A Novel Secure For Smart Home System Using IoT

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Abstract— Human services industry has been on the front line in appropriation and usage of the data. Internet of Things have opened up new paths for R&D in different fields including security and safety for home, Industries, Banking Sector. Here, IoT module and RFID labels are used for home security. It provides user authentication for only authorized users and avoids unauthorized access. It also detects gas or smoke inside the home and displays in a LCD Display. Lights glow after its authentication and identification of absence of gas or smoke.

Another application is Health Care monitoring system inside the home using BP sensor, Temperature sensor and Heart beat sensor. It sends message to the specific SIM using GSM Technology. This Smart home combines both home security and medical data of an individual.

Key Words— *GPRS, GSM, IoT , LCD, RFID.*

I. INTRODUCTION

[1] The Internet of Things (IoT) is an emerging technology that connects and interacts with the physical objects using the Internet. Iot has different applications like **Smart homes**, Smart Cities, Connected cars, **Smart health care Monitoring Systems** etc. In today's world there is need of creating smart homes. Home automation helps to run more number of home appliances with phone and tablet. Smart phones are creating new era by creating communication between different appliances using Bluetooth module, Wi-Fi module and its services. Because of home automation there is increase in level of work efficiency as well as it saves the time by reducing the human efforts. User friendly Android application provides the best platform to automate fans, light etc.

[2]Remote monitoring of patient's physiological parameters is major application of IoT in healthcare sector. It can give information regarding one's overall health parameters.

[3] IOT is an expanding network of physical devices that are linked with different types of sensors and with the help of connectivity to the internet, they are able to exchange data. Security and Safety have always been important criteria while designing homes, Industries etc. Authentication access is necessary for security. Gas leakages can be monitored and detected using gas sensor.

[4]For Health Monitoring System in Smart Home - BP, Heart Beat and Body Temperature are measured. Biomedical sensors measure the human body's heartbeat, blood pressure, pulse and Temperature sensor is additional.

II. DESIGN PRINCIPLE:

In the Smart home design, different components are connected and interacted with each other using IoT module and a Microcontroller. Different set of sensors are implemented to obtain the required criteria. This has a combination of medical security with home security. The domains involved are Embedded Systems and IoT.

Figure

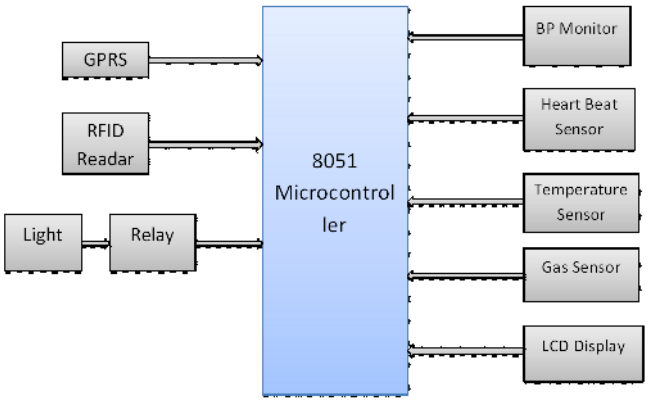

Fig: Block diagram for a novel secure for Smart home using IoT.

Sensors

- *Heart Beat Sensor*: It measures the changes in the volume of blood through any organ and determines the pulse. A sensor clip is attached to the index finger to identify the pulse rate.if abnormality of pulse occurs then it immediately sends message to the SIM and also LCD display.[Fig a].
- *Temperature Sensor*: The sensor used is LM35 to interact with the body. It measures the body temperature and also the variations in body temperature abnormally. [Fig b].
- *BP monitor*: BP monitor is designed to measure human blood pressure. It measures systolic, diastolic.
- *Gas Sensor using MQ*-2: The Grove - Gas Sensor (MQ2) module is useful for gas leakage detection (home and industry).Gas sensor identifies harmful gases like Ethane, carbon monoxide , green house gases, Propane etc. [Fig c].

Other Components

- *LCD Display:* A 16×2 LCD means it can display 16 characters per line and there are 2 such lines. That is, it has 16rows and 2 columns. It has different data pins from 0-7 and voltage VDD of +5 volts is used for operation. [Fig d].
- *GPRS*: General Packet Radio Service is a packet oriented mobile data standard on the 2G and 3G cellular communication network's global system for mobile communication (GSM).[Fig e].
- *RFID*: Radio frequency identification is a wireless identification technology that uses radio waves to identify the presence of RFID tags. It is used for identifications of people, object , etc.[Fig f].

- *Relay*: Relay is used as a switch to operate at specified voltages like on or off. [Fig g].

III. FIGURES AND ABBREVIATIONS

Fig a: **Heart Beat Sensor**

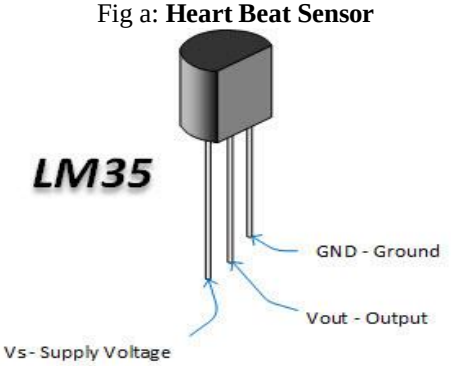

Fig b : **LM35 Temperature sensor**

Fig c : **MQ-2 Gas Sensor**

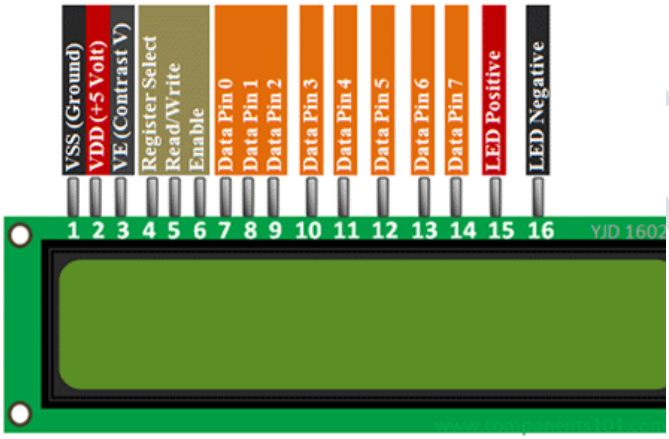

Fig d**: LCD Display**

Fig e: **GPRS- GSM**

Fig f: **EM-18 RFID Module**

Fig g: **Relay**

Abbreviations and Acronyms

- **GPRS**- General Packet Radio Service
- **GSM**-Global System for Mobile
- **IoT**- Internet of Things
- **LCD**-Liquid Crystal Display
- **RFID**- Radio Frequency Identification.

IV. DESCRIPTION

- A GSM Module is used to communicate with the specific SIM to submit the output. A SIM is inserted in the GSM to send the messages.
- RFID Cards are placed near the EM-18 module for user authentication and allows only the authorized users to access.
- The gas sensor is used to detect any smoke or gas leakage inside the home.
- A light is glowed indicating the authorized user access and indicating there's no smoke or gas detected inside the home.

- The second step of Smart home includes Health monitoring system which is carried out after entering into the home.
- The BP monitor, Temperature sensor and Heart beat sensor are used to check BP, body temperature and pulse beat of the person respectively.
- All the information is displayed in LCD Display and the obtained data is sent as the message to the specific SIM.

V. ADVANTAGES

- This type of Smart Home has Security, Safety in entering the home.
- Secondly, it provides Health information and is helpful especially during emergencies.

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