



WATER SCHEDULING AND DISTRIBUTION FOR SMART CITY AND VILLAGE USING IOT

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ABSTRACT

Water is at the heart of sustainable development, which is essential for economic and social development, productive energy for ecological safety and human survival. Water is also a human right. As the world's population increases, the need for a balance between all commercial water resource requirements is needed to allow communities to get enough water. At present, conventional water tanks can neither monitor nor control the water level in tank, leading to large amount of water waste. Also some families often face problems to examine the availability of water in water tanks, including the lack of water supplies in the area because of separation of water supply from the government in new and undeveloped areas.. The need of removal of these problems and providing an efficient and economical solution has been the main focus of this research paper. By using this application (the smart water tank), people can easily place an order using the smart application which notifies the water supplier to refill the water preventing shortage of water. In this paper, we propose an IoT-based water distribution system approach to monitor the level of water in overhead tank, flow rate of water, quantity and leakage of water in a water pipeline system based on the measurements accumulated from the flow meters and as well as proper distribution of the water resource. In urban and rural areas, the manual operation of water distribution system is being replaced. Internet of Things (IoT) technology is

water. The proposed methodology is realized through the use of real-time systems and sensors, where data are collected from individual houses then processed in real-time and finally the gathered information is displayed in the website.

Keywords: timer, water scheduling and distribution system, automatic control, wi-fi, IOT.

1.INTRODUCTION

A water distribution system consists of different elements like pipes, valves, pumps and tanks. The pipeline arrangement helps to convey water from the source to the individual house. Designing and operating a water distribution system is the most important consideration for a lifetime of expected loading conditions. Furthermore, a water distribution system must be able to assist the abnormal conditions such as pipe breakage, mechanical failure of pipes, valves, and control systems, power outages and inaccurate demand projections. Internet of Things (IoT) technology has made a great impact in today's world. The idea of connecting everything wirelessly made the thing easier. We can connect anything using the sensors designed specifically for objects. IoT is the network of objects, devices embedded with electronic sensors, and connectivity to enable them to talk to each other and execute functions. The devices participating in IoT must be designed in such a way that it should be interoperable with different embedded controllers as well as with different wireless

amount of information resulting in useful future actions. This work focuses on a solution for 'Water distribution and management' in urban and rural areas with the help of IoT. Water should be conserved and the supply needs to be regulated. Water demand is exponentially growing high with the increase in population. To maintain the supply demand ration proper, it is important to have systems to prevent excess usage of water and to reduce the wastage of water. Hence an IoT system is designed with we can monitor the usage of water according to the availability. A smart water management is a two-way real-time network that consists sensors and devices that continually and remotely monitor the water distribution system. [3] proposed a novel method for secure transportation of railway systems has been proposed in this project. In existing methods, most of the methods are manual resulting in a lot of human errors. This project proposes a system which can be controlled automatically without any outside help. This project has a model concerning two train sections and a gate section.

2.RELATED WORK

Several work were conducted about water distribution and scheduling system with different methods used and approaches. Christos gogos, (2006), a mathematical module and a solution for the pump scheduling problem based on genetic algorithms is presented. The main objective is the reduction of the electricity costs of the water department for the pumping effort. The constraints are such as to maintain strategic security and reliability limits for each water reservoir. The reduction of the peaks during a scheduling period is equivalent to the minimization of the electricity costs and this is in fact used in the solution process of our experiment. Actual results with the pump scheduling results of Chania, Greece are also presented.

Mr. kuldip singh, (2013), The paper is innovative step to digitalize the water supply system throughout the city as well as villages. A step to improve the water supply system, which sets a platform to make everyone "Save Water". The real time water supply system will control the water flow at each area according to time scheduling. The

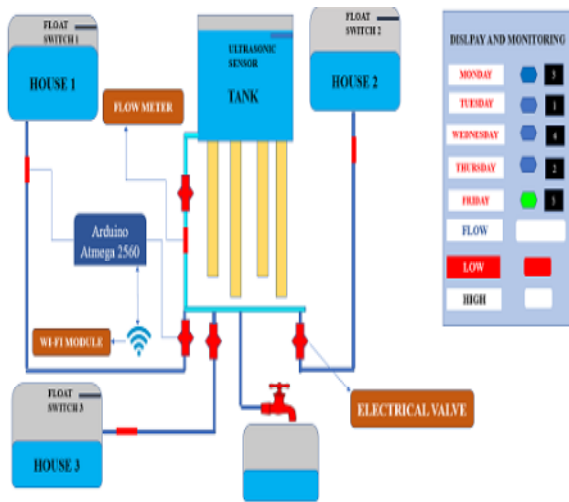
supply system is communicating with control room by RF to update the information for water supply. Each area had different communication code.

Jeughale et al, (2018) One of the advancements in the internet technology is the internet of things. IoT devices collect, monitor, evaluate and notify the user with the information. This technology is rapidly changing the life of humans into a new level. With the advancements in this technology and using various devices human life is changing from a normal life to a smarter life. Some of the examples as advantages of the emerging technology are smart homes, smart cities, improved healthcare systems. Water monitoring system is also an example of the Internet of Things. IOT technology can be used to monitor water levels and sensors can be applied to obtain information of the water level. Readings from sensor can be sent to the users

3.PROPOSED METHOD

This project deals to monitor the amount of water present inside the tank wirelessly using the distance between the sensor and the height of the tank. The need of the ultrasonic sensor is to measure the distance between the sensor and the tank level and the data collected by the sensor will be transmitted to Arduino. A flow meter is used in the main pipe and the branch pipe to measure the quantity of water consumed by each and every individual house in a respective region. The float switch is used in the underground tank which is used to switch the solenoid valve in the branch pipe to its on or off state based on the water level in the underground tank.

BLOCK DIAGRAM



4.METHODOLOGY

The system is having the architecture as below, which consists of DC motor, Wi-Fi module, Cloud, Mobile Application. The Fig above shows the architecture of overall system.. The Wi-Fi module ESP8266 is connected to the microcontroller. The grocery level information from the sensors are pushed into the cloud using the Wi-Fi module. In the cloud, the data is stored and analysed. This analysed result can be visualized using the mobile application.

5. INTERNET OF THINGS

Internet of Things (IoT) is the concept of machine-to-machine communication without any human intervention. This communication will take place through the internet. It is one of the fastest growing platforms used to connect wide embedded applications. The embedded models together with internet and cloud form the Internet of Things. In our Smart Grocery Management System the data from the ultrasonic sensor will reach the cloud platform through the internet. Then this data can be retrieved from the cloud and visualized. This setup is the so called Internet of Things.

6.RESULT

The inputs are the water level of the tank and the pressure of water flows in the pipeline. In the designed setup, an additional tank was used as temporary source of ground water where in the electric motor pump used to get water to fill the temporary water reservoir. To imitate the water system, the temporary water reservoir was also placed on a higher platform so that the

gravitational force of the water increases the pressure in the pipeline to meet the required pressure for the testing. It was also labelled in inches as basis to measure the level of water. the prototype layout design of a water distribution for the testing of the developed monitoring and controlling system. [5] discussed that the activity related status data will be communicated consistently and shared among drivers through VANETs keeping in mind the end goal to enhance driving security and solace. Along these lines, Vehicular specially appointed systems (VANETs) require safeguarding and secure information correspondences. [7] emphasized that Security is an important issue in current and next-generation networks. Blockchain will be an appropriate technology for securely sharing information in next-generation networks. Digital images are the prime medium attacked by cyber attackers. In this paper, a blockchain based security framework is proposed for sharing digital images in a multi user environment.

7.CONCLUSION

This project addresses the environmental features like durability, affordability, prevention against leakage and maintenance issues. Hence this system avoids excess usage of water, wastage of water and promises efficient water management system. This helps in improving the reliability and durability. A greater number of nodes can be included and also replacement for a particular component can be made easily. To develop an app in which the local residents can monitor their consumption of water. This project mainly addresses about the water scheduling for a separate ward in a city or municipality in a village. Man power can be reduced by operating the whole scheduling process in a mobile app. The time limit was adjusted in the Blynk app connected with the Wi Fi module and then it is connected to the relay. The whole system of operation was powered up by the regulated power supply. Using Internet Of Things (IOT), this system works efficiently and quickly to manage the scheduled time.

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