

Consumer Water Distribution and Control System

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Abstract: Now-a-days, using computer and IoT simplify deadly manual work in significance. Because technology gives benefits like speed, accuracy, flexibility, reduction and minimizing tedious manual work. The water billing, monitoring and controlling of water supply in Municipal Corporation is manual. To overcome the problem, we are proposing new system as Prepaid and Post-paid Water Distribution Controller which can control their usage according to their payment which is built in Asp.net and MS-SQL server database. The system is capable of two payment modes prepaid and post-paid and can block the supply after consumption amount limit or failure of bill payment. Each individual has their own capacity for usage of water but everyone has to pay same amount for their consumption. And if any person fails to pay water bill then there is not any system which can restrict the water supply to their houses. According to study, there is a case where one family gets water supply for 1 hr. per 2 days and another family gets 24 hours water supply. There is no system that can monitor the flow of water and consumption of water.

Keywords: IoT, Water distribution, Controller, Consumption.

1. Introduction

The “Consumer Water Distribution and Control System” has been developed to override the problems prevailing in the existing manual system. This system is designed for the municipal corporations to carry out drinking water operation in smooth and effective manner. In this system the user has two modes of payment. In pre-paid mode the user has to pay predefined amount of bill which consist of water consumption limit. After consumption of water the system blocks the supply and notify user for that. After recharging, the system starts water supply again. In post-paid mode, the bill is generated according to amount of usage of water by user and here also system is capable of blocking of supply if the failure in payment. The first beneficiaries of this proposed system is customer who can able to monitor the usage from home itself and can pay bills without any efforts. And the other one is the corporation who owns it, which increases the accuracy and effective supply of water to everyone and minimizes the human efforts for billing.

2. Problem overview and objectives

Each individual has their own capacity for usage of water but everyone has to pay same amount for their consumption. And

if any person fails to pay water bill then there is not any system which can restrict the water supply to their houses. According to study, there is a case where one family gets water supply for 1 hr. per 2 days and another family gets 24 hours water supply. There is no system that can monitor the flow of water and consumption of water.



Fig. 1. Existing system

The main objective of this project is,

- To monitor the flow and consumption of water by each family.
- To monitor and control the flow of water.
- To get real time data of consumption and can control the valve to restrict flow of water.
- To display the user usage anytime through dashboard or mobile application.

3. Methodology

A. High level design

Proposed methodology is to develop a meter which calculate amount of consumption of water which is wirelessly directed to server which store records. The web portal or mobile application access information from server and display to customer. Customer can interact with web-based portal or with mobile application to monitor the usage and for payment of bills or to stop or start the service.

B. Prepaid System

Customer will pay predefined amount and system send allowed unit details to meter. This data will get stored in flash memory. Now while consuming water system will decrease

allowed unit details in flash. As reading gets zero, system notify to server and stops the water supply.

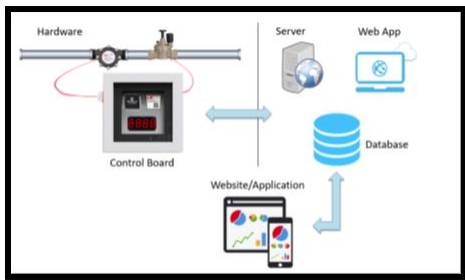


Fig. 2. Flow diagram

C. Post-Paid System

System will allow user to consume water and at the same time meter will send consumption details to server using GPRS. And, if user fails to pay the billing amount then the water supply will get stopped until amount not gets paid.

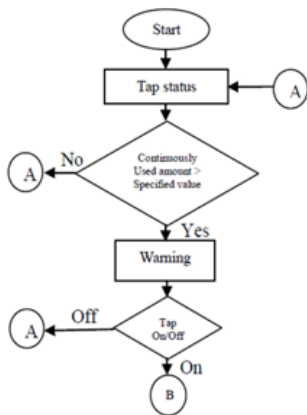


Fig. 3. Warning system flowchart

Fig. 3 shows the flowchart of warning system at the server. The system starts the process by checking the status of tap. If the tap continuously uses water greater than the specified value then the warning signal is activated. The system checks whether the tap is on or off. If the tap is off, then the system again checks the status of tap.

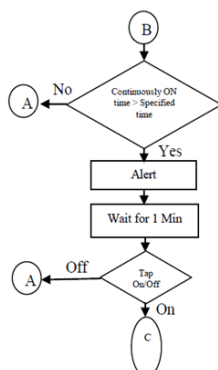


Fig. 4. Alert system flowchart

Fig. 4. Shows the alert system. The system checks if the tap is on for greater time than the threshold time limit. If yes alert signal is activated. Else if system is off it again and again checks the status of tap.

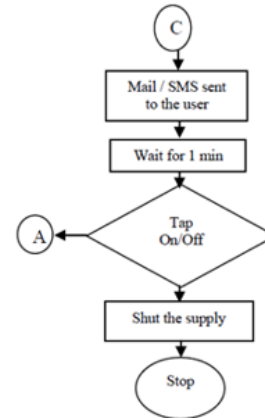


Fig. 5. Supply control system flowchart

Fig. 5. Shows the supply control system. It sends the valid message to the customer before actually cutting the water supply.

4. User interface

The usage of water is send to the cloud and through cloud send to the mobile application; the application will be the update for user to know how much of water they have utilized and how much charges they have to pay for their usage of water which is set value for all user. Fig. 6, shows the screenshots for application GUI. After opening the application, Fig. 7 shows the reading of use of water by house. Fig. 8, shows the consumption of water by each user in the form of graph classified as daily consumption and Today's consumption.

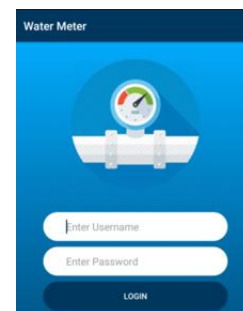


Fig. 6. Login User Interface

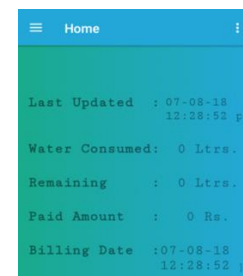


Fig. 7. Reading of use of water by consumer

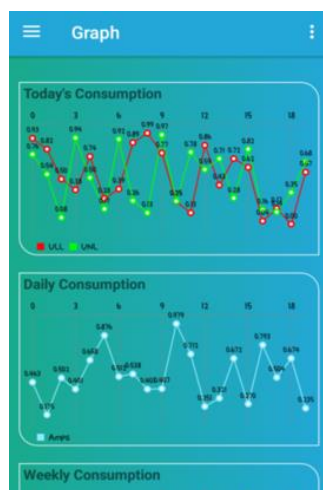


Fig. 8. Graphical representation of consumption of water

5. Conclusion

By this project, we can hope that using this application we can measure the accurate water usage efficiently and by using this application an individual must minimize the wastage by optimizing the usage of water in an opulent manner. This is a test run project which may tested in some 100 consumers for few months to check the project feasibility, we are at the end of implementation and we are hoping big success in this project to make the system more convenient and took next step to digital

India initiative by government and we are expecting help and support from every mentor. If an individual may save at least 2 gallon of water per day, then for the population of 1.339 billion of India, we can save 2.67 billion gallon of water per day.

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