Smart Wireless Water Meter with Web DB using Internet of Things

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***Abstract*:- Smart wireless water meter is a device that measures the amount of water consumed by householders or industries who have the device fitted within their premises. Water conservation is a big issue in many industries and householders like apartments and small scale industries. A common meter is fitted and cumulative consumption amount is shared among users where they are being monitor more than what they want. There are several idea to overcome this issue. In this paper we have proposed a solution to thisissue in which a device is used to calculate the flow rate and quantity of water consumed by the users and send data base to the cloud to monitor the consumption of water.**

1.INTRODUCTION

IoT(Internet of Things) is defined as a system where physical objects can become active participants and services are available to interact with these objects over the internet. It enable the devices that can communicate and network with each other and with the environment by exchanging information via the internet with or without human intervention. Smart water meter is an internet-capable device that measures the amount of water consumption in a building or home. Now a days, water conservation is big issue in many apartments. Apartment association shouldtake initiative to send the message of the amount ofwater consumed to all residents. In this paper we proposed the solution for the above issue by installing the smart water meter for every house inapartment to monitor the consumption level ofwater using IoT technology. The another problem is where a common meter is fitted in complex and bill for cumulative consumption amount is to be shared among the households, where they are being charged more than what is to be paid. So theyneed a system under which charges are levied as per consumption of each family instead of total cumulative consumption. Smart meter for water utilization provides solution for this problem and it measures the quantity of water consumed by each household and allow the user to monitor the consumption level. While installing this smart water meter we should avoid above issues and we should keep track on the water consumed over the internet. The supply of water can be ended if the residents are not present in their home and it reduces energy consumption directly or indirectly.

I. LITERATURE SURVEY

A .TITLE: IOT BASED SMART WATERSUPPLY MANAGEMENT SYSTEM

Water supply management system needs data regarding water storage present in Dam. Satisfying the increasing demand for water supply has been major challenge for many countries around theworld. Water is one of the major requirements for human survival, conservation and management of the water resources must be given most importance. The system can measure the water level and give measurement report to the central office. This system use sensors to measure thewater level of Dam and updates are provided to Corporation on daily basis. Supply of water to the particular area according to the water level in the dam, and it will be informing to the customer about water level and the time period of water supply using GSM message service. Next part contains Water meter which monitors water usage and calculate appropriate bill according to usage. It provides facility of online bill payment system.

II. LITERATURE SURVEY

B.TITLE: SMART METER FOR WATER UTILIZATION USING IOT

Smart water meter is a device that measures the amount of water consumed by householders who have the device fitted within their premises. Water conservation is a big issue in many apartments. A common meter is fitted and cumulative consumption amount is shared among households where they are being charged more than what is tobe paid. There are several idea to overcome this issue. In this paper we have proposed a solution to this issue in which a device is used to calculate the flow rate and quantity of water consumed by the householders and send it to the cloud to monitor theconsumption of water.

C.TITLE: SMART WATER QUALITY MONITORING AND METERING USING LORA FOR SMART VILLAGES

water is the basic need and elixir of life. Our daily water supply is through water tanks and dams which are constructed to store water for future usage. From there water crosses many stages through pipes to reach our homes. At each level, source water is prone to mix and get polluted from t he environment and humans. Excessive water overflow and pollution are the major cause of the depletion of water. The objective of the work is to monitor water quality, distribution, usage in Potable water and Chemical leakage detection in rivers, etc using M2M-LoRa. LoRa is a new type of wireless connectivity in the unlicensed 433MHz and 868MHz used for long-range transmission upto 15Kms. The proposed work ismainly for Smart Village Projects. The LoRa mote along withsensors will be placed in water tanks (200locations) at villages and within corporation limits. The system will continuously monitors the quality and level of water in all tanks

anddisplayed in a common place where the entire water distribution system can be controlled from one place. The distribution system saves the water and monitoring system controls the distribution of polluted water.
Finally, the potentiality of the smart meters for water distribution is discussed.

D.TITLE: IOT AND CLOUD COMPUTING BASED SMART WATER METERING SYSTEM

This paper focuses on the developmental and implementation methodology of smart water meterbased on Internet of Things (IoT) and Cloud computing equipped with machine learning algorithms, to differentiate between normal and excessive water usage at industrial, domestic and all other sectors having an abundance of water usage, both for Indian and worldwide context. Recognizing that intelligent metering of water has the potential to alter customer engagement ofwater usage in urban and rural water supplies, this paper fosters for sustainable water management, a need of the present. With shrinking reserves of clean water resources worldwide, it is becoming cumbersome to cater for this resource to masses inthe coming years on a consistent basis. Using our smart water meter, water resources can be managed efficiently and an optimum use could save water for the future generations. Sensors will provide for real time monitoring of hydraulic data, automated control and alarming from Cloud platform in case of events such as water leakages, excessive usage, etc. Analysis of the same will helpin taking meaningful actions. Thus we do propose for a smart water metering technology that can be utilized by Indian citizens, and worldwide, to curb wastage of water. With an ease of monitoring and visualization of the data through the Cloud platform combined with machine learning based tools to detect excess water consumption, the server-less architecture we propose can be easily adopted and implemented ina large scale.

III. EXISTING SYSTEM

Ultrasonic water meters have current widespread problems of poor site adaptability, low measurement accuracy, and poor stability. A high-precision intelligent ultrasonic water meterwith self-diagnosis function and adaptive technology was proposed in this paper, which is focus on improving the measurement accuracy and repeatability of the small pipe diameters. The hardware circuit design of the ultrasonic watermeter studied in this paper adopts the low-power STM32L053 microcontroller with Cortex-M0 core architecture and the high-precision 11 ps time resolution timing chip TDC-GP30 to complete themetering function. The software combines pulse width ratio and amplitude voltage measurement technology to make the water meter have self-diagnosis function, avoid measurement errors caused by accidental factors, improve adaptability and measurement accuracy, also the application of adaptive measurement period method is used to improve measurement repeatability. The software adopts the moving average filtering algorithm, which effectively reduces the fluctuation of the time-of-flight(ToF) difference and improve the measurement accuracy of the flow point in the lowzone (between the minimum flow and the boundary flow). The experimental verification results show that the accuracy of the small-caliber ultrasonic water meter can reach within ±1.5 %, and the repeatability is less than 0.5 %. In the face of fluid disturbances, adaptive technology is used in this water meter to adjust the measurement period and carry out self-diagnostic function research, and automatically respond to deal with abnormal faults, thereby realizing the demand for intelligence.

IV. WORKING PRINCIPAL

In this paper we proposed the solution for water utilization using water flow sensor and interface with Node MCU microcontroller which embedded with Arduino code. Arduino software is used for Arduino coding to find flow rate of water, display the output in serial monitor and send the sensed data to the cloud which can be monitored by mobile. The prototype model consist of flow sensor, arduino micro controller and IOT module. The flow sensor will interface with controller to monitor the water flow through the Pipe line and monitor the quantity base on the time of water flow. And also to monitor the leakage water.

HARDWARE REQUIREMENTS:

- Power supply
- Flow sensor
- Iot module
- Arduino microcontroller
- Pump motor
- Buzzer

SOFTWARE REQUIREMENTS:

- Arduino IDE
- Embedded C Language

V. PROPOSED SYSTEM

In this paper we proposed the solution for water utilization using water flow sensor and interface with Node MCU microcontroller which embedded with Arduino code. Arduino software is used for Arduino coding to find flow rate of water, display the output in serial monitor and send the sensed data to the cloud which can be monitored by customers.

VI. WATER FLOW SENSOR

Huge industrial plants, commercial and residential buildings require a large amount of water supply. The public water supply system is used to meet thisrequirement. To monitor the amount of water being supplied and used, the rate of flow of water has to be measured. Water flow sensors are used for this purpose.flow sensors are installed at the water source or pipes to measure the rate of flow of waterand calculate the amount of water flowed through the pipe. Rate of flow of water is measured as litersper hour or cubic meters.

CONCLUSION

On the basis of analysis and design, the system provides a smart water meter with eco- friendly and energy efficient

system. As the smart water meters are digitized and automated, high accuracy is maintained by decreasing human efforts. Water theft can be avoided since there are no mechanical parts that can be subjected to tamper. A flow sensor based water metering system was used for automated billing, eliminating the drawbacks of traditional water metering systems. Further, multiple houses in a building could use separate end nodes with a common gateway connecting to the internet for accurate billing based on individual consumption of houses. An analysis of water usage through various outlets in a house was provided in order to educate residents on cutting down wasteful usage. This paper demonstrates the successful implementation of an internet-based approach to monitor water supply and usage on a real time basis.

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