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Automation of City Water Supply using IOT and Android Phone Interface

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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 Ethernet or WIFI shield to operate the solenoids at particular time interval 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.

KEYWORDS: Arduino uno, Node MCU, Relays-4, Solenoid, Battery, Water level sensor, water pump, Blynk app.

I. INTRODUCTION

As per the survey in recent, urban areas face problems in distribution of water due to the increase in population. For the daily requirement several communities suffering with insufficient supply of water. The major problem in the water management is no proper controlling and monitoring in the distribution of water. Not all the areas in the city facing the insufficient water distribution problem only few areas are facing this. As per the survey in recent, urban areas face problems in distribution of water due to the increase in population. For the daily requirement several communities suffering with insufficient supply of water. The major problem in the water management is no proper controlling and monitoring in the distribution of water. Not all the areas in the city facing the insufficient water distribution problem only few areas are facing this. All these problems are because of improper real-time controlling and monitoring technology and also because of its traditional and manual technology.

Today, urban areas are currently changing and begun to adjust smart advancements for feasible areas. As they take an interest for financial progression and offices that expansion to their energy, water is a need in their agendas. Making water manageability an approach is required which is multidisciplinary. It additionally needs good state of art to work with the activity and the executives particularly in gathering and dissecting information to start an activity for management in smart way, arranging and making decisions. The proceeds with improvement in the city like development of business structures, regions, private houses and foundation of business, water supply is most in need. Presently, to proceed in growing their inclusion to give the requirements of the local area and giving the required measure of water every day for the buyers is a big deal.

II. RELATED WORK

A. Microcontroller Based Automatic Water Level Control System

Ejiofor Virginia Eber (2013) has proposed a firmware based water controlling framework which will control the water flow [1]. The proposed work utilized microcontroller to automate the procedure of water drawing in an over-head tank stockpiling framework and can analyze the quantity of water and it will educate the client through LCD shows. This examination gave great outcomes by utilizing implanted framework and utilization of DC rather than AC to stop electric shock.

B. Water Anti-Theft and quality monitoring system by using PLC and SCADA

Gaikwad Sonali Ashok (2013) has planned this strategy as a model for water circulation framework involving a control framework, communication means, funneling, actuators, sensors and valves [2]. This framework uses a communication

bus for controlling and checking water flow through the channeling by means of control of the actuator and valves. Control framework is additionally coupled to Supervisory Control and Data Acquisition (SCADA) unit. This paper concentrates especially to a control framework for controlling and checking segments inside a water dispersion framework. To transmit or receive the control and status information man machine and electrical interfaces are incorporated to PLC (Programmable Logic Controller).

III. METHODOLOGY

In this project Arduino uno is used as a micro controller. All components are interfacing with Arduino uno. For this project power supply is given through battery. Battery will charge by using solar panel. In this project Blynk android app is used for controlling for necessity pump functions. Node MCU is interfacing with android by using WIFI connection.

The proposed methodology for IOT controlled supply of water management for smart city concepts is represented in figure 1

This system utilizes IOT (Internet of Things) dependent solenoid processed valve system which is able to efficiently control the system of water supply. Programmed microcontroller communicated along with IOT protocol, which gets connected to the Wi-Fi or Ethernet shield to perform the solenoids at certain region and certain interval of time. To operate the complete process control room person utilizes android application by a smart phone. According to the necessity pump functions and some region of the solenoid turned on by microcontroller and now through the solenoid water starts flowing and supplying water to the respective regions. Next region of the solenoid gets trigger from the similar operation after the needed timed process.

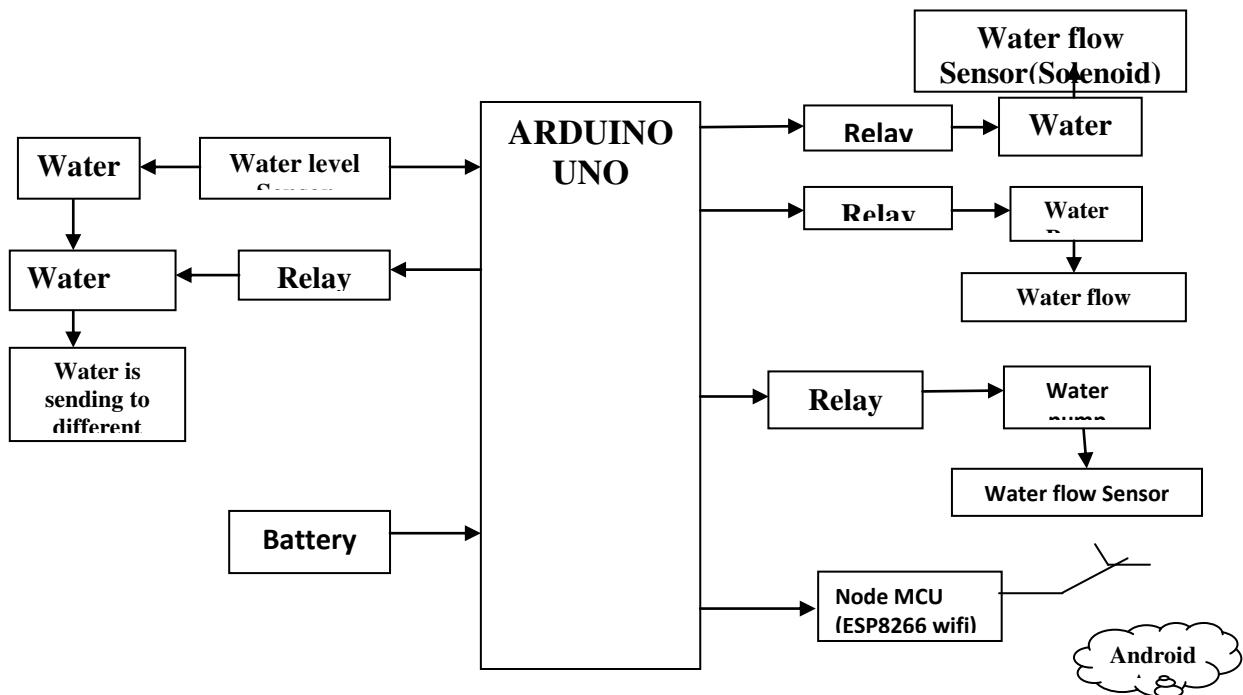


FIG 1: Block Diagram of Automation of City Water Supply using IOT and Mobile Phone Interface

IV. EXPERIMENTAL SETUP

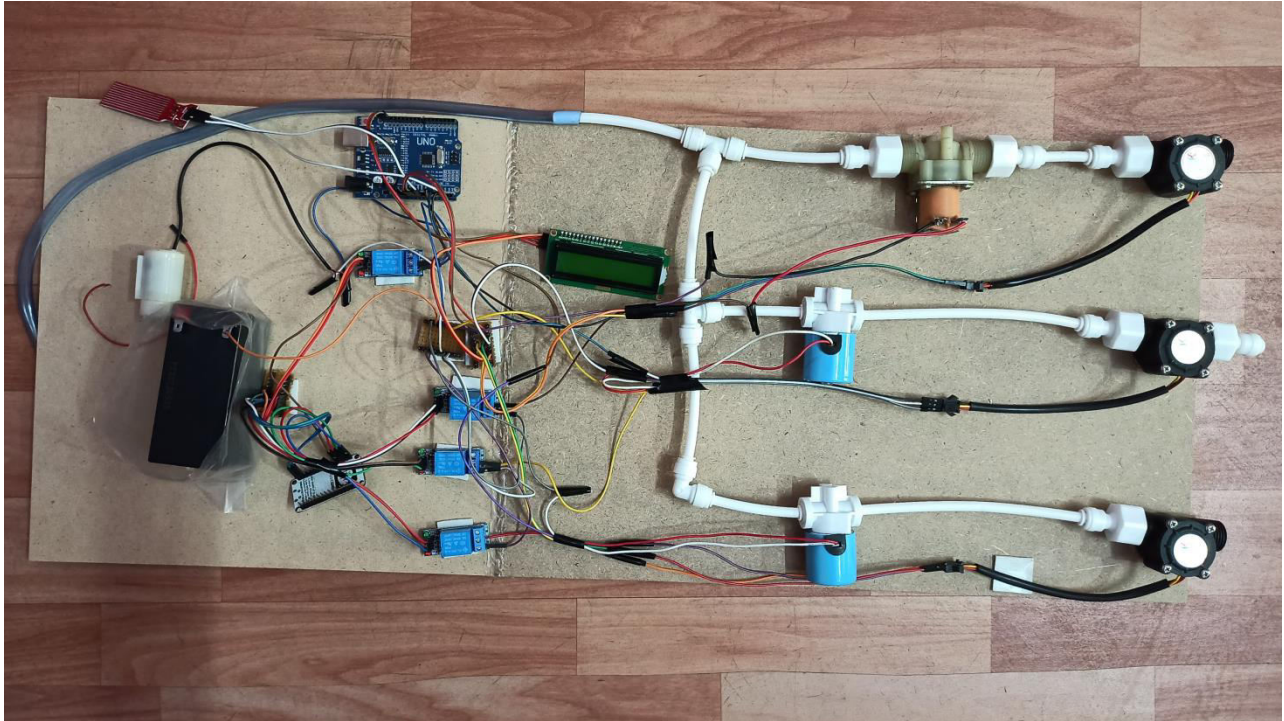


Fig 2: Working Diagram of Automation of City Water Supply Using IOT and Android Mobile Phone Interface

Working

In this project Arduino uno is used as a micro controller. All components are interfacing with Arduino uno. For this project power supply is given through battery. Battery will charge by using solar panel. In this project Blynk android app is used for controlling for necessity pump functions. Node mcu is interfacing with android by using wifi connection.

The proposed methodology for IOT controlled supply of water management for smart city concepts is represented in below figure.

This system utilizes IOT (Internet of Things) dependent solenoid processed valve system which is able to efficiently control the system of water supply. Programmed microcontroller communicated along with IOT protocol, which gets connected to the Wi-Fi or Ethernet shield to perform the solenoids at certain region and certain interval of time.

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V. EXPERIMENTAL RESULTS

The experimental results for automating city water supply using IoT and a mobile phone interface have been promising. Through the integration of IoT sensors and actuators within the water supply infrastructure, real-time data on water quality, pressure, and usage can be monitored. This data, accessible through a mobile phone interface, empowers both consumers and administrators to manage water resources efficiently.

The system enables consumers to track their water usage, receive alerts for leaks or abnormal consumption patterns, and remotely control water flow to individual fixtures or appliances. Administrators benefit from improved visibility into the distribution network, allowing for proactive maintenance and optimized resource allocation.

In trials, the system has demonstrated significant reductions in water wastage, quicker response times to leaks or malfunctions, and enhanced customer satisfaction through better service delivery. Additionally, the implementation of IoT-based automation has the potential to reduce operational costs and environmental impact associated with water management.

Overall, the experimental results indicate that leveraging IoT technology coupled with a user-friendly mobile interface holds promise for revolutionizing city water supply management, making it more efficient, sustainable, and responsive to the needs of both consumers and the environment.

VI. CONCLUSION

By developing new technique there are several advantages to the public and government. By utilizing IOT controlled supply of water management system, it regulates water utilization by decreasing the wastage, for the water supply it minimizes the human involvement in it, and also it provides water supply effectively to public this can helps to the government in water management. Here, by utilizing various circuits an automated supply of water system is innovated developed successfully.

This model is developed with some advantages, which is its reliability, minimum cost, and automatic control. This innovated model benefits the people to obtain accurate quantity of water with no wastage. By utilizing the android application from any place level of the water is able to monitor spontaneously. This model is innovated with full smart automated here automatically motor is able to controlled.

Wastage of water can be prevented and effective water supply can be achieved effectively for all region by utilizing this technique. By utilizing minimum manual power controlling of various time intervals program modification can be achieved effectively.

REFERENCES

- [1] Salvino, M.M. Método de Dimensionamento e Controle Operacional Otimizado para Redes de Distribuição de Água. Ph.D. Thesis, Universidade Federal da Paraíba, João Pessoa, Brazil, 2009.
- [2] OMG. Business Process Modeling Notation (BPMN). 2020. Available online: <https://www.omg.org/spec/BPMN/2.0/PDF> (accessed on 20 June 2020).
- [3] Pesic, M. Constraint-Based Workflow Management Systems: Shifting Control to Users. Ph.D. Thesis, Technische University Press Facilities, Eindhoven, the Netherlands, 2008.
- [4] Kamienski, C.; Soininen, J.P.; Taumberger, M.; Dantas, R.; Toscano, A.; Salmon Cinotti, T.; Filev Maia, R.; Torre Neto, A. Smart water management platform: IOT-based precision irrigation for agriculture. *Sensors* 2019, 19, 276.
- [5] Navarro-Hellín, H.; Torres, R.; Soto-Valles, F.; Albaladejo-Pérez, C.; López-Riquelme, J.; Domingo, R. A wireless sensors architecture for efficient irrigation water management. *Agric. Water Manag.* 2015, 151, 64–74.



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