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# Flood Detection and Alert System for Dam Using Raspberry Pi 3

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**ABSTRACT:** The main objective of this project is to develop a mechatronics based system. This system will detect the level of water and estimate the water inflow rate in a dam and thereby control the movement of gates using IOT in a realtime basis. It offers more flexibility over existing systems. Also the purpose of our project is to monitor the water level in dam using the advanced concept of IOT employing Raspberry pi. The Internet of Things (IOT) is a system in which real time things are interconnected to web. This system can also be used to sense the earthquake vibrations and explosive detection and as alert system. We are using Raspberry Pi which is a fully featured micro-computer implemented onto a small circuit board. It by default supporting python as the educational language along with embedded C. Here we have installed updated version of operating system i.e. Raspbian-pixel and done programming in embedded C. The Raspberry-pi unit checks that input and upload status on web. By this project each and every variation of water level is informed and then accordingly controlling action can be taken.

**KEYWORDS:** Relay driver ,Booting, GPIO, Secondary Memory Interface, Display Parallel Interface

## I. INTRODUCTION

The Internet of Things (IoT) is the network of physical objects namely the Things that are embedded with sensors, software, and various technologies for the purpose of connecting and exchanging data with other IoT devices and systems over a connection of internet. These devices range from ordinary household appliances to sophisticated industrial tools. Due to the convergence of multiple technologies the definition of the Internet of things has evolved, real-time analytics, machine learning (ML), commodity sensors, and embedded systems. Embedded systems' traditional fields such as, wireless sensor networks, control systems, automation, and others all contribute the enabling of IoT.

The internet of things is helping people to live and work smarter, as well as to have a complete control over their lives. Moreover, offering smart devices to automate homes, IoT is required for business in today's world. IoT offers businesses with a real-time view into delivering insights into everything, how their systems really work, from the performance of device to logistics operations and supply chain. IoT enables companies to automate processes and reduce labor usage. It also reduces on waste and improves service delivery, making it cost efficient to manufacture and deliver goods, and offering transparency into customer transactions. As such, IoT is one of the most important technologies of day to day life, and it continues to pick up steam as more businesses realize the potential of connected devices to keep them competitive in this digital world.

The ability to supervise operations surrounding infrastructure is a factor that IoT can help with the fast moving digital world. Sensors could be used to supervise events or changes within structural buildings, bridges and other infrastructural constructions. This brings fruitful benefits with it, such as cost efficient, reduced time, quality-of-life workflow changes and paperless process. There are many real-time applications of the internet of things, from consumer IoT and enterprise IoT to manufacturing and industrial IoT (IIoT). IoT applications span numerous verticals, including telecom, automotive and energy. In the consumer applications part, smart homes that are instilled with smart appliances and connected heating, lighting and electronic devices can be remotely controlled via computers and smartphones.

## II. LITERATURE SURVEY

**Design of flood detection system based on velocity and water level sensor in RASPBERRY with SWOD application on Kalimati-Kretek Gantung DAM Banyuwangi**

SWOD (Safety Water Overflow Detection) is an application that integrates with web server and sensor device as data taker able to provide real time volume and water speed information from dams through mobile device and comes with warning when reaching emergency condition.

### Real-time flood monitoring and warning system

Users can view real-time water condition as well as the forecasting of the water condition directly from the web via web browser or via WAP. The developed system has demonstrated the applicability of today's sensors in wirelessly monitor real-time water conditions.

### Effective Flood Alert with Android & IOT Based Emergency Support in Network Unidentified Zone

The projected system, distributed system mistreatment water & flow level sensors area unit deployed everywhere and monitored, gathered to the centralized server for quick & emergency support. within the modification half, AN automaton app is deployed all told the mobiles of the general public.

## III. PROPOSED ALGORITHM

### A. Environment Preparation:

- Raspberry Pi 3
- Ultrasonic sensor
- Waterflow sensor
- Motor driver
- Buzzer

#### Software requirements:

- Rasbian jessie
- HTML and PHP
- Language – Linux
- Python

### B. Description of the Proposed System:

In this System consists of RASPBERRY is interfaced ultrasonic sensor, flow sensor. Both the sensor has to find out the amount of water. The pumping motor supply to the water they flow sensor and lever sensor are analyse the water the level current position and the RASPBERRY connected to the module. It is determined water supply control and water flow automatically warning message. Then the man fails to ignore the warning and they controlled to the water supply.

#### Working:

Here we have made the system by using Raspberry pi over IOT. At the first stage of design an ultrasonic sensor is used for sensing water level accurately. Raspberry-pi is used to control the overall system automatically that reduces the design of system and control complexity. Raspberry pi takes input from the sensor unit which senses the water distance through ultrasonic sensors. When water level rises or decreases then the sensor circuit triggers the raspberry pi. We have designed the extra power supply for DC motor & buzzer. To drive the DC motor the driver IC has been used. To drive DC motor large amount of current is required. Using Raspberry pi we don't get the sufficient amount of current to drive the DC motor. Driver IC increases the current and drive the DC motor.

#### Relay driver

A Relay driver IC is an electro-magnetic switch that will be used whenever we want to use a low voltage circuit to switch a light bulb ON and OFF which is connected to 220V mains supply. ... High current capacities, capability to stand ESD and drive circuit isolation are the unique properties of Relays. The main purpose of the system carries out an advantage of transfer of information both of the cloud and public mobile phone paved the way for dynamic safety with high level accuracy in performance and feasible nature data analytics. water level monitoring and proposing on using wireless based type of monitoring using the raspberry

## IV. PSEUDO CODE

- Step 1: Plug in the Raspberry pi with 5 volt power supply.
- Step 2: Toggle the switch to turn on kit.
- Step 3: Water level sensor starts to send information to kit.
- Step 4: The water level measured is compared with the safe level.
- Step 5: Data is stored.
- Step 6: Check the below condition and end the process.

if (the water level is below the safe limit)  
 go to Step 3.  
 else  
 Step 7.

Step 7: If water level exceeds the safe limit alert message is sent to the people through cloud server.  
 Step 9: Let out the water.  
 Step 10: End.

### V. RESULTS

The history, culture, current and future socioeconomic status and environmental sustainability of India and its people are intricately linked to the water resources which are available from dams. These water resources available through dams are one of the main sources available for the usage to industries, livestock, irrigation etc. and there is a critical need to ensure the safety of the water level at these dams against any natural or anthropogenic threats and to develop an effective Water Level Management system using IoT. This paper gives an outline for the development of an information system based on the existing systems with the utilization of some sensors and IoT. This paper also proposes a novel idea of collecting and sharing real-time information about water levels to an authorized central command centre through far field communication. The authorized central command centre then takes a call whether to release the water by opening dam gates or keep them closed. By doing so, the operation of dams all over the country is centralized and automatized.

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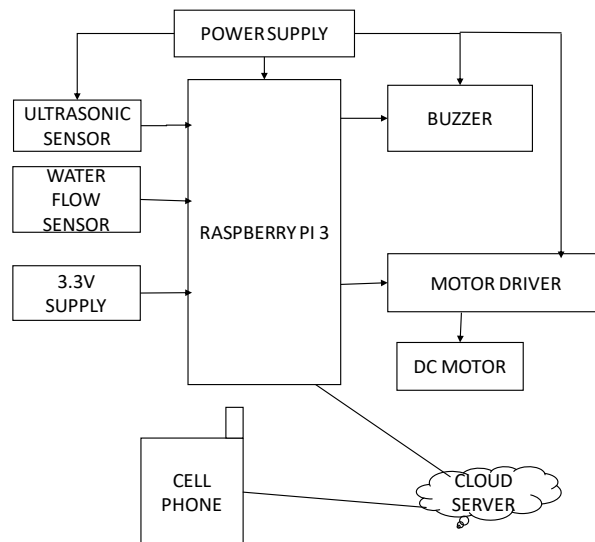


Fig.1.Block diagram



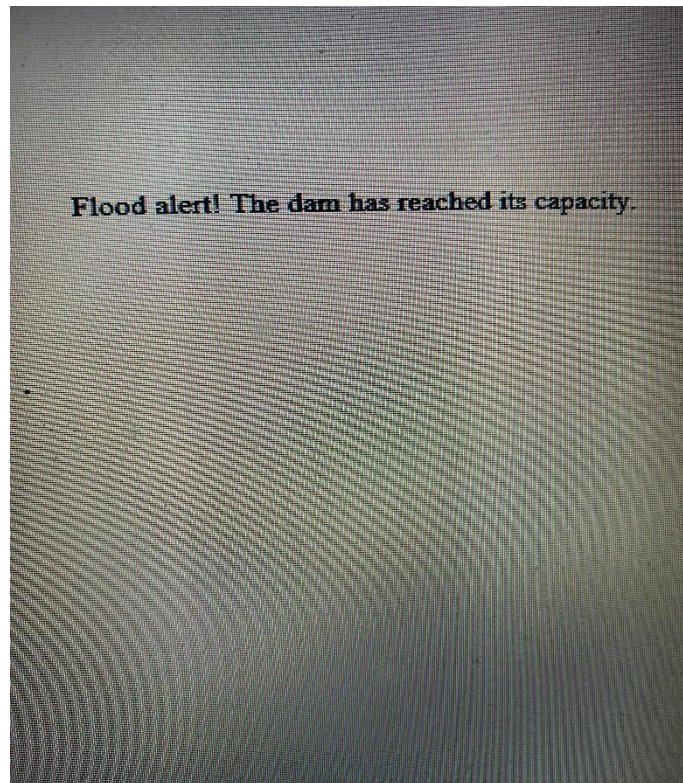


Fig. 2 Display of alert Message

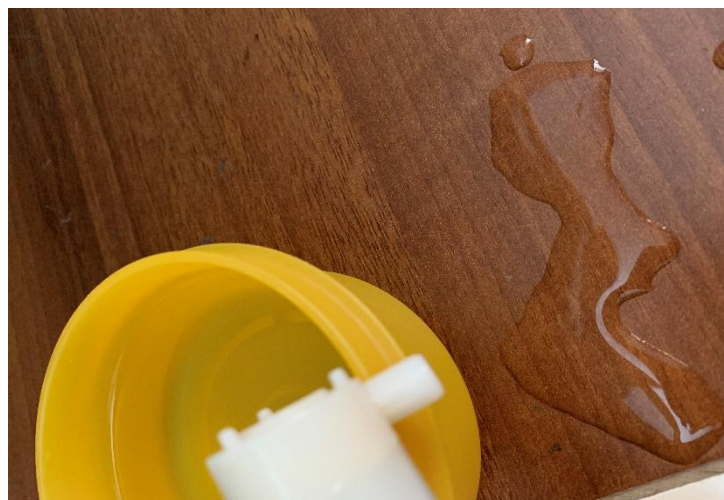


Fig. 3. Demonstration of water outlet during flood

## VI. CONCLUSION

The growth of IoT platform in various fields encourages the reduction of human life loss and damages to the properties caused by both natural and human-made disasters. The key advantage of IoT paved the way for dynamic safety with high level accuracy in performance and feasible nature data analytics. Adoption of new technology conveys the proper condition about the mishap. The response of the system is fast for the change in input. Thus, the study provides an IoT based monitoring and alerting of dam water level by using various past research contributions and issues remedy mechanisms which enables the smart warning technique for public safety.

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