Security System And Home Appliances Control Using IoT

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ABSTRACT

The aim of project is security system and home automation control using IoT. Today we are living in 21st century where automation is playing important role in human life. Home automation and security system allows us to control household appliances like light, door, fan, etc. It also provides home security and emergency system to be activated. Home automation not only refers to reduce human efforts but also energy saving and time efficiency. The main objective of home automation and security is to help handicapped and old aged people who will enable them to control home appliances and alert them in critical situations Security is the main concern of the world now days. Home automation and security system which is playing important role in modern life due to this flexibility and reliability in using different places we can control the home appliances which will reducing time and save money and also minimizing human efforts.

In this paper we present the implementation base on IoT because now-a-days internet plays a major role in every area, so integrating sensors technology with an IoT environment could resolve the security issues of society to a great extent .The various drawbacks of existing technologies are cost and range. We can control of appliances through the IoT and sensor data are stored in cloud. By using IoT we can monitor and control the sensors and actuators in all over world.

Keyword - *Internet of Things, Arduino uno, Esp8266 Wi-Fi, PIR sensor.*

1. INTRODUCTION

The internet of things can be described as the technology in which the actual physical entities (electronic devices) with data sensing, processing & self-adoption capacity can be used to interact with other such device and process that data to take an intelligent decision which will prove useful for our daily day to day life. The IoT is being formed from two words internet and things which combine means any object or person which can be distinguishable by the real world can be connected to global system of interconnected computer networks and governs by standard protocol. IoT is defined As an environment in which objects (devices) are given unique identifiers and the ability to transfer data over a network without having human-to-human or human-to-computer interaction. They defined IoT as "An open and comprehensive network of intelligent objects that have the capacity to auto organize, share information, data and resources, reacting and acting in face of situations and changes in the environment"

Smart home security has become absolutely pre-eminent in daily life of household and industrial works. Home security is something that is applicable to all of us and involves the hardware and a personal security practice. The hardware would be the doors, alarms, lock systems and different type of sensors like PIR sensor, Temperature sensor, fire sensor to detect unfavorable condition. In case of personal security practice involving doors locking, activating alarms, closing the windows and many other daily life tasks are performed to prevent a burglary. In the present time a lot of unsolicited deactivates like theft are increasing continuously so there is need to modify the functionality of existing security systems. Apart from unauthorized entry, fire and LPG leakage in the house etc. are the problems faced by the society which needs equal attention.

The Internet of Things (IoT) is the physical network of things or objects devices, buildings, vehicles, and other items embedded with electronics, software, sensors, and network connectivity that enable these things or objects to collect and exchange data. An anti-theft system is any device or method used to prevent or deter the unauthorized appropriation of items considered valuable. Internet of Things is expected to produce high degree of human to machine communication along with machine to machine communication. This project proposes the security system using IoT, which prevents theft in home, bank etc. The primary objective of this project is to reduce human work. Automation has always been a prime factor for security system. We aimed in the project is to design and implement a security system. System that offers controllability through a hand held mobile phone by means of IoT [3].

2. LITERATURE REVIEW

N. Sriskanthan and Tan Karand in their work have presented an application of Bluetooth Technology for Home Automation. The Bluetooth technology which emerged in late 1990's is used for implementing the wireless home automation system. Various appliances such as air conditioners, home theatres, cellular phones etc., are inter connected, thus creating a Personal Area Network in Home Environment. The communication between several client modules and the host server takes place through the Bluetooth module. A Home Automation Protocol has been developed to enhance communication between the host server and the client modules. The system also allows integration or removal of devices to the network which makes the system scalable. The wireless system aims at reducing the cost of Home Automation. But the system does not use the trending mobile technology.

Shahriyar, E. Hoque, M. M. Akbar, S. Sohan, I. Naim, and M. K. Khan presented a GSM based communication and control for home appliances. Different AT commands are sent to the Home Mobile for controlling different appliances. The drawback of this system is that a Graphical User Interface (GUI) is not provided to the user. Different commands have to be remembered by the users to control the connected devices. Also, the system supports Java enabled mobile phones. The system thus becomes less functional as now-a-days the use of Java enables phones are reducing and the use of Android phones are increasing tremendously.

Safa.H, SakthiPriyanka.N, VikkashiniGokulPriya.S, Vishnupriya.S, Boobalan.T,"Internet of things has been governing the electronics era with cloud services dominating the ever increasing electronics product segment. Security and safety has always become a basic necessity for urban population. The paper proposes a novel security system based on Open source cloud server "things speak .com" and a low cost esp8266 Wi-Fi module. The project includes a PIR module which constantly monitoring the Home or Work space to be monitored .When the PIR module detects a intruder it sends a signal to the Atmega 328p microcontroller and the controller is connected to a Esp8266 wifi module and also to a alarm system. The System transmits an alert signal tothe Open source cloud which provides a alert signal on the users mobile phone. The system employs a second esp8266module which is programmed to act as a web server, which allows the user to activate or deactivate the security system by means of any device with internet. The system also employs a thumb print reader rs305 which controls the opening and the closing of a safety locker door. Thus the system uses esp8266 Wi-Fi module and atmega328p to control the security system from the users mobile phone by means of any device with a potential internet connection.

M. N. N. A. Asghar, M.H., "Principle application and vision in internet of things" In this paper the transformations made in embedded computing systems every device got the ability to be uniquely identified. Internet of Things offers advanced connectivity of device, services and covers a variety of protocols, applications. In the concept of IoT, the devices collect useful data with the help of numerous technologies andthen flow the data between the devices. IoT had its impact on our lifestyle and it has lead a new dimension in the field of internet.

Dhawan S. Thakur and Aditi Sharma, This paper proposes a Voice control and Zigbee based Home Automation System, in this system user has to give a voice command to control the in-home appliances. Here Zigbee is used to communicate between base station and remote station. Both base station and remote station are placed in such a range that the Zigbee communication is possible. This system cannot be used outside the range of Zigbee communication.

3. PROPOSED SYSTEM
3.1 Overview

The proposed model of the home automation system is as shown in the figure 1. The models consist of different sensors like temperature, gas and motion sensor. Initially the Arduino Uno connects to the Wi-Fi through serial software. When the connection is established it will start reading the parameters of sensors. The threshold levels for the required sensor are set to the gas sensor. The sensor data are sent to the web server and stored in the cloud. The data can be analyzed anywhere any time. If the sensor parameters are greater than the threshold level then the respective alarm will be raised and the required actuation is done for the controlling of the parameters. In the project model the temperature, gas leakage, motion sensor house is monitored. The temperature and the motion detected and data are stored in cloud for the analysis. If the temperature exceeds the threshold level then the fan will turn on automatically and it will off when the temperature comes to control. If temperature is raised fan speed also increase. Similarly when there is a leakage of gas in the house alarm is raised giving the alert sound as well as light is on and give the indication. When an one unauthorized person are enter in home the PIR sensor is active and home alarm is blow as well as red light is on and is store in cloud. The required lights and fan are turned on/off automatically by using the thing speak web server. The user can also monitor the electric appliances through the internet via web server. If the lights or any electrical appliances are left on in home can be seen and turned off remotely through simply typing the IP address of the web server.
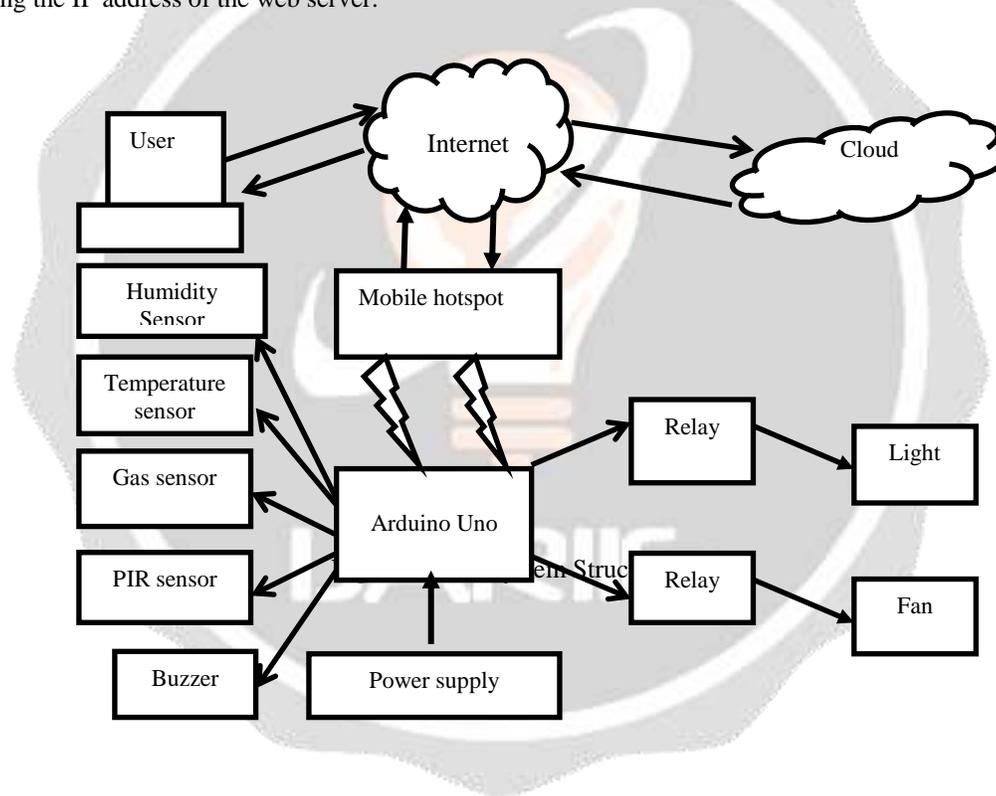
3.2 System Component

Hardware Components
1. Arduino uno
2. Sensors
    2.1 Temperature and Humidity sensor
    2.2 PIR sensors
    2.3 Gas sensor
3. ESP 8266 Wi-Fi module
4. Relay

5.   Buzzer

Arduino uno: Arduino Uno is a single board microcontroller, for building digital devices and inter active objects that can sense and gather information from the physical world. The Arduino IDE Software can be used for programming.

Temperature and Humidity sensor: DHT11 is a 4 pin sensor which can measure temperatures ranging from 0-50°C & relative humidity ranging from 20-95%. The sensor uses its own proprietary 1-wire protocol to communicate with Arduino uno and runs from 3.3V-5V. The timings must be precise and according to the datasheet of the sensor.

Gas Sensor: The MQ-2 Gas Sensor module detects gas leakage in home and industry. The MQ series of gas sensors use a small heater inside with an electrochemical sensor. They are sensitive to a range of gasses and are used indoors at room temperature. The output is an analog signal and can be read with an analog input of the Arduino. They are useful in gas leakage detection of LPG, propane, methane, i-butane, alcohol, Hydrogen, and smoke.

PIR Sensor: Motion Detection using PIR Sensor a PIR or a Passive Infrared Sensor can be used to detect presence of human beings in its proximity. The output can be used to control the motion of door. Basically motion detection use light sensors to detect either the presence of infrared light emitted from a warm objector absence of infrared light when a object interrupts a beam emitted by another part of the device. A PIR sensor detects the infrared light radiated by a warm object.

Wi-Fi Module: ESP8266 is Wi-Fi enabled system on chip (SoC) module developed by Espressif system. It is mostly used for development of IoT (Internet of Things) embedded applications**.** The ESP8285 is an ESP8266 with 1 MB of built-in flash, allowing for single-chip devices capable of connecting to Wi-Fi.

4. CONCLUSION

The security system and home appliances control using Internet of Things has been experimentally proven to work satisfactorily. By connecting simple appliances to it and the appliances were successfully controlled remotely through internet. The designed system not only monitor the sensor data, like temperature, gas, light, motion sensors, but also actuates a process according to the requirement, for example switching on the light when it gets dark. It also stores the sensor data in the cloud. This will help the user to analyze the condition of various parameters in the home anytime anywhere.

5. ACKNOWLEDGEMENT

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