PROJECT REPORT

REAL-TIME RIVER QUALITY MONITORING AND CONTROL SYSTEM

TEAM ID:

PNT2022TMID15981

1. INTRODUCTION :

1.1 Project overview:

Real-time river quality monitoring and control system : Current water quality monitoring system is a manual system with a monotonous process and is very time-consuming. This paper proposes a sensor-based water quality monitoring system. The main components of Wireless Sensor Network (WSN) include a microcontroller for processing the system, communication system for inter and intra node communication and several sensors. Real-time data access can be done by using remote monitoring and Internet of Things (IoT) technology. Data collected at the apart site can be displayed in a visual format on a server PC with the help of Spark streaming analysis through Spark MLlib, Deep learning neural network models, Belief Rule Based (BRB) system and is also compared with standard values. If the acquired value is above the threshold value automated warning SMS alert will be sent to the agent. The uniqueness of our proposed paper is to obtain the water monitoring system with high frequency, high mobility, and low powered. Therefore, our proposed system will immensely help Bangladeshi populations to become conscious against contaminated water as well as to stop polluting the water.

1.2 Purpose :

Water quality refers to chemical, physical biological and radio logical characteristics of water. It is a measure of the condition of water relative to the necessities of one or more bio-tic species and or to any human need or purposes .Water quality monitoring is defined as a sampling and analysis of the water in lake, stream, ocean and river and conditions of the water body. Smart water quality monitoring is a process of real-time monitoring and the analysis of water to identify changes in parameters based on the physical, chemical and biological characteristics. Monitoring water quality is clearly important: in our seas, our rivers, on the surface and in our ports, for both companies and the public. It enables us to assess how they are changing, analyze trends and to inform plans and strategies that improve water quality and ensures that water meets its designated use. There are several indicators determining water quality. These include dissolved oxygen, turbidity, bio indicators, nitrates, pH scale and water temperature. Monitoring water quality helps to identify specific pollutants, a certain chemical, and the source of the pollution. There are many sources of water pollution: wastewater from sewage seeping into the water supply; agricultural practices (e.g., the use of pesticides and fertilizer); oil pollution, river and marine dumping, port, shipping and industrial activity. Monitoring water quality and a water quality assessment regularly provides a source of data identify immediate issues – and their source.

- ✓ Identifying trends, short and long-term, in water quality.
- ✓ Data collected over a period of time will show trends, for example identifying increasing concentrations of nitrogen pollution in a river or an inland waterway. The total data will then help to identify key water quality parameters.
- ✓ Environmental planning methods: water pollution prevention and management.

- ✓ Collecting, interpreting and using data is essential for the development of a sound and effective water quality strategy. The absence of real-time data will however hamper the development of strategies and limit the impact on pollution control. Using digital systems and programs for data collection and management is a solution to this challenge.

- ✓ Monitoring water quality is a global issue and concern: on land and at sea. Within the European Union, the European Green Deal sets out goals for restoring biological biodiversity and reducing water pollution, as well as publishing various directives to ensure standards of water quality. Individual nation states, for example France, have also clear regulatory frameworks requiring the effective monitoring of water quality. In the United States, the Environmental Protection Agency (EPA) enforces regulations to address water pollution in each state. Across the world, countries increasingly understand the importance of effective water quality monitoring parameters and methods.

2. LITERATURE SURVEY :

2.1 Existing Problem :

A Wireless Sensor Network for River Water Quality Monitoring in India This paper introduces a river water quality monitoring system based on wireless sensor network which helps in continuous and remote monitoring of the water quality data in India. The wireless sensor node in the system is designed for monitoring the pH of water, which is one of the main parameters that affect the quality of water.

2.2 Reference :

1) AUTHOR: J. Navarajan

DESCRIPTION: An Detection on water pollution and water management using smart sensors IOT to ensure the safe supply of drinking water the quality should be monitored in real time for that purpose new approach IOT (Internet of Things) based water quality monitoring has been proposed. This system consists some sensors. Which measure the water quality parameter such as pH, turbidity, conductivity, dissolved oxygen, temperature. The measured values from the sensors are processed by microcontroller and these processed values are transmitted remotely to the core controller that is raspberry pi using Zigbee protocol. Based on a study of existing water quality monitoring system and scenario of water we can say that proposed system is more suitable to monitor water quality parameters in real time. Based on a study of existing water quality monitoring system and scenario of water we can say that proposed system is more suitable to monitor water quality parameters in real time.

2) AUTHOR: Natasa Markovic

DESCRIPTION: A Sensor Web for River Water Pollution Monitoring and Alert System Sensor Web has provided infrastructure for collecting and processing data from distributed and heterogeneous sensors. This set of technologies has found various implementations, especially in the area of environmental monitoring. The Sensor Web architecture for crisis management, described in this paper, provides active monitoring of measuring parameters and timely responses in cases of environmental disasters. The River Water Management and Alert System built on this architecture enable access, control and management of river water pollution.

3) AUTHOR: K. A. UnnikrishnaMenon

DESCRIPTION: An Wireless Sensor Network for River Water Quality Monitoring in India This paper introduces a river water quality monitoring system based on wireless sensor network which helps in continuous and remote monitoring of the water quality data in India. The wireless sensor node in the system is designed for monitoring the pH of water, which is one of the main parameters that affect the quality of water. Wireless sensor Network which aids in River Water Quality Monitoring. This paper also proposes a novel technique for the design of a water quality sensor node which can be used for monitoring the pH of water.

4) AUTHOR: B. Aswinkumar

DESCRIPTION: This research paper focuses on Detection on water pollution and water management using smart sensors IOT. To ensure the safe supply of drinking water the quality should be monitored in real time for that purpose new approach IOT (Internet of Things) based water quality monitoring has been proposed. This system consists some sensors. Which measure the water quality parameter such as pH, turbidity, conductivity, dissolved oxygen, temperature. The measured values from the sensors are processed by microcontroller and these processed values are transmitted remotely to the core controller that is raspberry pi using Zigbee protocol. Based on a study of existing water quality monitoring system and scenario of water we can say that proposed system is more suitable to monitor water quality parameters in real time. Based on a study of existing water quality monitoring system and scenario of water we can say that proposed system is more suitable to monitor water quality parameters in real time.

5) AUTHOR: Leonid Stoimenovet

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disasters. The River Water Management and Alert System built on this architecture enable access, control and management of river water pollution.

6) AUTHOR: Alif Akbar Pranata, Jae Min Lee

DESCRIPTION: This paper investigates a real-time water quality monitoring system by using a proposed broker less publisher subscriber (pub/sub) architecture framework. On the system, sensors sense the water measurement metrics, including temperature, pH, and dissolved oxygen level. All collected data are stored in a database and computed stochastically for further analysis on water quality. A complementary experiment compares the proposed pub/sub architecture and MQTT, a lightweight protocol on which IoT mostly uses, to show better performance of the proposed architecture in case of network latency and throughput for diverse message payload size, thus suggesting the future IoT implementation of the system.

2.3 Problem Statement :

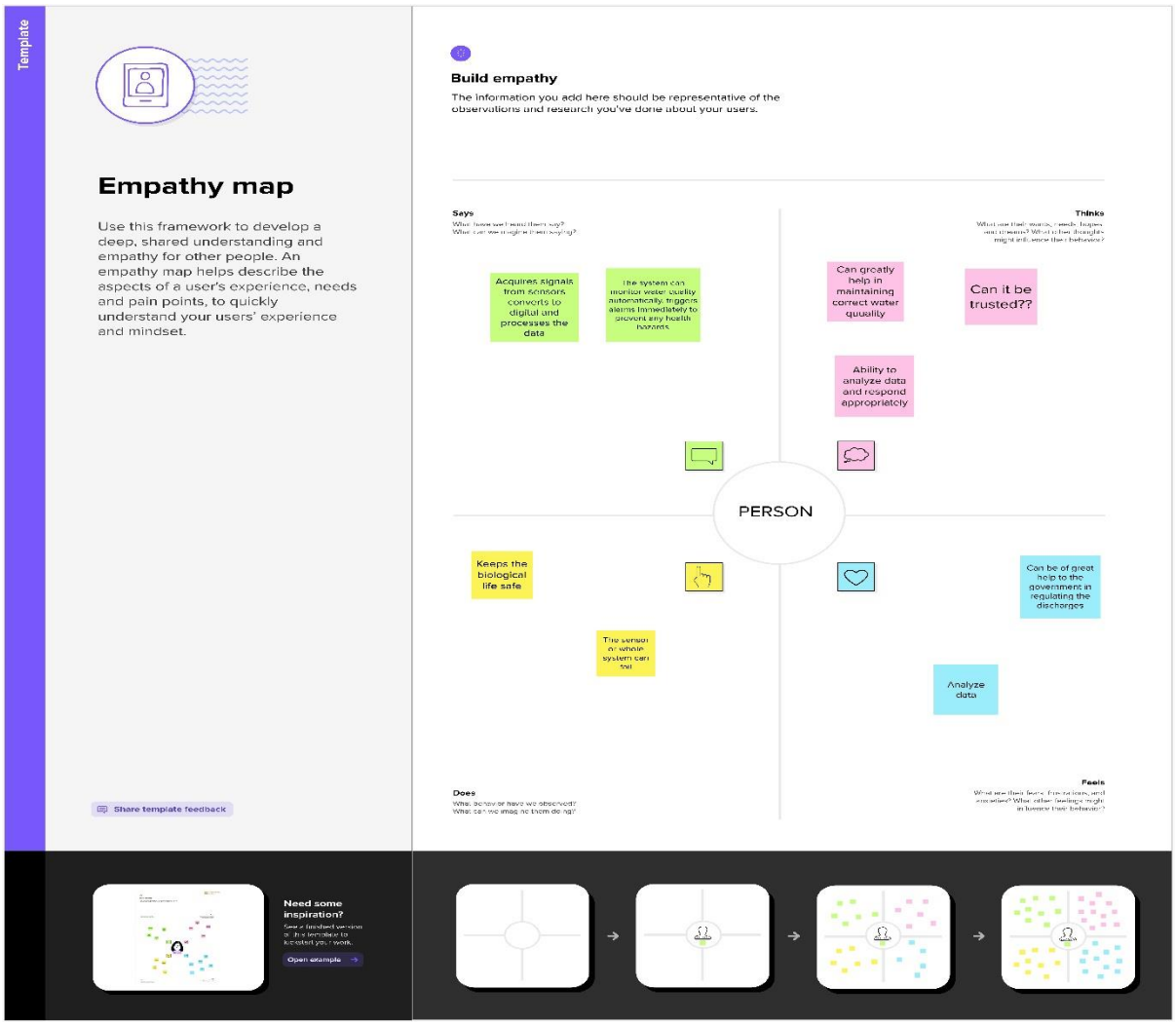
The reduce the river water pollution and to monitor the parameters of river water and control measures can impact vegetation, health. The Real time analysis of Indicators of River water(Ph, salinity, nutrients, etc..,)

Problem Statement (PS)	I am (Customer)	I'm trying to	But	Because	Which makes me feel
PS-1	A Farmer	use river water for irrigation	i dont know the quality and level of the water	i dont know how to measure the quality of the water	frustrated
PS-2	An Industrialist	use river water for drinks manufcuring	i dont know the pH level of river water	we can't use water with acidic nature for cool drinks manufacturing	indecisive

3. IDEATION & PROPOSED SOLUTION :

3.1 Empathy Map Canvas:

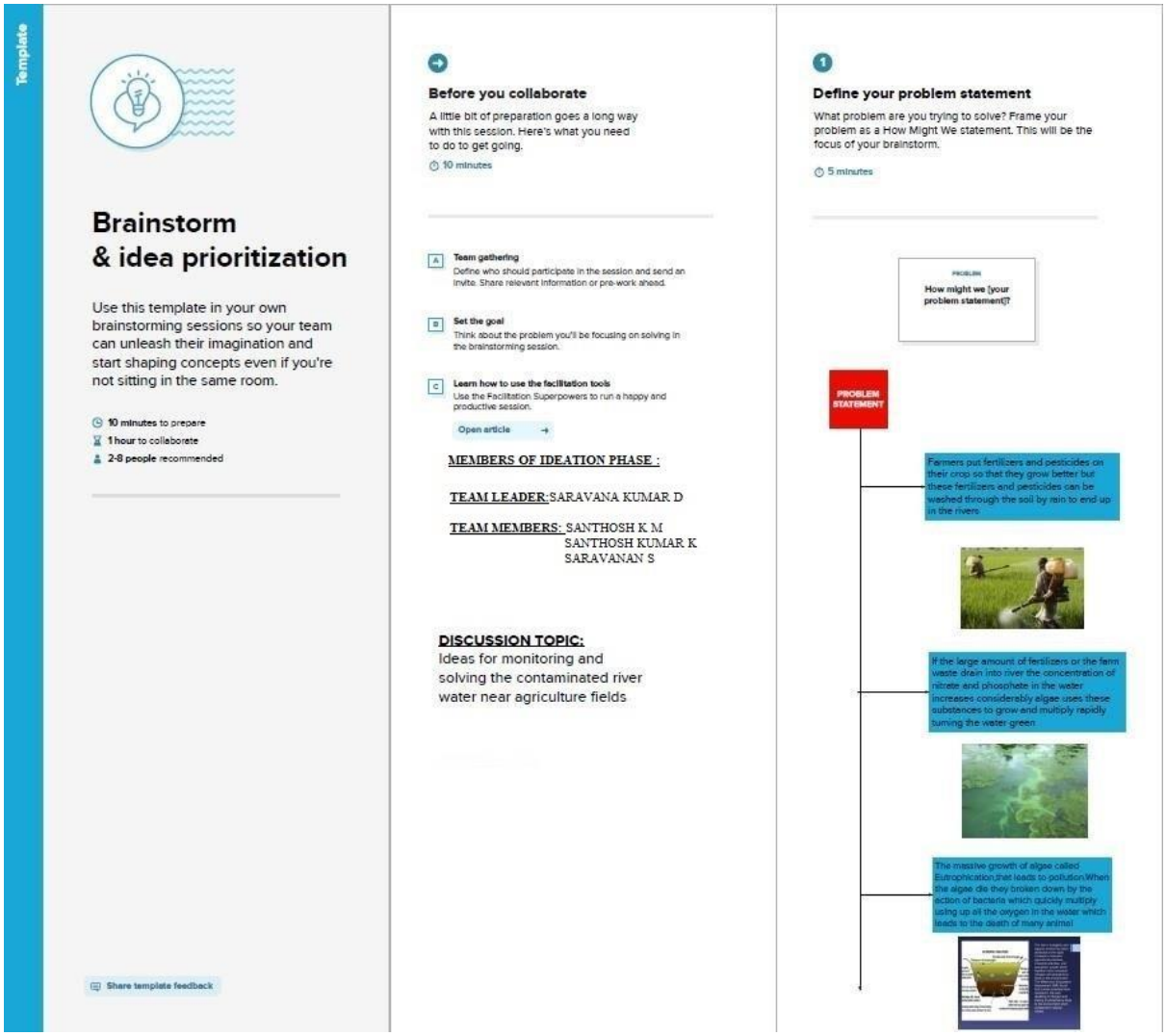
An empathy map is a simple, easy-to-digest visual that captures knowledge about a user's behaviours and attitudes. It is a useful tool to helps teams better understand their users. Creating an effective solution requires understanding the true problem and the person who is experiencing it. The exercise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



3.2 Ideation & Brainstorming :

Brainstorming provides a free and open environment that encourages everyone within a team to participate in the creative thinking process that leads to problem solving. Prioritizing volume over value, out-of-the-box ideas are welcome and built upon, and all participants are encouraged to collaborate, helping each other develop a rich amount of creative solutions.

Step-1: Team Gathering, Collaboration and Select the Problem Statement :



Step-2: Brainstorm, Idea Listing and Grouping :

2

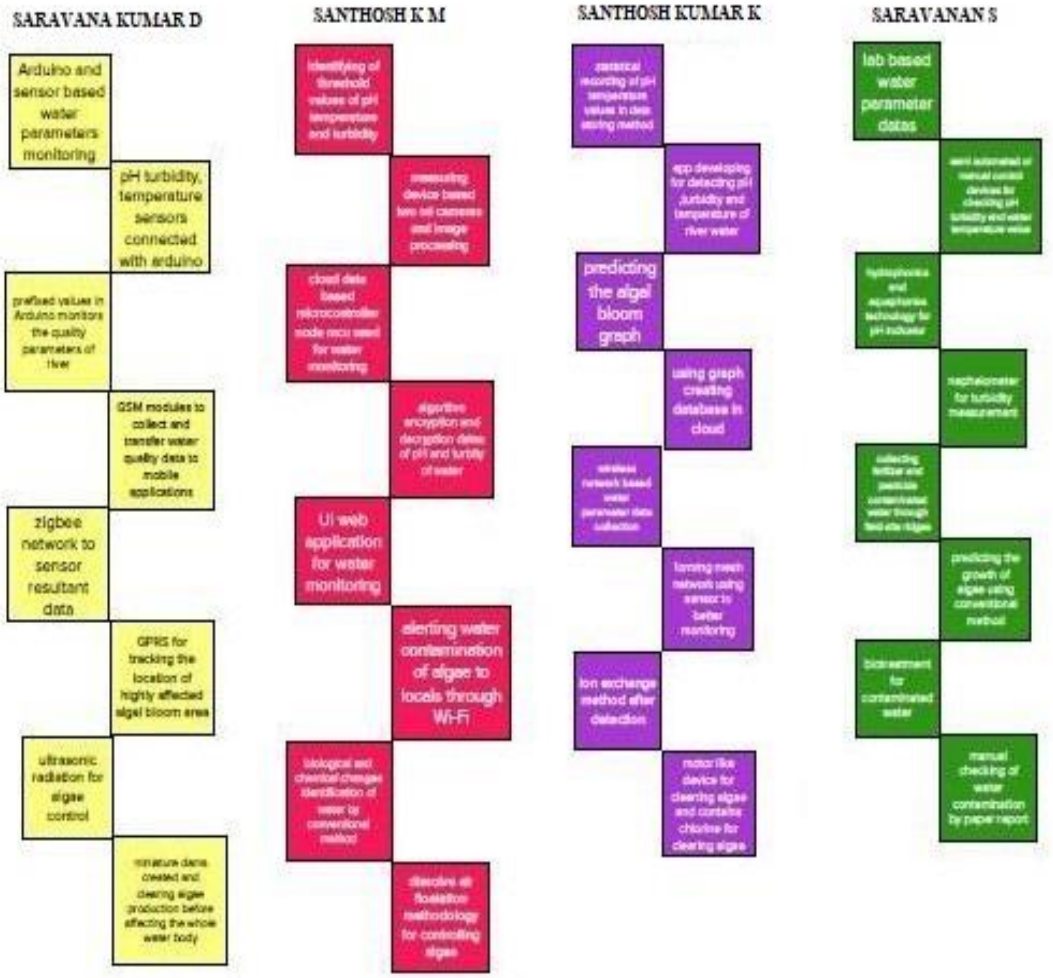
Brainstorm

Write down any ideas that come to mind that address your problem statement.

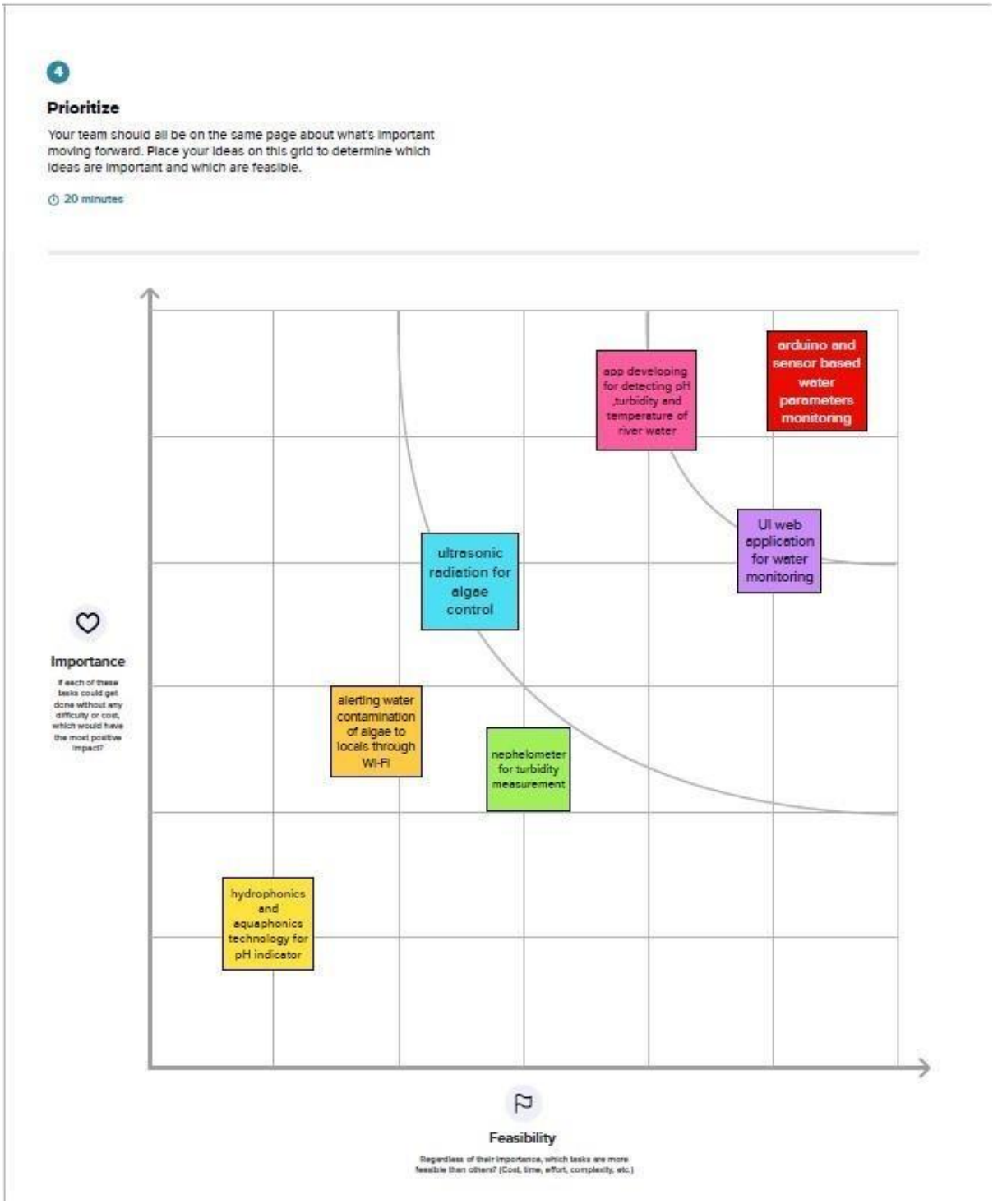
10 minutes

TIP

You can select a sticky note and hit the pencil (switch to sketch) icon to start drawing!



Step-3: Idea Prioritization :

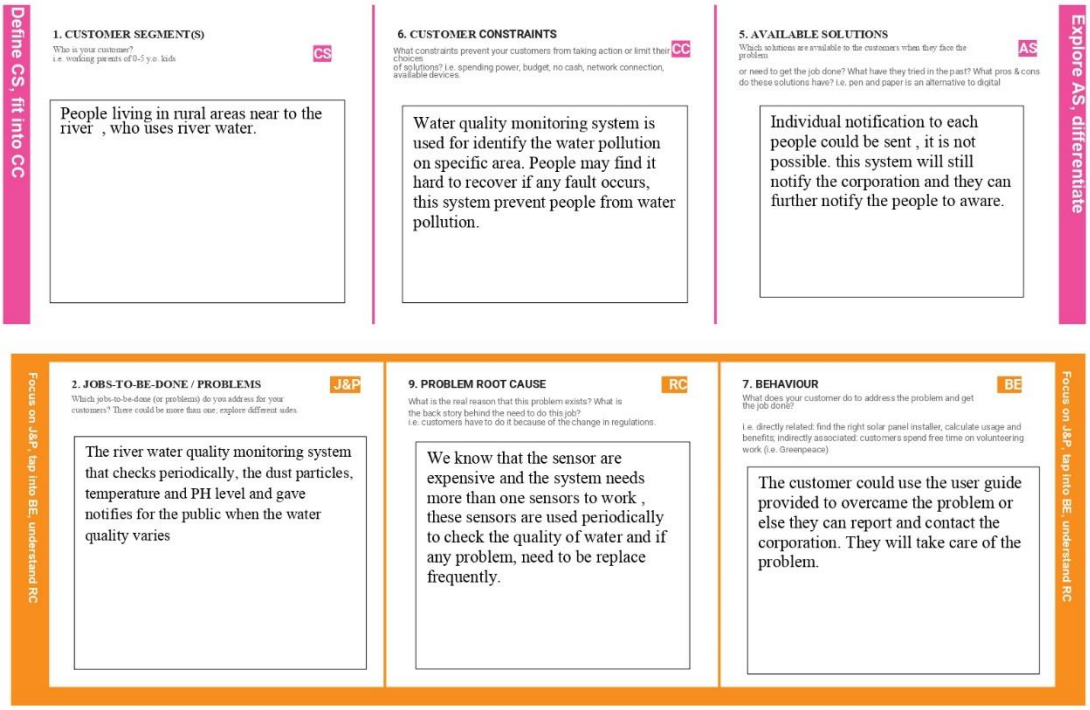


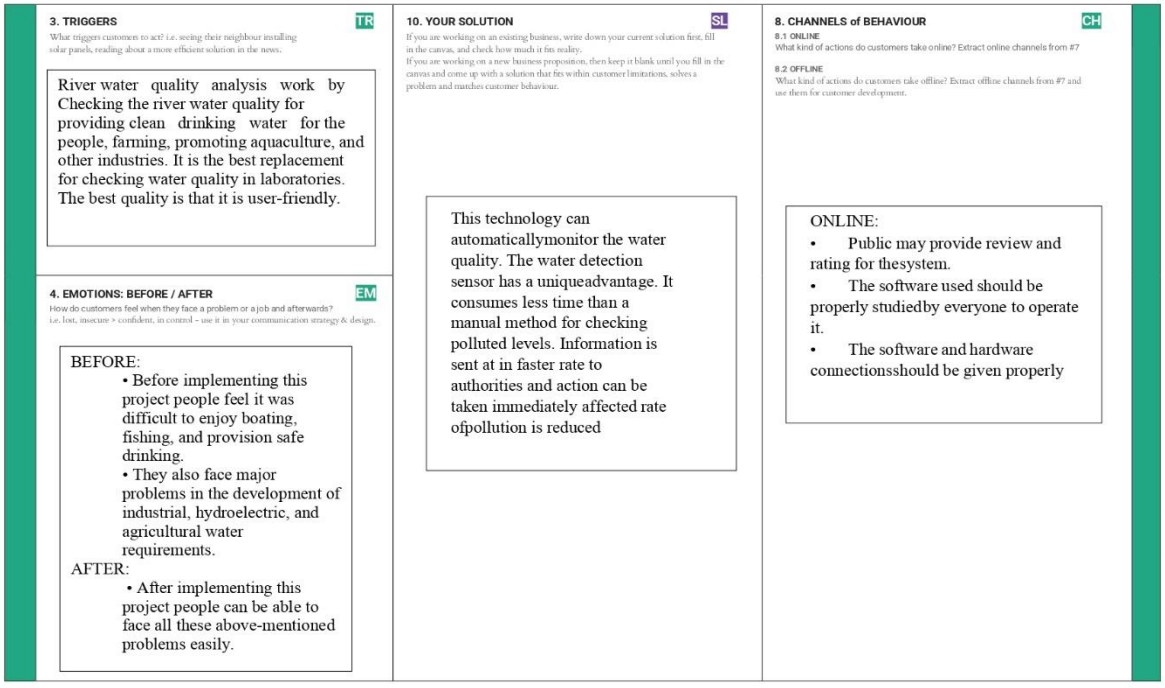
3.3 Proposed Solution :

S.No.	Parameter	Description
1.	Problem Statement (Problem to besolved)	Massive growth of algae called eutrophication leads to pollution (monitoring and controlling the quality of river water)
2.	Idea / Solution description	Detecting the dust particles , PH level of water,Dissolved oxygen and temperature to be monitored and altering the authorities if water quality is not good.
3.	Novelty / Uniqueness	River water quality can be monitored by web application. Quality parameter will track continuously with standard measurements.
4.	Social Impact / Customer Satisfaction	Localities will not get suffered by poor quality of water by alerting them when the water quality is not good.
5.	Business Model (Revenue Model)	Water quality monitoring system by aeron systemsfor industrial water treatment plant, river bodies, aqua forming , digital loggers.
6.	Scalability of the Solution	Measuring of real time values and continuous monitoring helps in maintaining the quality ofwater.

3.4 Problem Solution fit :

Project Title: Real-Time River Water Quality Monitoring and Control System **Project Design Phase-I - Solution Fit Template** **Team ID:** PNT2022TMID15981





4. REQUIREMENT ANALYSIS :

4.1 Functional requirement :

Following are the functional requirements of the proposed solution.

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	**User Registration**	Registration through Form Registration through Gmail Registration through LinkedIN
FR-2	**User Confirmation**	Confirmation via Email Confirmation via OTP
FR-3	**Ph level detection**	Ph sensor is used to monitor the water quality and the signals are send to Arduino.
FR-4	**Turbidity detection**	Turbidity sensor TS-300B measures the turbidity (counter of suspended matter) in the wash water and the signals are send to Arduino.
FR-5	**Ultrasonic generator**	Waves generated at regular interval times to clear algae 25% ,50%, 100%

4.2 Non-Functional requirements :

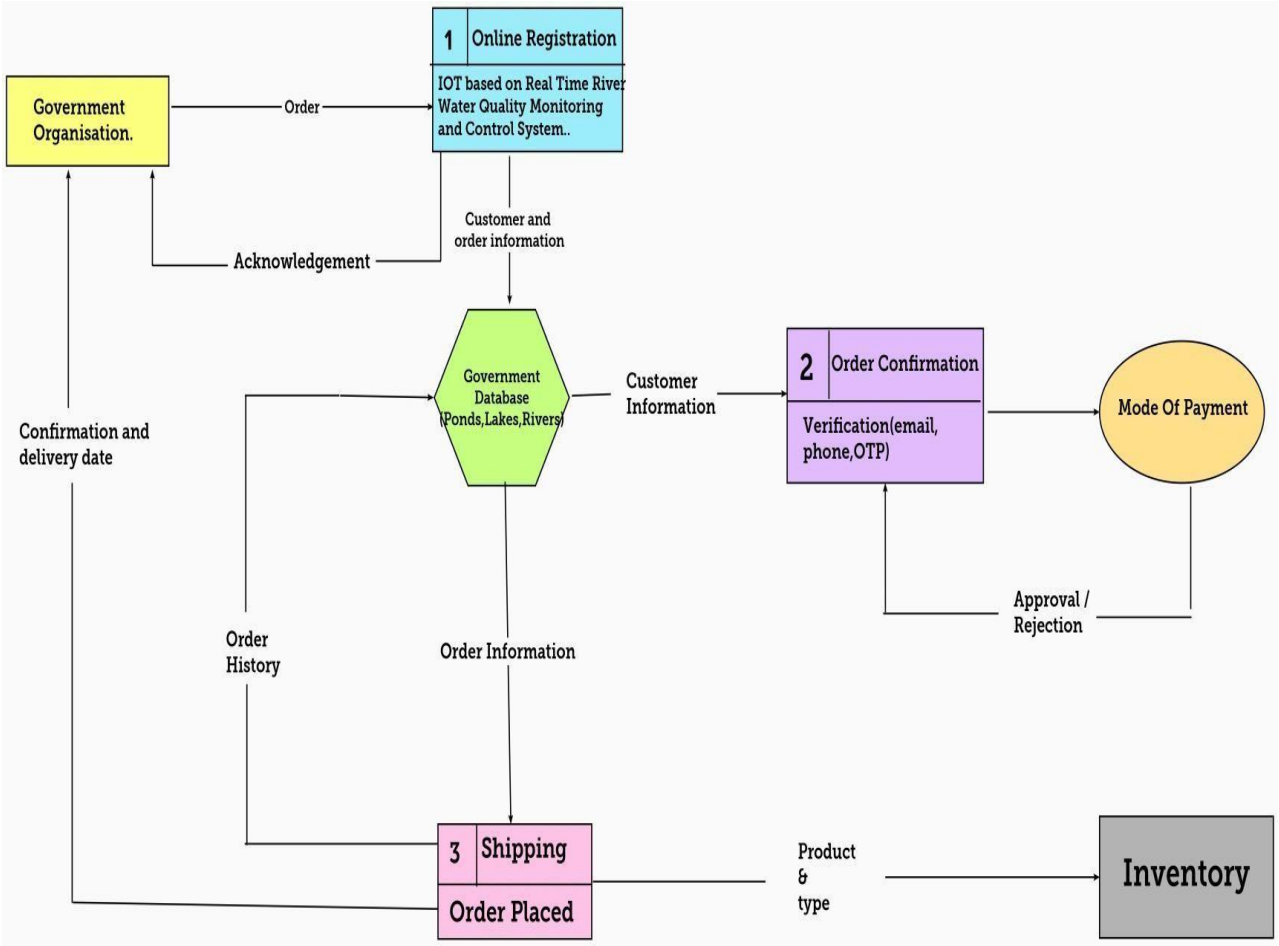
Following are the non-functional requirements of the proposed solution.

FR No.	Non-Functional Requirement	Description
NFR-1	**Usability**	Efficient to use and has simple monitoring system.
NFR-2	**Security**	Mobile application is secured with firewalls protection.
NFR-3	**Reliability**	Real time sensor output values with future predicted data storage.98% efficient monitoring output . Assurance for aquaculture safety.
NFR-4	**Performance**	Greater performance and environmental safe model.
NFR-5	**Availability**	In form of mobile UI 24 x 7 monitoring system.
NFR-6	**Scalability**	Highly Scalable .It is capable to produce a best final output.
NFR-7	**Stability**	It is highly stable .
NFR-8	**Efficiency**	It is highly efficient and it has simple monitoring system .

5. PROJECT DESIGN :

5.1 Data Flow Diagrams :

A Data Flow Diagram (DFD) is a traditional visual representation of the information flows within a system. A neat and clear DFD can depict the right amount of the system requirement graphically. It shows how data enters and leaves the system, what changes the information, and where datais stored.



5.2 Solution & Technical Architecture :

Summary :

This code pattern explains how to build an IOT based river water monitoring and controlling system with some predefined values.

Flow :

- ✓ Feed the data received from the Sensor unit which are placed in the riversides.
- ✓ The collected data will be displayed in the Web page to the user.
- ✓ Then the collected data is sent to the data base, where the collected dataand the predefined data are checked and monitored.
- ✓ If any data exceed the predefined data then the control signal will send tothe Admin.
- ✓ The collected data will be stored in the IBM cloud storage. Later the data will be controlled by the admin via UI.

Components & Technologies:

S.No	Component	Description	Technology
1.	Sensor Data	The data is collected form the various sensor placed in the river sides.	ESP32Wifi modul eRaspberry Pie.
2.	Database for Storage	The data/info need to bestored for accessing it in future	MySQL-Oracle

3.	File Storage	File storage requirements	IBM Block Storage or Other Storage Service or Local Filesystem
4.	Cloud Database	Database Service on Cloud	IBM cloud
5.	Data Storage	File storage requirements	IBM Block Storage

Application Characteristics :

S.No	Characteristics	Description	Technology
1.	PH level Monitoring	The PH level of river water can be monitored via placing sensors inrivers.	PH-sensor
2.	Air Quality Monitoring	The clarity and purity of river water can be monitored	Surface Mount Sensor
3.	Temperature Monitoring	The temperature of river water can be monitored	Temperature sensor
4.	Water Treatment	can be used as botha safety device in the water purificationprocess as carbon dioxide, methane, and carbon monoxide are some of the key gases produced during the treatment process	NDIR gas sensors

5.3 User Stories :

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance criteria	Priority	Release
Customer (Mobile user)	Registration	USN-1	As a user, I can register for the application by entering email, password, and confirming my password.	They can access my account/dashboard	HIGH	SPRINT-1
		USN-2	As a user, I will receive a confirmation email once I have registered for the application	They can receive e confirmation email & click confirm	HIGH	SPRINT-2
		USN-3	As a user, I can register for the application through Google	They can register & access the dashboard with Google	HIGH	SPRINT-1
		USN-4	As a user, I can register for the application through Gmail	They can register through the mail.	MEDIUM	SPRINT-2
	Login	USN-5	As a user, I can log into the application by entering email, password & captcha	They can receive login credentials.	HIGH	SPRINT-1
	Interface	USN-6	As a user, the interface should be user-friendly manner	They can able to access easily.	MEDIUM	SPRINT-1
Customer (Web user)	Dashboard	USN-7	As a user, I can access the specific info(ph value, temp, humidity, quality).	They can able to know the quality of the water	HIGH	SPRINT-1
Customer (input)	View manner	USN-8	As a user, I can view data in visual representation manner(graph)	They can easily understand by visuals.	HIGH	SPRINT-1
	Taste	USN-9	As a user , I can able to view the quality(salty) of the water	They can easily know whether it is salty or not	HIGH	SPRINT-1
	Colour visibility	USN-10	As a user , I can able predict the water colour	Thry can easily know the condition by colour	HIGH	SPRINT-1
Administrator	Risk tolerant	USN-11	An administrator who Is handling the system should update and take care of the application	Admin should monitor the records properly.	MEDIUM	SPRINT-3

6. PROJECT PLANNING & SCHEDULING :

6.1 Sprint Planning & Estimation :

TITLE	DESCRIPTION	DATE
Literature Survey & Information Gathering	Literature survey on the selected project is done by gathering information about related details on technical papers and web browsing.	06 OCTOBER 2022
Empathy Map	Prepared Empathy Map Canvas to combine thoughts and pains, gains of the project with all team members .	08 OCTOBER 2022
Ideation	Brainstorming session is conducted with all team members to list out all the ideas and prioritise the top 3 ideas.	09 OCTOBER 2022
Proposed Solution	Prepared the proposed solution document, which includes the novelty, feasibility of idea, business model, social impact, scalability of solution, etc.	28 OCTOBER 2022
Problem Solution Fit	Prepared problem solution fit document.	30 OCTOBER 2022

6.2 Sprint Delivery Schedule :

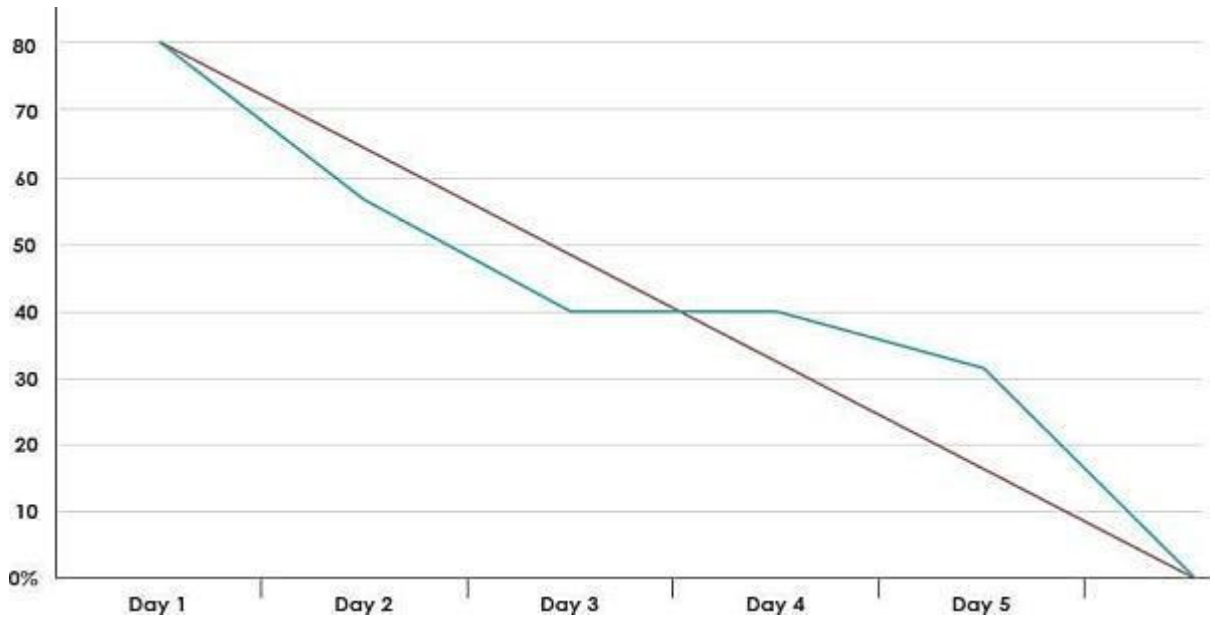
Product Backlog, Sprint Schedule, and Estimation

Sprint	Total Story Points	Duration	Sprint Start Date	Sprint End Date (Planned)	Story Points Completed (as on Planned End Date)	Sprint Release Date (Actual)
Sprint-1	20	6 Days	24 Oct 2022	29 Oct 2022	20	29 Oct 2022
Sprint-2	20	6 Days	31 Oct 2022	05 Nov 2022	30	30 Oct 2022
Sprint-3	20	6 Days	07 Nov 2022	12 Nov 2022	49	06 Nov 2022
Sprint-4	20	6 Days	14 Nov 2022	19 Nov 2022	50	07 Nov 2022

VELOCITY:

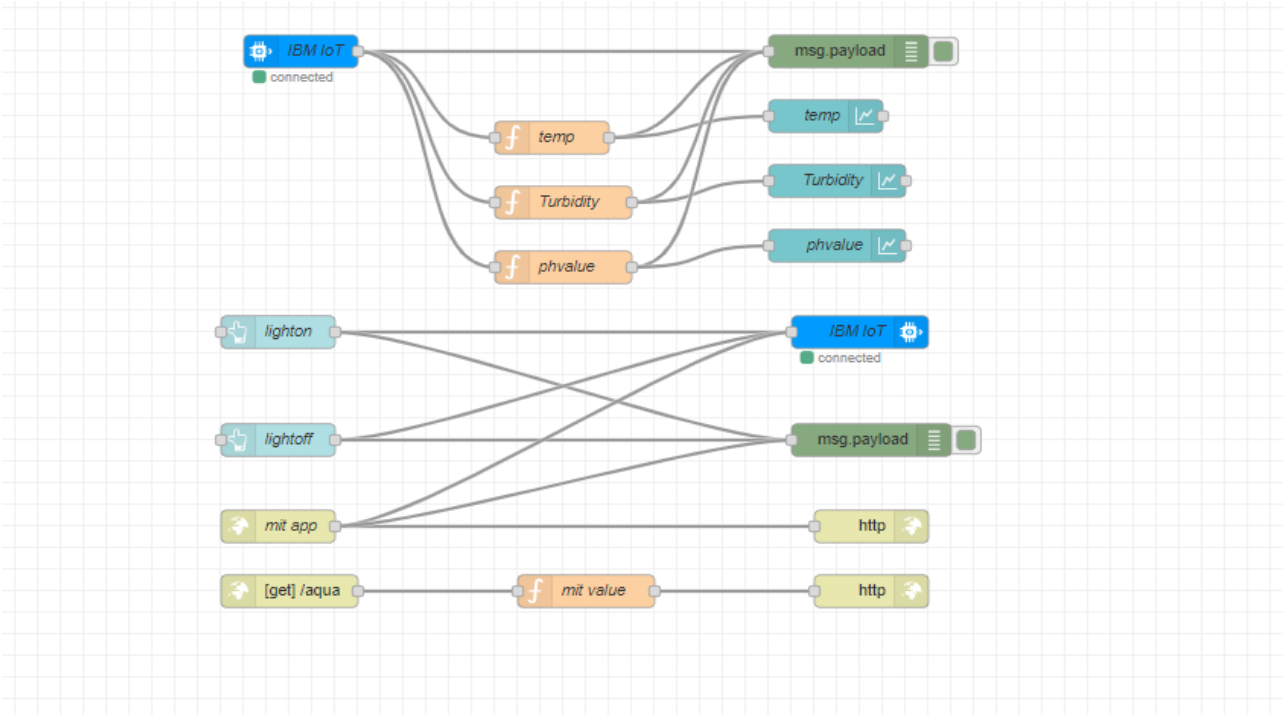
$$AV = \frac{sprint\ duration}{velocity} = \frac{20}{10} = 2$$

BURNDOWN CHART :

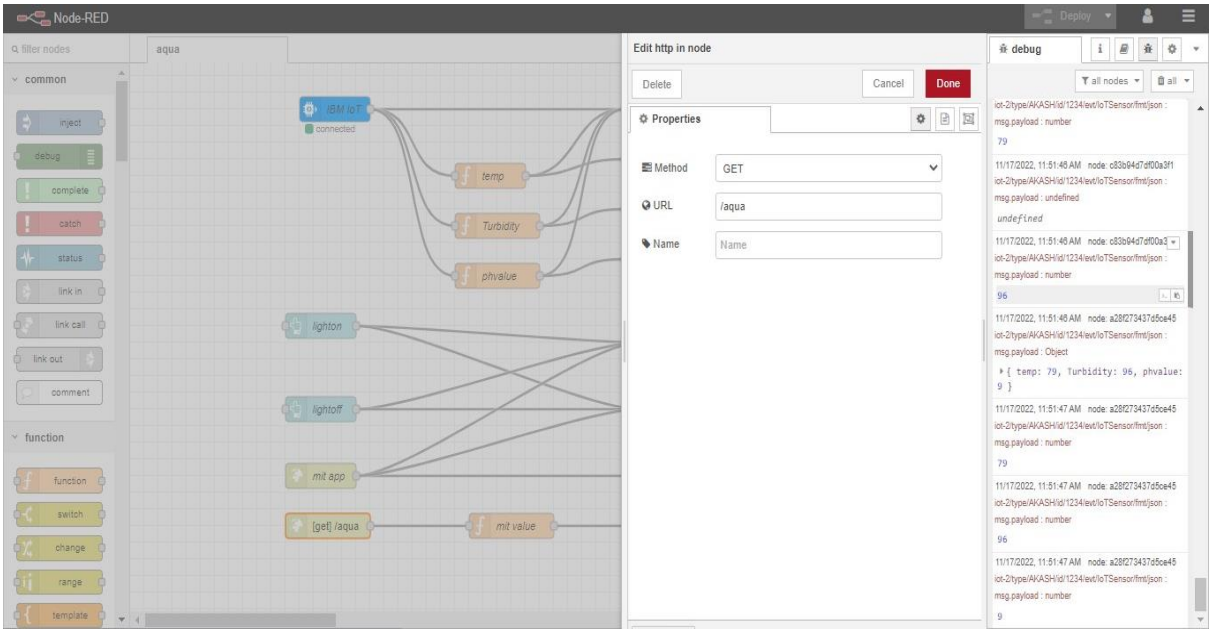


7. CODING AND SOLUTIONING :

7.1 Feature 1:



7.2 Feature 2:



8. TESTING :

8.1 Test Cases :

This report shows the number of test cases that have passed, failed, and untested.

Section	Total Cases	Not Tested	Fail	Pass
Print Engine	15	0	0	15
Client Application	45	0	0	45
Security	1	0	0	1
Outsource Shipping	2	0	0	2
Exception Reporting	10	0	0	10
Final Report Output	4	0	0	4
Version Control	3	0	0	3

8.2 User Acceptance Testing :

- ✓ **Purpose of Document**
  - The purpose of this document is to briefly explain the test coverage and open issues ofthe REAL TIME RIVER WATER QUALITY MONITORING AND CONTROL SYSTEMS project at the time of the release to User Acceptance Testing (UAT).
- ✓ **Defect Analysis**
  - This report shows the number of resolved or closed bugs at each severity level, and how they were resolved

Test case id	Feature	Component	Test Scenario	Steps to Execute	Test Data	Actual Result	Status
Login page	Functional	Home page	Verify user is able to seethe Given app	1.Download the given APK File 2.Click on download button 3.Verify login popup displayed or not"	APK File	Working as expected	Pass
Login page	Functional	Home page	Verify user is able to seethe Login/Signup popup when user open the Aqua Meter	1. Download the given APK File 2.Click on download button 3.Verify login popup displayed or not"	APK File	Working as expected	Pass
Login page	Functional	Home page	Verify the UI elements in Login/Signup popup	1. Download the given APK File 2.Click on download button 3.Verify login popup with belowUI elements: A .Username text box A .password text box B .Submit button	APK File	Working as Expected	Pass
Login Page	Functional	Home page	Verify user is able to log into application with Valid credentials	"1 Download the given APK File 2.Click on download button 3.Enter Valid “Given “ usernamein Username text box 4.Enter valid password in password text box 5.Click on Submit button"	Username: Username Password: Password	Working as Expected	Pass
Login Page	Functional	Home page	Verify user is able to see the output	1.output displayed	APKFile	Working as Expected	Pass

9. RESULT :

9.1 Performance Metrics :

			NFT - Risk Assessment						
S.No	Project Name	Scope/feature	Functional Changes	Hardware Changes	Software Changes	Impact of Downtime	Load/Voluem Changes	Risk Score	Justification
1	REAL TIME RIVER WATER QUALITY MONITORING AND CONTROL SYSTEM	New	Low	No Changes	Moderate	3days	>5 to 10%	ORANGE	As we have seen the changes

Performance Table :

PARAMETER	PERFORMANCE	DESCRIPTION
ADMIN TESTING	95%-100%	THE TESTING DONE BEFORE IT IS DEPLOYED AS AN APP
CUSTOMER SATISFACTION	75-85%	THE CUSTOMER NEED TO BE SATISFIED WITH THE MOBILE APPLICATION
USER INTERFACE	65-85%	THE APP CAN USED BY ANYONE.(EASE OF ACCESS)
SEVER RESPONSE	50-75%	URL - response
DATA VALIDATION WITH NO. OF TEST CASE	60-80% (15-30 TESTCASE)	VALID DATA FROM THE APP
ERROR	3-5%	REAL-TIME DELAY MAY OCCUR

10. ADVANTAGES AND DISADVANTAGES :

ADVANTAGES :

- ✓ The prototype developed for water quality maintenance is very beneficial for safeguarding public health and also adds to the clean environment.
- ✓ The automation of this water monitoring, cleaning and control process removes the need of manual labor and thus saves time and money.
- ✓ The automation of the system makes the control and monitoring process more efficient and effective. Real time monitoring on mobile phone which is possible through the interface of plc with Arduino and Bluetooth module allows remote controlling of the system.

DISADVANTAGES :

- ✓ It is difficult to collect the water samples from all the area of the water body.
- ✓ The cost of analysis is very high.
- ✓ The lab testing and analysis takes some time and hence the lab results does not reflect real time water quality measurement due to delay in measurement.
- ✓ The process is time consuming due to slow process of manual data collection from different locations of the water body.
- ✓ The method is prone to human errors of various forms.

11. CONCLUSION :

- ✓ Thus our project is used to Monitoring of Turbidity, PH & Temperature of Water makes use of water detection sensor with uniqueadvantage and existing GSM network. The system can monitor water quality automatically, and it is low in cost and does not require peopleon duty. So the water quality testing is likely to be more economical, convenient and fast. The system has good flexibility. Only by replacing the corresponding sensors and changing the relevant softwareprograms, this system can be used to monitor other water quality parameters.
- ✓ The operation is simple. The system can be expanded to monitor hydrologic, air pollution, industrial and agricultural production and so on. It has widespread application and extension value.By keeping the embedded devices in the environment for monitoring enables selfprotection (i.e., smart environment) to the environment. To implement this need to deploy the sensor devices in the environment for collecting the data and analysis. By deploying sensor devices in the environment, we can bring the environment into real life i.e. it can interact with otherobjects through the network.
- ✓ Then the collected data and analysis results will be available to theend user through the Wi-Fi.

12.FUTURE SCOPE :

We use water detection sensor has unique advantage .It consumes less time to monitor than a manual method for checking polluted levels, and notifies immediately to reduce affected rate of pollution in water. People who are living in rural areas near to the river will be very satisfied with our idea. It will be useful to monitor water pollution in specific area. So this system prevent people from water pollution. It willbe used for farming purpose to check quality water, temperature and PH level. Our Impact of this project is also create a social satisfaction for farmers too. The scalabilty of this project gives the addition of more different type of sensors. By interfacing the relay we can control the supply of water. We can also implement as a revenue model. This system could also be implemented in various industrial processes. The system can be modified according to the needs of the user and can be implemented along with lab view to monitor data on computers.

13. APPENDIX :

PYTHON CODE TO PUBLISH DATA :

```
import time import sys

import ibmiotf.application

import ibmiotf.device

import random

#Provide your IBM Watson Device Credentials

organization = "uo60re"

deviceType = "AKASH"

deviceId = "1234"

authMethod = "token"

authToken = "12345678"

# Initialize GPIO

def myCommandCallback(cmd): print("Command received: %s" %

cmd.data['command']) status=cmd.data['command'] if status=="lighton":

print ("led is on") else:

print ("led is off") #print(cmd)

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 exception
```

connecting device: %s" % str(e)) sys.exit()

Connect and send a datapoint "hello" with value "world" into the cloud as an event of type "greeting" 10 times

deviceCli.connect()

while True:

#Get Sensor Data from DHT11

temp=random.randint(60,100) Turbidity=random.randint(0,100)

phvalue=random.randint(2,14)

data = { 'temp' : temp, 'Turbidity': Turbidity,'phvalue': phvalue}

#print data

def myOnPublishCallback(): print ("Published temp = %s

'C" % temp, "Turbidity = %s %%" % Turbidity,"phvalue = %s %%" % phvalue, "to IBM Watson")

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

if not success:

print("Not connected to

IoTF")

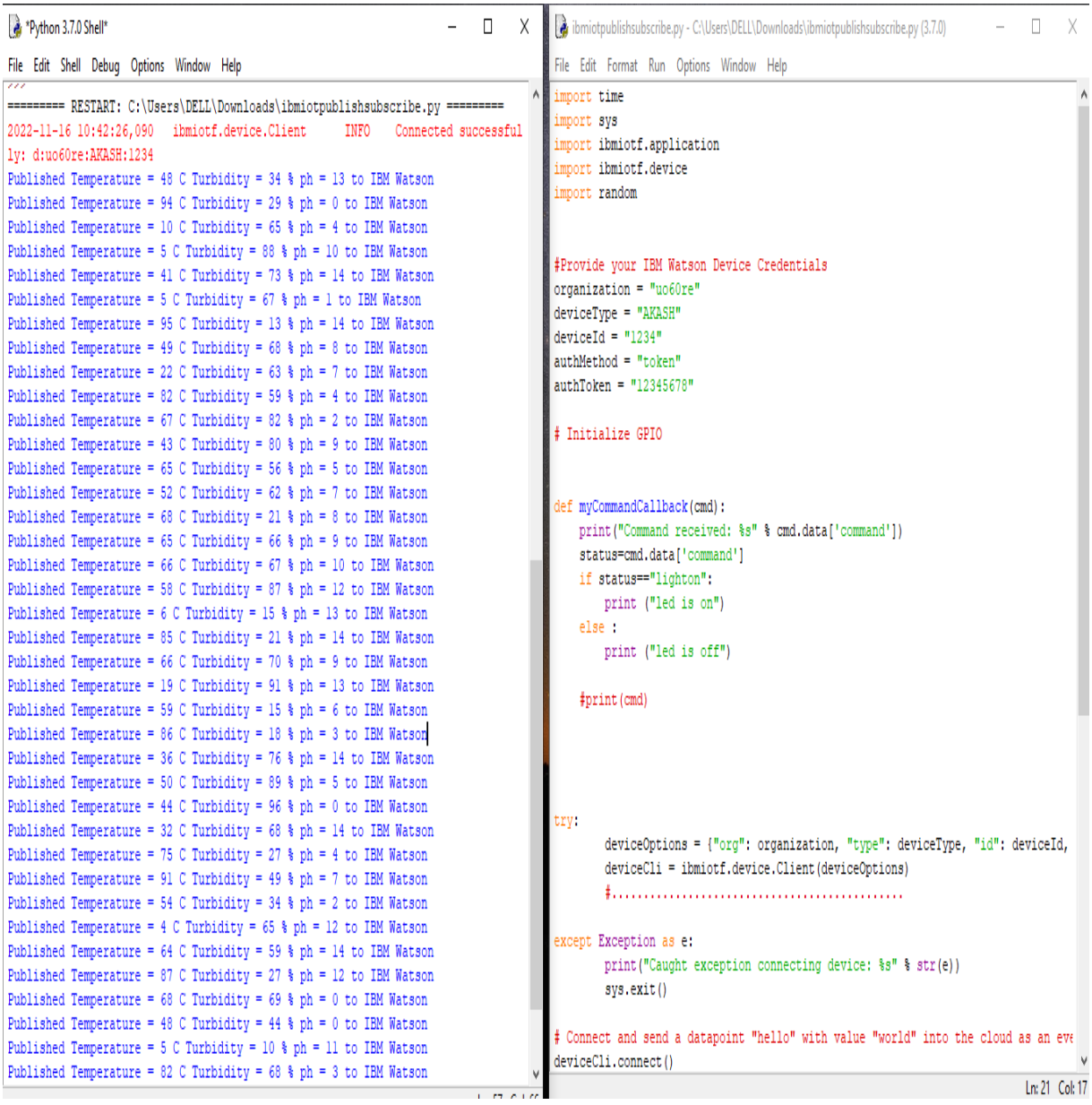
time.sleep(10)

deviceCli.commandCallback = myCommandCallback

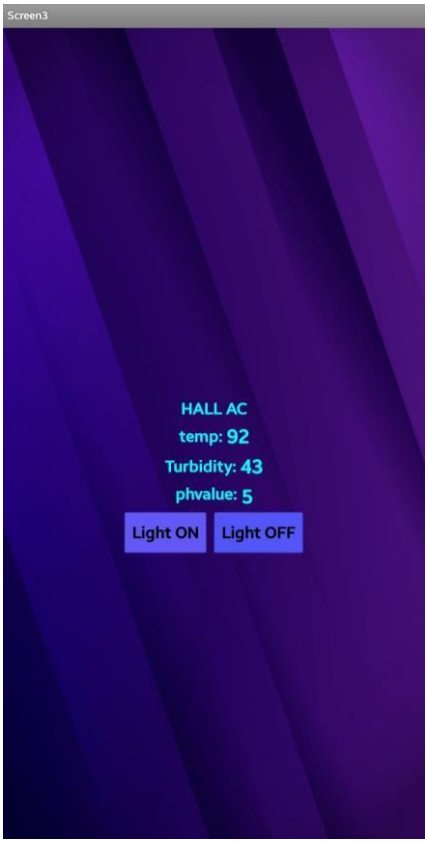
Disconnect the device and application from the cloud

deviceCli.disconnect()

OUTPUT :


Python 3.7.0 Shell
File Edit Shell Debug Options Window Help
======== RESTART: C:\Users\DELL\Downloads\ibmiotpublishsubscribe.py ========
2022-11-16 10:42:26,090 ibmiotf.device.Client INFO Connected successfully: d:uo60re:AKASH:1234
Published Temperature = 48 C Turbidity = 34 % ph = 13 to IBM Watson
Published Temperature = 94 C Turbidity = 29 % ph = 0 to IBM Watson
Published Temperature = 10 C Turbidity = 65 % ph = 4 to IBM Watson
Published Temperature = 5 C Turbidity = 88 % ph = 10 to IBM Watson
Published Temperature = 41 C Turbidity = 73 % ph = 14 to IBM Watson
Published Temperature = 5 C Turbidity = 67 % ph = 1 to IBM Watson
Published Temperature = 95 C Turbidity = 13 % ph = 14 to IBM Watson
Published Temperature = 49 C Turbidity = 68 % ph = 8 to IBM Watson
Published Temperature = 22 C Turbidity = 63 % ph = 7 to IBM Watson
Published Temperature = 82 C Turbidity = 59 % ph = 4 to IBM Watson
Published Temperature = 67 C Turbidity = 82 % ph = 2 to IBM Watson
Published Temperature = 43 C Turbidity = 80 % ph = 9 to IBM Watson
Published Temperature = 65 C Turbidity = 56 % ph = 5 to IBM Watson
Published Temperature = 52 C Turbidity = 62 % ph = 7 to IBM Watson
Published Temperature = 68 C Turbidity = 21 % ph = 8 to IBM Watson
Published Temperature = 65 C Turbidity = 66 % ph = 9 to IBM Watson
Published Temperature = 66 C Turbidity = 67 % ph = 10 to IBM Watson
Published Temperature = 58 C Turbidity = 87 % ph = 12 to IBM Watson
Published Temperature = 6 C Turbidity = 15 % ph = 13 to IBM Watson
Published Temperature = 85 C Turbidity = 21 % ph = 14 to IBM Watson
Published Temperature = 66 C Turbidity = 70 % ph = 9 to IBM Watson
Published Temperature = 19 C Turbidity = 91 % ph = 13 to IBM Watson
Published Temperature = 59 C Turbidity = 15 % ph = 6 to IBM Watson
Published Temperature = 86 C Turbidity = 18 % ph = 3 to IBM Watson
Published Temperature = 36 C Turbidity = 76 % ph = 14 to IBM Watson
Published Temperature = 50 C Turbidity = 89 % ph = 5 to IBM Watson
Published Temperature = 44 C Turbidity = 96 % ph = 0 to IBM Watson
Published Temperature = 32 C Turbidity = 68 % ph = 14 to IBM Watson
Published Temperature = 75 C Turbidity = 27 % ph = 4 to IBM Watson
Published Temperature = 91 C Turbidity = 49 % ph = 7 to IBM Watson
Published Temperature = 54 C Turbidity = 34 % ph = 2 to IBM Watson
Published Temperature = 4 C Turbidity = 65 % ph = 12 to IBM Watson
Published Temperature = 64 C Turbidity = 59 % ph = 14 to IBM Watson
Published Temperature = 87 C Turbidity = 27 % ph = 12 to IBM Watson
Published Temperature = 68 C Turbidity = 69 % ph = 0 to IBM Watson
Published Temperature = 48 C Turbidity = 44 % ph = 0 to IBM Watson
Published Temperature = 5 C Turbidity = 10 % ph = 11 to IBM Watson
Published Temperature = 82 C Turbidity = 68 % ph = 3 to IBM Watson
ibmiotpublishsubscribe.py - C:\Users\DELL\Downloads\ibmiotpublishsubscribe.py (3.7.0)
File Edit Format Run Options Window Help
import time
import sys
import ibmiotf.application
import ibmiotf.device
import random
#Provide your IBM Watson Device Credentials
organization = "uo60re"
deviceType = "AKASH"
deviceId = "1234"
authMethod = "token"
authToken = "12345678"
# Initialize GPIO
def myCommandCallback(cmd):
print("Command received: %s" % cmd.data['command'])
status=cmd.data['command']
if status=="lighton":
print ("led is on")
else :
print ("led is off")
#print(cmd)
try:
deviceOptions = {"org": organization, "type": deviceType, "id": deviceId,
deviceCli = ibmiotf.device.Client(deviceOptions)
#.....
except Exception as e:
print("Caught exception connecting device: %s" % str(e))
sys.exit()
# Connect and send a datapoint "hello" with value "world" into the cloud as an eve
deviceCli.connect()
Ln: 21 Col: 17

MOBILE APP:



GITHUB LINK :

IBM-EPBL/IBM-Project-12166-1659439253: Real-Time River Water Quality Monitoring and Control System (github.com)

PROJECT DEMO LINK :

Folder - Google Drive