PREPAID AND POSTPAID WATER DISTRIBUTION CONTROLLER OVER IOT

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Abstract : **Now days, using computer and Iot simplify deadly manual work in significance. Because technology gives benefits like speed, 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 Postpaid Water Distribution Controller which can control there usage according to their payment which is build 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**.

INTRODUCTION

Municipal Corporation Water Distribution System is manual system and have no system to monitor the consumption of water. Each individual have their own capacity for usage of water but everyone have 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./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. The "Prepaid and Post-paid Water Distribution Controller" 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.

The first beneficiaries of this proposed system are 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 minimize the human efforts for billing.

EASE OF USE

The main ease of use of this project is to develop a system to keep track of water level of water source from distant location. The IoT based proposed system presented in this project will be helpful to acheive such task. Project is about prepaid and post-paid water distribution controller will monitor the flow,consumtion and quality of water by each consumer. The system will get planted on the water supply pipes at every consumer location. It will monitor and control the flow of water. We get real time data of consumption and can control the valve to restrict flow of water. User can see the usage any time through dash board or mobile application

OBJECTIVE(S) AND SCOPE

Cost recovery is a key element for sustainable water supply. Currently most water service providers are experiencing problems with cost recovery from community water supply schemes. Many are considering introducing prepayment systems or other innovative ways of cost recovery. Prepayment water metering systems are already available in India although historic and practical performance reports in a 'real' environment are in many cases still lacking. Although proposed system is by no means the final word on this subject, it predicts that both water service providers and their customers are likely to welcome these systems as cost effective and user friendly. The report also explains how water payment and administrative support systems can be selected and introduced in a manner which promotes effective cost recovery. Metering, prepayment, and the accompanyying systems should never be viewed as technical solutions to the problem but instead a holistic approach should always be adopted.

For this very reason proposed system address a whole range of options and not a single system. Secondly the costs' of 'cost recovery, and especially the administration costs, are also included as this must be taken into account for affordability and sustainability. The water billing, monitoring and controlling of water supply in Municipal Corporation is manual. To overcome the problem, proposed system is developed as Prepaid and Post-paid Water Distribution Controller which can control there usage according to their payment. 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.
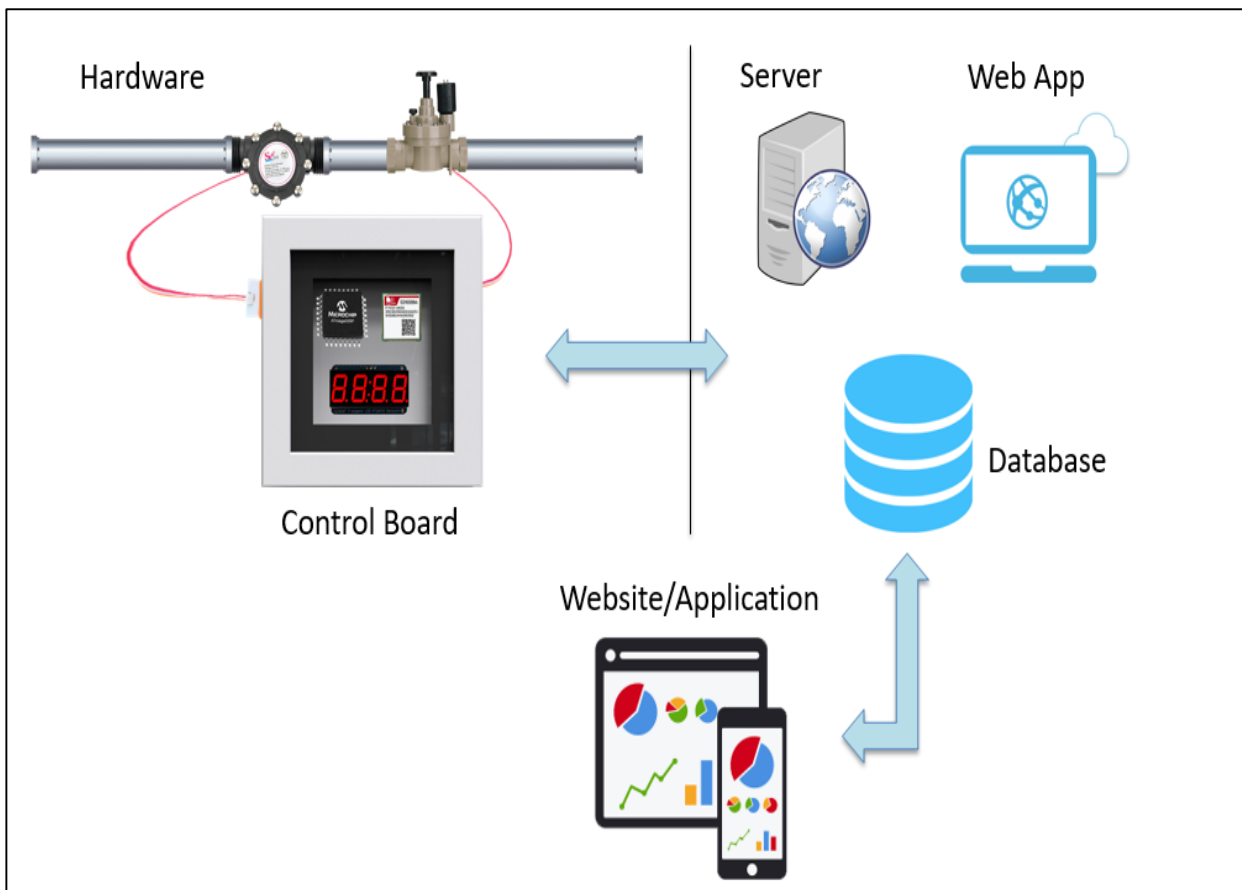
SYSTEM DESIGN

 Prepaid and Post-paid Water Distribution Controller will monitor the flow and consumption of water by each family. The system will get planted on the water supply pipes of every house. It will monitor and control the flow of water. We get real time data of consumption and can control the valve to restrict flow of water. User can see their usage anytime through dashboard or mobile application.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 it to customer. Customer can interact with web-based portal or with mobile application to monitor the usage and for pa

yment of bills or to stop or start the service.

COMMUNICATION WITH GSM MODEM

•   AT commands are instructions used to control a modem. AT is the abbreviation of Attention.
•   Every command line starts with "AT" or "at". That's why modem commands are called AT commands.
•   Many of the commands that are used to control wired dial-up modems, such as ATD (dial),ATA (answer),ATH (hook control) are also supported by GSM/GPRS modem and mobile phones.
•   Beside this common AT command set, GSM/GPRS modems and mobile phones support an AT command set that is specific to the GSM technology, which include SMS-related commands like AT+CMGS (send SMS message),AT+CMSS(send SMS from storage),AT+CMGR(Read SMS message),AT+CMGL(list SMS message).

 Arduino Platform:-Arduino is an open-source electronics platform based on easy-to-use hardware and software. Arduino boards are able to read inputs - light on a sensor, a finger on a button, or a Twitter message - and turn it into an output - activating a motor, turning on an LED, publishing something online. You can tell your board what to do by sending a set of instructions to the microcontroller on the board. To do so you use the Arduino programming language (based on Wiring), and the Arduino Software (IDE), based on Processing.
Project is divided into three Modules

1.   *Hardware Module:* It consists of hardware parts like Flow Sensor, Solenoid Valve, and Microcontroller for controlling the flow of water.
a.   **Flow Sensor:** To measure water consumption.
b.   **Solenoid Valve:** To control water supply.
c.   **ATMega382p:** Arduino supportable microcontroller.
d.   **4-Digit 7-Segment Display:** To display real time meter reading.
e.   **SIM800 Module:** GSM+GPRS supportable module to use GSM and GPRS functionality in project.

2.   *Web Server Module:* It consists of server parts like web server, database, web app to fetch and store the reading of meter.
a.   Server will fetch the real time ratings and display the same on website/application in form of records or charts.
b.   Store the customers' information and billing status.

3.   *Website/Application:* It consists of application part like website or mobile application to monitor usage of water.
a.   User Interface to display the reading and consumption data to users and provide billing system.

Proposed System

- Prepaid and Post-paid Water Distribution Controller will monitor the flow, consumption and quality of water by each consumer.
- The system will get planted on the water supply pipes at every consumer location.
- Solenoid valve is an electromechanical device in which the solenoid uses an electric current to generate a magnetic field and thereby operate a mechanism which regulates the opening of fluid flow in a valve.
- Flow sensor is collectively refer to all sensors that measure the flow of fuild or bulk material.
- It will monitor and control the flow of water.
- We get real time data of consumption and can control the valve to restrict flow of water.
- User can see their usage anytime through dashboard or mobile application.
- Gprs stands for general packet radio service.it is a packet oriented mobile data standard on the 2G and 3G cellular communication networks global system for mobile communication.

IMPLEMENTATION AND RESULT

IomaTic Board Features
Monitor and Control
Control all your devices, tools, systems, machines and everything that you want to control remotely just at a single click. Using the latest protocols and tools monitor all your devices, sensors and equipment through web and mobile version of data analysis software.

Track and Communicate
With the help of on board GPS and tracking web platform user can track all your assets. Wide range of communication starts from serial, GSM, GPRS, Bluetooth to Wi-Fi.

On-Board
Temperature, humidity, LCD, Buzzer, Relays, Digital IO ports, ADC ports, multi-level voltage out, Configurable Dip Switches gives you freedom to build your power application.

Software Support
IomaTic comes with data push web service, data analysis web application, product manageable dashboard and finally the control and monitor mobile application with cloud based data storage.
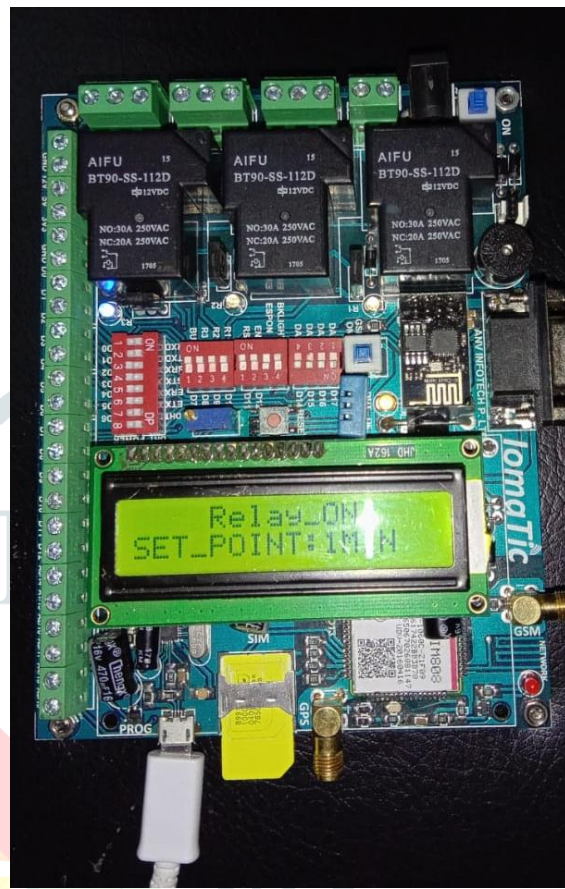
Arduino IDE support
Well known and best in class Arduino IDE support makes it easy to code, manage and develop applications with existing world-wide support.
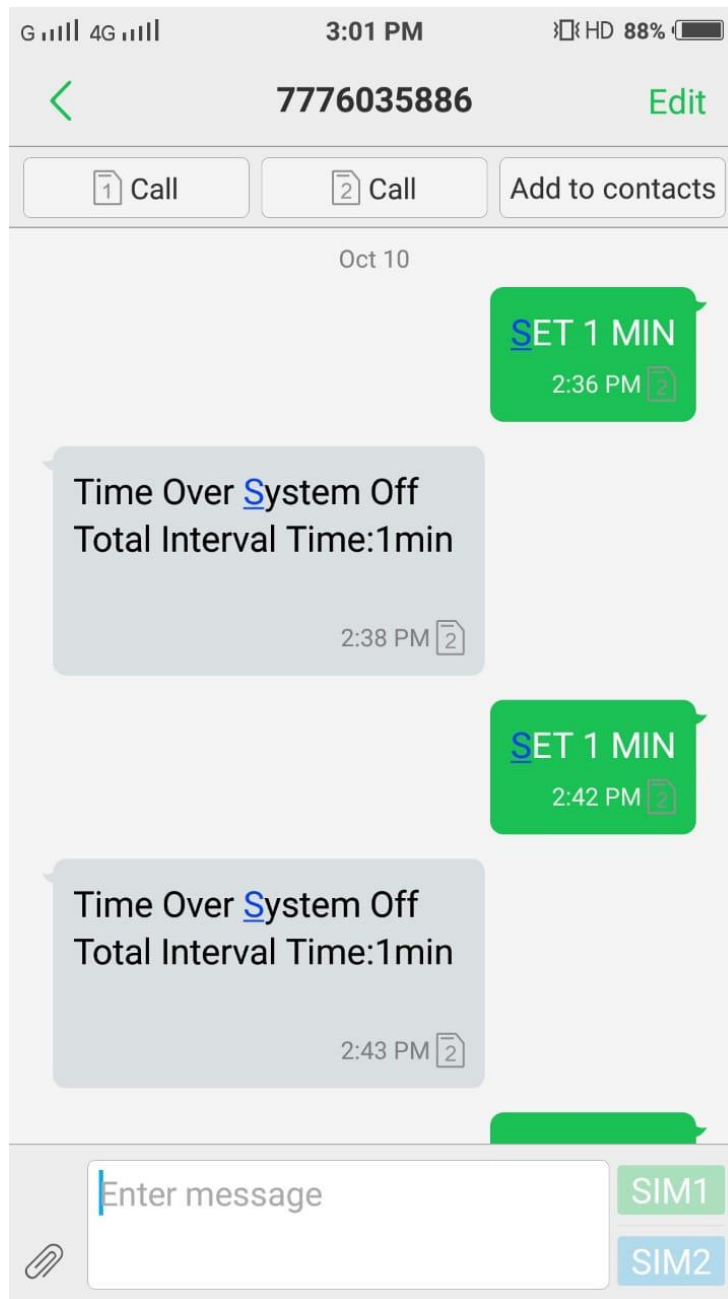
Sample Source Codes
IomaTic provides user not just a sample source code but a wide range of ready to use applications.

PROGRESS IMPLEMENTATION-1

PROGRESS IMPLEMENTATION-2

CONCLUSION

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 first phase 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.

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