Project Design Phase-II
Technology Stack (Architecture & Stack)

Date	03 October 2022
Team ID	PNT2022TMID21316
Project Name	Project - Rain water quality monitoring system
Maximum Marks	4 Marks

Technical Architecture:
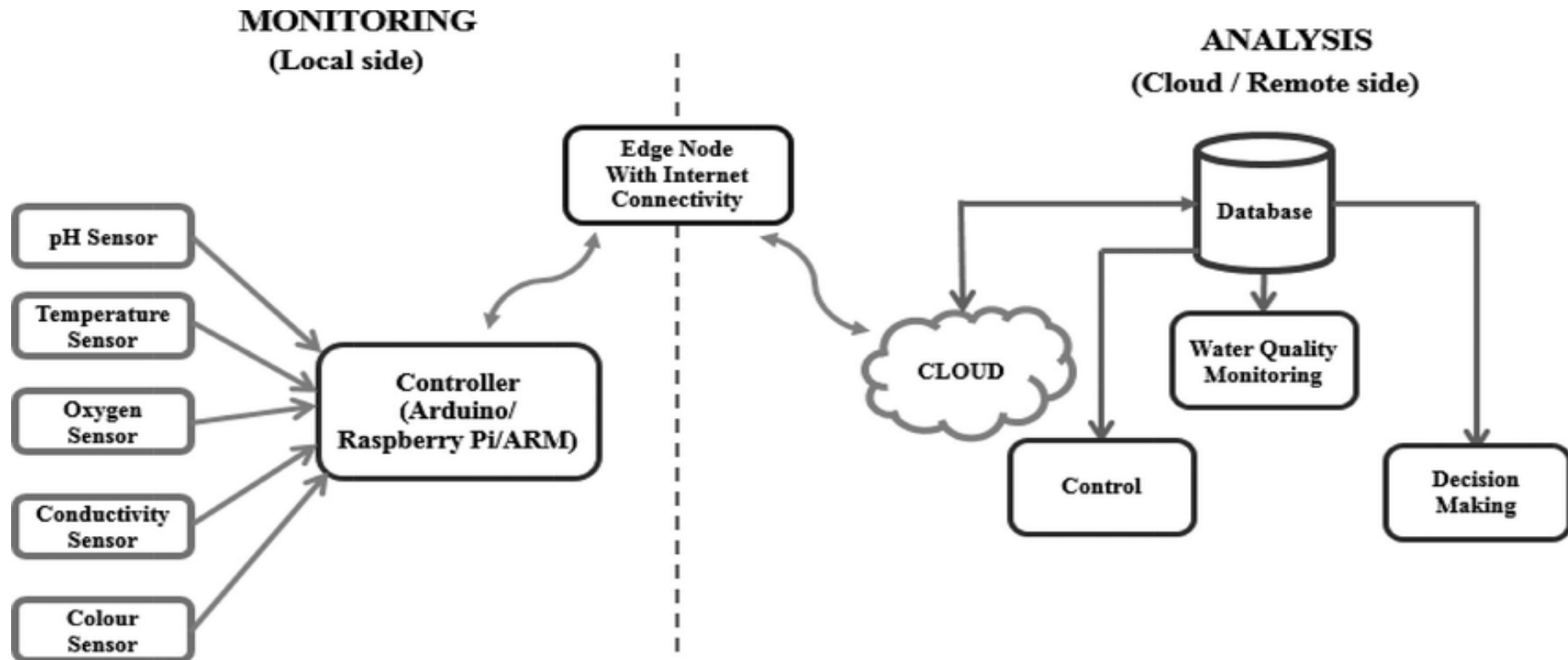
1. pH sensor is used to measure the pH of the river water, Temperature sensor is used to measure the temperature of the water and like that totally 5 sensors are placed to measure the pH, Temperature, CoD, BoD and Salinity of the water.

2. All these Sensors are controlled by the controller. Here, we are going to use Raspberry Pi.

3. Then the controller will be connected to the online open-source tool called as Node-RED with the help of Laptop/PC and also good Internet connectivity.

4. Then the data will be monitored in the Node-RED dashboard with the help of Gauge node and Chart node.

5. The Edge node will be deployed in the IBM Cloud. Store the data's collected in the Node-RED to database associated with the cloud.

6. Here, the water quality is monitored and there will be a threshold fixed for each pH, Temperature, CoD, BoD and Salinity.

7. With the help of threshold, in case the water quality detected does not match the pre-set standards, an alert message will be sent routinely via a mobile app to an authorized person.

Table-1 : Components & Technologies:

S.No	Component	Description	Technology
1.	User Interface	User will be notified with the help of a Mobile App.	XML, JAVA
2.	Edge Node	The Node-RED is connected with the help of Raspberry Pi, which controls the sensors.	Node-RED, Raspberry Pi
3.	Edge to Cloud Connectivity	Node-RED edge application is deployed to IBM cloud to store the results.	IBM Watson STT service
4.	Cloud Database	Database Service on Cloud	IBM Cloudant.
5.	File Storage	File storage requirements	IBM Block Storage

Table-2: Application Characteristics:

S.No	Characteristics	Description	Technology
1.	Open-Source Frameworks	Node-RED	Node-RED is built on Node.js, taking full advantage of its event-driven, non-blocking model. This makes it ideal to run at the edge of the network on low-cost hardware such as the Raspberry Pi as well as in the cloud.
2.	Scalable Architecture	Micro-services	The device is scalable independent of any measurement or sub stations since it's a cloud-based model.
3.	Availability	Use of load balancers	The Design make the continuous monitoring of the data and quality so as to make any emergency alerts at any time, suitable at any weather conditions.
4.	Performance	number of requests per sec	Use of Cloud applications and Node-RED will provide additional features to the model. And hence the model will be smart. When water quality detected does not meet pre-set standards, a mobile app will send an alert message to an authorized person.