Design and Implementation for Water Level Alert system and Quality Measurement Using GSM/IOT

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Abstract— *To adapt to debacle circumstances legitimately, it is critical to recognize the calamity scale and give the exact data of the site to the proper specialists including fiasco site and Central Disaster Management Center, nearby order post, and so forth and offer the data gave. Specifically, sharing data on catastrophe circumstances should control the debacle rapidly to keep the fiasco circumstance from enduring and growing. Nonetheless, in case of a vast scale catastrophe, delay is caused in the current business organize and in this way, the calamity circumstance can't be imparted rapidly and precisely. Keeping in mind the end goal to decide the circumstance precisely in case of a debacle, security and availability of the system and stream of information are essential. Another situation is Water contamination is one of the greatest feelings of dread for the green globalization. To keep the water contamination, first we need to gauge the water parameters like pH, turbidity, conductivity and so forth, as the varieties in the estimations of these parameters point towards the nearness of toxins. At introduce, water parameters are recognized by substance test or research center test, where the testing supplies are stationary and tests are given to testing types of gear. Along these lines the ebb and flow water quality checking framework is a manual framework with dreary process and is extremely tedious. In the proposed framework, we introduce a sensor to quantify water level in waterways, lakes, tidal ponds and streams. For such reason and to demonstrate our idea, we outlined a pilot extend through a miniaturized scale display that is built with a water level estimation sensor in light of a basic open circuit that closes when in contact with water and tentatively tried into a water holder under a controlled domain. At the point when the water level ascents and achieves the resistors, shifts the impedance, this demonstrates the real water level et cetera for various statures. The data from water level sensor is transmitted by means of Wi-Fi to a portable PC, and after that this data is likewise found in advanced cells, where clients can see the water level in streams*

Keywords—*Continuous monitoring; GSM modem; Real time; Sensors; WSN*

I. INTRODUCTION

As of late, different catastrophic events and simulated fiascos are expanding abruptly because of quick populace development, extension of city, anomalous atmosphere caused by regular annihilation around the globe and consequently, the harm scale is additionally extending. There exist a few sorts of catastrophic events, it is realized that surge is a standout amongst the most risky since they have enough ruinous energy to change the course of streams, clear away and wreck whatever is in their way. Our inspiration for this work depends on all harms caused in our district because of surges, this catastrophic event has made many individuals endure harm to their homes and losing their possessions. Exact expectation and fast reaction are required to limit catastrophe harm and efficient debacle administration advancements and fiasco counteractive action data systemthat rapidly spread calamity circumstances, national activity tips through media, for example, TV, Radio, Smart Phone, DMB, Navigation, GPS and so on in case of a calamity and bolster save, harm rebuilding should be fabricated. In the aversion step, catastrophe circumstances detecting and expectation utilizing CCTV and sensors are completed and instruction and preparing for arrangement are performed. In the reaction step, reactions to harm circumstances distinguished in case of a catastrophe are performed through interchanges for the most part around multi substance, for example, sound and video and so on.

The way that the information accumulation of levels of water bodies is executed by a man and it conveys perils and postponements in the spread of data. One of these dangers is imperiling the individual who comes to make a move, as heavy rains access to the measuring focuses are to a great degree muddled, and in instances of conceivable flooding these deferrals are significant to rescuing effects and particularly the lives of individuals living in zones at chance. In view of the costly cost of

gages to quantify water level and the significance of creating cautioning frameworks for measuring levels in streams that add to shield lives of subjects who possess locales in risk of flooding, we introduce a water level sensor in view of water conductivity.

II.   RELATED WORK

The Internet of Things (IoT) is a novel worldview that is quickly making strides in the situation of present day remote broadcast communications. The fundamental thought of this idea is the inescapable nearness around us of assortment of things or items, for example, Radio-Frequency Identification (RFID) labels, sensors, actuators, cell phones and so on.- which through interesting tending to plans, can interface with each other and collaborate with their neighbors to achieve shared objectives. IoT speaks to the following advancement of the Internet, taking a colossal capacity to accumulate, break down and convey information that we can transform into data known and eventually, insight in this specific circumstance. As of now IoT ventures are under way that guarantee to close hole amongst poor and rich , enhance circulation of universes assets to the individuals who require them the most and enable us to comprehend our planet so we can be more proactive and less reactive.Hence, it is conceivable to utilize the idea of IoT to give correspondence capacities to a gadget that could caution fortunately to a populace before a cataclysmic event occurs.A sensor hub comprises of four fundamental segments: a detecting unit, a handling unit, an influence unit, and a handset unit. Extra segments, for example, control generator, worldwide situating framework, and area discovering unit can likewise be joined relying upon the application. The handling unit, temperature furnished with little memory, deals with the work of different segments; it is in charge of data correspondence, and furthermore administers possible coordinated effort of the hub with different hubs in fulfilling doled out detecting undertakings. So it is critical for our steering calculation to have little calculation time, and little memory prerequisites. The handset unit associates the hub to the network.Communication frameworks are basic in the coordination and arranging of crisis and calamity help operations. Lamentably existing frameworks Often give negligible correspondence foundation to providing data about the nature or reach out of a crisis or disaster.Once catastrophe happened, correspondence system and data framework are truly harmed and correspondence implies for occupants can't be utilized as a part of the hazardous situation. Along these lines, it is required to get ready crisis organize framework which can be immediately reproduced to recuperate from the system disappointment

and used to affirm inhabitant's security and harmed territory data. an expanded remote adhoc arrange is proposed to speedily protect correspondence intends to get a handle on the data with hazardous situation, occupant's security and alleviation merchandise on the event of debacle. By consolidating different swelled remote system hubs, a huge adhoc arrange is sorted out in the sky on the hazardous situation and can cover protects or interfered with correspondence zone as earnest correspondence means. This framework utilizes remote sensors to transmit natural information to a PC framework. Different sort of sensors conveyed in the ALERT framework is precipitation, water level, and climate sensors. These sensors supply data to the brought together database framework. This framework has empowered a more advantageous early cautioning framework and gives a framework ready to find out about the wonders of catastrophic events. Flow crisis administration and catastrophe recuperation frameworks as a rule include a few sections, for example, a correspondence foundation and a data administration system. Forecasting streak surge by the flooding of waterways can prepare, break down (by methods for rain gage and stream gage) and remotely detected information to recognize the event of a surge. This framework is the perfect arrangement, however it is costly.

A Water Level Meters

Different estimation frameworks are utilized to quantify the water level. These can discover straightforwardly measuring the tallness of the fluid by attracting up to reference line, other measuring hydrostatic weight, some more which depend on a buoy framework whose removal caused by a similar fluid is evaluated or likewise those that adventure the electrical properties of a fluid. Limnimeter Rule Meter: Rule for graduating that is set in a stream and used to peruse the variances of the water levels. (See Fig 1).
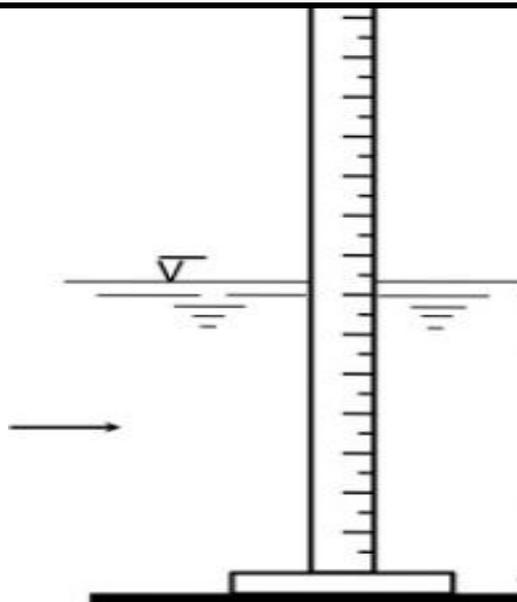
Fig.1 Limmemeter rule

Liquid Level Meter: This device measures directly the height of liquid taking into account a reference of level measurement of a container. (See Fig. 2).
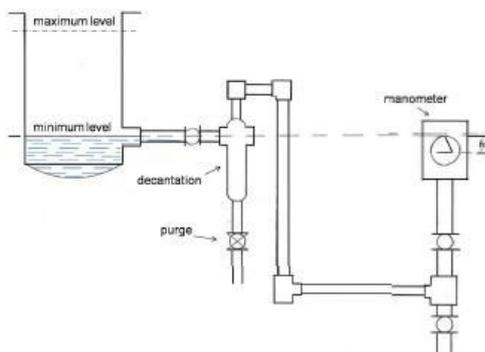

Fig.2 Liquid Level Meter

Sounding Line Meter: It is a rod or ruler which is inserted into a reservoir, the water level is determined directly by measuring the length that is wetted by the liquid. (*See Fig 3).*
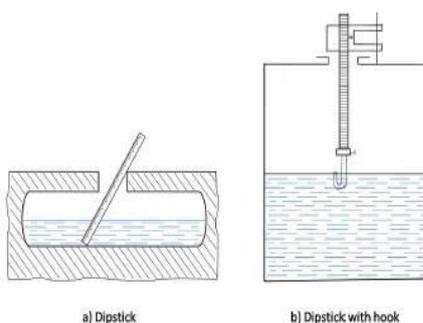

Fig.3 Sounding Line Meter

Mechanical Float Meter: It consists of a float located in the tank connected to the outside showing the liquid level with graduated scale. The connection can be direct, magnetic or hydraulic. (*See Fig. 4).*
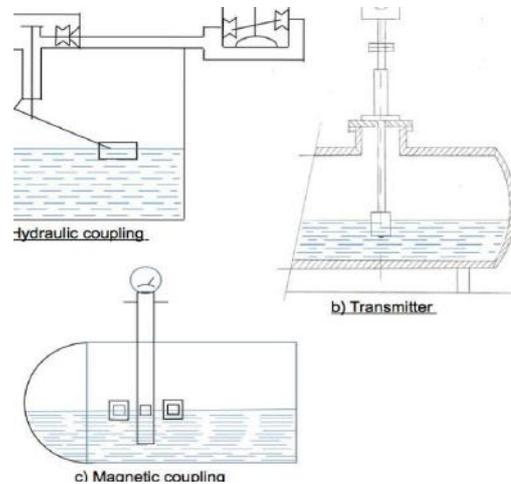

Fig.4 Mechanical Float Meter

B. Water Level Measurement Sensors

At the present time exists refined early cautioning frameworks equipped for giving some assurance from surges. These frameworks can be from substantial rain occasion discovery through satellite sensors, precipitation gage systems, radar systems, or some mix of the three, until the point when air fine-scale models, to conjecture the danger of flooding in streams or water bodies a brief span later on.

A model was intended to test the execution of water level estimation framework. The model gives the elements of surge caution framework and water quality analyzer. In model, water level meter is associated with a capable of being heard alert gadget in 24 hour operation. At the point when the water level achieves the level denoted a speaker ready (Siren) is activated. The model additionally sends data about water level from the holder to a web server and advanced mobile phones also.

There are distinctive models and sorts of water level meters, including sensors in view of various innovations. As of now, we plan an answer in light of a straightforward open circuit that closes when in contact with water that takes favorable circumstances of existing sensors, so we believe that an execution of water level framework can send ready signs toward a web server or a product application introduced on advanced mobile phones. While completing this water level framework, we considered the physical properties of water, consequently, take to decide the levels of fluids. Water can lead or

transmit warmth, power or sound. We trust that the conductivity highlight of the water could be a straightforward and conservative answer for measuring water level, in view of this thought, our work concentrated on contemplating changes in impedance or resistance of a few gadgets when they are secured by water.

III.   WATER LEVEL DESIGN

This micro-model consists of a water container, an electronic circuit, a Arduino board, an Access Point, a laptop, and a smart phone. It is convenient to use an automatic level measurement and wireless data transmission, connect the device to a server.
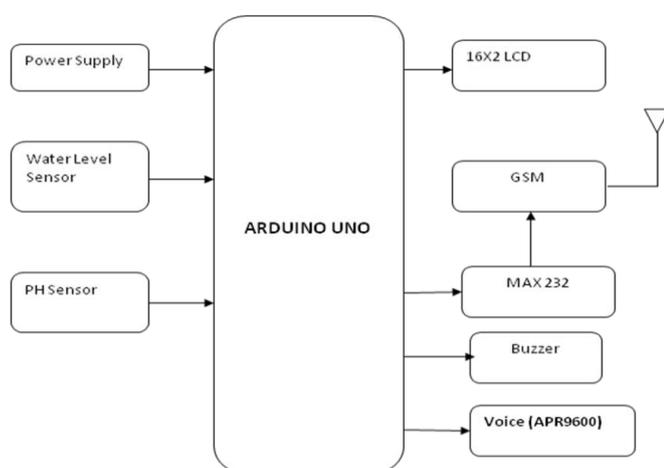

Fig.5 System Overview

A.   Equipment and Materials

In order to design the prototype the following materials and equipment were used. All parts and elements are shown in Figure 7.

1) Wifi Module ESP8266- To wireless communication.
2) LED colors - three colors (color code):
• Green: Moderate Alert
• Yellow: Caution Alert
• Red: Maximum Alert
3) Water Container It enables to emulate a controlled environment.
4) Arduino Uno board is an electronic platform to create our prototype since it calculates measurement and stores readings of levels.
• Speed: 168 MHz, Cortex-M4
• Code Storage: 384 KB
• RAM: 100 + KB

5) 9 resistors (10 ohms).- To cable data input to Arduino Uno
6) Micro USB cable (1 m).- To connect the data transmission from the Arduino Uno board to the Web.
7) Copper wires For cabling all circuit and connecting to the Arduino Uno board.
8) Water (5 liters) To fill the container.
9) Speaker Alert (Siren).- To emit a loud sound when water
is rising the red level.
10) 1 Laptop A computer to execute and interact with Arduino Uno.
11) Embedded C Programming Language for running the water level system.
12) Smart phone To receive advices when the water level is changing.

B.   Architectural Design

All parts are coordinated and assembled it all, in this Figure is demonstrated the compositional outline, it has three open electric circuits, the terminals or finishes (green, yellow and red wires) of these circuits are set inside the water holder, these terminals are associated into three pins of the Arduino board, these circuits experience a breadboard where associations are sorted out. Terminals are situated in various statures enabling water to decide three levels, it is doled out a shading to each level to distinguish all the more obviously, where the LED in green shading is the least level, yellow LED is middle of the road and red LED is the most elevated one.The darker wire is the nonpartisan shaft of the circuit and this post is for all time in the base of the holder when the electrical vitality moves through the circuit, at that point it stays open until the point when the water level achieves the main terminal shown by the green shading. The fluid fills in as a transmitter of power however with a resistance esteem so a short out is absent. On the off chance that there is an adjustment in circuit current, the breadboard has a LED shading associated with this circuit, at that point it has achieved the main level (green), et cetera. In the meantime, the circuit additionally triggers the speaker caution. Measurement and interpretation of obtained values during sensing

The water level is measured by means three phases or layers, That is, green alert, yellow alert, and red alert.
1) A device emits a signal to the respective sensor to measure the water level.
2) The value obtained from the sensor becomes in alert levels.

3) In case of failure to comply with the higher criterion than one (>1), return to step 1.

4) Using a dynamic IP address AP with mobile devices where readings transmitted data is connected.

5) A measurement in degrees is added, together the date and time when transmitting a signal to the sensor.

6) It is stored into the memory card.

C. PH SENSOR

PH is a critical restricting compound factor for sea-going life. In the event that the water in a stream is excessively acidic or essential, the H+ or OH-particle movement may disturb sea-going life forms' biochemical responses by either hurting or slaughtering the stream living beings. pH is communicated in a scale with ranges from 1 to 14. An answer with a pH under 7 has more H+ movement than OH-, and is viewed as acidic. An answer with a pH esteem more prominent than 7 has more OH-movement than H+, and is viewed as essential. The pH scale is logarithmic, implying that as you go all over the scale, the qualities change in elements of ten. A one-point pH change demonstrates the quality of the corrosive or base has expanded or diminished ten times. Streams by and large have a pH esteems extending in the vicinity of 6 and 9, contingent on the nearness of broke up substances that originated from bedrock, soils and different materials in the watershed.

Fig.6 PH Sensor

IV. TESTIING AND IMPLEMENTATION

Testing prototype

As specified, a water compartment with three wires inside and an unbiased post were set inside a holder, that was loaded with water in three phases and keeping in mind that the compartment was filling, the model was sending cautioning messages to advanced mobile phones. How we tried the model proposed is depicted in detail as takes after:

1) The holder (unfilled and dry) was topped with water off to the level of the primary wire (green terminal).

2) Immediately the PC program introduced on the tablet set off a capable of being heard flag and a message of green alarm was shown, in the meantime in the Smartphone is demonstrated a similar ready message.

3) We kept emptying water into the compartment up to the level of the second wire (yellow terminal).

4) Similar to the past case, the application on the Laptop set off a perceptible flag and a yellow message was shown, same occurs in the Smartphone, a yellow message was shown on a screen.

5) Finally, we kept filling the compartment with water that was in the yellow state level, the water achieves the third and last level (red wire).

6) PC application quickly sounded the siren and green cautioning message was shown on the screen, while in the advanced cell was shown a similar red ready message, demonstrating that the populace ought to empty.

7) The model worked backward request when the water was expelled from the best level, the application changed consequently to yellow ready and green alarm separately.

Along these lines model was tried once gradually being loaded with water the holder; if the water level ascents, cautioning messages are sent to both the portable workstation and the advanced mobile phone.
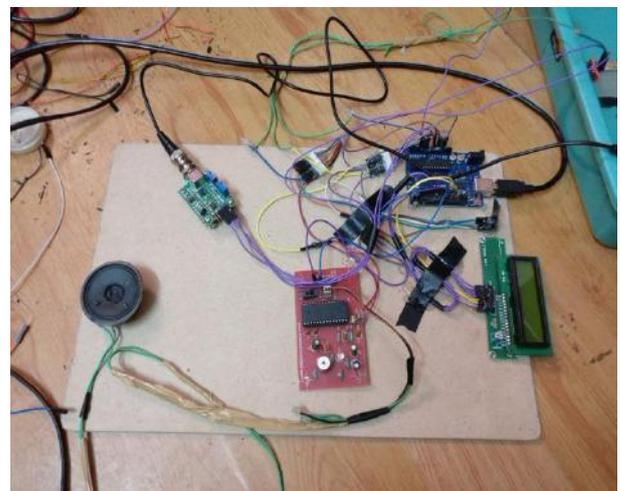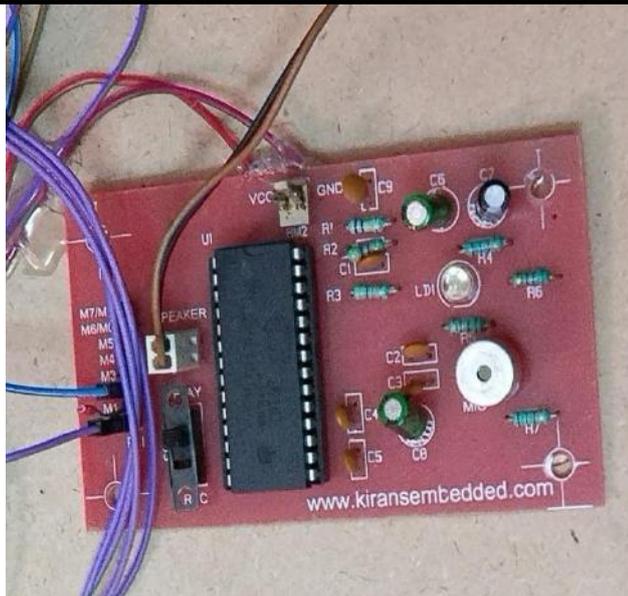
V. RESULTS

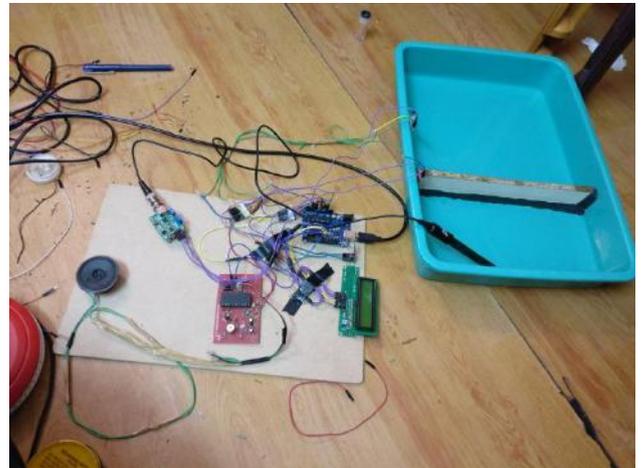*Fig.7*

Fig.8

Fig.9

Fig.10

Fig.11

Fig.12

VI. CONCLUSION

Considering a sensor as a component of IoT which empowers to impart its present status and be distributed on Internet, at that point our proposition is near what we are aiming to accomplish inside the idea of Internet of things. The genuine plan of the proposition is to accomplish a surge early cautioning framework. Up until now, we have just assembled a smaller scale show through a model that sends a capable of being heard flag and graphical messages towards advanced mobile phones about the water level into a holder.

Henceforth, individuals can be fortunately educated when rising stream levels, so occupants can settle on a choice and begin get ready to clear their homes if fundamental. So now this can be considered as a truly cautioning framework to ready occupants of low lying regions about changes in waterways. Required for this examination

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