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REMOTELY CONTROLLED WATER TANK SYSTEM USING INTERNET OF THINGS (IOT)

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Abstract— Now a day's advancement of technology is rapidly increasing and people want to do different tasks in smart way. All the members in a home need to go outside for working. The people want to solve day to day life task in a fast manner. This will results a technology which can control over the domestic and industrial applications using Internet of Things **(IOT).** IOT is a system where appliances are embedded with software, sensors and actuators. Normally smart home automation is usually for controlling the electronic devices in home for consuming electricity through a smart phone or computer.

Water Scarcity is one of the important problem which are sensationally going in all over the world. Due to this water scarcity, especially in our state, the supply of drinking water is very minimum at certain period of time. Because of this people don't know the supply time of drinking water. In office time, when the water supplier release the water, no one will be in home to store the water.

In this project ,this problem will be rectified by building a home automation system, where one can control the home appliances and also detect the presence of water inside the pipe sensed by water sensor ,then using the simple GSM based phone, just by including calls.

The main objective of this project is to **develop** a home automation system using an **Arduino board with GSM/GPRS being remotely controlled by any android OS smart phone**. This technique is incorporated in our house to make the appliances convenient and automated Connecting a water sensor to an Arduino is a great way to detect a leak, spill, flood, rain, etc. It can be used to detect the presence, the level, the volume and/or the absence of water. This project will be developed by arduino software, android and GSM/GPRS module.

Keywords : Internet of Things (IoT), Wi-Fi network , Water flow sensor, Water level sensor, GSM/GPRS , SMS Arduino UNO controller , Android application , Cloud ,App Inventor.

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I. INTRODUCTION

Internet has become an important part of human's social life and educational life without which they are just helpless. The Internet of Things (**IoT**) devices not only controls but also monitors the electronic, electrical and various mechanical systems which are used in various types of infrastructures. These devices which are connected to the cloud server are controlled by a single user (also known as admin) which are again transmitted or notified to all the authorized user connected to that network.

Web browser present in laptop or smart phone or any other smart technique through which we can operate switches, simply removes the hassle of manually operating a switch. As there is rapid change in wireless technology, several connectivity devices are available in the market which solves the purpose of communicating medium with the device and the micro-controller.

Home auto mation using IoT is one such application which provides safety, comfort and above all, self-control, via automation. Such a system must also be able to monitor energy consumption and keep track of all activities happening inside the house.

In recent years , the issue of sustainable water resource management has taken a leading role worldwide because of several concomitant factors, including climate change and population growth, which significantly reduce water availability. Due to this problem , especially in our state, the supply of drinking water is very minimum at certain period of time. Because of this , people don't know the supply time of drinking water. In office time, when the water supplier release the

water, no one will be in home to store the water.

In this project ,this problem will be rectified by building a home automation system, where one can control the home appliances and also detect the presence of water inside the pipe sensed by water flow sensor ,then using the simple GSM based phone, just by sending SMS through his phone and also including calls.

In this scenario, real time monitoring systems of water consumption can represent the real opportunity for Water Utilities to optimize the management of their water networks, and for users to become more sensitive to the issue of water saving . At the same time , systems for the recovery and reuse of rain and grey water inside buildings are also intended as technologies that aim to limit the use of drinking water, while ensuring greater environmental sustainability.

II. PROPOSED SYSTEM

In this system android application used to send signal to Arduino board and Wi-Fi module connected to Arduino gives this signal to Arduino for controlling appliances using relay board.

The architecture presented in this work can be customized in several ways in order to the accommodate different application scenarios with minimum design and recoding i.e. each time a new device is added to the micro Web- server(Google Firebase), a new thread dedicated to the device can be added to the web server.

Hence, the aim of the proposed work is not to incorporate expensive components such as high end personal computers. This system allows authorized home owners to control and monitor connected devices at home. The web server provides a graphical user interface (GUI) for accessing and controlling the devices.

1) ADVANTAGES

- Energy Savings.
- Convenience.
- Security.
- Efficient and Saves Time.

III. IMPLEMENTATION

A. Arduino UNO

Arduino is an open-source electronics 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 message and turn it into an output activating a motor, turning on the an **LED**, publishing something online. Arduino UNO is an Atmega328 based microcontroller board having 14 digital I/O pins. Among those 14 pins, 8 pins have been used for interfacing home appliances. USB connection, reset button and a power jacket is also provided.

Figure : 1

B. GSM Module

GSM stands for **Global System for Mobile Communication**. It is a digital cellular technology the used for transmitting mobile voice and data services. GSM makes use of narrowband Time Division Multiple Access **(TDMA)** technique for transmitting signals. GSM was developed using digital technology. GSM module or a GPRS module is a chip or circuit that will be used to establish communication between a mobile device or a computing machine and a GSM or GPRS system.

Figure : 2

C. Relay Module

A relay is an electrically operated switch that can be turned on or off, letting the current go through or not, and can be controlled with low voltages, like the 5V provided by the Arduino pins. The relay module is a separate hardware device used for remote device switching. With it you can remotely control devices over a network or the Internet.

Figure : 3

D. Power Supply Circuit

The power supply is the elementary unit of any electronic system which provides the required power for the operation of the system . In this project, Arduino and relay module uses the +5V power supply and GSM module SIM 800 uses +12V power supply.

E. MIT App Inventor

To develop android application for GSM and Bluetooth, we use MIT app inventor which is initially provided by Google. Nowadays, Massachusetts Institute of Technology (MIT) maintains it.

F. Android App

Data and messages are sent to the app on the smart phone when the buttons are clicked through GSM and Bluetooth from the mobile to Bluetooth module which is connected to the Arduino board .The received data is processed and the relay module is operated according to the microcontroller.

G. *Sensors*

1) Water Flow Sensor

Water Flow sensor is basically used to **detect presence or absence of water**. Water flow sensor consists of a plastic valve body, a water rotor and a hall effect sensor.When **water flows** through the rotor, the rotor start rolling after feeling the pressure.

Figure : 4

2) Water Level Sensor

Water Level Sensor is used to detect the level of substances that can flow. It can be used to identify the point at which a liquid falls below a minimum or rises above a maximum level.

Figure : 5

IV. SYSTEM ORGANIZATION BLOCK DIAGRAM

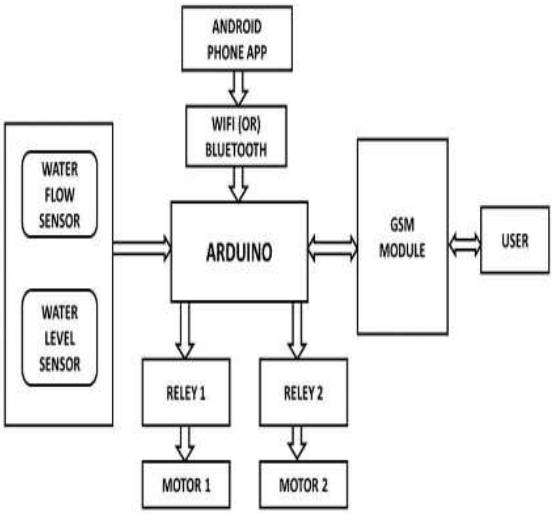

Figure : 6

V. SYSTEM ARCHITECTURE

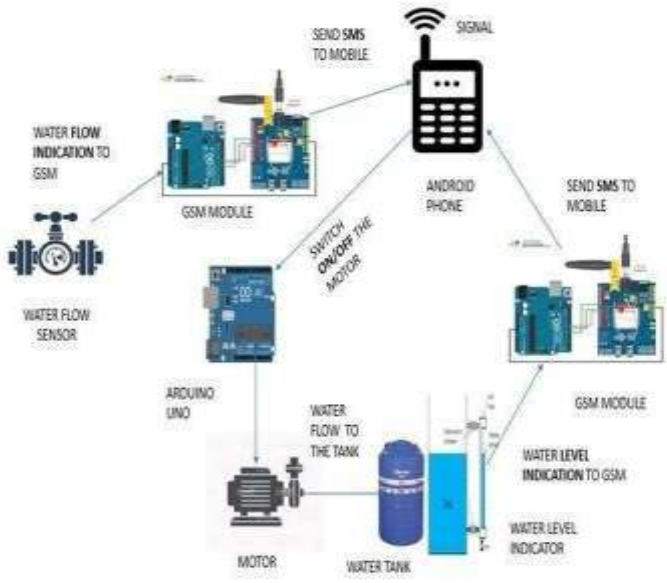

Figure : 7

VI. LITERATURE REVIEW

TITLE: Smart Home System Based on GSM Network

DESCRIPTION: Due to the increasing robbery and intrusion, establishing home- security system has become a correlated part of the modern houses, buildings, and offices. As the family members are not at home all the time, the traditional home security system, which makes alarm sound only, may not be efficient enough. Alternatively, Global System for Mobile communications **(GSM)** based security system can provide higher level of security and convenience compared to the traditionally used systems.

The main objective of the current paper is to design and implement cost-efficient and reliable security, safety and home automation system for protection and occupants' convenience. If any undesired events, such as intrusion, gas leakage and fire occurs in the house, our system warns the homeowner in real-time using Short Message Service **(SMS)**.

TITLE: Smart Ho me Automation System using Android Application.

DESCRIPTION: The Ho me Automation System **(HAS)** is extension of current activities performed inside the home and this Home Automation System (HAS) can be developed easily now a day's, because of powerful computational devices and wireless sensor network **(WSN)**, to provide user friendly and cost fairly home automation system. In home automation system (HAS), different technologies like Wi-Fi, Bluetooth and Zig Bee are used for communication, and different devices like smart phone, tablet and laptop used for controlling various appliances.

VII. CONCLUSION

Remotely Controlled Water tank System provide interface between various types of home and electrical appliances like light and fans, etc., including the water tank motors. In this paper the continuous monitoring and processing system of Water pipe presented. It provides control and ease of use of appliances as per users need .After analyzing other existing systems, we propose the novel technique for

better human interaction and for providing better utilization of android and arduino. By using Ho me automation system we can manage cost, flexible and energy efficient smart homes.

VIII. FUTURE ENHANCEMENT

Here we used GSM module. So every month, we should recharge our SIM inserted our GSM module.

In future, we will implement the automatic switch ON/OFF, when the sensor detects the water in the pipe and level of water in the tank without human interaction.

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