# Smart Water Management Using IoT

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## ABSTRACT

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. This project presents an IOT device which help to manage and plan the usage of water. This system can be easily installed in residential societies. Sensors placed in the tank which continuously informs the water level at the current time. This information will be updated on the cloud and using the webpage, user can visualize the water level on any Operating System anywhere which is connected to Internet. According to the level of water in the tank the motor functioning will be automatically controlled, And according to the members in the flat, water will be distributed to them, and if the flat members require more water then they can request it by using the webpage.

## INTRODUCTION

Water is an important resource and it is vital for all known forms of life. Due to its shortage it is necessary to conserve water and have control over its distribution. Hence there is need of better water distribution by keeping good water quality. In Urban areas the water is distributed area wise and for new areas water tanks are developed with water filtering plant to keep the water quality good. Even in the societies and apartments the water distribution is done manually by controlling the valves. Due to the limitation of water pressure from the municipal tanks and water supply in limited quantity, the water distribution is done manually in societies. The main important thing is that the water quality is monitored in municipal tanks only, and when the water is distributed through pipes the water gets contaminated due to following factors such as rusting of pipe any leakage and holes in pipes, and these contaminated water causes common illness such as diarrhea.  Thus water quality cannot be checked at every point while it is being distributed as it will take lot of time and more manpower will be required. Hence, there is need of smart water management and water quality check at societies. By focusing on the above issues, we have proposed model based on IoT environment to overcome the above problems. In our proposed model, we have used Raspberry Pi as a controller and different sensor which can upload data to the cloud. Some sensor can be controlled through the cloud using web interface.

## LITERATURE SURVEY

Smart Water Management is mainly concentrating in reducing the challenges facing in the water sector. Information and communication Technologies plays a major role in Smart Water Management SMW can maximize the social and economic welfare by integrating. [1]

ICT products and can be effectively used for continuous monitoring, finding anomalies and the data can be used for optimizing the water distribution network. [2]

SMW includes data acquisition and integration using sensor networks or smart meter, data distribution using WiFi or internet, data processing and storage using cloud technologies, modelling and analytics and visualization and decision support using web based tools. [3]

N. Vijayakumar & R. Ramya proposed The Real Time Monitoring of Water Quality in IoT Environment where they are sending, storing and viewing the data. The water quality can be monitored anywhere in the world. They developed a system using different sensor and raspberry PI B+ model. The scope of the work is to monitor the water quality without taking any necessary steps when water quality starts degrading. [4] IoT for water management increases the productivity by allowing real-time control, process optimization, service time reduction,new business models, resource conservations, and the capability to do all of this globally. It increases efficiency by allowing the tracking, monitoring and enabling continuous improvement. [5]
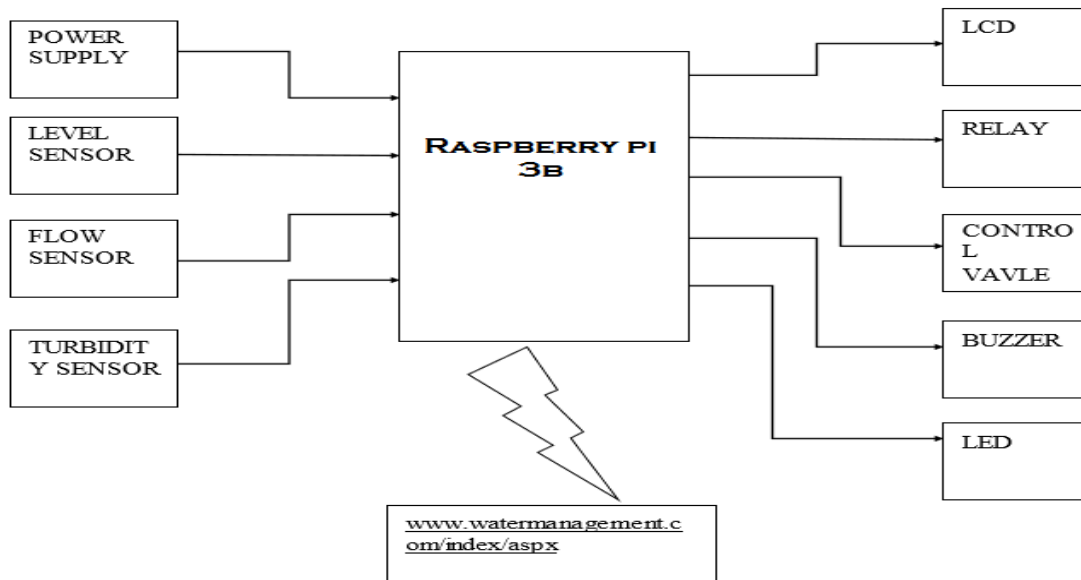
## METHODOLOGY



**Fig. 1 Block diagram of IoT based Water Management**

## WORKING

Our aim is to control the water distribution to each flat in society by using Iot with Raspberry Pi controller. This system will work in three phase. First of all microcontroller will come into picture.We have used three sensors flow sensor, turbidity sensor and ultrasonic sensor that is level sensor. After initialization of each sensor they will start collecting the data. After that raspberry Pi will read data from sensor. By using GSM module the collected data will be uploaded to IoT server. In this way data will be displayed on LCD. Then system will work for webpage module. User and admin can communicate with each other by using web application. Both of them will be assigned by specific username and password. They have to logged on the system for accessing the system. After initialization system will wait for admin to allocate water for specific flat with specific quantity. After allocation completes, system will send this data to microcontroller. Microcontroller will receive data from web. It will process the data and starts operating according to data. Relay and control valve have main role in this phase. For actual distribution of water these two will work as main components in this phase. If user required extra water then he has to request it by using webpage. Admin will process the request and work according to it.

## EXPECTED RESULTS

This system basically uses to control the water supply management for particular area in which it measure how   much water is used. Water level of the particular tank is sense by the

level sensor. It gives the signal to Raspberry Pi and with the help of an LCD display we can see level of the water contained in a tank. When the water is at normal level it will display on LCD and the water will supply in the respective area. When water level crosses the buzzer will ON and it will also display on LCD. At the same time water pump will OFF. But sometimes pressure of the water increases due to this there may be chance to damage the water pump to avoid that flow sensor control is used.Flow control sensor controls the flow of water. Level sensor measure the level of water and it will display on LCD.
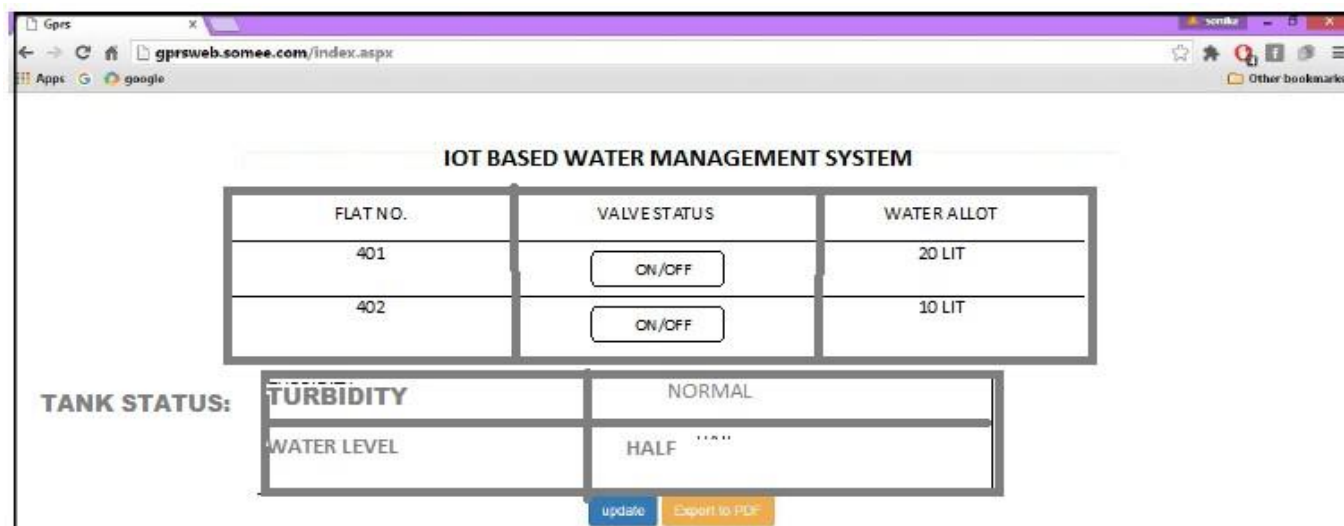
### · SOFTWARE RESULT



**Fig. 2 Web page for IoT based water management**

## CONCLUSION

The conventional method used before in older times, results into problems like empty running overflow, leakage. IoT based water management thus helped to overcome this problems based on level, pressure, flow parameters and it also minimizes human efforts for the same. The main purpose of this paper is to deliver water to consumer with appropriate quality, quantity, pressure and to reduce water wastage due to human negligence and environmental conditions. The performance of the system is enhanced by achieving saving of manpower and avoiding human errors. The entire system can be accessed by IoT to represent a pictorial view of water management system which include internet, databases with inclusion of software and hardware.

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