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Automated Monitoring & Control of Water Distribution System for Smart Cities

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Abstract - *Water is the most precious and valuable because it's a basic need of all the human beings but, now a day's water supply department are facing problem in real time operation this is because less amount of water in resources due to less rain fall. To overcome water supply related problems and make system efficient there is need of proper monitoring and controlling system where urban residential areas have increased because of this reasons water has become a crucial problem which affects the problem of water distribution, interrupted water supply, water conservation, water consumption and also the water quality.*

Key Words: IoT

1. 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.

In this paper, we are focusing on continuous and real time monitoring of water supply in IOT platform. Water supply with continuous monitoring makes a proper distribution so that, we can have a record of available amount of water in tanks, flow rate, abnormality in distribution line.

The combination of physical objects with electronics, sensors, software, and network connectivity is nothing but Internet of things. Monitoring can be done from anywhere as central office. Using Blynk as free sever data continuously pushed on cloud so we can see data in real time operation.

With efficient client server communication using different sensors with controller and raspberry pi as Minicomputer can monitor data and also control operation from cloud.

Before explaining the proposed system let us give how water flows into the taps in houses. Cities usually source water from rivers, lakes, and ground water reservoirs. From these water sources, the water is pumped from pump houses into treatment plants through pipes. Water is cleaned at the treatment plant and from there it is piped into reservoirs. The reservoir is the storehouse for the treated water. Water is pumped from these reservoirs to the overhead tanks spread across the city.

In some cases, the water is directly supplied from the reservoirs to the houses. As all the cities are working on a smart city concept, our system focus on, Internet of things which is new scenario to make city as a smart city with different application. Proposed system consist of a Raspberry pi used as minicomputer, different sensors such as water level sensor, flow sensor, and turbidity sensors are used. Raspberry pi receives data from Arduino.

2. PROPOSED ARCHITECTURE

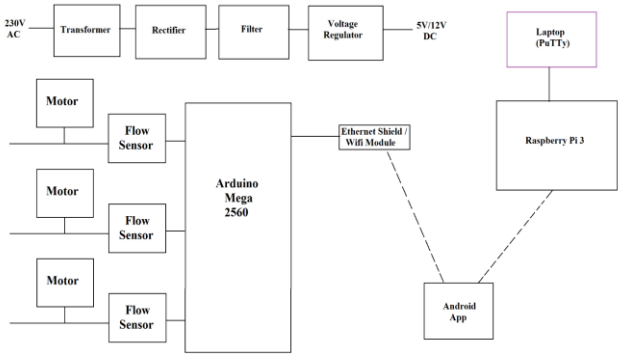

Figure 1: Proposed System.

1) In traditional water distribution system there is no provision to monitor the consumption of water.
2) If consumption of water could be monitored on real time basis then the proper distribution of water could be planned according to monitor the flow of water we will use flow sensor that will measure amount of water consumed by the consumer.
3) A motor mechanism is used to turn off and on the valve manually if theft is detected.
4) Ethernet Shield or Wifi Module will connect Arduino Mega to phone's hotspot.
5) Raspberry Pi will act as a server as we will download cloud of android app on it.
6) Raspberry Pi will be connected to phone's hotspot.
7) Arduino Mega and Raspberry Pi will be connected to our phone's hotspot which will form a small network and all readings of flow sensor will be displayed on Android App.
8) We can manually turn on and off the supply of water on a press of a button on Android App that controls the motor mechanism of valve.
9) We will use Putty software as a monitor of Raspberry Pi.

3. CONCLUSIONS

Thus, water supply monitoring system was built. Using proposed system, we can make centralized water control system. We can ensure fair water supply to all users by preventing water theft and ensuring by taking necessary action. The disadvantage of the existing system that required manpower was eliminated. This real time automation implemented in the system avoids wastage of water and reduces time. Due to database, it is possible to monitor the whole system from central office and produce daily, monthly and yearly reports for quantitative analysis of supply water.

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