Smart Water Management System

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[1]Project Guide

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Abstract— The Internet, invention of the century, has completely revolutionized the world and brought people closer to each other than ever before. The advancement in technologies of computing, communication brings the next generation of Internet, Internet of Things. As the population and urbanization increases, the cities have to transform to Smart Cities which can be achieved with the help of Internet of Things. Water is one of the vital resource for existence of human life and so Smart water management system has a key role in smart city. The paper reviewed different technologies and platforms that are required for a smart environment. An architecture design for Smart water management is proposed and an implementation detail of Smart water monitoring system is discussed.

Keywords: Smart Water Management System

I. INTRODUCTION

According to recent survey, water has become a big issue because of less rain fall, increase in population many cities are facing this problem people have to suffer from this problem they don't have sufficient amount for their daily needs . Due to lack of monitoring water can't be supplied properly, some areas in city get water while other some areas can't so, there is a need of continuous monitoring, water supply scheduling and proper distribution another problems are excessive consumption, overflow of tanks, leakage in pipeline ,interrupted water supply . Water is a basic need of every human being everyone has to save the water many a times with lack of monitoring, overflow of these overhead tanks can occur because of this lots of water get wasted, another thing because of overflow in the pipelines with more pressure there is possibility of pipeline damage, leakage detection is one more problem all these problems are because of lack of monitoring, manual work, less man power. Before implementing this project a survey of Aurangabad city and field survey have been taken to understand water supply distribution and related problems with the system. After taking a survey, a fact has been discovered that all the work is manual and need a better technology to make proper distribution. By focusing on problems in traditional methods our system design and develop a low cost embedded system device for real time monitoring of water distribution system in Internet of things (IOT) platform. IOT is a world where billions of objects can sense, communicate and share information, all interconnected over public or private Internet Protocol (IP) networks. These interconnected objects have data regularly collected, analysed and used to initiate action, providing a wealth of intelligence for planning, management and decision making.

II. PROBLEM STATEMENT

Present days Water is a limited resource and is especial for agriculture, industry and for creatures existence on earth including human. Lots of people don't realize the true importance of drinking enough water every day. More water are wasted by many uncontrolled way. This problem is quietly related to poor water allocation, inefficient use and lack of adequate and integrated water management. Therefore efficient use and water monitoring are potential constraint for home or office water management system.

III. LITERATURE

B. Dhivyapriya et.al.(2015) in "continuously keeps track of the level of water in water systems like overhead water tanks"- proposed the client can send the message to the framework to realize the water level subtleties of the tank and furthermore be utilized to manage the siphon suddenly by killing the siphon when the basic dimension of water in tank is come to and send the message to the client that the water in the tank is full. This is intended to control the dimension of water with help of ultrasonic sensor and GSM innovation.

Dr.V. Chandrasekaran et.al.(2015) in "GSM based water tank level monitoring and pump control system".- proposed in which another procedure is proposed to consistently monitors the dimension of water in water frameworks like overhead water tanks. The client can send the message to the framework to realize the water level subtleties of the tank and furthermore be utilized to control the siphon unexpectedly by killing the siphon when the basic dimension of water in tank is come to and send the message to the client that the water in the tank is full. This is meant to control the dimension of water with help of ultrasonic sensor and GSM innovation.

M .S. Mohan kumar et.al.(2015) in "IOT based water management System for a Campus proposed real time water monitoring system for campus."- recommended that work utilized an off-the rack ultrasonic sensor HC-SR04. which is mounted at the highest point of the tank. It sends so much ultrasound beats at 40 KHz towards the water surface and measures an opportunity to get the reflected waves by detecting when the reflected edge crosses an edge. this methodology functions admirably when the got sign are huge in adequacy and consequently its range was restricted to about 4km,which is deficient for huge appropriation tanks that can be profound as 8m.

IV. PROPOSED SYSTEM

This system is focused on, Internet of things which is new scenario to make city as a smart city with different application. Main objective to implement this project is to design and develop a low cost reliable and efficient technique to make proper water distribution by continuous monitoring and also controlling it from a central server so that we can solve water related problems. Proposed system consist of a Raspberry pi used as minicomputer, different sensors such as water level sensor, flow sensor, and turbidity sensors are

used. Arduino collects the data from sensors and send it raspberry pi. This system solves problem of Overflow, over consumption, Quality of water and makes a proper distribution. Continuous monitoring and controlling from a central server is possible using this system.

A. *Hardware Requirements:*
− Arduino
− Wi-Fi Module
− Water flow sensor
− Water controlling valve
− Ultrasonic sensor
− Breadboard
− Convertor

B. *Software Requirements:*
− Java
− JArduino
− Kodular
− Android studio
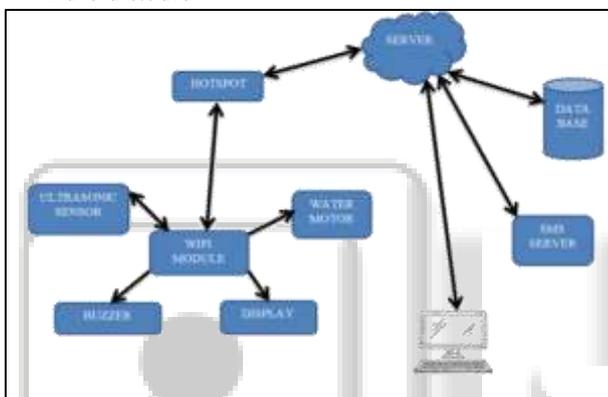
V. ADVANTAGE OF SMART WATER MANAGEMENT SYSTEM

− Reduced water and sewer costs: Low flow water conservation devices reduce water usage and costs as well as sewer costs.
− Weather-based irrigation controls: This type of control system saves water usage and cost especially during the hot summer months.
− Reduced energy usage: Low flow water devices reduce the amount of hot water used which, in turn, reduces the amount of energy used to heat the water.
− Reduction of unbilled water: Replacing old, inaccurate water meters and distribution piping can result in increased revenues for the water district.
− Wastewater treatment energy usage: Wastewater treatment plants are one of the largest users of energy within a city. Plant upgrades and aeration optimization can dramatically reduce energy usage and save money.

VI. 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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