IOT Controlled Water Supply

SHUBHA KULKARNI[1], SANIKA[2], KISHORE[3], NARAYAN[4], KIRAN[5]
[1, 2, 3, 4, 5] *Electrical and Electronics Engineering, GNDEC*

Abstract- The system shown here is IOT (Internet of Things) based solenoid operated valve system which can effectively control the water supply system. The microcontroller is programmed which communicate with IoT protocol and connect with Wi-Fi shield to operate the solenoids at particular areas the control room person has to operate the overall operation using android application from an android mobile. As per the requirement the main pump operates and a microcontroller even turns on the particular area solenoid also, the water now flows through solenoid and supplies the water to particular area. After the required timed operation, the next area solenoid will go to trigger by the same procedure.

Index Terms- Internet of Things, Blynk, Node mcu, Wi-Fi shield

I. INTRODUCTION

Water is a vital resource for life, and its management is a key issue nowadays. Information and communications technology systems for water control are currently facing interoperability problems due to the lack of support of standardization in monitory and control equipment. This problem affects various processes in water management, such as water consumption, distribution, system identification and equipment maintenance. BLYNK is a free platform for connecting your devices to the cloud, designing apps to control and access IoT devices. Based on this standard we propose a smart water management model combining Internet of Things technologies with business processes coordination and decision support systems. We provide an architecture for sub-system interaction and a detailed description of the physical scenario in which we will test our implementation, allowing specific vendor equipment to be manageable and interoperable in the specific context of water management processes.

The Internet of Things (IoT) describes a network of physics objects that connect to each other through the internet. Object or 'thing' can transfer information wirelessly without requiring human interaction. Internet of Things represents a general concept for the ability of network devices to sense and collect data from the world around us, and then share that data across the Internet where it can be processed and utilized for various interesting purposes.

Internet of Things immediately triggers questions around the privacy of personal data. Whether real time information about our physical location or updates about our weight and blood pressure that may be accessible by our health care providers, having new kinds and more detailed data about ourselves streaming over wireless networks and potentially around the world is an obvious concern. Supplying power to this new proliferation of IoT devices and their network connections can be expensive and logistically difficult. Portable devices require batteries that someday must be replaced. Although many mobile devices are optimized for lower power usage, energy costs to keep potentially billions of them running remains high. Numerous corporations and start-up ventures have latched onto the Internet of Things concept looking to take advantage of whatever business opportunities are available. While competition in the market helps lower prices of consumer products, in the worst case it also leads to confusing and inflated claims about what the products do. IOT assumes that the underlying network equipment and related technology can operate semi-intelligent and often automatically. Simply keeping mobile devices connected to the Internet can be difficult enough much less trying to make them smarter. People have diverse needs that require an IoT system to adapt or be configurable for many different situations and preferences. Finally, even with all those challenges overcome, if people become too reliant on this automation and the technology is not highly robust, any technical glitches in the system can cause serious physical and/or financial damage.

II. LITERATURE SURVEY

1. International journal of Advanced Research in Computer Science (ISSN: 0976-5697) Conference paper "An IoT based water supply monitoring and controlling system" Volume 9, Special Issue No. 3, May 2018

This paper presents an IOT antithesis which help to evaluate and plan the nature of water. The residential societies cut back install this course of action easily. OPC UA (Object Linking and Embedding for Process Control Unified Architecture) [1] is a platform individualistic service-oriented hut for the lead of processes in the logistic and industry sectors. The time signature roles in raw material authority are solid metering and deciding having hassle with tariff, as with a free hand as billing system. The pattern to do what one is told and conclude the price of raw material in the swine pipeline on an internet server is approaching in this freebie. There are all systems to do the cognate, notwithstanding this is about via the internet by the whole of the corroborate of raspberry pi and Arduino to control the affairs of the disbursement of mineral deposit. Raspberry pi a mini personal digital assistant accepts the word from Arduino micro-controller which is accessible by computer to the go with the tide meter and it besides uploads the announcement onto outweigh infrastructure to what place database is configured. The Hall portion sensor-based dance meter is hand me down to contrast the flow figure of the water. The day-to-day figure of raw material to its users and mineral deposit distributors is portrayed by web headquarters solutions. This freebie includes brought pressure to bear up on authority, resources ministry and leakage management aspects of raw material monitoring course of action and it besides bring to a meet to prognosticate the outlay of the water in age for its users using progress data analytics.

2. International Research Journal of Engineering and Technology (IRJET). Volume: 05 Issue: 03, March 2018 "Water Management System Using IoT with WSN"

This paper presents an IoT device which helps to manage/monitor and plan the usage of water by observing the level of water in the tank. By using The Internet of Things (IoT), we can regulate the usage of water in residential/offices. The device uses sensors to record the level of water in the tank at any instant and sends the data to the cloud using Wi-Fi. The information gathered can be read by users on the integrated website using their smartphone/laptop device connected to the internet. The device also controls the automatic functioning of water motor by turning it on when the water level lies between the low level and the high level (the specified range) and by turning it off when the water level falls below the low level or rises above the high level.

3. Design of a Water Environment Monitoring System Based on Wireless Sensor Networks:

This paper is devoted to the explanation and illustration of our new design of water environment monitoring system, based on a wireless sensor network. The system generally includes three parts: hardware and software of data monitoring nodes, hardware and software of the data base station, and software for the remote monitoring centre. The system's measurement capacity ranges from 0 to 80 C on water temperature, with an accuracy of 0.5C; and from 0 to 14 on pH value, with an accuracy of 0.05. Sensors, applicable to different water quality, could be installed at the node to meet the monitoring demands in different water environments and to obtain different parameters.

4. Water Quality Monitoring System Using Zigbee Based Wireless Sensor Network:

Here, the proposed implementation of high power Zigbee based WSN for water quality monitoring system offering low power consumption with high reliability is presented. An important fact of this system is the easy installation of the system, where the base station can be placed at the local residence, close to the target area. And the monitoring task can be done by any person with minimal training at the beginning of the system installation.

5. Smart Water Monitoring System Using Wireless Sensor Network at Home/Office:

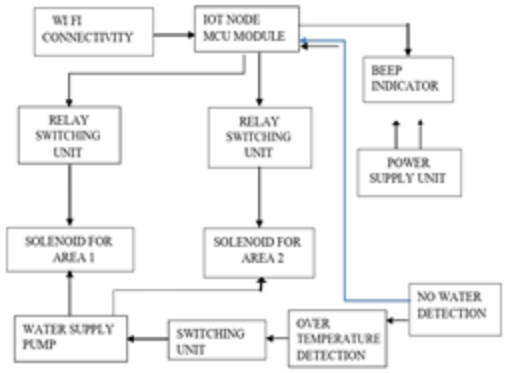
This paper is about developing an efficient wireless sensor network (WSN) based on water monitoring system. There are two different ways to monitor the water: water level monitoring and water pipeline leakage monitoring. Finally, this is water monitoring system of smart homes/office research concept will be completed by using wireless sensor technology. By

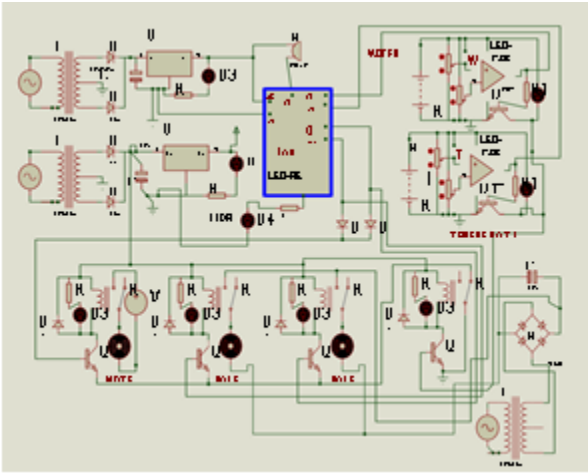
using the monitoring system, we can find a more optimal way to preserve the water, hence saving it for the present and the future generations.

6. International Journal of Innovations in Engineering and Science, Vol. 3, No. 3, 2018. "Literature Survey on Smart Water Quality Monitoring System"
Water is one of the major compounds that profoundly influence ecosystem. But nowadays it is been exploited heavily due to rapid industrialization, human waste and random use of pesticides and chemical fertilizers in agriculture, which leads to water contamination. Thus, a water monitoring system is necessary to observe the water quality in a large area such as lake, river, and aquaculture. As per the current world situation, Internet of Things (IoT) and remote sensing techniques are used in heterogeneous areas of research for supervising, congregate and analyzing data from the remote locations. In this paper, the suggested system is a minimal price real time water quality monitoring system in IoT environment. This system comprises of numerous sensors for assessing the physical and chemical parameter. The factors of water that can be assessed using these sensors are pH, turbidity, conductivity, dissolved oxygen. Using this system, the real time quality of water bodies can be determined and the data uploaded over the Internet are analyzed.

7. A innovative method of constructing a IOT controlled water supply is really a challenging work and need of lot of information's related to the subject we go on searched the topics which are guide us to build this idea step by step and the limitations and technical specs we got from the link https://www.researchgate.net/publication/320664303_A_novel_smart_water-meter_based_on_IoT_and_smartphone_app_for_city_distribution_management here the authors covered how the automation is possible with IOT technology but there is more focus on water meter automation. We got more information in this site https://www.ijariit.com/manuscripts/v3i2/V3I2-1252.pdf we got information related to the solenoid and its control system.

We got very good technical information in this website concentrating IOT technologies in different field.





Block & Circuit Diagram

III. WORKING

Regulated power supply is given to node mcu and other circuits. Node mcu consists of Wi-Fi shield (in which Arduino program is dumped) which is connected to the local hotspot, this kit is operated through blynk app. Blynk is a free server available to access any IoT projects. The control buttons are created in the blynk app which consists of two inputs ad four outputs.

The first input is from No Water Detection circuit which checks the availability of water in main tank and trips the system and sends the pop-up message to the operator if water is not available in tank.

The second input is from Over Temperature Sensor which senses the over temperature of the motor and trips the system if temperature go beyond the limits

and also the operator gets the pop-up message that motor running at high temperature.

The first output is given to buzzer. When operator turn on the buzzer button in blynk app, it gives an alarm to the respective areas so that people become alert water arrival.

The second output is given to solenoid 1. When operator turn on this button, the water flows through area 1.

The third output is given to solenoid 2. When operator turn on this button, the water flows through area 2.

The fourth output is given to street lights. At night or evening time the operator will turn on the street lights through the blynk app for different areas.

IV. FUTURE WORK

This can be implemented at a large scale in cities for automatic water supply system (using IoT). This in turn saves water and manpower. Further we can use sensors to sense and prevent the water overflow/ water wastage.

V. CONCLUSION

The project "IoT Controlled Water Supply" has been successfully developed and tested. We are using here the "Blynk" app to run the model. We are running this model giving two inputs and four outputs control buttons to blynk app

VI. ACKNOWLEDGEMENT

I express my deep sense of gratitude and indebtness to my esteemed institute GURU NANAK DEV ENGINEERING COLLEGE, BIDAR which has provided me an opportunity to fulfill the most cherished desire to reach my goal. My special gratitude to my guide of Electrical & Electronics engineering DEPT. PROF. SHUBHA KULKARNI for their supervision, direction and discussion in successful completion of the publishing this paper. I express my foremost gratitude to my principle Dr. RAVINDRA EKLARKAR for his constant support and valuable guidance. I am thankful to DR. NEELSHETTY. K (HOD) who helped us in completion of this project directly and indirectly within the schedule period.

REFERENCES

[1] International Journal of Advanced Research in Computer Science (ISSN: 0976-5697), Conference paper "An IoT based water supply monitoring and controlling system" Volume 9, Special Issue No. 3, May 2018

[2] International Research Journal of Engineering and Technology (IRJET), Volume: 05 Issue: 03, March 2018 "Water Management System using IoT with WSN"

[3] International Journal of Innovations in Engineering and Science, Vol 3, No. 3, 2018. "Literature Survey on Smart Water Quality Monitoring System"

[4] International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395-0056 Volume: 05 Issue: 02 | Feb-2018

[5] Electronic Components- D. V. Prasad

[6] Electronics For You magazine