



FLOW MONITORING SYSTEM

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ABSTRACT

For life to live and flourish, water is a crucial resource. Today, the population of cities is growing quickly as a result of increased migration from rural to urban areas. We are putting up an IoT-based strategy to meet the demand for water and the needs for water monitoring. We provide an IoT-based methodology for tracking water usage in this research. The data will be gathered via sensors and made available in real time via a website. The suggested system is made up of various parts, including a water flow sensor, a Node MCU serving as the core controller and having an integrated WiFi module, cloud services, and a user interface (website). A microcontroller processes the data from the sensors and sends it to the cloud through a wireless communication module. This data is hence used for monitoring flow and analysis purposes.

Introduction

Water, a natural resource that was once seen as unlimited, is now facing an uncertain future. To compensate for the diminishing supply, there needs to be proper monitoring and analysis of usage of the resources. In addition to conserving precious natural resources, a smart water flow monitoring system offers several features that can improve overall efficiency and keep water costs to a minimum. The water flow measuring sensor is measuring the rate of flow of water through a pipeline and will send data to Node MCU. All the data from Node MCU is going to the cloud storage. The users will get the data through a user interface. The user interface will display the real time data in tabular form as well as in forms of various graphs. The system will generate an alert when the flow rate through the pipeline reduces below or above a specific value. This is done by accessing the data from the cloud server in real time. Further analysis can be done by using this data.

Background

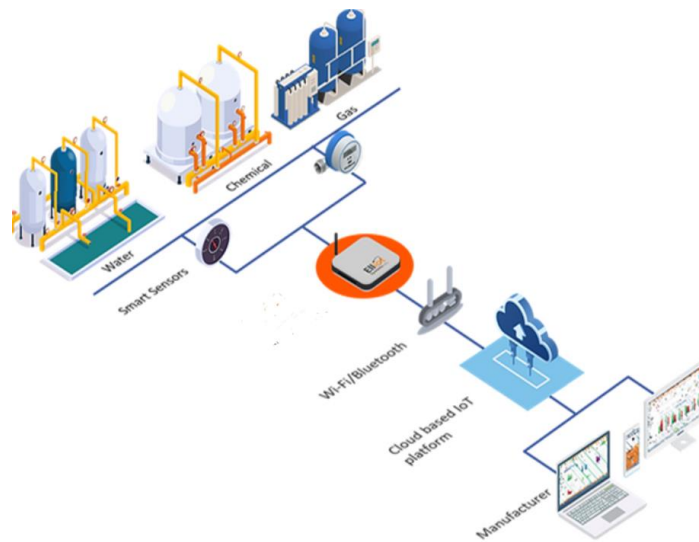
Water is one of the most important elements in the world. Many countries are predicted to run out of water by 2025 because of its daily consumption growth, which creates a water shortage. Therefore, there is a pressing need for potential solutions to get through this crisis. It should be possible to quantify water usage for this reason and then analyse the amount of water consumed. Our goal is to create a sensor-equipped system for monitoring water flow that is sustainable. This sensor will track water flow and assess how much water is wasted each month by displaying the data on the cloud.

Methodology

The "Flow Monitoring System" project will be designed by us. The microcontroller (Node MCU) linked to the flow meter will first receive the flow rate reading from the pipeline and deliver it to the microcontroller. The Node MCU will then transmit this data via Wi-Fi to the Cloud server. The User Interface will retrieve this data and provide the User this rate. The system will serve as a monitoring system and notify the user of any anomalies through alerts.

The System showcases the design flow of the "Flow Monitoring System" project. Firstly, the flow meter will read the flow rate flowing through the pipeline and will send this to the microcontroller (Node MCU) connected to it. Then the Node MCU will send this data to the Cloud server by using the Wi-Fi module. This data will be accessed by the User Interface and display this rate to the User. The system will act as a monitoring system and will report any discrepancies in forms of alerts to the user. GUI allows users to directly interact with their devices and complete certain tasks by manipulating elements like icons and scroll bars, is one-way designers make their digital devices more efficient and usable. We are going to design an interactive user interface that will give users real time readings calculated by our device. This will be done by using cloud technology. The GUI will be made by using web development software like ReactJS and NodeJS. The graphical user interface will give the readings in form of tables for analysis purposes to the user as well as in form of graphs which will enable user to visualize and understand the flow mechanism. Also, we will generate alerts to communicate with the users the changes in flow of water in the system by using real time data analysis using cloud technologies.

System Architecture



Future Scope

The proposed "Flow Monitoring System" are limited to manually controlling leakage and flow rate. This limitation needs to be overcome in such a way that there must not be any such physical need to check the devices every single time and control the inspection of flow rate virtually. We can also consider the time duration of the reduction in water flow rate to attain accuracy in the system. The system can also be modified further for Prediction and Analysis of usage.

Conclusion

Our "Flow Monitoring System" provides solutions like: Tracking usage of fluids through the pipeline using flow sensors, provides real time data using Cloud to monitor the proper working of the system. And alerts to the user whenever change occurs using the real time data. Gives Tabular and Graphical representation of data stored for better understanding. This data can be used for Predictions and Analysis tasks. The proposed system will ensure proper and efficient usage of water, hence drastically reducing the wastage of water. Hence the most important goal to save water can be achieved by using the proposed project.

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