Enhanced Water Management System using IOT

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Abstract: *Water is the most abundant natural resource on the planet. We have many sources of water and entire living beings are dependent on water for survival. Water estimation by watching a source is found often, assume a role which is dedicated to monitor and control the loss and power use of water. This role is very essential undertaking who has huge responsibility in managing and controlling water supply to different routes. Water level viewing is an important role as it is utilized to assure water to everyone and to distribute/save water. Specifications of required equipment, product design, theoretical explanation and execution plan of IoT based water board structure is briefly discussed in this paper. This enables us to control water usage with electricity and internet inorder to conserve water efficiently. With LDR system we can limit the power consumption to save electricity.*
CATCHPHRASES: Internet of Things, IoT, Water Level Monitoring, IoT Application, LDR
COMPONENTS: LDR [Light Dependent Resistor], Arduino, LCD, Motor, Light Sensor, Relay
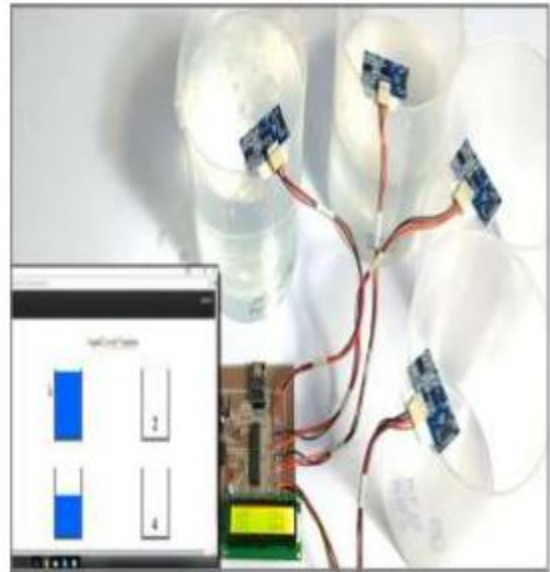
Figure 1: The Basic IoT Based Water Level Monitoring System.

I. INTRODUCTION

Water is the most essential element for survival of living beings. Human bodies are contained in excess of 60 percent water. We utilize clean water to drink, make crops for sustenance, work mechanical workplaces, and for swimming, surfing, computing and cruising. Water is in a general sense crucial to each bit of our lives. Checking surface water will help shield our conductors from pollution. Farmers can utilize the data to help better deal with their area and yields. Our neighbourhood, state and national governments use watching data to help control pollution levels. By utilizing water watching structure, we keep up a crucial partition from the water wastage, control use and effectively keep the water for our generation.Water watching day was created in 2003 by America's flawless water establishment as a worldwide instructive effort program that means to produce open consideration and joining in ensuring water assets around the globe. World water watching day is idolized on September 18. Tank Water Level Monitoring, is utilized to swear off flooding and individual segment of water in the tank. Monitoring and controlling water level in tanks is most practical and much needed solution for home automation applications. Controlling the motor pump remotely to manage the water level in tanks is currently supported by automated tools which display water level on real time. This data helps the customer to remotely control the power supply to the water pumping source.

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Currently the standard procedure for level control in homes is triggered by the feed at a low water level in the tank and engage it to keep running until a preferred threshold water level is filled which can be configured as per individual's choice. Fluid estimation control frameworks are pretty useful in monitoring water capacity in industrial scale dams & natural bodies which help in forecasting usage. Water pollution checking can help with water spoiling affirmation, entry of unsafe produced manifestations and sullying in water. In addition, additionally check the quality by utilizing Temperature, pH and turbidity are the normal parameters gathered in stream/lake water contamination/quality watching structures. The objective of this errand is to design and deal with a Wireless Sensor Network (WSN) that screens water with the assistance of data distinguished by the sensors absorbed water, to keep the water asset inside a standard delineated for family use and to more than likely take fundamental activities to re-establish the nature of the defiled water body. Water pipelines spill unmistakable evidence, Pipeline frameworks are in charge of transporting significant materials, for example, water, oil and gas. Any leakage in the pipe can cause major monetary hardships and conceivable trademark harms. Beginning at now, verified pipelines are just checked at key focuses, which can be detached two or three kilometres disconnected. A structure with a higher spatial goals would give executives an unrivalled comprehension of their system. In verified pipeline watching, sensor fixates are passed on in soil. The underground condition powers certifiable limitations on sensor focus focuses, for example, poor RF transmission and nonappearance of sensibility.

II. LITERATURE SURVEY

An interesting project titled "Water Tank Control system based on I.O.T "to reduce water spoilage was presented by Divya which covered many important attributes. For building a controlled system to manage the water pumping motor remotely, a certain behavioural data of people's daily routine especially their efforts towards maintaining the water level in their tanks is very helpful. Across our country, all the states have their very own dedicated water supply body which makes laws and regulations over consumption and usage. Usually this body acts under state government and aims to preserve water table for future generations. As we have limited supply of water which can be used for personnel and commercial purposes, distribution to public is regulated at certain reserved time slots in a day with fixed duration as per the government policy. So this document focuses on portraying integration of control structure with a water level controller using connectivity and electronic equipment.

Vijayakumar and Ramya have presented a project on "Economic alternative for Structure/headway of exertion system for instant water quality monitoring using IoT". Product includes various sensors like depth measuring sensors, pH etc. Multiple attributes are derived and data required for calculation is secured from sensors like Raspberry PI B plus. Data extracted from these sensors can be accessed from World Wide Web by using cloud based processing and these gadgets have proven to be more economic and efficient for computing, sending command via internet module to adaptable phones. Consolidated view and analysis of data can be accessed through finger tips from everywhere.

Excellent work has been done on "Consistent Wireless Monitoring and Control of Water Systems using Zigbee 802.15.4" by Saima & Nidhi. In this paper, built plan includes different parts such as water quality sensor, PC, GSM modem, XBee, water level sensor along with a database. Predicting the pattern/trend in data and broadcast it to the receiving instrument or tool via inverter is handled by sensor nodes which proved to be extremely important in this project. Identified data is supported by framework supplies like Router.

XBees and other tools transfer data to routers which is then transferred via sensors and broadcasts data to coordinator. All required information derived from these data can be accessed using any PC for our further analysis. In the Computer: bore water level and conduit level is computed with C # programming language. An alert can be triggered as per user's settings which can be configured along with automated "SMS" linked to pre-defined actions. . These massive piles of data can be stored in a private database which can be used for our analysis.

Thinagaran & Nasir, Leong worked on" IoT Enabled Water System" .Monitoring water level on a real time basis using Internet of Things was experimented and executed by them. This objectives is of straightforwardness which fuses course of action of facilitated substantial that licenses internal observation for nature of water. This is a very economic and cost effective solution which can be embedded with sensors enabling us to examine water quality. Qualitative checks are mandatory for review. Composition, warning signatures in water, contaminations and any other relevant data which can affect eco-system is migrated among cloud servers using connectivity which enables end customers root access . The water estimation is calculated and displayed.

A Thingspeak as a segment of prepared system which is facilitated in addition. It is highly beneficial for individual and private customers with thingspeak integration as it delivers quality data on industrial and commercial water usage. By using IoT, qualitative analysis of water can be derived enabling us to build an alarm system to notify drastic events.

Saraswati, Endrowednes, Pono submitted a thesis on "SMS controlled Water Level Management system architectural design". Ultrasonic sensors are used to map water capacity with no physical contact with water. Central Controller is used to access electronic parts remotely and a microcontroller is used for data processing. SMS notifications with accurate values of water level is available in this design. Measuring water level just by using microcontroller without actually keeping in contact with water is the primary objective of this project and is custom designed to accommodate this. This also helps in longevity of electronic devices as their resistance to water is pretty low. Just like any other message, these computed results can be shared with any mobile devices of clients as per their own personnel interests.

III. COMPONENTS FUNCTIONS

A. ARDUINO UNO BOARD

An Arduino microcontroller progress board is embedded in the hardware along with sensors based on ultrasonics and a Wi-Fi module to gather and exchange information via cloud. Arduino Uno microcontroller is used to gather data from pre-installed ultrasonic sensors. Its efficiency and easy integration with different kind of sensors and technology is what makes it stand apart. And being an open source platform is what attracts users' interest. Arduino microcontroller comes in multiple models with high level customization which serves us in a multipurpose domains. It control gadgets similarly as can investigate information from a wide extent of sensor. ATmega328P is found in a Arduino Uno is a microcontroller board. Abundant in supply hence no hassle finding required specifications. Arduino Uno is engineered with fourteen male sticks along with six essential reception sticks to interact with different devices that derives fundamental analog data points.

Fig 2: ARDUINO UNO

B. DC MOTOR

A DC motor in clear words is a gadget that changes over direct current(electrical significance) into mechanical vitality. It's of main importance for the business today.

A DC motor is proposed to keep running on DC electric power. Two instances of

unadulterated DC structures are Michael Faraday's homo-polar engine (which is incredible), and the metal ball motor, which is (up until this point) an oddity.

By a wide edge the most outstanding DC motor sorts are the brushed and brushless sorts, which utilize inside and outer compensation freely to make a floundering AC current from the DC motor—so they are not absolutely DC machines in a strict sense. We in our undertaking are utilizing brushed DC Motor, which will work in the appraisals of 12v DC 0.6A

Fig 3: Motor

C. LEVEL SENSOR

Level sensors see the segment of substances that stream, including fluids, slurries, granular materials, and powders. Every single such substance stream to wrap up basically level in their holders (or other physical cut-off focuses) on account of gravity. The sample which is under observation is subjected in apparatus, also can exist in its natural occurrence (such as ponds, water bodies etc.).Deduced figures are most likely to be a fixed value constant or down to decimal points. Resolute estimation sensors can map depth in a pre-set value when deduce the calculated value of subject a targeted confined area/point, while point-level sensors essentially decide whether the substance is above or underneath the distinctive point. For the most part the last see levels that are an unnecessary measure of high or low.
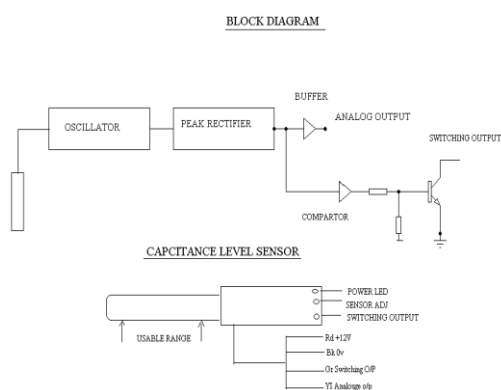
Fig 4: Level Sensor Block Diagram

D. LIGHT DEPENDENT RESISTOR (LDR)

Light reliant resistor (LDR) is a resistor whose confinement decreases with developing occasion light power or the an alternate way. As the name proposes, LDR is a sort of resistor whose working relies upon just on the light falling on it. The resistor proceeds as demonstrated by extent of light and its yield unmistakably changes with it. As a rule, LDR resistance is least (in a perfect world zero) when it gets most absurd extent of light and goes to most imperative (preferably massive) when there is no light falling on it.
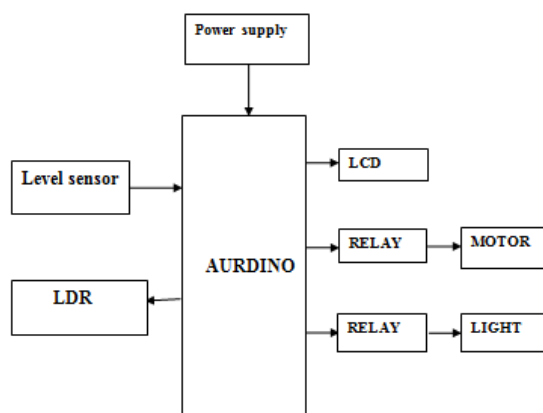
Fig 5: Block diagram

E. RELAY

The essential trade was made by Joseph Henry in 1835. The name hand-off gets from the French noun relays' that indicates the steed trade spot of the postal transporter. By and large a trade is an electrical rigging contraption having an input and output gate. The yield portal contains in no short of what one electrical contacts that switch when the information entryway is electrically invigorated. It can understand a decoupled, a switch or breaker for the electrical power, a negation, and, on the base of the wiring, confounded astute points of confinement containing and, or, and flip-flop. In the past trades had a wide use, for example the phone exchanging or the railroad organizing and crossing structures. In spite of electronic advances (as programmable contraptions), trades are so far utilized in applications where obnoxiousness, ease, long life and high dependability are basic segments (for example in security applications).
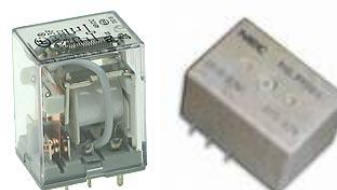
Fig 5.Relay

IV. EXISTING SYSTEM

In this existing system framework there is no assurances taken to control the flood of water when the

tank is full. So we are losing such a great deal of water what's more there is no ensure to control the light on and off. Encase of any human carelessness loss of intensity. So to pound these we need to propose another framework.

V. PROPOSED SYSTEM

In this framework, we can utilizing water level sensor furthermore utilizing LDR (Light ward resistor). In our undertaking water level sensor we used to perceive the part of water in the water tank. At whatever point the water level is full accordingly the engine will be off. At whatever point the water level is low the engine will be on. By this framework we proposing suitable structure to save the water.

VI. RESULTS
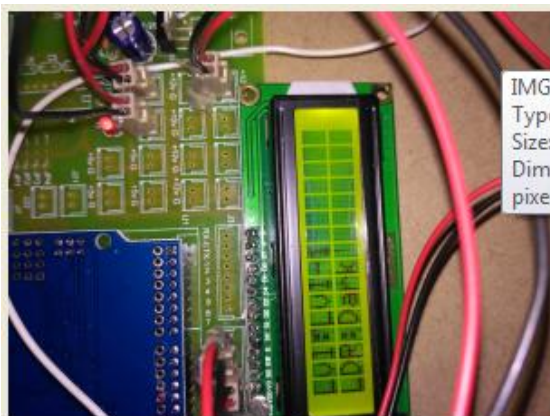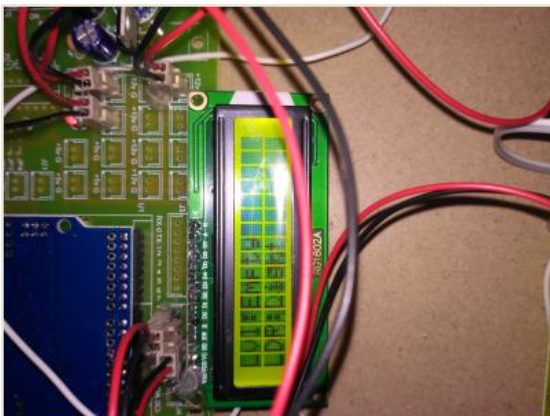
VII. CONCLUSION

In this paper the proposed system focus on water level monitoring goes under the field of Internet of Things (IoT). The main target was to plan a smart framework for approximating the water level in the tank and dismiss water wastage. Through this structure with LDR (Light ward resistor) we will save the power.

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