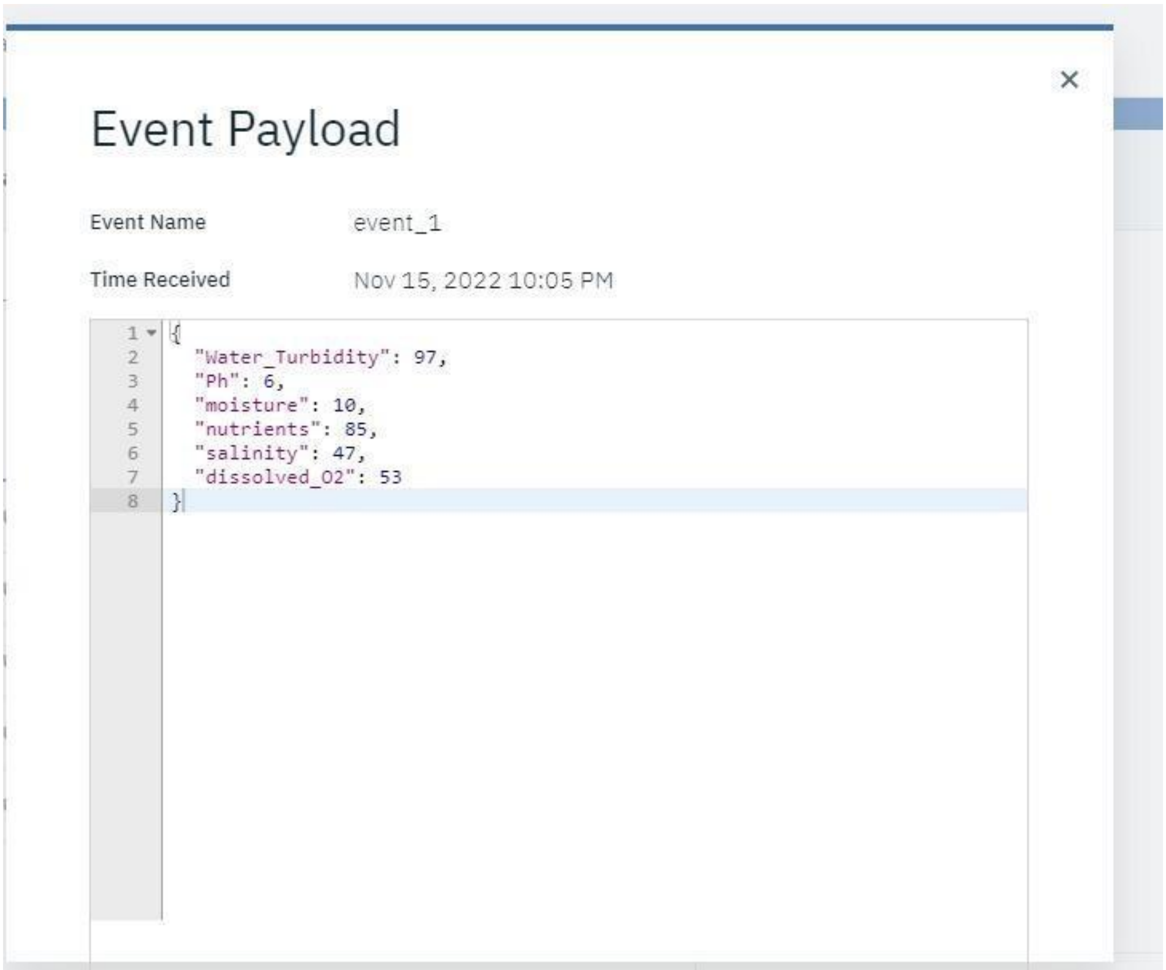


STEP 6:

Deploy the Services and verify the output values.

OUTPUT IN IBM WATSON IOT PLATFORM:


Browse
Action
Device Types
Interfaces
Add Device
Identity
Device Information
Recent Events
State
Logs
The recent events listed show the live stream of data that is coming and going from this device.
Event
Value
Format
Last Received
event_1 {"Water_Turbidity":73,"Ph":4,"moisture":60,"nutr... json a few seconds ago
event_1 {"Water_Turbidity":71,"Ph":4,"moisture":75,"nutr... json a few seconds ago
event_1 {"Water_Turbidity":31,"Ph":11,"moisture":60,"nu... json a few seconds ago
event_1 {"Water_Turbidity":30,"Ph":8,"moisture":2,"nutri... json a few seconds ago
event_1 {"Water_Turbidity":62,"Ph":13,"moisture":2,"nutr... json a few seconds ago


Event Payload
Event Name event_1
Time Received Nov 15, 2022 10:05 PM
{
"Water_Turbidity": 97,
"Ph": 6,
"moisture": 10,
"nutrients": 85,
"salinity": 47,
"dissolved_O2": 53
}

SPRINT 3

PROJECT DEVELOPMENT PHASE

PROJECT DEVELOPMENT (SPRINT-3)

Team ID : PNT2022TMID07790

Project Name Project : Real Time River Water Monitoring and Control system

DESIGN AN APP IN MIT APP INVENTOR PARAMETERS ARE:

1. Ph

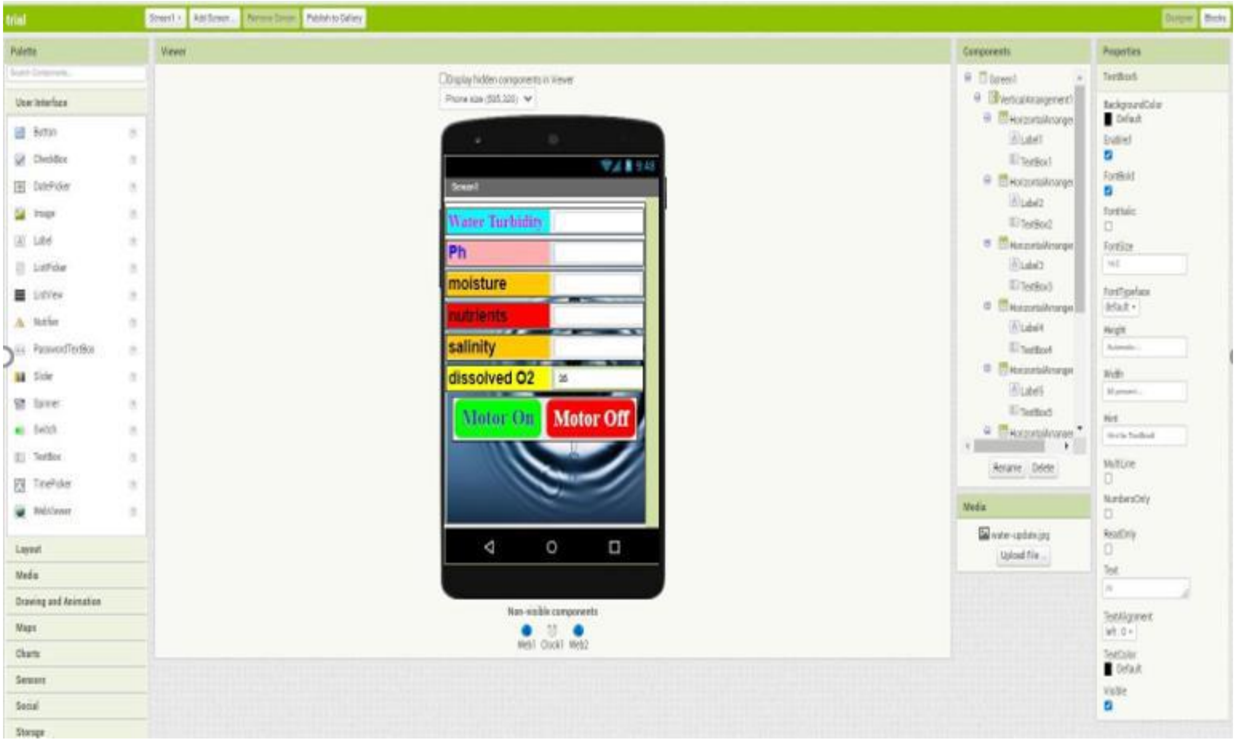
2. Water turbidity

3. Moisture

4. Salinity

5. Dissolved Oxygen

6. Nutrients

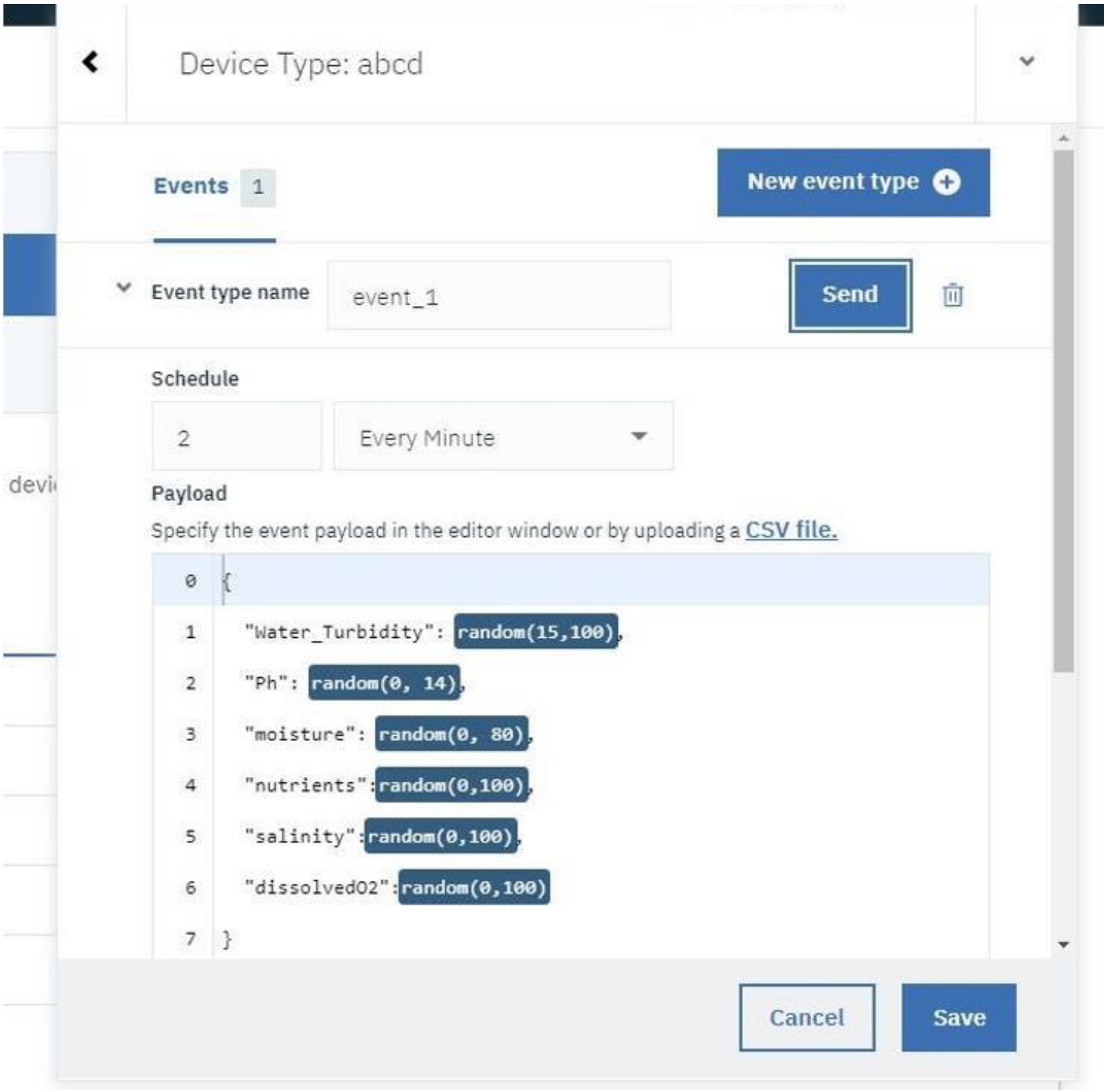


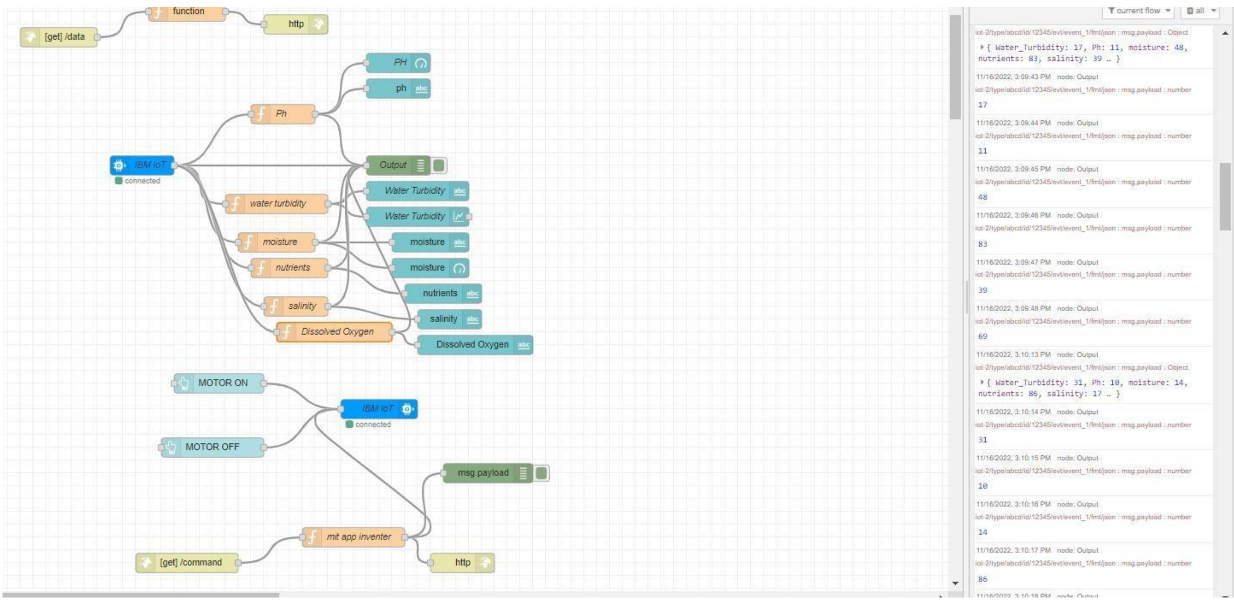
FRAME THE BLOCKS FOR FUNCTIONING

FOR BUTTONS

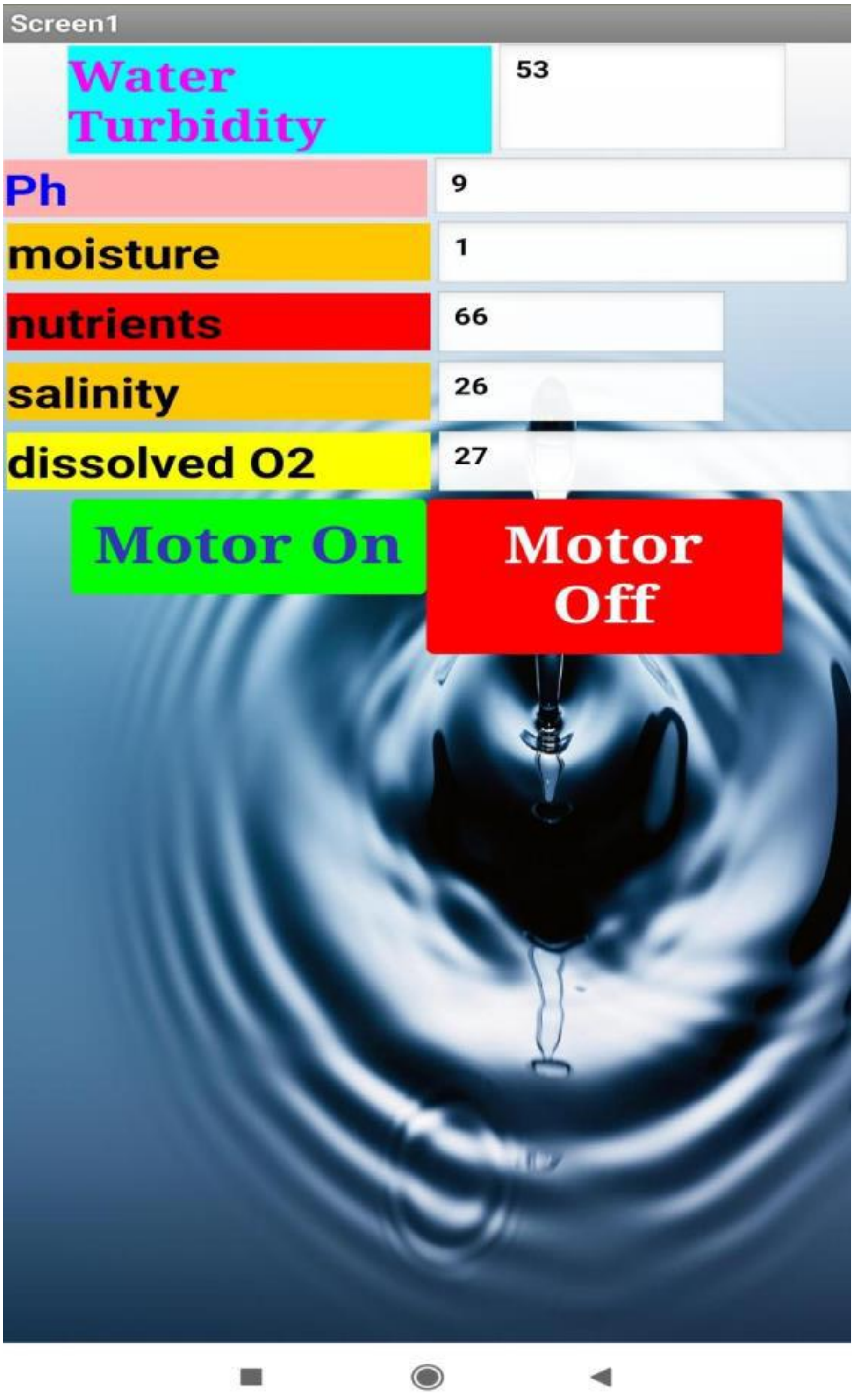
https://node-red-qltdp-2022-11-07.eu-gb.mybluemix.net/data

{"Ph":6,"waterturbidity":78,"moisture":73,"nutrients":10,"salinity":38,"dissolvedO2":50}


Device Type: abcd
Events 1
New event type
Event type name
event_1
Send
Schedule
2
Every Minute
Payload
Specify the event payload in the editor window or by uploading a CSV file.
0 {
1 "Water_Turbidity": random(15,100),
2 "Ph": random(0, 14),
3 "moisture": random(0, 80),
4 "nutrients":random(0,100),
5 "salinity":random(0,100),
6 "dissolvedO2":random(0,100)
7 }
Cancel
Save


function
http
[get] /data
PH
ph
Ph
IBM IoT
connected
Output
water turbidity
Water Turbidity
Water Turbidity
moisture
moisture
moisture
nutrients
nutrients
salinity
salinity
Dissolved Oxygen
Dissolved Oxygen
MOTOR ON
IBM IoT
connected
MOTOR OFF
msg.payload
mit app inventer
[get] /command
http

APP IN MOBILE



SPRINT 4

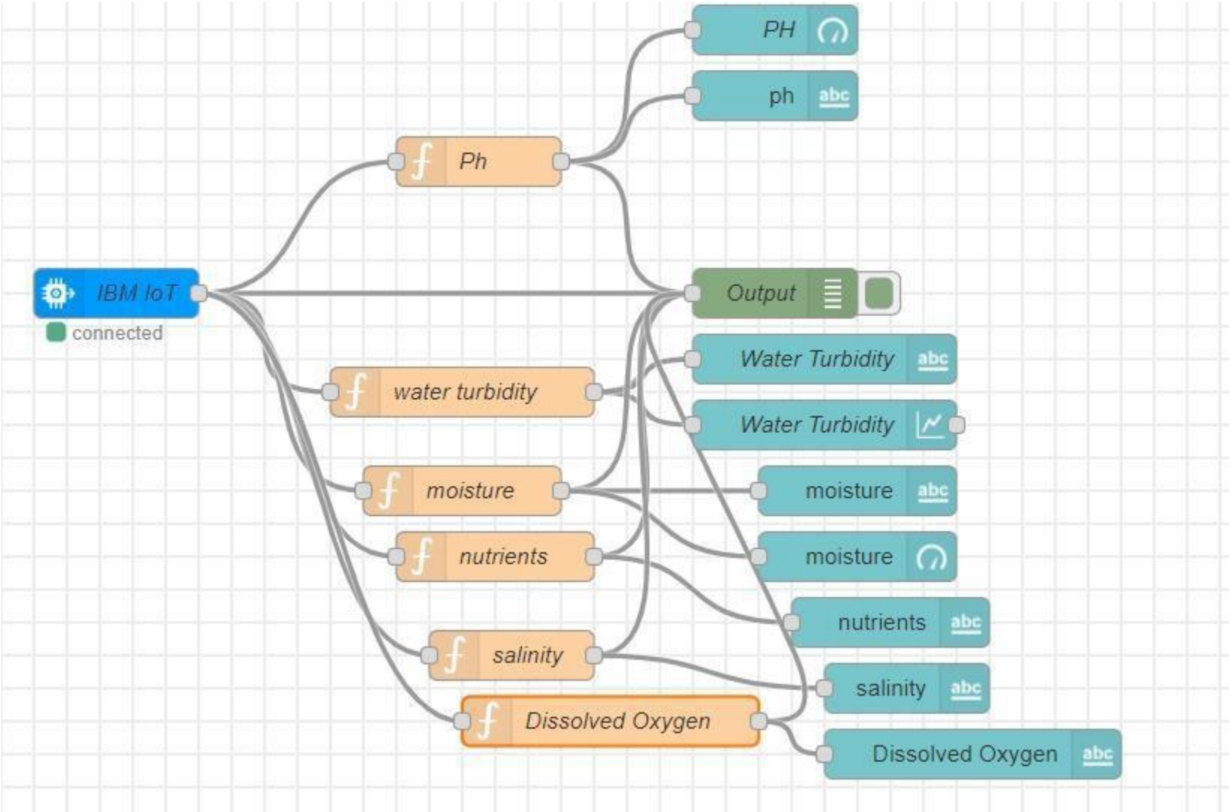
PROJECT DEVELOPMENT PHASE

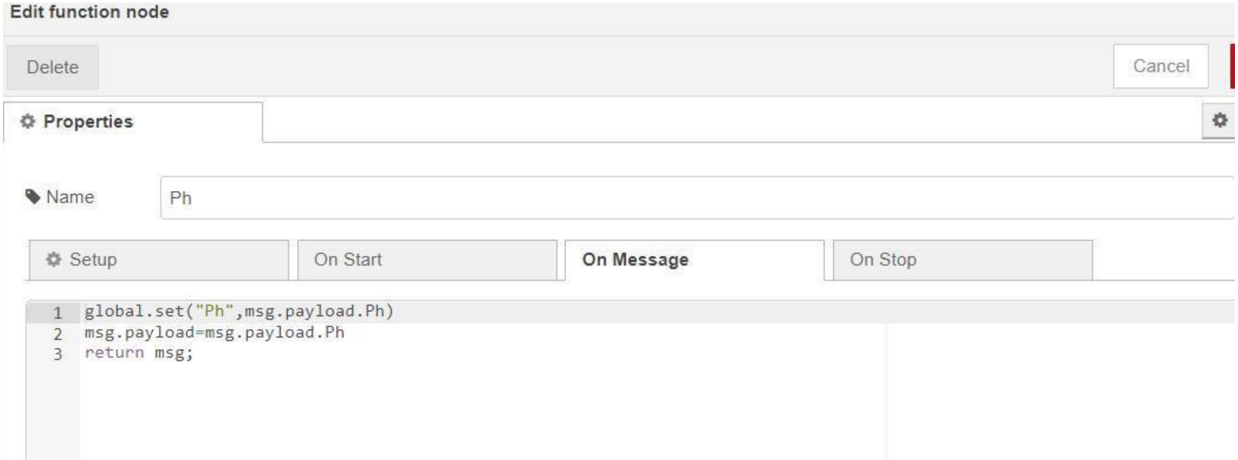
PROJECT DEVELOPMENT (SPRINT-4)

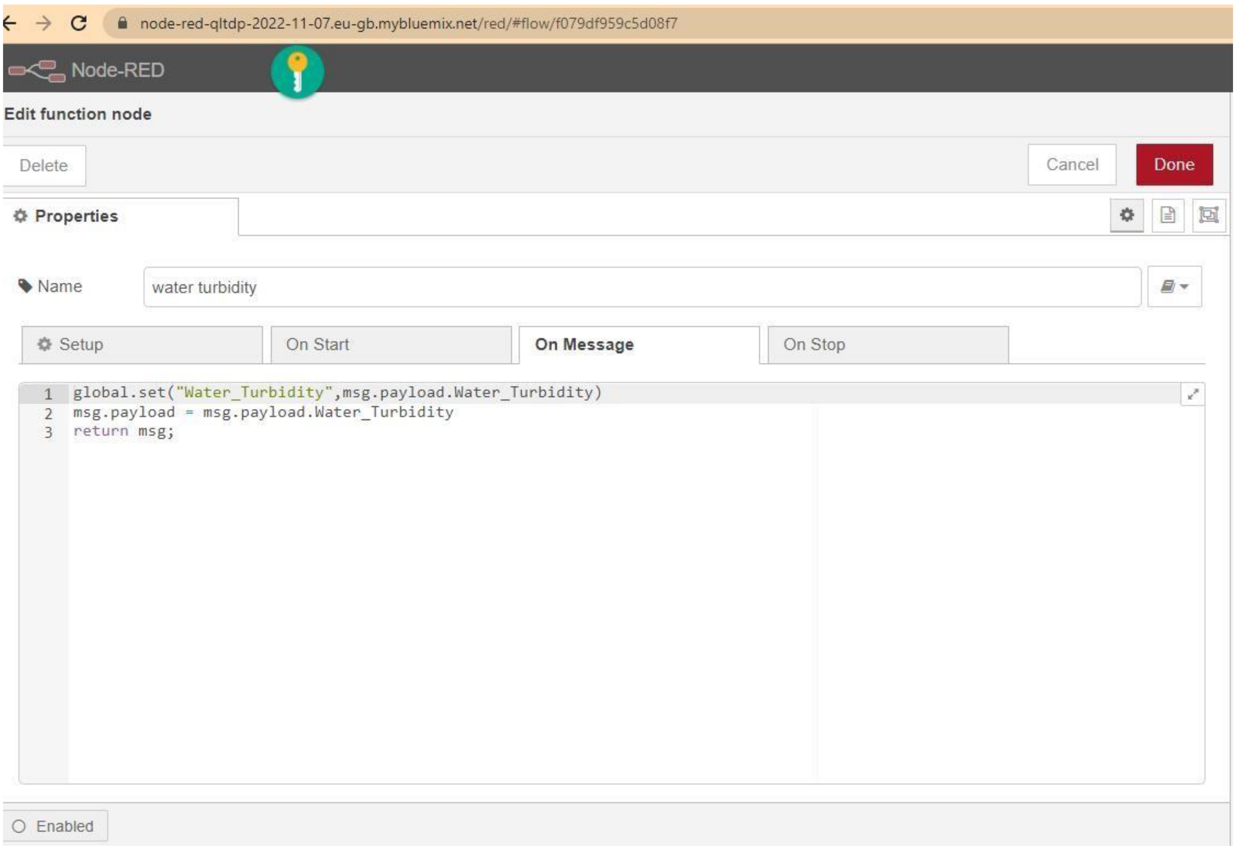
Team ID : PNT2022TMID07790

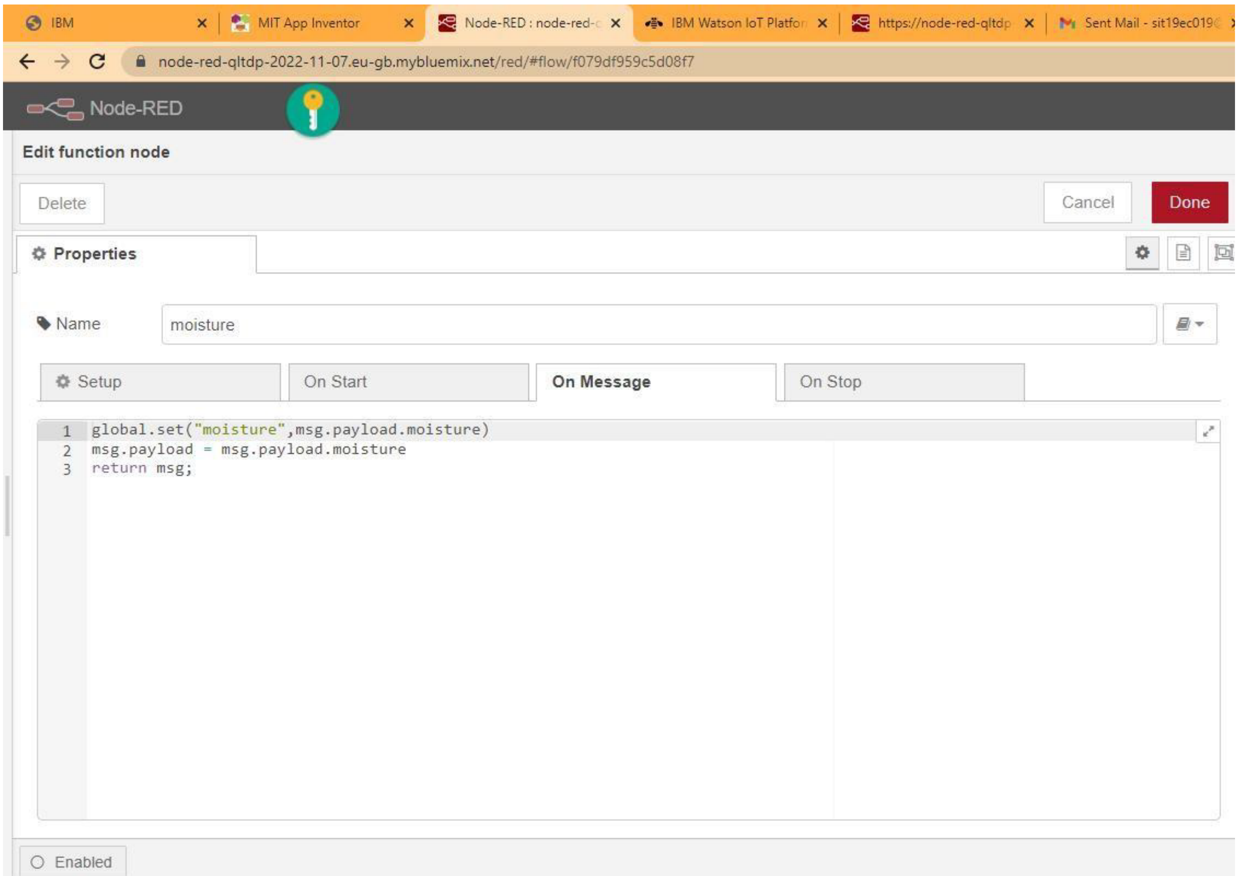
Project Name Project : Real Time River Water Monitoring and Control system

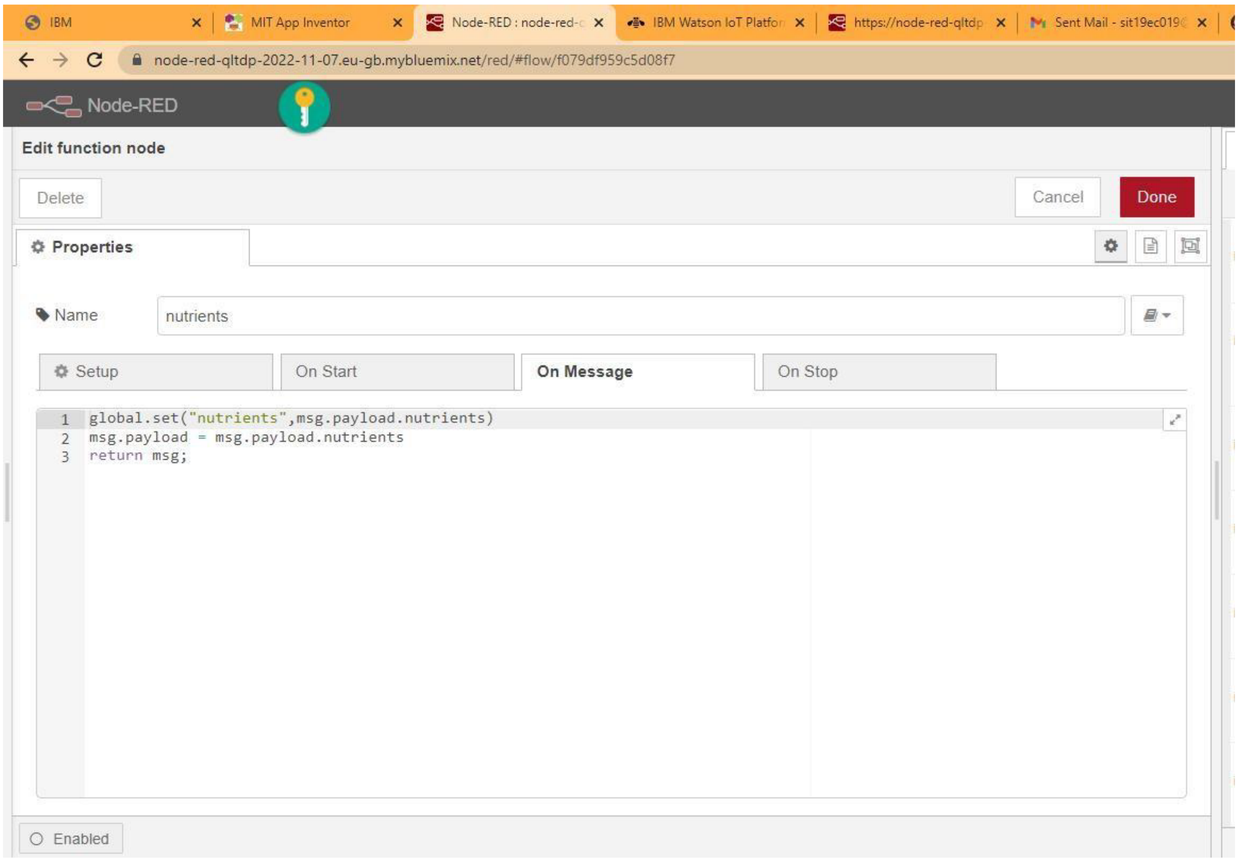
Node-red-dashboard

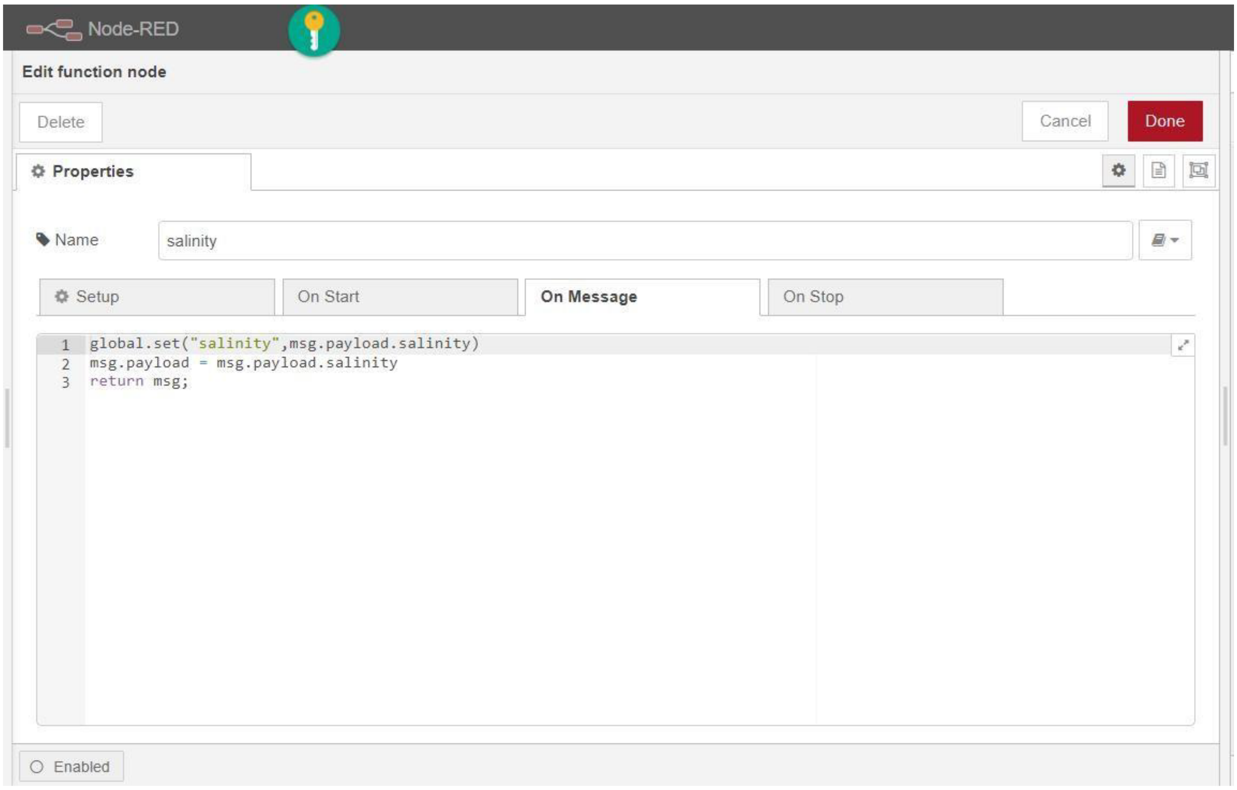



Edit function node
Delete
Cancel
Properties
Name
Ph
Setup
On Start
On Message
On Stop
global.set("Ph",msg.payload.Ph)
msg.payload=msg.payload.Ph
return msg;

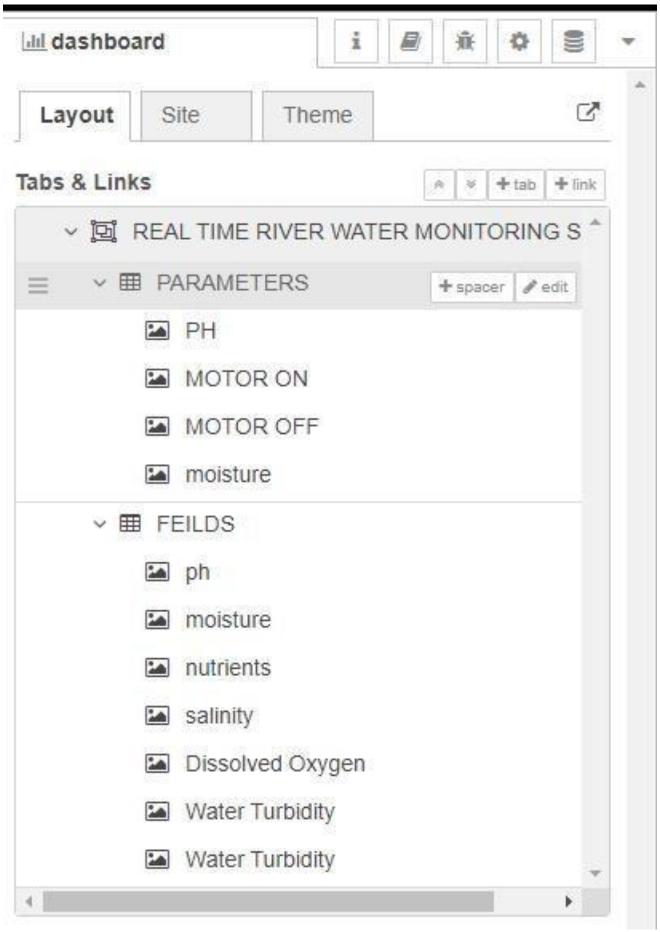

node-red-qltdp-2022-11-07.eu-gb.mybluemix.net/red/#flow/f079df959c5d08f7
Node-RED
Edit function node
Delete
Cancel
Done
Properties
Name
water turbidity
Setup
On Start
On Message
On Stop
global.set("Water_Turbidity",msg.payload.Water_Turbidity)
msg.payload = msg.payload.Water_Turbidity
return msg;
Enabled

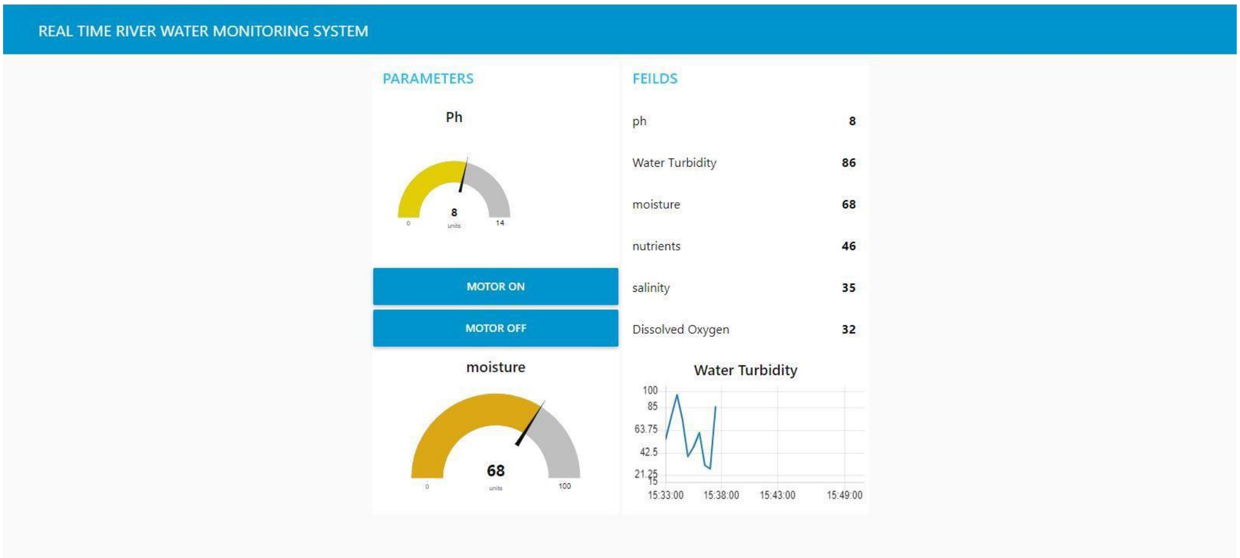

node-red-qltdp-2022-11-07.eu-gb.mybluemix.net/red/#flow/f079df959c5d08f7
Node-RED
Edit function node
Delete
Cancel
Done
Properties
Name
moisture
Setup
On Start
On Message
On Stop
global.set("moisture",msg.payload.moisture)
msg.payload = msg.payload.moisture
return msg;
Enabled


node-red-qltdp-2022-11-07.eu-gb.mybluemix.net/red/#flow/f079df959c5d08f7
Node-RED
Edit function node
Delete
Cancel
Done
Properties
Name
nutrients
Setup
On Start
On Message
On Stop
global.set("nutrients",msg.payload.nutrients)
msg.payload = msg.payload.nutrients
return msg;
Enabled


Node-RED
Edit function node
Delete
Cancel
Done
Properties
Name
salinity
Setup
On Start
On Message
On Stop
1 global.set("salinity",msg.payload.salinity)
2 msg.payload = msg.payload.salinity
3 return msg;
Enabled

UI


dashboard
Layout
Site
Theme
Tabs & Links
tab
link
REAL TIME RIVER WATER MONITORING S
PARAMETERS
spacer
edit
PH
MOTOR ON
MOTOR OFF
moisture
FEILDS
ph
moisture
nutrients
salinity
Dissolved Oxygen
Water Turbidity
Water Turbidity


REAL TIME RIVER WATER MONITORING SYSTEM
PARAMETERS
Ph
8
0
14
MOTOR ON
MOTOR OFF
moisture
68
0
100
FEILDS
ph 8
Water Turbidity 86
moisture 68
nutrients 46
salinity 35
Dissolved Oxygen 32
Water Turbidity
100
85
63.75
42.5
21.25
15
15:33:00
15:38:00
15:43:00
15:49:00