# IOT Based Water Level Monitoring System For Lake

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***Abstract*:** In this paper we introduce the notion of water level monitoring and management for lake water storage source for villages. More specifically, we introduced the raspberry pi as controller for water level sensing and controlling in a wired and wireless environment. Water Level management approach would help in reducing the time required for water allocation, need of water in summer season, drought and as well as overcome the wastage of water. Furthermore, it can indicate the amount of available water in the lake that can support Global Water types including cellular data loggers, GSM through data transmission systems for water management in office. Moreover, cellular phones with relative high computation power and high quality graphical user interface became available recently. From the users perspective it is required to reuse such valuable resource in a mobile application. Finally, we proposed a web and cellular based monitoring service protocol would determine and senses water level to all people needed the information about available water in lake.

***Keywords:*** **IOT, Water level, GSM, Raspberry pi, web based monitoring.**

## 1. INTRODUCTION

Water allocation is the process of specifying or quantifying the volumes of water available for, or used by, one or more "consumptive uses". In this lake management context this refers to volumes of water used in the contributing catchment, used from the lake or reservoir itself, or released from the lake or reservoir for downstream use. Consumptive uses are those which involve removal of water from a river, lake or reservoir, and thus include irrigation, industrial uses, and domestic water supply. A Brief was judged to deal with the topic of water allocation if it considered the absolute or relative volumes or water used, or proposed to be used, in any of these enterprises .Generally, this would also involve some level of the articulation of lake or lake water balance, for example, the relative or absolute values of water inflows and outflows.

This paper is organized in the following ways. The second point concentrated with the basic concepts of the system design. In third we described the concrete idea of Raspberry pi 3 model b. Design and Implementation part is described in chapter fourth. Fifth point describes about our proposed monitoring and controlling network. Chapter six deals with the conclusion and future works.

## 2. BASIC CONCEPT:

The technique of water level monitoring system concentrated with some basic parts which are softly aggregated together in our proposed method. Basic descriptions of some parts are described below.

### 2.1. Water Level Sensor:

A basic ultrasonic sensor consists of one or more ultrasonic transmitters (basically speakers), a receiver, and a control circuit. The transmitters emit a high frequency ultrasonic sound, which bounce off any nearby water. Some of that ultrasonic noise is reflected and detected by the receiver on the sensor. That return signal is then processed by the control circuit to calculate the time difference between the signal being transmitted and received. This time can subsequently be used, along with some clever math, to calculate the distance between the sensor and the reflecting object.

### 2.2. GSM module:

GSM module is basically used for the message sending and receiving to user.we interfaced the GSM module with raspberry pi. User can check the information about the present level of water in the lake at anytime and anywhere. This system used because it is very easy way to

obtaining the information of water level on any type cellular phones.

### 2.3. Web portal:

The actual water level present in the lake is displayed on the web portal. Web portal stores the previous records of the water level information. Anybody can use this portal to get an information about water available in lake.

### 3. Raspberry Pi 3 Model B:

A complex IC that integrates the major functional elements into a single chip or chipset. Which consists of programmable processor, on-chip memory, accelerating function hardware (e.g. GPU), both hardware and software, analog components. Ultrasonic sensor is connected to the GPIO pin of raspberry pi. Ultrasonic sensor sense the water level and sends this information to raspberry pi. Through the wi-Fi in raspberry pi an information directly sends to a web portal. Via the GSM module level is send to users.

### 4. Design and implementation:

For experiment this design we have been using an Raspberry pi, a GSM, a tank besides the lake. Water tank has been controlled using water level sensor. Ultrasonic water level sensors are used to detect the water level. We used python programming software to write into Raspberry pi 3 model b.

#### 4.1 Working Principle:

At the first stage of design a water level sensor is been made for sensing water level accurately. Raspberry pi is used to control the overall system automatically that reduces the design and control complexity. Raspberry pi takes input from the sensor unit which senses the water level through sensors. After processing input variables, resultant output decides the water level with respect to current water status of the tank.

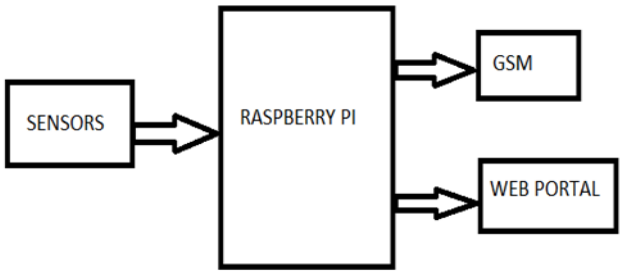


Fig 1:- Block Diagram of System

### 5. PROPOSED WATER LEVEL MONITORING NETWORK :

Water, one of the great natural resources should be utilized in proper form. But a huge amount of water is being wasted during daily life due to lack of control. Our proposed system guarantees to accumulate a good amount of usable water every day. This monitoring and controlling system uses daily life device like laptop or mobile phone. Due to the fact of controlling remotely we introduced a useful wireless automated controlling system. This proposed web based monitoring and controlling network can work with the existing water controlling system successfully as described graphically in below figure. We would like to partition this whole proposed wireless network in the following manner.

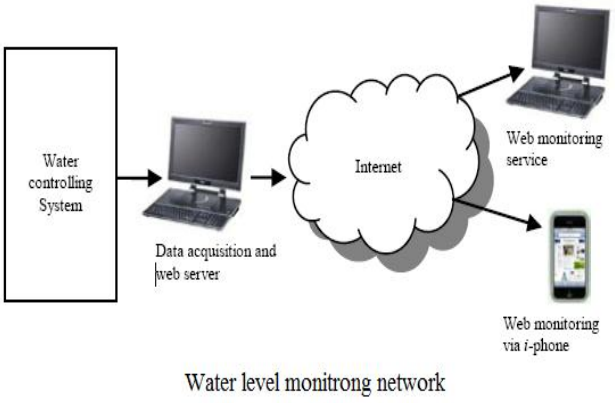


Fig 2 :- Water Level Monitoring Network

### 6. CONCLUSION:

Water is one of the most important basic needs for all living beings. But unfortunately a huge amount of water is being wasted by uncontrolled use. Some other automated

water level monitoring system is also offered so far but most of the method has some shortness in practice. We tried to overcome these problems and implemented an efficient automated water level monitoring and controlling system. Our intension of this research work was to establish a flexible, economical and easy configurable system which can solve our water losing problem. We have been used a low cost Raspberry Pi 3 model in this system which is the key point to reduce cost. We have successfully experiment the system in lab and therefore proposed a web based water level monitoring and controlling network which flexibility would offer us to control this system from any place via internet even with different type of devices. This could have a substantial benefit from this research work for efficient management of water.

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