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ABSTRACT

The water supply shortage has increased in recent days due to over population, climate change and obsolete water facilities where deteriorated pipes cause most of the water leaks. The problem is not the size of the leak but the time it takes to detect it. Our project idea is to develop a leakage detection technique using pressure management by optimizing water level in storage tank along with optimized control. The system consists of water flow meter, solenoid valve, ultrasonic sensor to detect the leakage in the tank. A micro controller is used to evaluate whether there is a water leak or not. An alert message and the consumed data can be sent periodically to the mobile phones. All the data are stored in the cloud and it can be viewed by the owner's smart phone. The motor can be controlled via android app. It can be concluded that the proposed water leakage detection technique provides better cost effective and efficient solution for leakage control.

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LIST OF ABBREVIATIONS

Some of the most frequently occurring abbreviations used in the text are tabulated here.

ABBREVIATIONS	EXPANSION
IOT	**Internet of things**
SMS	**Short Message Service**
iOS	**iPhone OS**
GPRS	**General Packet Radio Service**
GSM	**Global System for Mobile Communication**
LCD	**Liquid-Crystal Display**
DC	**Direct Current**
PCB	**Printed Circuit Board**
IDE	**Integrated Development Environment**
USB	**Universal Serial Bus**
ADC	**Analog to Digital converter**

1.1 INTRODUCTION

Conserving the water resources in domestic usage is very important nowadays. Almost 70% of earth's surface is covered with water. So conserving this water resource is a provoking issue. It is found that much of the water is wasted due to the inefficient and poor water allocation and lack of integrated water management system. In recent times, smart phones have become an important part of our daily lives. Taking smart phones as the basic tool, this paper shows a way how to prevent the water wastage using smart pump controller app. One can use this android application to check water level of a tank and turn the pump on and off from the user's house. Water supplies to most part of the house are drawn from the tanks. When there is power failure, no water is pumped up to fill the tanks. Unexpected water shortage does occur any time if the tank is not properly monitored.

This system introduces the notion of water level monitoring and management. Hence, a monitoring system to monitor the tank water level has to be developed and eventually able to alert the person on the current status of the tank. The water level indicator indicates three levels such as low, medium, high and also empty tank. The system will automate the process by placing a single sensor unit in the tank that will periodically take measurements of the water level and will control the motor automatically. Water level management approach would help in reducing the home power consumption and as well as water overflow.

The system has water level detector circuitry integrated with ESP8266 Wifi module.Upon reaching the critical water level in the tank,an SMS is sent to the user's mobile phone. The current status of the

tank is shown in the smart phone using an mobile application and when a leakage is identified, an alert message is sent to the owner's smart phone.

Internet Of Things(IOT) provides the infrastructure that is used to connect different devices and to communicate among devices. Here the arduino is used as a microcontroller and ultrasonic sensor is also used for detecting the distance between the sensor and the water level.The water level is fixed for overflow identification. If the distance is too low then it is identified as overflow.

If water gets overflow from the tank, then the system sends a notification message to the user through mobile application that the water tank is going to be filled so that the user can turn off the motor. At the same time it periodically monitors the level of the water to prevent the water from overflow.

The Ultrasonic sensor is used to detect the water level . This process is done with the help of Arduino board. Programs are embedded in the Arduino micro-controller, and WIFI module is used to send alert message.

1.2 IMPORTANCE OF WORK

Water is a vital resource for human life and its management is a key issue. In this system, the water is saved from the tank using sensors from overflow.

Therefore, the water level is to be monitored periodically which is used to identify the overflow. This system works effectively and the cost of the system is less.

By using this system, overflow of the water in the water tank will be prevented.

1.3 OBJECTIVE

The main objective is to develop the water leakage monitoring system where the water level is automatically detected by the sensor system.Then to find the leakage and to prevent the overflow of the tank and final it will alert the users through SMS when tank is up to overflow or any damage occured.

These objectives are achieved by using the water flow sensor to measure the level of water in tank. Ultrasonic sensors are used to measure the distance of the obstacles by using sound waves. Blynk platform is used to develop an application for monitoring the tank.

1.4 PROBLEM DESCRIPTION

The proposed system is simply designed to identify the level of the water in the water tank. In this system, an alert message is sent to the user and it helps the user to know the status of the tank.

1.5 PROJECT DESCRIPTION

In the proposed model, Ultrasonic sensor is used to detect the water level of the tank. Overflow of water can be prevented and also flow of water is detected. Then an alert message is sent to the user intimating the overflow.

1.6 SOCIAL IMPACT

- It helps to avoid the wastage of the water, because during the overflow, the water in the water tank gets wasted unnecessarily.
- Easy to monitor the level of the water in the tank periodically .

1.7 CHALLENGES

If there is sudden failure of sensors then it is difficult to monitor the water level.

1.8 LIMITATION

If there is no internet access then the water level in the tank can not be detected using the sensors.

In case of the failure of sensor, accurate results cannot be produced.

1.9 ORGANIZATION OF REPORT

This project report is organized as

Chapter 2 highlights literature survey in which it defines various existing systems, their working and their limitation.

Chapter 3 presents the requirement specification in which it defines the hardware and software specification in detail.

Chapter 4 presents the system design and its flow diagram

Chapter 5 describes a full module description

Chapter 6 describes the system implementation in which it defines the implementation of proposed system.

Chapter 7 presents the implementation results along with the output screen shots on the proposed system.

Chapter 8 presents the conclusion, recommendations and future enhancement

LITERATURE SURVEY

2.1 Priyen P.shah et al proposed a system of water level monitoring with Iot and controlling through android application[5]. This system uses ESP8266 as microcontroller ,the values of minimum and maximum water levels are obtained by Wifi from Firebase cloud.ESP8266 accesses the hotspot with the password once it gets accessed to internet,these values are stored .When the current values equals or gets below the minimum level,the motor automatically starts .The user can control by toggling the status of the motor from the android application. The current water level is obtained from the ultrasonic sensor based upon the values the motor is turned ON/OFF.The advantage of the system is that it is economically effective in case of cost.The limitation is that it is not used in the apartments.This system has enormous application but it failed to implement for a wide range of various depth of water tanks making the design completely reliable.

2.2 Haesung Tak et aldesigned the system that monitor water tanks on the smart phone[2]. This system visualizes sensor data using a simple user interface. Real time data processed for water tanks in ships are being monitored. This system uses solenoid valve and relay method. Solenoid valve method deals how to control the flow of water. Relay method is used to shut-off the main motor. Sensor data is stored in an external database than storing it on smart phones. The advantage of using a database is to reduce the time consumed in processing of the data. This system develop the application for android rather than for iOS due to its

preference among users. The disadvantage is accessing the web page. The future work can be done by using data mining techniques.

2.3 Monisha.S et al designed a system used microcontroller to automate the process of water pumping in tank storage system [3]. This system was able to monitor and it detect the water level , it switch ON/OFF the pump according to the status of tank.In this paper the design and implementation was done by two Radio Frequency transceivers along with a microcontroller used for wireless communication.This system uses GPRS feature for the irrigation control system and GSM is used to tell the exact condtion of the field.SMS notification was sent to the user was added to automatic controller system.Solenoid valves was used to control the water flow to different part of the field.Other relays are used to shut-off the motor .The advantage of the project is that by using SMS notification with an alarm user can aware about the tank storage.The disadvantage is that the motor should be repaired manually rather than automatic in case of any malfunction.

2.4 Mousumi das et al designed the system that control the water pumps using smart phones [4]. This system uses wireless radio transmitters and Wi-Fi router to turn on and off the water pumps. This also uses a water level detector and a digital on/off switch. Water level detector is used to detect what percentage of water is filled in the tank. This system allows one to instruct the switch to turn the pump ON or OFF from the application. This includes active internet connection. The disadvantage is that total amount of electricity used is not mentioned. The

future work is that all the household electrical appliances can be controlled with the help of one smart phone application.

2.5 Yogita Patil et al introduced an idea of smart water tank management system operated with Atmega 128A microcontroller [8]. The methodology used in this project are water level indicator which indicates the level of the water in the tank.Contact Sensors are used for water level sensing purpose.The LCD is used to display the current status of the water level.The individual water pumps are attached to each tank so that when the tank is empty the water pump will draw the water from the reservior upto the water tank is full.The water in the tank will be indicated in three cases as LOW,MEDIUM,HIGH.When the level in the water tank falls in the any of the cases then the water pump should be made ON/OFF.The Relay used is a solid state realy working on 12V,its operating voltage and used for automatic switching of the water pump.They have used WinAVR's Programming Notepad software for code simulation and implementation.The main advantage of the system is that it reduces manwork,used in several chemical industries,The limitation is that the water level shown by the indicator is not accurate as much and also this design cannot be operated using smart phones.

2.6 Ayob Johari et al developed a water level monitoring system with the integration GSM module to alert the person-in-charge through Short Message Service and receiving the appliances status[6]. The objective of this paper is to reduce the unexpected shortage of water supply.The system consists of three different circuit boards namely the detector relay, circuit boards and the microcontroller circuit boards.The

PIC16F877A microcontroller used as a central processor and works on a 5V DC power supply with 20MHz crystal oscillator.The Printed Circuit Board(PCB) is used to transferred the image to the circuit board using the photolithography process.The merits of this project is that it meets with the objectives and provides the system that could monitor the tank water level.The limitation in this system is delay occurred in receiving the SMS because of the detector circuit.

2.7 Ryan Hanson et al implemented a system for detecting a water leak which installed in the hydraulic facilities of a residence, to detect water leaks [7]. The methodology used in this system is Quad-Band 850MHZ GSM which connects into any global GSM network with any 2G/3G sim.The system consists of a water sensor installed by a water reservoir which is used to sense the water level in the reservoir. A microprocessor is used to interpret the exact data and evaluate whether there is a water leak or not, an SMS alert message is provided to the user about the changes in the water level with notification, and an electrical actuator is to shut off/on the main water supply to avoidleakage.The main advantage of this system gives the consumption in power supply and replacement can be done efficiently.The system finds where the leakage occurs but it doesnot shutoff automatically .

2.8 Samarth Viswanath proposed a remote monitoring system which are effective to control the information from bulk storage tank [8]. The system modules are ultrasonic sensor is connected to the microcontroller which is used to determine the depth of the liquid in the water tank.An ARM based 32 bit controller ,the STM32F100R8T6B has

an analogue to digital convertor is used to control the overall operation.The Huawei MG323-B is the GSM module which uses the serial communuication link to and from the microcontroller.The hardware are Printed Circuit Board(PCB) and the software STM32 microcontroller.The advantage of the project microcontroller are used in a efficient way and helps to identify the water leak effectively,lower power consumption is the markable feature.The disadvantage is that the life of the battery is very low and replacement should me made everytime when the battery fails.

OVERVIEW

3.1 OVERVIEW OF SYSTEM REQUIREMENTS

System requirements are the collections of information about hardware and software required to complete the work. All the system software requires hardware to interact with it.

3.1.1 HARDWARE REQUIREMENTS

- Arduino
- Ultrasonic sensor
- Node MCU
- DC Motor
- Water flow meter
- Wifi
- Connecting Wires
- USB Cable

3.1.2 SOFTWARE REQUIREMENTS

Operating System: Windows 8 OS and Arduino OS

Development tools: Arduino IDE,Blynk app inventor

3.2 HARDWARE CONFIGURATION

3.2.1 ARDUINO

Arduino is a small microcontroller board with a USB plug to connect to your computer and a number of connection sockets that can be wired up toelectronics,suchasmotors,relays,lightsensors,laserdiodes,loudspeakers, microphones,etc.They can either be powered through the USB connection from the computer or from a 9V battery.They can be controlled from the computer or programmed by the computer and then disconnected and allowed to work independently.

Arduino is an open-source prototyping platform based on easy to use hardware and software.Arduino Boards are able to read inputs- light on a sensor,a finger on a button,or a Twitter messageand turn it into an output activating a motor,turning on an LED,publishing something online.User can tell to the board what to do by sending a set of instructions to the microcontroller on the board.To do so user should use the Arduino programming language (based on Wiring), and the Arduino Software (IDE), based on processing.

The project is based on a family microcontroller board designs manufactured primarily by smart projects in Italy, and also by several other vendors, using various 8-bit Atmel AVR microcontrollers or 32-bit Atmel ARM proceesors.These systems provide sets of digital and analog I/O pins that can be interfaced to varrious expansion boards (“shields”) and other circuits.

There are many Arduino-compatible and Arduino-derived boards. Some are functionally equivalent to an Arduino and can be used interchangeably. Many enhance the basic Arduino by adding output drivers, often for use in school-level education to simplify the

construction of buggies and small robots. Others are electrically equivalent but change the form factor, sometimes retaining compatibility with shields, sometimes not. Some varients use completely different processors, with varying levels of compatibility.

The features of serial communications interfaces including USB on some models,for loading programs from personal computers.For programming the microcontrollers,the Arduino platform provides an Integrated Development Environment (IDE) based on the proceessing project, which includes support for C,C++ and Java programming languages.

The first arduino was introduced in 2005,aiming to provide an inexpensive and easy way for novices and professionals to create devices that interact with their environment using sensors and actuators. Common examples of such devices intended for beginner hobbyists include simple robots, thermostats, and motion detectors.The hardware design specifications are openly available, allowing the Arduino boards to be manufactured by anyone. Adafruitit industries estimated in mid-2011 that over 300,000 officials Arduino had been commercially produced, and in 2013 that 700,000 official boards were in users hands.

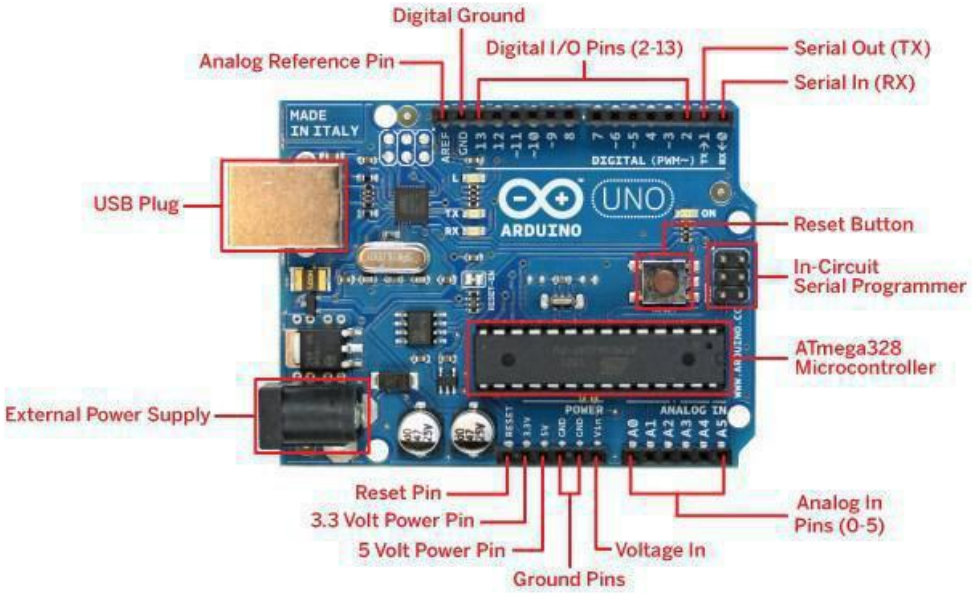

Figure 3.1 : Arduino UNO

3.2.1.1 ARDUINO FEATURES

1. It is a multiform environment and it can run on Windows X, Linux

2. It is based on the processing programming IDE, an easy to us development environment used by engineers and designers.

3. It can be programmed via USB cable, not a serial port. This feature is useful because many modern computers do not have serial ports.

4. The Arduino project was developed in an educational in an educational environment and is therefore great for newcomers to get things working quickly.

3.2.1.2 WHY ARDUINO?

Inexpensive-Arduino boards are relatively inexpensive compared to other microcontroller platforms. The least expensive version of the

Arduino module can be assembled by hand, and even the pre-assembled Arduino modules cost less than $50.

The Arduino Software(IDE) is easy-to-use for beginners.It is simple and a clear programming environment yet flexible enough for advanced users to take advantage of as well. For teachers, it's conveniently based on the processing programming environment, so students learning to program in that environment will be familiar with how the Arduino IDE works.

The Arduino software is published as open source tools, available for extension by experienced programmers.The language can be expanded through C++ libraries, and people wanting to understand the technical details can make the leap from Arduino to the AVR C programming language on which it's based. Similarly, you can add AVR-C code directly into your Arduino programs if you want to.

The plans of the Arduino boards are published under a Creative Commons license, so experienced cricuit designers can make their own version of the module, extending it and improving it.

3.2.2 SENSOR NODES DESIGN

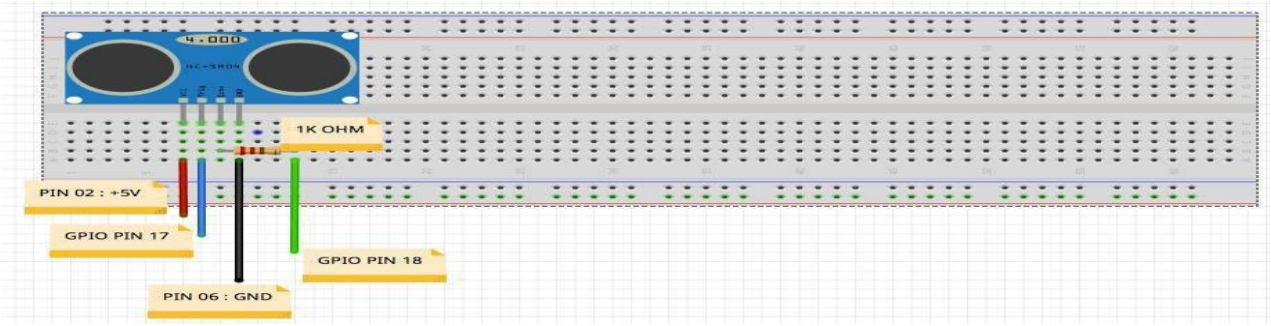

Figure 3.2: Sensor nodes design

Sensor nodes are designed to collect raw signals from the water . A sensor node under take three tasks which is used for detecting signal via front-end, digitizing for a multi access communication and finally wireless transmission via a radio transceiver technology. It then passes through a filtering stage to remove unwanted signals with noise. After which, it will go through an analog to digital conversion(ADC) stage to be converted into digital for digital processing. The digitized signal is then processed and stored in the micro controller.

3.2.3 ULTRASONIC SENSOR

Ultrasonic sensors are used in highly sophisticated environmental and industrial applications that measure level of water: ponds, streams and canals. Ultrasonic sensors are reliable, cost-effective instruments for these applications. In operation, the sensor is mounted over the water. To determine the distance to the water, it transmits a sound pulse that reflects from the surface of the water and measures the time it takes for the echo to return.

Figure 3.3: Ultrasonic Sensor

3.2.4 Node MCU

NodeMCU is an open source IoT platform. It includes firmware which runs on the ESP8266 Wi-Fi SoC from Espressif Systems, and hardware which is based on the ESP-12 module. The term "NodeMCU" by default refers to the firmware rather than the dev kits. The firmware uses the Lua scripting language.

Figure 3.4: Node MCU

3.2.5 DC Motor

A **DC motor** is any of a class of rotary electrical machines that converts direct current electrical energy into mechanical energy. The most common types rely on the forces produced by magnetic fields. Nearly all types of DC motors have some internal mechanism, either electromechanical or electronic, to periodically change the direction of current flow in part of the motor.

DC motors were the first type widely used, since they could be powered from existing direct-current lighting power distribution systems. A DC motor's speed can be controlled over a wide range, using either a variable supply voltage or by changing the strength of current in its field

windings. Small DC motors are used in tools, toys, and appliances. The universal motor can operate on direct current but is a lightweight motor used for portable power tools and appliances. Larger DC motors are used in propulsion of electric vehicles, elevator and hoists, or in drives for steel rolling mills. The advent of power electronics has made replacement of DC motors with AC motors possible in many applications.

Figure3.5:DC Motor

3.2.6 WATER FLOW METER

A flow meter is a device used to measure the flow rate or quantity of a gas or liquid moving through a pipe. Flow measurement applications are very diverse and each situation has its own constraints and engineering requirements. Flow meters are referred to by many names, such as flow gauge, flow indicator, liquid meter, etc. depending on the particular industry; however the function, to measure flow, remains the same.

Precision flow meters are used to provide accurate monitoring and/or flow control. Some industrial applications require precise calculation of quantity, such as precision servo-valve development for the aerospace industry. On the other hand, an application to measure water flow to a vineyard may only require a measurement accuracy of 5% to 10%.

There are no “universal” flow meters which are suitable for all applications. Selecting the proper technology for your application requires writing a flow specification which covers the use of the meter. There are usually trade-offs with each meter type, so knowing the critical specifications will be important.

Figure 3.6:Water FlowMeter Sensor

In most of the world water meters measure flow in cubic metres (m3) or litres but in the USA and some other countries water meters are calibrated in cubic feet (ft.3) or US gallons on a mechanical or electronic register. Some electronic meter registers can display rate-of-flow in addition to total usage.

Flow measurement is the quantification of bulk fluid movement. Flow can be measured in a variety of ways. Positive-displacement flow

meters accumulate a fixed volume of fluid and then count the number of times the volume is filled to measure flow

3.2.7 WIFI

Wifi is a technology for wireless local area networking with devices based on the IEEE 802.11 standards.Devices that can use Wi-Fi technology include personal computers, video-game consoles, phones and tablets, digital cameras, smart TVs, digital audio players and modern printers.

Wi-Fi compatible devices can connect to the Internet via a WLAN and a wireless access point. Such an access point (or hotspot) has a range of about 20 meters (66 feet) indoors and a greater range outdoors. Hotspot coverage can be as small as a single room with walls that block radio waves, or as large as many square kilometres achieved by using multiple overlapping access points.

Figure 3.7: Wifi(ESP 8266)

3.2.8 JUMPER WIRES

A jump wire (also known as jumper, jumper wire, jumper cable, DuPont wire, or DuPont cable – named for one manufacturer of them) is an electrical wire or group of them in a cable with a connector or pin at each end (or sometimes without them – simply "tinned"), which is normally used to interconnect the components of a breadboard or other prototype or test circuit, internally or with other equipment or components, without soldering.

Figure 3.8: Jumper Wires

Individual jump wires are fitted by inserting their "end connectors" into the slots provided in a breadboard, the header connector of a circuit board, or a piece of test equipment.

3.3 SOFTWARE REQUIREMENTS

3.3.1 ARDUINO SOFTWARE IDE

A program for Arduino may be written in any programming language for a compiler that produces binary machine code for the target

processor.Atmel provides a development environment for their microcontrollers,AVR studio and the newer Atmel studio.

The arduino project provides the arduino integrated development environment(IDE), which is a cross-platform application written in the programming language java.It originated from the IDE for the languages processing and wiring.It includes a code editor with features such as text cutting and pasting, searching and replacing text, automatic indenting,brace matching, syntax highlighting, and provides simple one-click mechanism to compile and upload programs to an Arduino board.It also contains a message area, a text console, a toolbar with buttons for common functions and a hierarchy of operation menus.

A program written with the IDE for Arduino is called a sketch are saved on the development computer as text files with the file extension.ino.Arduino software (IDE) pre-1.0 saved sketches with the extension.pde.

The Arduino IDE supports the languages C and C++ special rules of code structuring.The Arduino IDE supplies a software library from the wiring project, which provides most common input and output procedures.User-Written code only requires two basic functions, for starting the sketch and the main program loop, that are included with the executable code into a text file in hexadecimal avrdude to convert the executable code into a text file in hexadecimal encoding that is loaded into the Arduino board by a loader program in the board's firmware.

A minimal Arduino C/C++ sketch,as seen by the arduino IDE programmer, consists of only two functions:

Setup: This function is called once when a sketch starts after power-up or rest.IT is used tom initialize variables,input and output pin modes, and other libraries needed in the sketch.

Loop: After setup has been called, function loop is executed repeatedly in the main program.It controls the board until the board is powered off or is reset.

Most Arduino boards contain a light-emitting diode(LED) and a load resistor connected between pin 13 and ground,which is a convenient feature for many tests and program functions.A typical program for a beginning Arduino programmer blinks an LED repeatedly.

This program uses the functions pinmode,digitalWrite, and delay, which are provided by the internal libraries included in the IDE environment.The program is usually loaded in the Arduino by the manufacture.

3.3.2 BLYNK APP INVENTOR

Blynk is an Internet of Things platform with a drag-n-drop mobile application builder that allows to visualize sensor data and control electronics remotely in minutes. Blynk IoT cloud solution is open-source. Blynk hardware libraries support Arduino, Genuino, Raspberry Pi, Particle Photon, Electron, SparkFun, Espressif .

It allows newcomers to computer programming to create software application for the Android operating system (OS). It uses a graphical interface, very similar to Scratch and the Star logo TNG user interface,

which allows users to drag-and-drop visual objects to create an application that can run on Android devices. In creating App Inventor, Google drew upon significant prior research in educational computing, as well as work done within Google on online development environments.

3.3.3C/C++

C is an imperative (procedural) language. The language was designed to encourage cross-platform programming. It was designed by Dennis Ritchie.

The C language was designed to encourage cross-platform programming.A standards-compliant an portably written C program can be complied for a wide variety of computer platforms and operating systems with few changes to its source code.The language has become available on a very wide range of platforms, from embedded microcontrollers to supercomputer

SYSTEM DESIGN

4.1 SYSTEM DESIGN

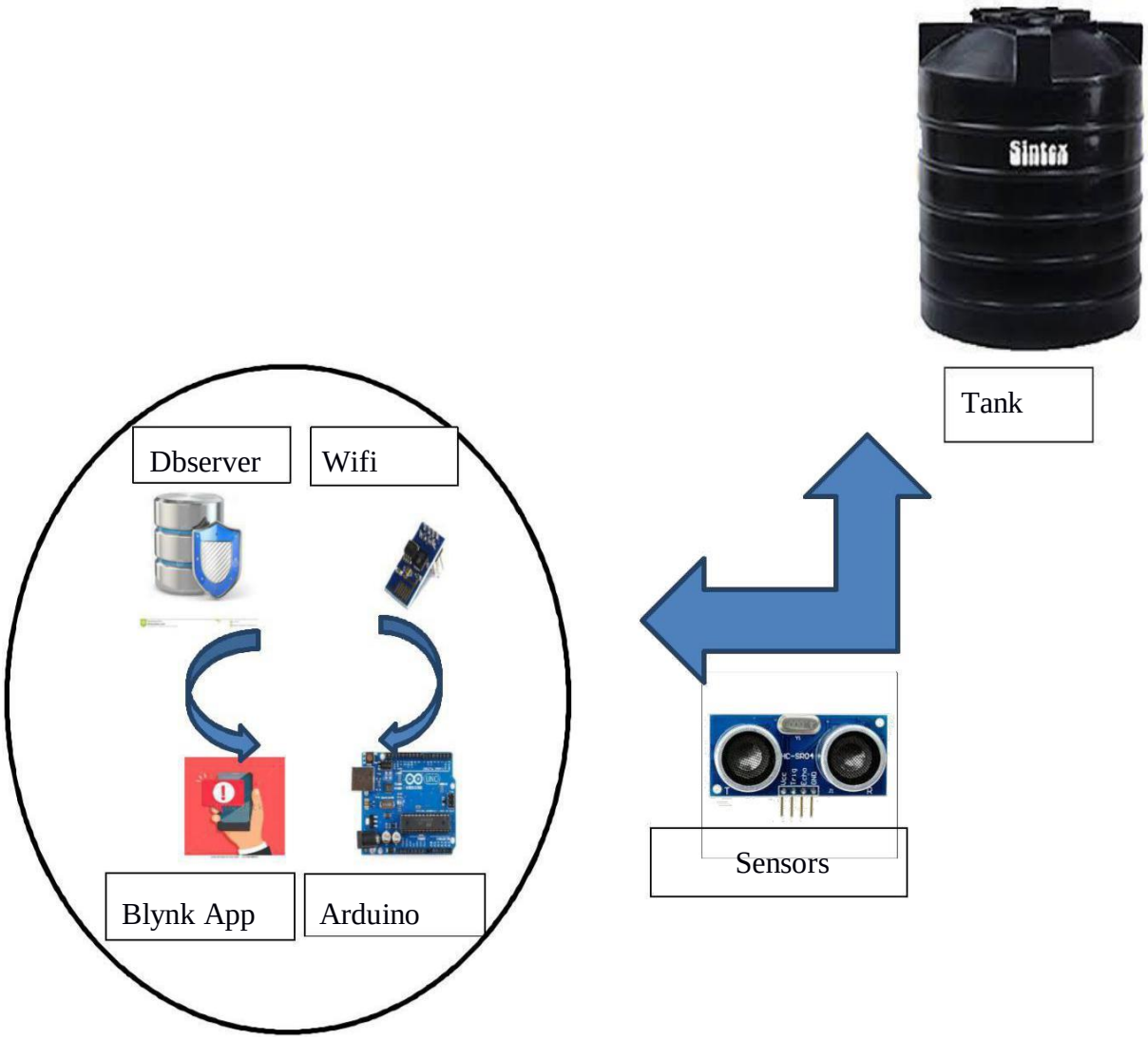

Figure 4.1 : System Design

The system has sensors which are connected with the arduino.The purpose is to monitor the water level and to detect the overflow.And also when there is a chance of pipe leakage it will alert to the user through users mobile phone via the blynk application.

4.2 FLOW CHART

4.2.1 DETECTION OF WATER LEVEL

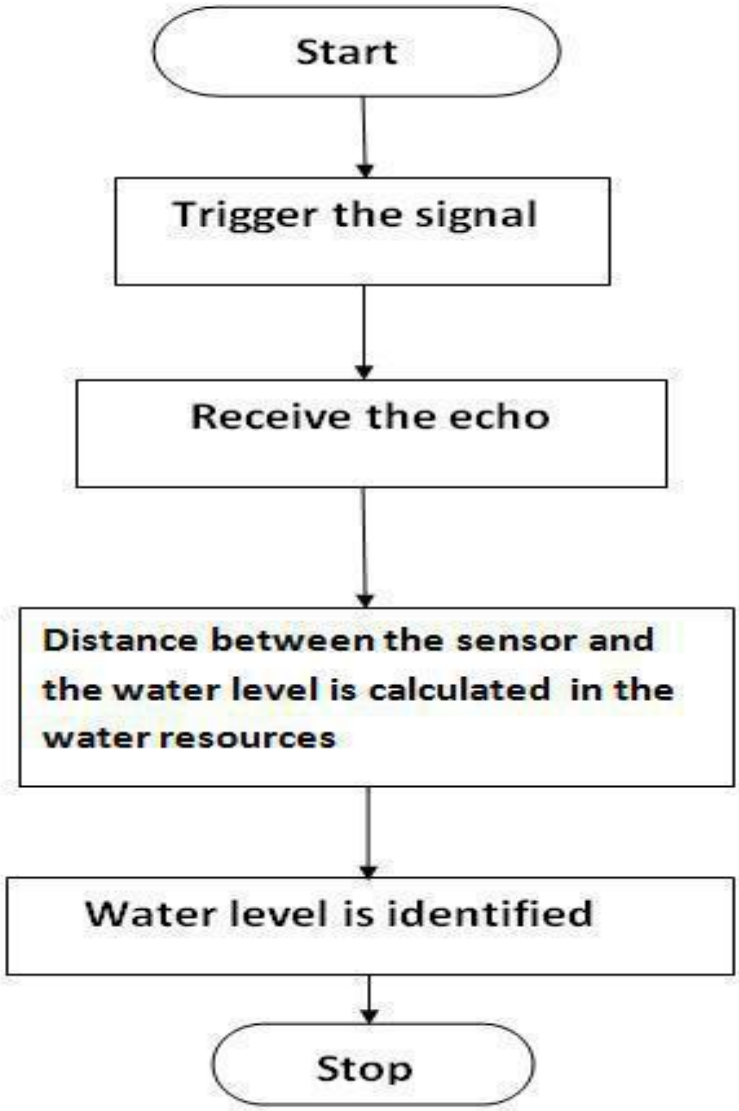

Figure 4.2: Detection of water level

4.2.2 ALERT SYSTEM

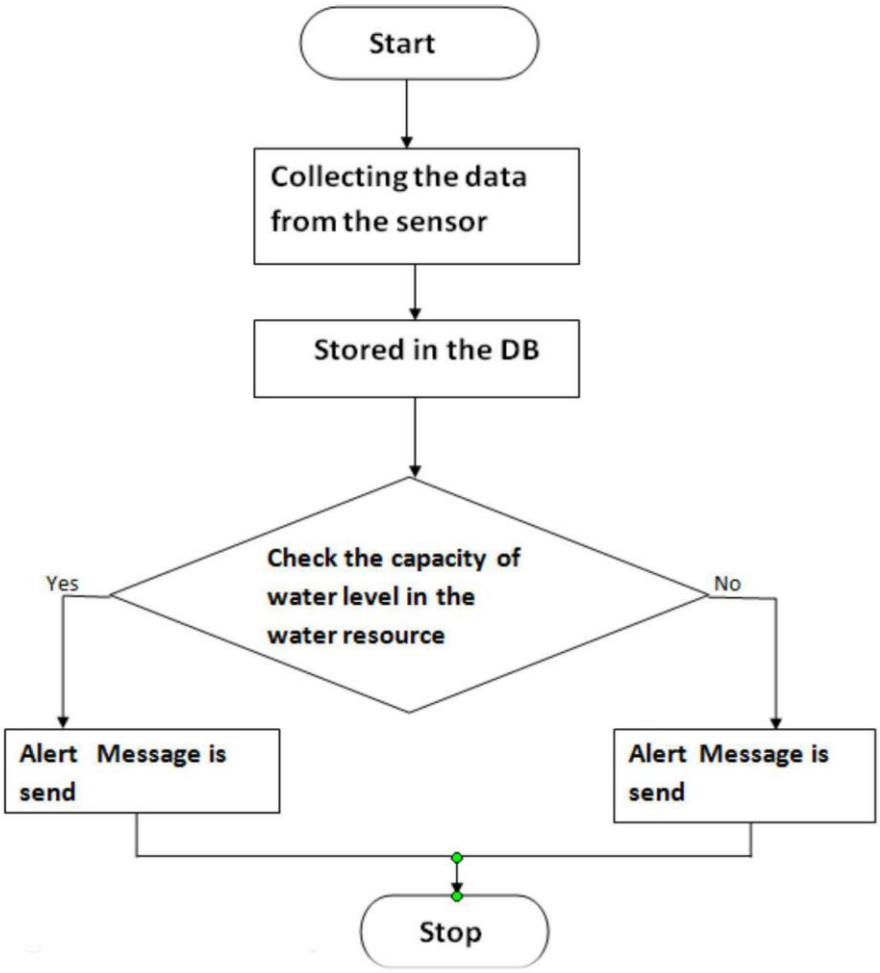

Figure 4.3: Alert System

SYSTEM IMPLEMENTATION

5.1 MODULES

This system has three modules,

Module 1: Overflow Prevention

Module 2: Flow Rate Detection

Module 3: Alert system

Module 3.1: Alert system for Water overflow/Leakage

5.2 MODULE DESCRIPTION

5.2.1 PREVENTION OF OVERFLOW

The aim of this system is to prevent the overflow of the water by using ultrasonic sensor.

5.2.1.1 ULTRASONIC SENSOR

The ultra sonic sensor has two transducers.The transmitting transducer sends the signal and the signal gets reflected from the surface of the water.The receiving transducer receives the reflected signal. The distance between the transmitted and received signal is measured as the water level.

5.2.2 DETECTING WATER FLOW RATE

The aim of this system is to detect the water flow rate level by using waterflow meter sensor.

5.2.2.1 WATER FLOW METER SENSOR

Water flow sensor consists of a plastic valve body, a water rotor, and a hall-effect sensor. When water flows through the rotor, rotor rolls. Its speed changes with different rate of flow. The hall-effect sensor outputs the corresponding pulse signal. This one is suitable to detect flow in water dispenser or water tank.

5.2.3 ALERT SYSTEM

In this module, it extracts the data from the database. Then it checks whether the water is present in the upper limit or the lower limit. The upper limit may be 80% of the water resource. The lower limit may be 20% of the water resource. Similarly , the identification of the water level happen in the water tank .

5.2.3.1 ALERT SYSTEM FOR WATER OVERFLOW

Whenever the water level reaches the upper limit then the alert message along with the water level is sent to the User. When there is a leakage, the system will alert about the water leakage in the tank. Finally, the alert will be sent in the form of message to control the flow of the water via the Mobile Application.

RESULTS AND CONCLUSION

6 OVERVIEW

In this section it represents experimental setup and overview of the developed system.

SNAPSHOTS

6.1 DETECTION OF OVERFLOW

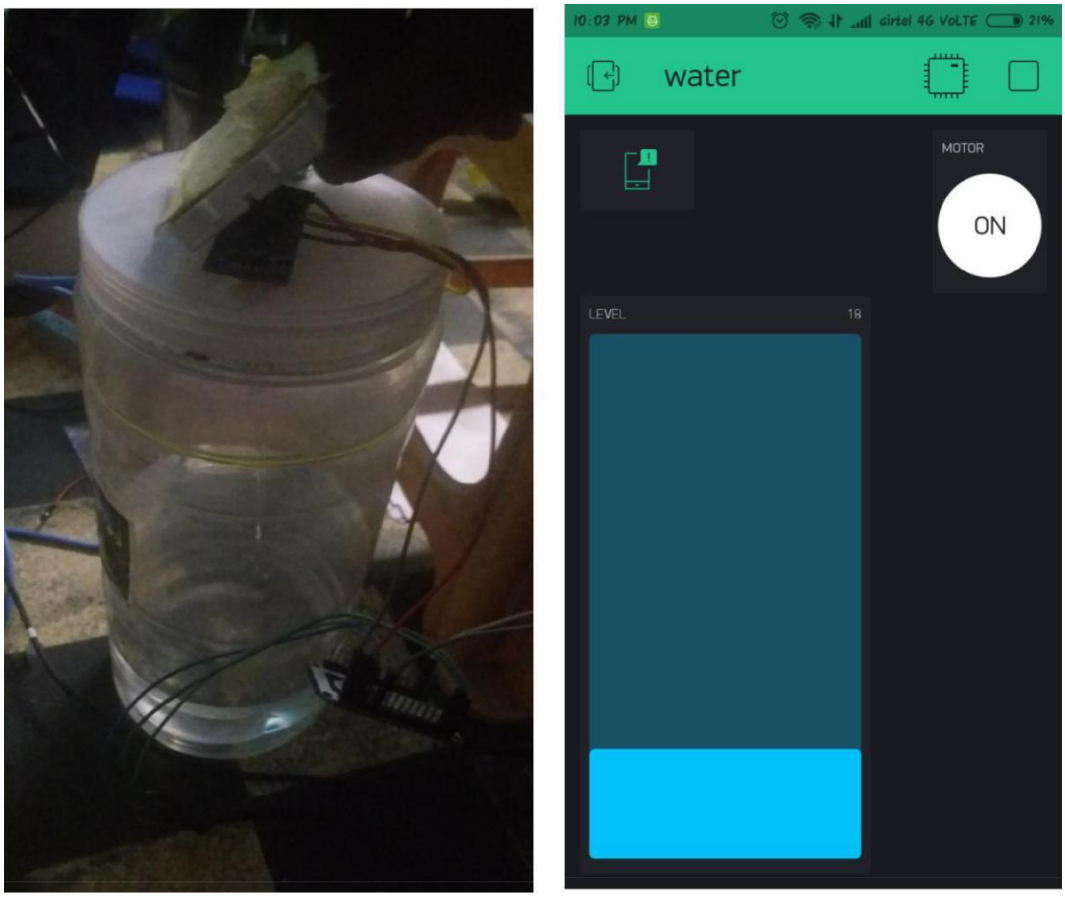

Figure 6.1: Result of OverFlow

The water level in the tank is monitored using

Ultrasonic Sensor and the level is shown in the app.

6.2 DETECTION OF WATER FLOW RATE

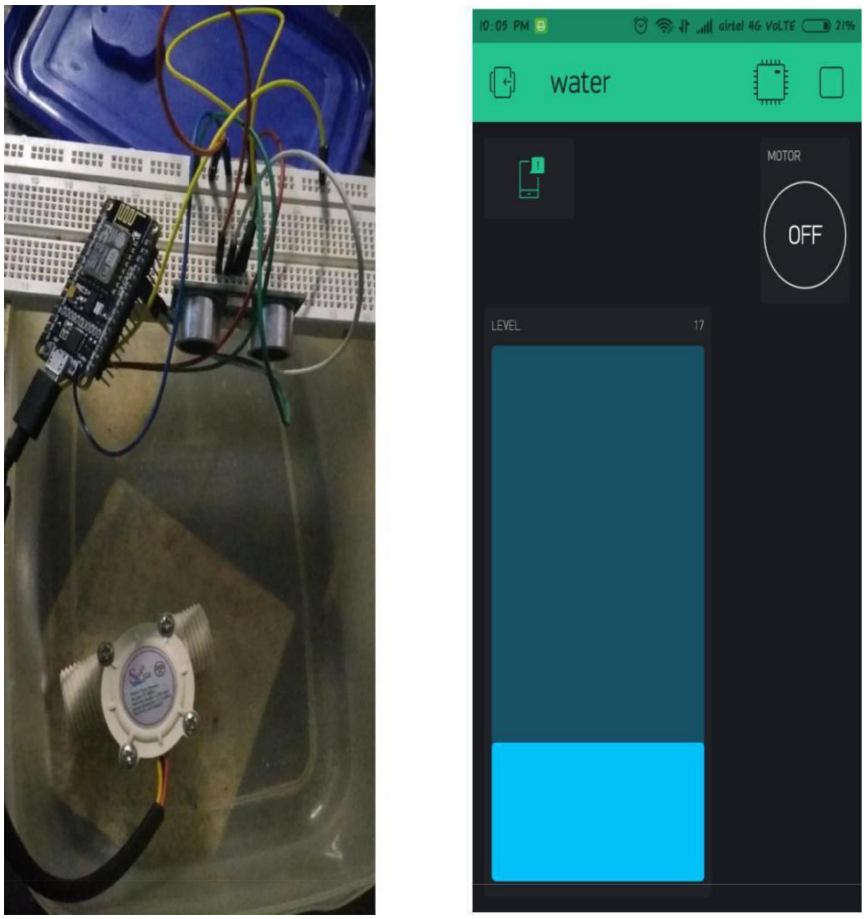

Figure 6.2: Result of Water FlowRate Setup

The FlowRate of the Water is Detected using Water Flow Meter and it is shown in the app.

6.3 ALERT SYSTEM

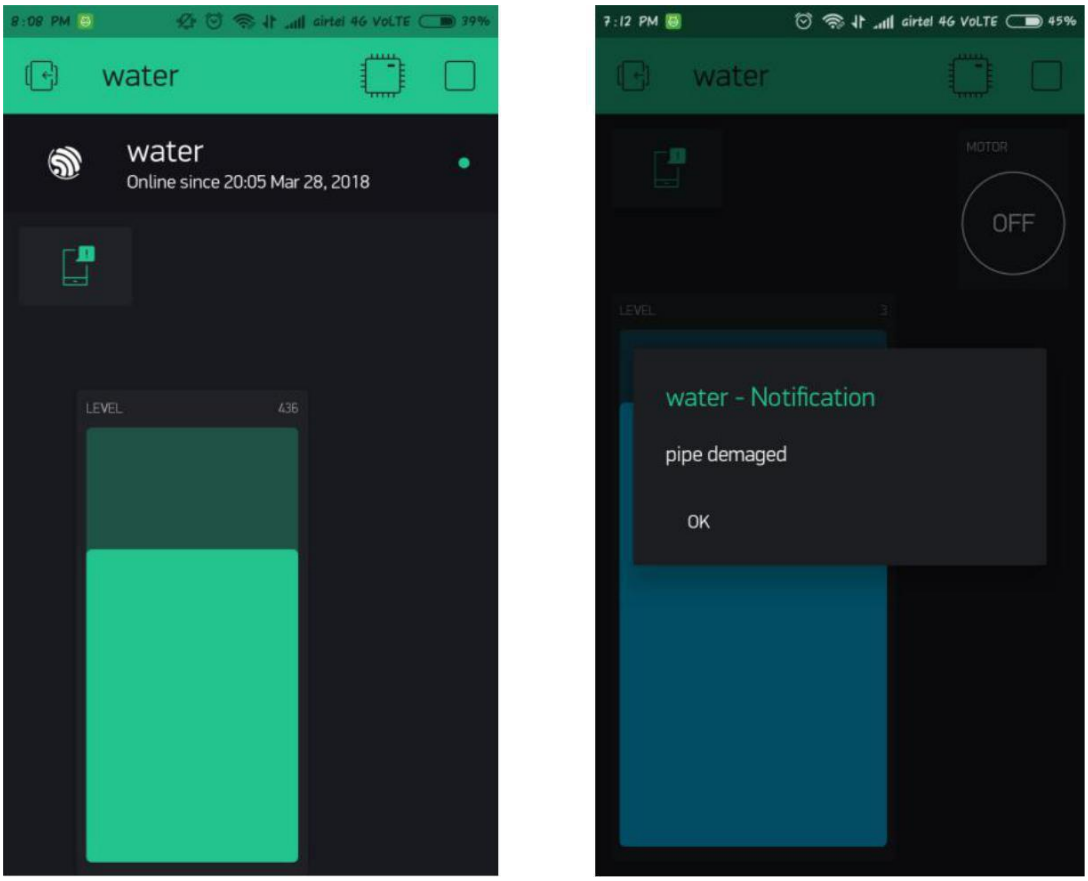

Figure 6.3:Alert Message

If the tank gets filled or any damage occurs, the alert will be popped in the users mobile phone.

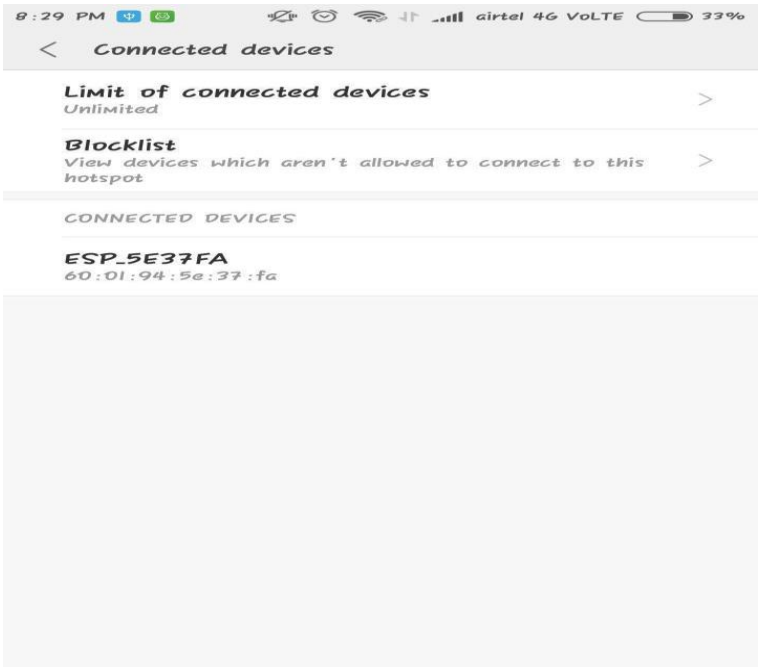

Figure 6.3.1:Connected Devices

CONCLUSION AND FUTURE

WORK 7.1 CONCLUSION

In this system the readings of two parameters (ultrasonic and water flow meter) are monitored and displayed, It is updated in the mobile application through Wifi. During overflow situation, an alert message along with the readings is sent to user's phone.

7.2 FUTURE WORK

In future, this system can be extended for the industrial purpose with an enhancement using the cloud Architecture.

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