Water Supply and Management using IoT

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Abstract: ***Water is one of the most precious natural resources to use in everyday life, agriculture and industry. In this project we present the approach of the Water Supply and Management project which is oriented to develop a new system which will help to reduce wastage of water and to manage water efficiently. This abstract presents an IOT device which help to manage and plan the usage of water and quality of water design with the objective of notifying the user of the real-time water quality parameters and users usage. Parameters are used to detect water impurity. This system can be easily installed in residential societies, colleges and row houses, etc. Sensors placed near the water tap which informs about their recharge and quality of water. This information will be updated on the cloud and using an android application, user can easily handle the system through the smartphone anywhere if the system will be connect to the internet.***

Index Terms: Water management, Water quality parameters, Sensors, IOT, Internet, GSM, WSN.

I. INTRODUCTION

Nowadays the world is increasingly looking forward to use of new technologies to improve quality of life as well as reduce human efforts and activities. Residential and commercial sectors receive and pay for utilities such as natural gas, electricity, or water through the use of a utility company. Water resources around the world are getting scarcer day after day. Climate, global warming, and irresponsible usage are major factors the make the situation even harder. Tremendous population growth causes insufficient and uneven distribution of water. So measuring the water usage and providing it with proper amount will limit the wastage of water in society. These resources should be carefully managed for the future purpose. And there is also one challenge to provide the pure water to the users, because the contaminated water causes many diseases. So for this there should be a system with new technology that will prevent such types of problems.

II. AN INTELLIGENT SMS-BASED REMOTE WATER METERING SYSTEM

Here the Prepaid Water Meter System is a kind of technology used for keeping the track of billing of water along with observing the water meter readings automatically from remote area without human intervention. This system makes Billing really fast, accurate, and no overhead along protection against tampering it. Also there is additional security features added for prepaid billing of water using Short Message Service (SMS) has been depicted. Global System Mobile communications (GSM) is used mainly for sending as well as receiving sums. This System Prototype is made which outputs us further system exploration and experiment.

As previously stated SMS service is a feature in of our integrated prepaid water meter system which has been proposed. Here there are varieties of different hardware and firmware units are used in prepaid meter and also the central server's different modules are shown along with communication protocol. Various experiments are carried out along with two remote meters and one central server have been displayed, it composed of an interfacing a General Packet Radio Service modem along with the prepaid meter makes the central server would be received makes the data continuous and much falsely[1].

III. DESIGN AND IMPLEMENTATION OF WATER BILL CONTROL SYSTEM BASED GSM

Here the automatic meter reading helps in the circulation of water consumption for use reach according to that particular users need. The water company provides remote control for the water meter in consumer surroundings. The system makes use of GSM network to connect water meter with Water Company. An arduino microcontroller issues appropriate signal according to the input readings. The system automatically separates the water from the user if the amount of water prepaid ended.

Automatic water Meter reading is one method used for reading and processing data automatically communication with help of computer. The automatic water meter reading system makes use of wireless technology GSM module system for data transmission was successfully connected. This wireless meter reading system is designed to measure the amount of water used and to completely cut off water supply remotely whenever the consumer did not renew the water. The system uses the existing GSM network, which can send its readings directly to a server application using a GSM the water meter system. A process of monitoring amount water flow rate and its calculating the bill etc. is through preprogrammed Arduino controller. Automatic water Meter reading avoids the human intervention, provides efficient meter reading, avoid the billing error and reduce the maintenance cost and its tampering. It displays the corresponding information on LCD for user notification[4].

IV.A SMART WATER-METER BASED ON IOT AND SMARTPHONE APP FOR CITY DISTRIBUTION MANAGEM -ENT

An approach to performed automated water meter reading for updating of consumption information from field to the Utility office of actual Municipal Corporation. The smart metering approach developed by making use of low cost IoT hardware and smartphone app. This scheme is very helpful to both Meter Reader as well as individual domestic / industrial consumers to use regular smartphones to perform meter reading and update the particularly users to utility's portal / database for billing and payment. The proposed scheme removes additional overheads caused on billing for water distribution in metropolitan cities and areas.

A system for implementing a very cheap and reliable smart water distribution metering using IoT based hardware and smartphone App is discussed. This approach removes disadvantages in certain smart-meter systems such as tampering in pre-paid water-meters cause the nature of previous water meter was standalone; also makes sure that the unauthorized Top-Up updates to pre-paid meter smart cards using hacking would be discovered[3].

V. DESIGN AND DEVELOPMENT OF WIRELESS SENSOR NETWORK (WSN) FOR WATER QUALITY MONITOR -ING USING ZIGBEE

The implementation of Wireless Sensor Network for water quality tracking by using Zigbee. The continuous monitoring is carried out for water quality monitoring and carried out with help of a number of sensor nodes that has particularly networking ability which can be installed using wireless sensor network. In water quality monitoring the parameters involved are pH, temperature, turbidity this parameters are remotely taken without any human resource and by the sensors that send the data to database. Such monitoring system can be setup has very low power consumption, is very cheap, easy handling, installation and maintenance. The system consists of sensor nodes (pH Sensor, Turbidity Sensor), a microcontroller, a Zigbee radio, and a base station (Zigbee radio and microcontroller).For comparing routing results of different topologies OPNET simulator is used like the mesh network if a node fails in its way to transmission to another node this care has been taken with help of OPNET model.

The reason behind this paper was to explore more about capabilities of OPNET Modeler which acts as main during the simulation of zigbee wireless sensor network, also design a prototype for water quality monitoring. Also that OPNET Software has capability to form mesh network using Zigbee with will be further helpful. The output must be in between 7 to 8.9 for pH sensor node and turbidity displayed around 73% for water which was tested in lab. The suggested prototype has low power consumption as the protocol is Zigbee[8].

VI.DESIGN AND IMPLEMENTATION OF COST EFFECTIVE WATER QUALITY EVALUATION SYSTEM

Composition of low cost and immensely proficient water quality monitoring system is very crying need for those people living in the outlying territory where immune drinking water is not good. This paper is based on the microcontroller based water quality monitoring system with high degree of accuracy and susceptible to determine several parameters of water such as temperature, turbidity and potential of hydrogen. These above parameters are extremely helpful in Detection of those parameters of water is very important for living a healthy life as different source of water are being populated. Various analytical schemes are there used for checking the quality of water where several are time-consuming but a few are used for industrial applications which are not applicable for simple water meter monitoring. It is a simple model that consists of a simple device that tracks out various parameters of water accurately. Here a research work, a simple microcontroller is used as central processing unit along with collection of various multiple sensors that detect various parameters and these collected data from them is send the data to microcontroller and finally the LCD gives the results.

The device is cost effective and the accuracy of this device is at a better level. Here a system is developed with the help of the three parameters of water. This detection of such parameters will cause people to live more healthy life rather than causing diseases due to bad quality of water[6].

OVERVIEW:

Techniques	Purpose	Operations	Results drawn like
An Intelligent SMS-Based Remote Water Metering System	Keep the track of billing of water along with observing the water meter readings	It automatically captures reading of meter of that particular remote area without human resources.	GPRS unit connects with prepaid meter so that faster and continuous data is send to prepaid meter central server's modules
Design and Implementation of Water Bill Control System Based GSM	Automatic water meter reading system makes use of wireless technology GSM module system for data transmission was successfully connected	Here a General Packet Radio Service is used along with the prepaid meter so that faster and continuous data can be received in the central server.	System makes Billing easy displayed with feature added for prepaid billing of water using Short Message Service (SMS)
A Smart Water Meter based on it and Smartphone App for City Distribution Management	Automated water meter reading for update of consumption information from field to the municipal corporation database.	It describes methodologies of making use of low cost iot hardware to connect it with smartphone app.	Smart-meter makes sure that tampering in pre-paid water-meters unauthorized Top-Up updates to pre-paid meter should not be declared falsely and generate alert.

Design and development of wireless sensor network (wsn) for water quality monitoring using zigbee	Which allows a Sensor to identify and describe itself to the control unit within the transceiver system long-distance supervision System based on the wireless sensor networks zigbee	It passes to meter by the water quality sensors convert water quality parameters to electrical signals, the signal may be voltage signal	The sensor node is composed by the Water quality sensor, the signal gathering module and the Wireless communication module.
Design and Implementation of Cost Effective Water Quality Evaluation System	Water quality monitoring system is very desperate need for those people living in the outlying territory where immune drinking water is not good for drinking.	Microcontroller based water quality monitoring system with high degree of Accuracy and susceptible to determine several parameters of water like temperature, turbidity, ph quality.	A microcontroller is used as central processing unit (CPU) and multiple sensors that detect various this data displayed on the LCD

CONCLUSION

The whole study in this paper was to study various water meters which reduce the wastage of water and check the quality of water and to understand which techniques they used. The Smart
Water quality check meter is automatic and does not require much human interference, thereby reducing the errors. The real-time monitoring provides immediate remote access to the water quality .All these measures aims at bringing down the unnecessary usage of water and prevention of health hazards caused due to consumption of impure water. So our study has reached that the water meter which will restrict the usage of water and also helps to check the purity of water will give more advantage.

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