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IoT Based Smart Security and Home Automation System

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Abstract:- Internet of Things (IoT) conceptualizes the idea of remotely connecting and monitoring real world objects (things) through the Internet [1]. When it comes to our house, this concept can be aptly incorporated to make it smarter, safer and automated. This IoT project focuses on building a smart wireless home security system which sends alerts to the owner by using Internet in case of any trespass and raises an alarm optionally. Internet of Things (IoT) conceptualizes the idea of remotely connecting and monitoring real world objects (things) through the Internet [1]. When it comes to our house, this concept can be aptly incorporated to make it smarter, safer and automated. This IoT project focuses on building a smart wireless home security system which sends alerts to the owner by using Internet in case of any trespass and raises an alarm optionally. The main concern of the world today is the security. Sensor based smart home security system and the home automation system is methodical and high technology systems which connect most of the wireless systems and ensure the real time operations and also indicates the threat to the house. The main idea for the use of home security system is for the comfortable living and it has also changed since the past decade as wireless technologies digital, vision are implemented. In the present world Internet plays a major role in every field, so the idea of integrating sensors technology along with an IoT environment could be helpful to resolve the security issues and the major problems of society to a very great extent. The drawbacks of existing technologies would be mainly cost and range. In this paper a perfect implementation and the complete design of sensor based smart security system with an IoT environment is been presented, which for sure resolves various security issues like fire detection in the places, unauthorized intruder entry and many. Therefore by the use of it continuous monitoring of the home or apartment or any locations can be possible. The system is much cost effective, has low power consumption and much reliable compared to the existing one.

Keywords: _Arduino Uno's board, IoT, Sensors._

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I. INTRODUCTION

The term Internet of Things is of about 16 years old. But the idea of connected devices and security is been longer, at least since the 70s. But the idea was often termedas "embedded internet" or as "pervasive computing". The actual term "Internet of Things"(IoT) was coined in 1999 by Kevin Ashton during his work at Procter & Gamble. The initial implementation and the concept of the Internet of Things (IoT) was termed early in the 1980s and became popular in late 1990s [1]. Recent developments in many relevant areas, including embedded systems, automation, wireless sensor networks, and micro-electromechanical systems (MEMS), has evolved the Internet of Things (IoT) [2,3].The term IoT and its conception can also be traced back topreviously in 1985 when Peter T Lewis spoke about the different useful criteria's in his speech at Federal Communications Commission (FCC). Since then from 1985 the scope and the concept of IoT has grown very rapidly. In the currently era it consists of more than 12 billion devices and according to the experts it will increase to about 50 billion and more by the end of 2020. The IoT infrastructure has also helped in many ways by providinganalysis using accurate sensors and seamless connectivity and also in the real time information gathering, which helped in making efficient decisions too many others.Internet of Things (IoT)

refers to the networks of connected physical objects that can communicate and also exchange data among themselves without the need of any human intervention. It is basically termed as an "Infrastructure of Information Society", because IoT allows us to collect different sets of data or information from humans, vehicles, animals and kitchen appliances. Thus it implements that any creature in this world which can be provided with IP address for data transmission over a wide range of network can be made as a part of IoT systems. The dual aspects of the proposed work is the wireless home security and the home automation system where the aim is to provide a secure framework for the users and it basically sends alert messages to the owner through voice calls or alarms by using the Internet if it senses any kind of human movement near the house then it raises an alarm optionally upon the user's discretion.The provision forsecurity in case of critical situation is also built into the system.The main idea for the use of home security system is for the comfortable living and it has also changed since the past decade as wireless technologies digital, vision are implemented.With the advent of IoT both consumers as well as manufacturers have benefited. Manufacturers have gained information like into how their products and devices are used and also howthey perform out in the real world and to increase their revenues and funds by providing the users value added services which enhance the lifecycle of their

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products and also their services. Consumers on the other hand have the ability to control and integrate more than one device for the more customized and more improved user experience.

Fig1:IoTBased Smart Security System

II. COMPONENTS OF PROPOSED SYSTEM

1) TI CC3200 LaunchPad
2) AccessibleWi-Fi
3) Pir motion detector Sensor
4) Alarm
5) Relays for connecting home appliances, electromechanically controlled doors or windows,
6) Mobile phone to receive Voice Call
7) Energia (Software)

III. PROPOSED SYSTEM

Many of the sensors are interfaced with the Arduino board. Arduino board has about 14 digital and 6 analog pins. IR and Fire sensors are the digital sensors. LPG (MQ6) and water sensors are analog sensors.
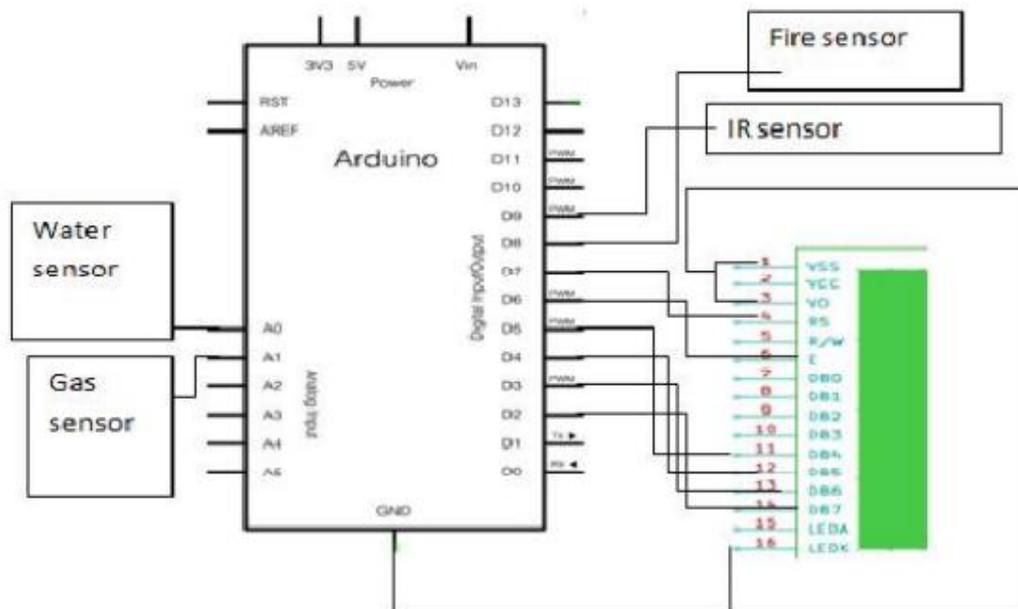

Fig 2: Interfacing Diagram of the Proposed System

.Implementation steps to be followed

1. The output pin of IR sensors is connected with D9 Pin of Arduino Uno. VCC pin is connected to Arduino Uno's 5v pin and Ground pin is connected to the ground.
2. The fire sensor output pin is connected with D8 pin of ArduinoUno's, VCC pin is connected to ArduinoUno's 5v pin Ground pin is connected to the ground.
3. The LPG gas sensor output pin is connected with A1 pin of ArduinoUno. VCC pin is connected to ArduinoUno's 5v pin and Ground pin is connected the ground.

4. The water level sensor output pin with A0 pin ArduinoUno. VCC pin is connected to ArduinoUno's 5v pin and Ground pin is connected to the ground.Interface LCD with ArduinoUno board.

The applicationin the visual studio is created basically to set an IoT environment. Hosting and the Domainare usually purchased from the site godaddy.com. Next that domain is added to the hosting site and later to the index.aspx file which is created basically in the visual studio, its then uploaded. Along with it database file is also uploaded, which is created in the SQL server management studio. The created website can now be opened using the domain name with the help of Internet.

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IV. WORKING

The Proposed system has two parts, software and the hardware.

1. The hardware system consists of, the Arduino Wi-Fi shield, the sensors, ArduinoUno's board and basically the home appliances.

2. The software system makes use of java based android application and it also uses Arduino language to configure the sensorsand the Arduino board.

3. Arduino board is mainly helpful to develop an interface between the software and the hardware applications.

4. The main use of the Arduino Wi-Fi shield isreceiving&transmitting the input which is given by the user.

5. The main application of Arduino is that it acts as an interface between software and the hardware component.

V. ADVANTAGES

1. Your Home in the Age of Technology
2. Control at Your Fingertips
3. Safety
4. Accessibility
5. Energy Efficiency
6. Cost Effectiveness

VI. APPLICATIONS

- Heating, ventilation and air conditioning (HVAC): it is possible to have remote control of all home energy monitors over the internet incorporating a simple and friendly user interface.

- Lighting control system

- Appliance control and integration with the smart grid and a smart meter, taking advantage, for instance, of high solar panel output in the middle of the day to run washing machines.

- Security: a household security system integrated with a home automation system can provide additional services such as remote surveillance of security cameras over the Internet, or central locking of all perimeter doors and windows.

- Leak detection, smoke and CO detectors.

- Indoor positioning systems

- Home automation for the elderly and disabled

- Pet Care, for example tracking the pets movements and controlling access rights

- Occupancy-aware control system: it is possible to sense the occupancy of the home using smart metersand environmental sensors like CO_2 sensors, which can be integrated into the building automation system to trigger automatic responses for energy efficiency and building comfort applications.

VII. CONCLUSION

The main aim of using the proposed system is to provide a best security and also cost effective solution. The system is basically concerned in overall home security of the house/any locations which can automatically sense the worse cases or accidents or situations and send the emergency messages on the host pages or websites which further can be very easily accessed by the owners security guards or individuals. The system is made very easily accessible and user friendly.The extensive characteristics of the system are those,which makes it more interesting. The endproduct is to make an easy, interactive, simple and reliable system.

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