

# IOT BASED WATER SUPPLY MANAGEMENT SYSTEM

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**Abstract :** The IoT Based Water Management System is an IoT-based application, which helps the user in monitoring, controlling and managing the water supply system at home. This system is designed to overcome the difficulties in water management system and it can be used from remote places. It is very useful to reduce water wastage. These systems can be installed to more than one house and can be controlled by a person in flats and apartment buildings.

In this project, the water pump is being monitored and controlled by the android app at the user end. By this work, the wastage of water and the consumption of power by motor can be reduced so that they are conserved for the future use. This system provides complete monitoring of water usage and the water price. Node Mcu is used as a main hardware part and water flow sensor is used to find the flow of water. The system designed does not require the physical presence of the client. The system is automatically monitored and the pump is switched ON or OFF.

*IndexTerms - Water Management, Water Wastage, IoT, Node MCU*

## I. INTRODUCTION

The main purpose of this Water Management System is to reduce the water wastage and to monitor the usage of water for each house. The Water Management System is used to monitor the amount of water used by one block of house in a flat system. In current system the total bill for water is divided to all houses irrespective of water usage.

There is a monitor which monitors the whole water flows that takes place in between water tank and applied areas. Since there is a monitor, people do control the usage of water. This probably increase the water availability of the flat. The payment option can be done through the system therefore we don't have to give any type of additional charges. We have to pay only for the amount of water that we used.

Flat management takes the role of admin of this water management system. This type of digitalization impress the customers and this may give an extra credit to the management. Since Indian government looking forward to a digital Indian concept, this can be a vital step towards digitalization. Here flat members are customers. By this Water Management System there will not be any water scarcity in the flat. Water will be available all the time. We can assure that there will not be any water wastage in the flat.

## II. PRODUCT PERSPECTIVE

This IOT used water management system is very helpful for future life. Because it helps to manage the water without wastage. Here we have hardware NodeMCU which monitors the flow of water. The data's which came to NodeMCU is from flow meter.

## III PRODUCT FEATURES

The system completely helps the flat members to use the water efficiently. This IOT device monitors the water used by each individuals and the price also. Hence they can pay the amount according to the usage. From the NodeMCU data's will be storing to the database and it available to all users.

## IV EXTERNAL INTERFACE REQUIREMENTS

### 4.1 USER INTERFACES

The complete system is based on IOT concept and NodeMCU board helps to monitor the water usage. There is a website where all users can register the account. From there all can access the database and it shows all the usage of water and the price.

### 4.2 HARDWARE INTERFACE FOR WATER MANAGEMENT

Micro Controller : NodeMCU

Communication Module : Wi-Fi

Sensors : Water Flow Sensor, Relay Switch

### 4.3 SOFTWARE INTERFACE

The system requires a wifi connection in order to work properly. The programs are uploaded to the micro controller and that is being placed into the NodeMCU. The program interacts with the database whenever there is an updation in data.

### 4.5 PERFORMANCE REQUIREMENTS

The proper functions of pipes and valves may improve the efficiency and accuracy of the system. System needs good wifi connection with high transaction speed for the better performance.

### 4.6 SAFETY REQUIREMENTS

Amount that needs to be paid by the customer is calculated by the system. There are certain methods to calculate the amount. The calculation completely based on the water usage. The database is protected by the authentication methods. Therefore there is no chance of malicious activities.

#### 4.7 OTHER REQUIREMENTS

External micro chips and other sensors are also required for the function of this system. The water management system is being controlled by the program that is stored on the NodeMCU board. As we using sensors and hardware's we have to make sure that it will be protected from other damages.

#### V SYSTEM DESIGN

The main purpose of this design is to translate the ideas in the minds of a client into a formal document. Through design the client clearly describes what it expects from the proposed system and the developer clearly understands what capabilities are required to build the system.

The main purpose of this project is to swithing pump ON/OFF using an androidapp.And also it shows the exact usage of water and its price. It is easy to operate pump using Mobile app.This water management system is IOT based application. It makes use of web based interface. Users with valid login id and password are allowed to use the system. This system serves as a means for eliminating inefficiencies from back office operations.

#### 5.1 AUDIENCE

This document may be referred by the following for the purposes mentioned:

Developers: To work on the project in order to know the workflow to be taken.

Quality Analysts: Testing project on the whole to check if requirements are met or not.

Users: To check for requirements process and as a user guide.

#### 5.2 DESIGN CONSIDERATIONS

In system design, as we are doing IOT based water management system first we have to define general system characteristics. Once we are thorough with the hardware part then need to place the connections. Node Mcu is used as our main hardware part and water flow sensor is used to find the flow of water. The data storage and access for the database layer need to be designed. The user interface at the client side needs to be designed.

The developer should have the good knowledge of the modules which are going to be designed. Use of the modules, sub modules details should be known to the developer to develop the system. This system may be extensible by adding some more modules.

#### 5.3 CONTEXT DIAGRAM

It is common practice to draw the context-level data flow diagram first, which shows the interaction between the system and external agents which acts as data source and data sinks. On the context diagram the system's interactions with the outside world are modeled purely in terms of data flows across the system boundary. The context diagram shows the entire systems the single process, and gives no clues as to its internal organization

#### 5.4 LEVEL 0

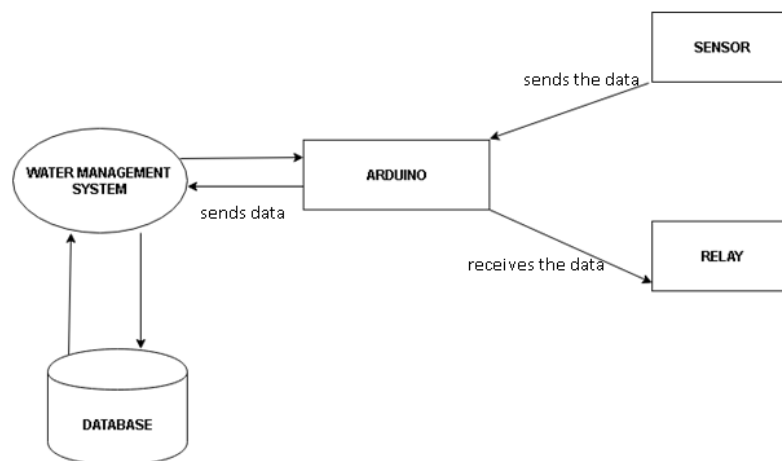


Figure 4.1: Level 0 of the Context Diagram

5.5 LEVEL 1 DFD

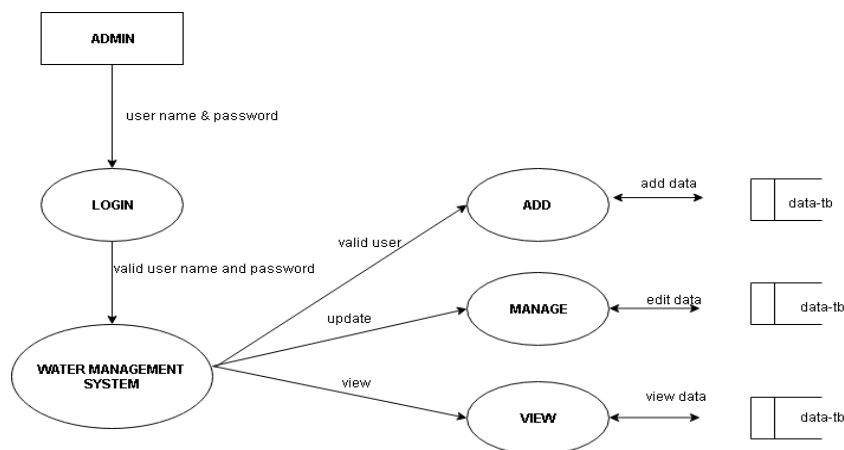


Figure 4.2: Level 1 of the DFD

5.6 MODULAR DECOMPOSITION OF COMPONENT

**DESCRIPTION OF THE COMPONENT:**

- **Functional Component 1: View data**
- View data:
- ✓ **Input:** No need of any input.
- ✓ **Output:** View of All data.
- ✓ **Processing:** Continues update of data from database.
- ✓ **Interface with other functional components:** :All the modules will be affected as the result of this module.
- **Functional Component 2: ON/OFF of pump**
- ON/OFF of pump:
- In this module, user has to press the button to ON/OFF of pump.
- ✓ **Inputs:** Pressing the button
- ✓ **Output:** Status of Pump will be changed.
- ✓ **Interface with other functional components:** : All the modules will be affected as the result of this module.

5.7 USE CASE DIAGRAM

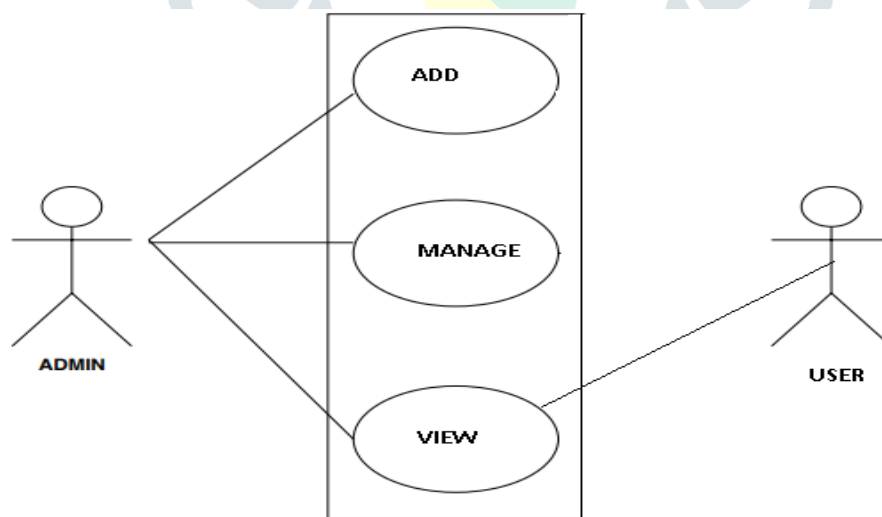


Figure 5.1: Use Case Diagram of Water Management System

## VI CONCLUSION

In this project, the water pump is being monitored and controlled by the android app at the user end. By this work, the wastage of water and the consumption of power by motor can be reduced so that they are conserved for the future use. This system provides complete monitoring of water usage and price. The system designed does not require the physical presence of the client. The system is automatically monitored and the pump is switched ON or OFF.

The IoT Based Water Management System is an IoT-based application, which helps the user in monitoring, controlling and managing the water supply system at home. This system is designed to overcome the difficulties in water management systems. This system can be used from remote places. It is very useful to reduce water wastage. These systems can be installed to more than one house and can be controlled by one person for example, in flats and apartment buildings.

## VII ACKNOWLEDGEMENT

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