Project Title: Real-Time River Water Quality Monitoring and Control System Project Design Phase-I  Team ID: PNT2022TID23204

**AS**

**5. AVAILABLE SOLUTIONS**

The main aim is to develop a system for continuous monitoring of river water quality at remote places using

wireless sensor networks with low power consumption, low-cost and high detection accuracy. pH, conductivity,

turbidity level, etc. are the limits that are analyzed to improve the water quality. Following are the aims of idea

implementation (a) To measure water parameters such as pH, dissolved oxygen, turbidity, conductivity, etc. using

available sensors at a remote place. (b) To assemble data from various sensor nodes and send it to the base station by

the wireless channel. (c) To simulate and evaluate quality parameters for quality control. (d) To send SMS to an

authorized person routinely when water quality detected does not match the preset standards, so that, necessary

actions can be taken.

. The proposed water quality monitoring system based on WSN can be divided into three parts:

• IoT platform

• Neural network models in Big Data Analytics and water quality management

• Real-time monitoring of water quality by using IoT integrated Big Data Analytics

**CC**

**6. CUSTOMER CONSTRAINTS**

**CS**

**1. CUSTOMER SEGMENT(S)**

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.to improve the quality of the river water

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.

**Explore AS, differentiate**

**Define CS, fit into CC**

**BE**

7. BEHAVIOUR

IoT Water Quality Monitor Station and Data Management Layer Architecture Integration. Turbidity, oxidation reduction potential

(ORP), temperature, pH, conductivity, etc. of river water are gathered continuously through IoT devices. IoT devices have capability to stream

the array of collected data wirelessly to the remote Data Aggregator Server in the cloud which are efficiently stored and analyzed through the Big

Data Analytics applications. Thus, the Data Aggregator Server can retrieve the analysis result and transfer the result to the applications running

on smart phones, tablets, laptops, and desktops in the cloud.

**RC**

9. PROBLEM ROOT CAUSE

the quality of the river water will be affected due to large amount of farm fertilizers or farm waste drain into river concentration of nitrate and phosphate increases

**J&P**

**2. JOBS-TO-BE-DONE / PROBLEMS**

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.

**Focus on J&P, tap into BE, understand RC**

**Focus on J&P, tap into BE, understand RC**



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| **Identify strong TR & EM**  **Identify strong TR & EM** | **3. TRIGGERS TR**  the quality of the river water will be affected due to large amount of farm fertilizers or farm waste drain into river concentration of nitrate and phosphate increases | **10. YOUR SOLUTION**  Due to the limitation of the budget, we only focus on measuring the quality of river water parameters. This  project can be extended into an efficient water management system of a local area. Moreover, other parameters  which wasn’t the scope of this project such as total dissolved solid, chemical oxygen demand and dissolved oxygen  can also be quantified. So the additional budget is required for further improvement of the overall system SL | 1. **CHANNELS of BEHAVIOUR CH**   IoT Water Quality Monitor Station and Data Management Layer Architecture Integration. Turbidity, oxidation reduction potential  (ORP), temperature, pH, conductivity, etc. of river water are gathered continuously through IoT devices. IoT devices have capability to stream  the array of collected data wirelessly to the remote Data Aggregator Server in the cloud which are efficiently stored and analyzed through the Big  Data Analytics applications. Thus, the Data Aggregator Server can retrieve the analysis result and transfer the result to the applications running  on smart phones, tablets, laptops, and desktops in the cloud. |  |
| **4. EMOTIONS: BEFORE / AFTER EM**  How do customers feel when they face a problem or a job and afterwards?  Concentration of nitrate and phosphate in river water increases  Measures the clarity of muddiness in the water  Measures the temperature of the water |