

Water Level Monitoring System Using IOT

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Abstract— Since mankind stepped foot on this planet, the appropriate use as well as administration of water has been a challenge depend of an extremely good deal debate as desirable as warning for everyone. For residential communities, water administration is distinctly crucial and managing a massive machine is hard. Hence, we have brought forth a system the vicinity the water waft and diploma can be monitored with the resource of telephone utility and approves get admission to for advantageous clients with privileges to get admission to the motor controls as appropriate as specific community members to increase an bother in opposition to water contamination, water leakage, low water go with the flow and so on and take a look at the water status. The reput of the raised problem can additionally be tracked. As mobile telephones are owned through all these days, this computing device creates a well-established communication between them and their society is concerning water management.

Keywords: Water Level Management, Ultrasonic Sound Waves, Ultrasonic Sensor, Cloud Server, Mobile Application, Carriots

I. INTRODUCTION

Internet Of matters has been associated with cities, sensible houses and moreover to manipulate web page traffic structures the location it would manipulate the way our lights and site traffic lights would work. However, a unknown fact about the Internet of Things science is that it is additionally applicable in the course of many unique fields Associated with our day nowadays life, some different such vicinity the location the Internet of Things technological expertise can play a predominant feature is water management. Ever thinking about that mankind stepped foot on this inexperienced planet, the suitable use as well as administration of water has been a theme of a lousy lot debate as well as warning for everyone.

We are already acquainted to the advantages of Internet of Things science in our smart water machine project. It will help in the effective conservation and administration of our energies and resources.

This mission frequently focuses to improve an original, dependable, pliable water gorgeous monitoring computing device for in-situ monitoring of a long way off water diploma in the course of a Wi-Fi sensor zone. Wireless Sensor Networks furnish a new mannequin for sensing and speak records from a range of environments and many applications.

Wireless Sensor Network supply massive blessings each in Genius and in cost. Wireless sensor neighborhood for a water stage monitoring consists of coordinator and volume of sensor nodes with networking performance which are deployed at unique overhead tanks in an area. Each sensor node consists of an PIC microcontroller, a Wi-Fi community connection module and water stage and glide sensors in which these sensors will in a function to learn about the water

diploma parameters such as Electrical conductivity, pH, volume and temperature and ship facts to the records center the region the data is saved into central server. Graphic User Interface (GUI) is used to analyses water diploma facts when water nice detected is underneath standards. The recorded data can be analysed the usage of more than a few is gear for future correspondence and movements to calculate the reliability and effectiveness of the proposed system.

II. BASIC CONCEPTS

A. Ultrasonic sensor

This sensor consists of a speaker which will emit ultrasonic sound waves and a mic which will find out the unique sound waves, these sound waves are handed by means of the tank from pinnacle to bottom. The sound waves will hit the water and it will get mirrored once more in the structure of Echo waves. The Echo opening receives the Echo waves.

B. Flow Sensor

Flow Sensors are placed in pipes which proves to be a really useful gadget for water conservation systems, water recycling domestic applications, storage tanks, and irrigation systems. The sensors furnish a digital pulse each time an extent of water passes thru the pipe. The output is related to a microcontroller and monitored for water utilization and to calculate the quantity of water left in a tank.



Fig. 1: Water Flow Monitor

C. pH Sensor

The pH sensor is a machine to decide the acidity or basicity of the liquid. The pH scale is a logarithmic scale whose range is from 0-14 with an impartial factor being 7. Qualities over 7 demonstrate alkalinity or primary association and values under 7 would exhibit an acidic arrangement. Favorable pH stage in water for a living being is of 6.5 – 9.0. Anything outdoor of this perfect vary is viewed as deadl to the marine organic community. Outrageous pH esteems additionally increment solvency of components and mixes making them harmful also, in this manner more inclined to be ate up by marine life. Moreover, temperature has a reverse association

with pH that is, as temperature expands pH degrees cut back and the other way around.

D. Cloud Server

The cloud acts as an interface between the IOT and ANDROID application. It will ship the facts to the software of which is received from the IOT MODULE.

E. Android Application

Carriots is a Platform as a Service (PaaS) in the main made for Internet of Things (IoT) and Machine to Machine (M2M) projects. Using REST API furnished through carriots, we create software to manipulate water. In this app, the patron has to set the conditions like most and minimal values of water stage in the tank, water pressure in the pipes and the present day water stage in the tank is displayed in an app.

F. Automatic Switch

We use automated exchange controller to trade on and off the motor off water tank, this automatic swap controller will be embedded in the android application.

III. PROBLEM FORMULATION

Majority of the water wastage takes neighborhood due to the reality of overflowing water tanks, leakage in water traces and poor fine of water. Water tanks are manually managed by way of the use of an operator. In the absence of a person, water continues overflowing until the motor is switched off. Conventional water tanks can neither reveal nor manipulate the water stage in the tank, important to big volume of wastage.

IV. PROPOSED SYSTEM

The motive of the assignment is to diagram a computer which manages the water diploma in the tanks as true as to supply an overview and manage over the water circuit/grid for residential communities and places of work with the use of sensors. The files is despatcher to the cloud thru IOT module and the character will apprehend the water stage thru android application.

V. MODULE DESCRIPTION

A. Module 1: Hardware Integration:

This module consist of the hardware integration process. An Arduino board with an IC system collects the readings of the sensor and switch to IOT module.

B. Module 2: IOT Module:

IOT module acts as an interface between the cloud and the sensors. From Module 1, the accumulated information are uploaded in the cloud reminiscence via IOT.

C. Module 3: Cloud server:

Using Carriots the facts are transferred to Web server. End Users accumulate the data from the net server through android application.

D. Module 4: Online portal/Android Application:

End customers can get proper of entry to the internet web page or through an android application for tank status, closing

fill records, etc. Users can additionally increase troubles regarding low water supply, water contamination, etc.

VI. SYSTEM DESIGN

The projected laptop works the use of the IOT module, which is the predominant furnish for gadget module. In this proposed system, we have used pic16f877a as microcontroller. The most and minimal stages are obtained by way of way of this microcontroller from cloud. These values are received from the Arduino board. The today's diploma of the values is obtained and relying upon this values the motor is robotically became off/on. Depending upon the water stage the motor is automatically controlled. The utility is designed in such a way that it indicates the on the spot rate of current day reputation in the tank in percentage. Calculations and making selections are made much less tough and a whole lot less difficult to enforce in programming.

VII. CONCEPT IMPLEMENTATION

A. Ultrasonic sensor

The sensor in precise creates an ultrasonic wave with the resource of providing excessive enter to set off for two microseconds and low enter for 10 microseconds. This wave is then detected by means of way of echo. The time required for emitting and receiving the wave is calculated and saved in a variable.

As speed = distance/time,

Distance = speed of sound in air*dur/20000 [eq.1]

This gives distance in centimeters. This is then converted into percentage of water in tank giving the current level.

B. LAYERS

Data from the Sensors (Physical Layer) is transferred to the Carriots (Service Layer) linked micro- controller board the location the statistics is analyzed and translated to patron understandable language. Then it is finally displayed the use of an software created via Carriots or thru internet services (Presentation Layer).

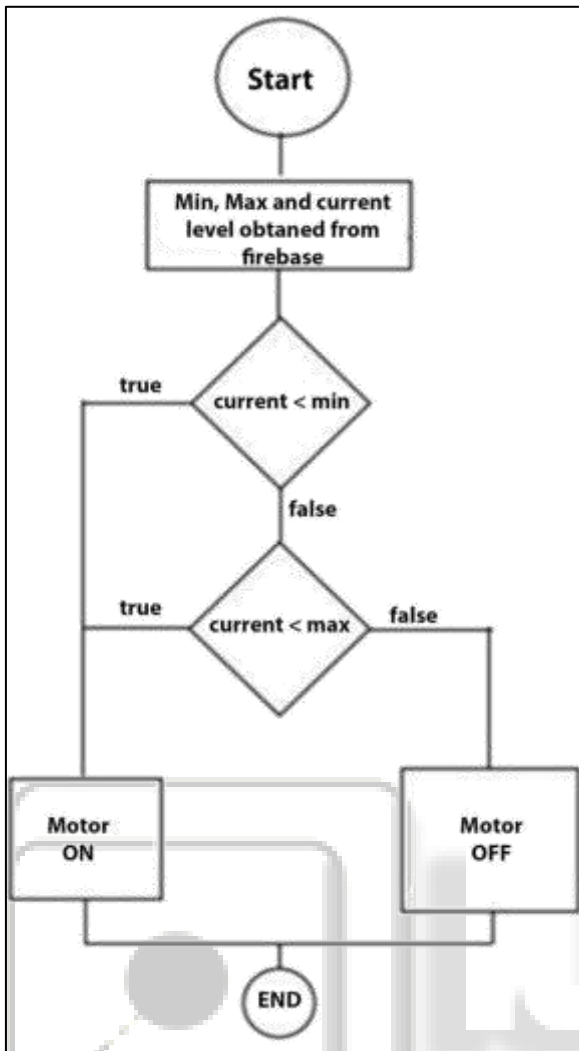


Fig. 2: Block diagram of logic in application for water tanks

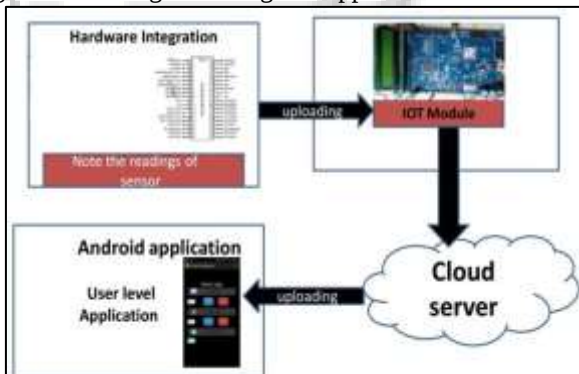


Fig. 3: Module Diagram

C. CARRIOT



Fig. 4: Networking using Carriots

1) Connect your Devices

- Devices like Sensors, Gateways, Machines, and a lot increased Arduino, Raspberry Pi, Nan ode, etc. can be connected.
- Basically any hardware giving us internet connectivity is a pinnacle solution.

2) Collect Data

- HTTP REST full API to push and pull XML or JSON archives is used.
- It is effortless and fast. Only net connection is needed.
- Secure: Apikeys, checksums and HTTPS.
- Data of any range – Temperature, difficult sensor lectures, custom-made archives streams, etc. It is stored in our No SQL Big Data Base for us to use it.

3) Manage your devices

- It is deployed, interacted, enable or disable our gadgets from Carriots.
- Status is checked and configurations and firm wares are managed remotely.
- Properties are prolonged and protection is managed.

4) Build our app

- If-then-else approach with easy expressions.
- Full Complex Logic with Groovy scripts.
- Push and Pull strategies.
- Build our whole manipulate panel over Carriots REST API in any language.
- Integrate our IoT information in exterior statistics waft or use it to have interaction with distinctive systems.

5) Application Usage

- It can be used via tens of thousands and thousands of devices.
- The software is used with the useful resource of us and carriots elevate the systems, safety and communications.
- Time taken for improvement is saved.

VIII. CONCLUSION AND FUTURE SCOPE

In this paper, a real time water stage is monitored the usage of IOT primarily based definitely Technology and from cloud. Future work consists of the utilization of greater surroundings pleasant and greatest algorithms which will tempo up the process. Future work additionally depends on improvement of sensors.

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