IOT Based Water Management System

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***Abstract*- The conventional technique of measuring the quality of water is to gather the samples manually and send it laboratory for analysis, but this technique is time overwhelming and not economical. Since it is not feasible to take the water sample to the laboratory after every hour for measuring its quality. The water quality measuring system can measure the essential qualities of water in real time. The system consists of multiple sensors to measure the standard of water, microcontroller and Wifi modem to send the information to the watching center. It's a true time system which is able to endlessly measure the standard of water and can send the measured values to the watching center when each predefined time.**

During the past decade, water needs have increased unpredictably in India. Increasing demand of water supply has become a major challenge for the world. Wasteful usage of water, climatic changes and Urbanization has further depleted the resource. Conservation and management of the resource must be given utmost importance. In this paper, we present review of work done by different authors for effective water management in past. This paper also proposes an IoT design for water monitoring and control approach which supports internet based data collection on real time bases. This system is designed to overcome shortcomings of the existing models for a ubiquitous usage of wireless systems for smart quality monitoring and communicate data wirelessly.

I. INTRODUCTION

Water is an important resource for all the livings on the earth. In that, some people are not getting sufficient amount of water because of unequal distribution. We can use this approach so that everyone gets the equal amount of water. It is also used to avoid the wastage of water during the distribution period. In the previous method, the employee will go to that place and open the valve for a particular duration; then again the employee will go to the same place and close the valve. It is waste of time. The proposed system is fully automated. Here human work and time are saved. 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. In this project, we will implement the design of IOT base water quality monitoring system that monitors the quality of water in real time. This system consists some sensors which measure the water quality parameter.

II. LITERATURE REVIEW

This paper highlights the entire water quality monitoring methods, sensors, embedded design, and information dissipation procedure, role of government, network operator and villagers in ensuring proper information dissipation. It also explores the Sensor Cloud domain. While automatically improving the water quality is not feasible at this point, efficient use of technology and economic practices can help improve water quality and awareness among people [1].

This paper describes 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. In this paper, we present the design of IOT based water quality monitoring system that monitor the quality of water in real time. 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. Finally, sensors data can view on internet browser application using cloud computing [2].

This paper describes the conjunction of the Smart

City Initiative and the concept of Industry 4.0. The term smart city has been a phenomenon of the last years, which is very inflected especially since 2008 when the world was hit by the financial crisis. The main reasons for the emergence of the Smart City Initiative are to create a sustainable model for cities and preserve quality of life of their citizens. The topic of the smart city Water Quality Monitoring System Based on IoT 1109 cannot be seen only as a technical discipline, but different economic, humanitarian or legal aspects must be involved as well. In the concept of Industry 4.0, the Internet of Things (IoT) shall be used for the development of so–called smart products. Subcomponents of the product are equipped with their own intelligence. Added intelligence is used both during the manufacturing of a product as well as during subsequent handling, up to continuous monitoring of the product lifecycle (smart processes). Other important aspects of the Industry 4.0 are Internet of Services (IoS), which includes especially intelligent transport and logistics (smart mobility, smart logistics), as well as Internet of Energy (IoE), which determines how the natural resources are used in proper way (electricity, water, oil, etc.). IoT, IoS, IoP and IoE can be considered as an element that can create a connection of the Smart City Initiative and Industry 4.0 – Industry 4.0 can be seen as a part of smart cities [3].

In this paper an efficient energy management frame work to provide satisfactory QOI experience in IOT sensory environments is studied. Contrary to past efforts, it is transparent and compatible to lower protocols in use, and preserving energy-efficiency in the long run without sacrificing any attained QOI levels. Specifically, the new concept of QOI-aware "sensor-to-task relevancy" to explicitly consider the sensing capabilities offered by an sensor to the IOT sensory environments, and QOI requirements required by a task. A novel concept of the "critical covering set" of any given task in selecting the sensors to service a task over time. Energy management decision is made dynamically at runtime, as the optimum for long-term traffic statistics under the constraint of the service delay. Finally, an extensive case study based on utilizing the sensor networks to perform water level monitoring is given to demonstrate the ideas and algorithms proposed in this paper, and a simulation is made to show the performance of the proposed algorithms [4]

This paper presents the burst detection and localization scheme that combines lightweight compression and anomaly detection with graph topology analytics for water distribution networks. We show that our approach not only significantly reduces the amount of communications between sensor devices and the back end servers, but also can effectively localize water burst events by using the difference in the arrival times of the vibration variations detected at sensor locations. Our results can save up to 90% communications compared with traditional periodical reporting situations [5].

III. PROPOSED SYSTEM

In this system, we get water quality conditions through various sensors like pH level sensor, water level sensor, turbidity, and conductivity and Arduino board.The information will be uploaded continuously from the WSN through Microcontroller and Wi-Fi. We control and upload this data to cloud and users can access this data through designed application on the website. From this system, a person from anywhere can monitor the information at any time.

This system can be implemented on water tanks for safe and waste less consumption. Water when supplied from the reservoir to tanks then the pH level of water will be checked, if it comes in required range then the conductivity of water will be checked. If pH or conductivity of water will not be in safe range then the water will not be supplied to household tanks and valves will be closed. The Same procedure will be followed till water does not come in safe range. After the satisfactory quality check of water if the tanks are full then valves of the tank will be opened and water will be distributed. During distribution of water rate of flow is measured so that equal distribution is done. This whole data is sent from Wi-Fi to the Web page so that system can be accessed remotely from a computer. The flow of distribution and quality of water both will be monitored from the web page which can be displayed anywhere using the internet.

IV. CONCLUSION

In this paper we have analyzed different water quality monitoring systems. There are lots of techniques available to do the same. All these techniques are

expensive and difficult in terms of analyzing and collecting the data. We have also identified the shortcomings of these systems. This paper proposes IoT based water management system which will overcome all the issues occurred in the systems designed in past. We have identified a suitable implementation model that will consists of different sensor devices and other modules, their functionalities. Future scope of this paper involves implementation of this paper in real time.

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