Water Canal Distribution System Using IOT

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Abstract: **Now days, in canal water distribution system, there is a lot of corruption at water distribution points. It is managed manually and decentralized way. A key man with canals inspector is responsible for delivering water to local farmers as per their demand. To avoid such corruption, we are developing a computerized system, which will give the proper distribution of water to the farmers and avoid the corruption. As per the requirement specified by farmers, the computerized system will open the valve for given time span as per farmer request and after the time bound the valve will close automatically. Farmer will get the message before supplying water.**

Keywords: Arduino, IoT, Fault diagnosis, Water Channel Distribution.

• Introduction

The world is increasingly looking forward to automation and the use of new technologies to improve the quality of life as well as reduce the impact of human activities to make their life easier. The growing number of internet-connected devices can be the second revolution of the internet which will allow for connected objects to play an active role in the smart environment. In the case of IOT, it makes the devices more user-friendly and the user can access device from anywhere.

In the case of a canal water distribution system, it makes the distribution process of water easier. This system basically making the digital form of water distribution through a canal. Typically, in the existing system distribution of water is manual. The gates are present on the canals. A key man with canal inspector is responsible for delivering the water to the specific or demanded farmer's canal. Most of the time, if a farmer has demand 70% of the water then only 30% water is discharged and remaining 40% is given to the person or company which don't have right on that water. Due the corruption done by the key man, he can able to distribute that water to other and may get benefited to himself by charging extra amount. As we know, because of such kind of things corruption gets increased. Farmers are unable to get water supply as per his need.

The objective of this system is, provide the same amount of water requested by farmer as per their right. Design canal water distribution system automatic so transparency remains between the irrigation department and farmer. It is also easy for irrigation department to discharge the water by opening the gates of canal from their place. They can immediately generate the bill of that water and farmers can also make payment online which is also called as pani-patti. The whole process follows the mission of digital India. All the farmers get online message of bills and date of payments. So, no corruption is happened, as there is transparency between the farmers and department.

• LITERATURE SURVEY

The main contribution of this paper is to provide automatic and centralized system for water canal distribution system. As we have pointed in introduction, to the best of our knowledge, we are the first proposing such kind of application for water canal distribution in India.

Alexandru Predescu[1], "Real time implementation of IOT structure for pumping stations in a water distribution system".
This article presents a real-time control system for an experimental model of a water distribution system. The hardware and software implementation follow the latest trends in IoT and proves that such an architecture can be used for real-time process control in distributed systems. The control of flow is implemented using a multiple-model control algorithm for the pumping station[1].

Kiran S. Shingote [2], "Microcontroller   Based Flow Control System for Canal Gates in Irrigation Canal Automation"
In this paper, we propose a microcontroller-based design for flow control system for gate in canal automation. Flow control system consist of subsystems: RTU, solar power system, level measurement system, flow measurement system, gate actuator system and communication system. In this paper, more focus on flow control activities of distributed, laterals and Direct Pipe Outlets (DPOs). Remote Terminal Unit monitors upstream level, downstream level, downstream flow, power space, gate opening, gate health and security. All system components designed to operates on solar power and battery backup. Conventional operational system has some drawbacks and inaccuracies.

Shubhangi P. Bhat [3], "Automation of water discharge process at canals"
The ultrasonic sensors sense the level water available at upstream.as per available water at upstream, the decision is taken whether to discharge the demanded water or not. If upstream obtainable water is not enough to meet the demand, the system highlights the appropriate message and even the Control Cabin (CC), Head Regulator (HR) is given the message about the situation. If the upstream water level is crossing the danger mark, the situation is handled by giving an audio indication by automatically blowing the buzzer and as well by video indication.

M Suresh [4], "A novel smart Water Meter based on IOT and smartphone app for city distribution management"

This paper proposes smart water distribution metering approach. Which is especially suited to third work countries with limited investments in infrastructure. These system relies on the use of simple Internet of Things (IoT) approach for Water metering in conjunction with a custom built Smartphone App. Metering data communication and update to CRBM, logging of complaints, dynamic checks for water leakages at consumer-end and Utility monitoring of hourly consumption from individual or group of meters for suspected leakages, tampering etc. are potential advantages using this approach. The paper describes a novel Smart meter implementation architecture that permits both online and offline methods especially for areas with poor, unreliable cellular network coverage.

PROPOSED SYSTEM

The water network presented in this article can be used for experimental testing of a control algorithm for the water distribution system. We use the hardware like Arduino, relay, solenoid valve etc. We also present the software solution i.e. requirement of water by the farmers, online bill payment etc. Also, we are going to implement leak detection system. We considered an IOT approach for monitoring and controlling a water distribution system. The performance of this solution can be observed through the experiments presented in this article and we comment on the feasibility of such architecture.

The system block diagram above shows the flow of control of the canal automation system. Following given the explanation of system block diagram.

3.1 Login:

First of all there will be login for system users. There are basically two types of login. 1) Login for admin 2) Login for farmer. If the farmer is new then he has to register (i.e. basic information of farmer like name, mobile no, canals, the crops in their farm ,recharge plans etc.) first to our website and if he/she is already register then he can directly login. And once they login to our website next time they can directly login to it and can make the online payment or online recharge. After registration admin will take the requirement of farmer, According to that requirement, person or key man in irrigation department can discharge the water needed to the farmer and conversation take place between admin and user and hence no another person can get the water which is not from their rights. Farmers can easily interact with the system once they register
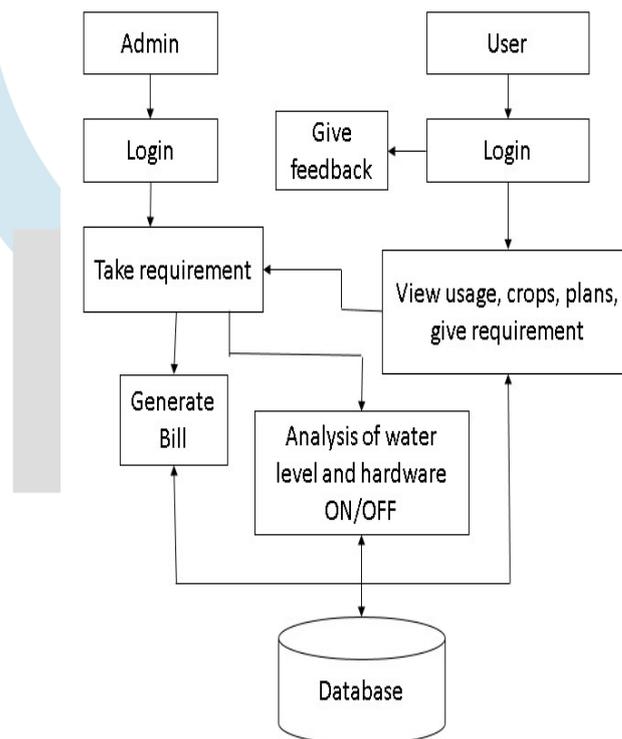

Fig 3.1: Block diagram

3.2 Give Feedback:

Once farmers/users used this website they can also give the feedback about it. It is then stored in database and according to that further improvement will be done.

3.3 View usage, crops and Give the requirement:

After the admin login, he/she will add the farmers/users. Farmer will give the amount of water he needed for through the canal. This request is received by the admin or person at the department.

3.4 Analysis of water level and hardware ON/OFF:

Admin will check the level of water i.e. is their sufficient amount of water available or not if available then discharge the water by opening the valves. Firstly, when water requirement is given by the farmer's admin will convert it into time by using formula. And then it gives the time to our device like Arduino (shown in fig 3.2) and opens the valve for a given amount of time. When given amount of time is completed the valve will close. Arduino and relay working is gives as below:

The work signals are given to the Arduino which is shown in fig 3.4.1 Arduino is one type of single-board
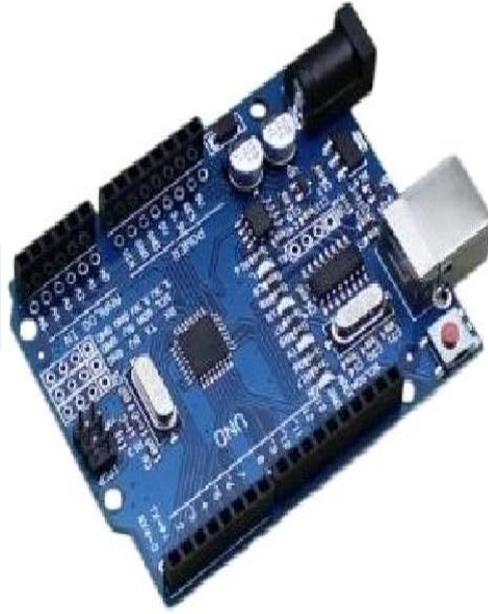
Fig 3.2: Arduino

Microcontroller or microcontroller kits for building digital devices and interactive objects that can sense and control objects in the physical and digital world. Along with-it relay is used which shown in fig 3.3.

Fig 1.3

Fig 3.2: Relay

Relay is an electrically operated switch. Many relays use an electromagnet to mechanically operate a switch. A relay is also used for controlling a circuit by a low-power signal, or where several signals control by one cognately acts as IOT device in our system. After passing the signal from Arduino it opens the solenoid valve which will be open for a certain period which we have calculated

and for that certain period water will be discharged through the canal of the requested farmer. Afterword, completion of time valves gets closed automatically. A signal is passed to the system.

3.5 Generate bill and close the valves:

After the completion of all the process (If farmers get required amount of water) bill gets generated and all the devices get closed.
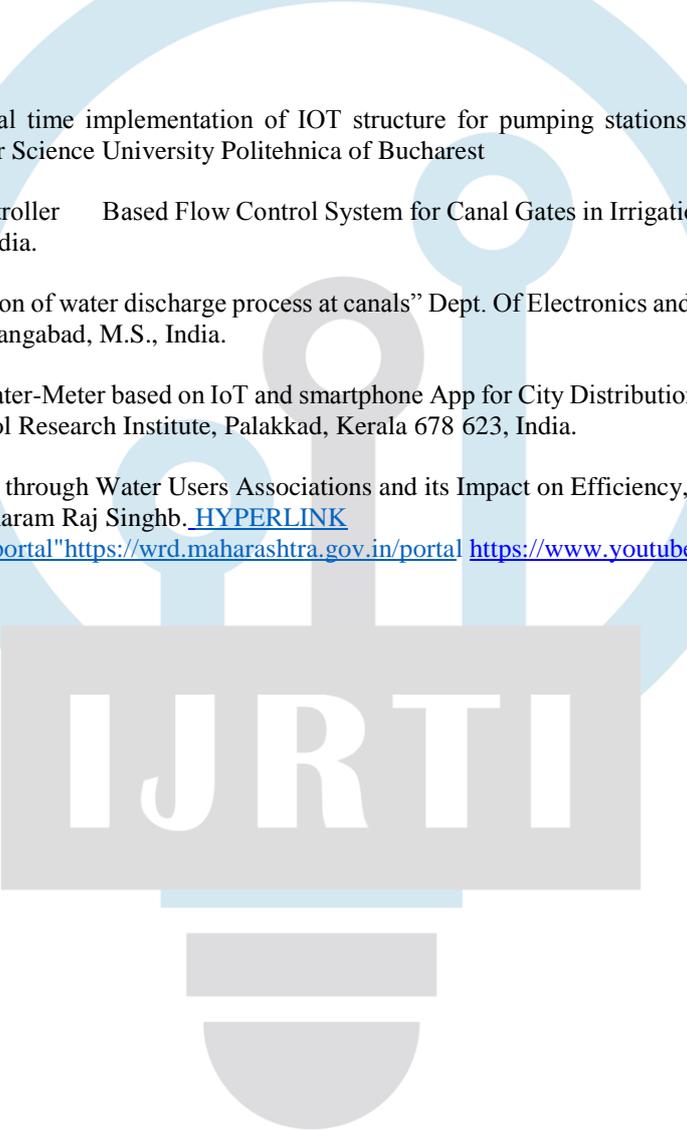
We are going to use water level sensors also to detect the level of water. If water is crossing the normal level, then give the message to all the farmers through video and audio indication.

• **CONCLUSION**

In this article, we have explained how water can be distributed from the canals automatically. It reduces the stealing of water from unauthorized person, as we are using IOT approach it is easy for the user to communicate with the system which makes all the process automatic. And farmers can do their payment and all the things from the home only. As data is going to be centralized so work can manage centrally.

REFERENCES

[1] Alexandru Predescu[1], "Real time implementation of IOT structure for pumping stations in a water distribution system" Automatic Control and Computer Science University Politehnica of Bucharest

[2] Kiran S. Shingote" Microcontroller Based Flow Control System for Canal Gates in Irrigation Canal Automation" Symbiosis Institute of Technology, Pune, India.

[3] Shubhangi P. Bhat "Automation of water discharge process at canals" Dept. Of Electronics and Telecomm. Engg. Govt. College of Engineering, Aurangabad Aurangabad, M.S., India.

[4] M Suresh "A Novel Smart Water-Meter based on IoT and smartphone App for City Distribution Management" Data Acquisition Systems Laboratory, fluid Control Research Institute, Palakkad, Kerala 678 623, India.

[5] Canal Irrigation Management through Water Users Associations and its Impact on Efficiency, Equity and Reliability in Water Use in Tamil Nadu G. Aruna, Dharam Raj Singhb. HYPERLINK "https://wrd.maharashtra.gov.in/portal"https://wrd.maharashtra.gov.in/portal https://www.youtube.com/watch?v=I3RUFh 1-87k