Smart Home Automation

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Abstract: Smart Home Automation has became a Revolutionary technology in recent years, evolution on adopting ther Lifestyle by seamlessly integrating various devices and systems into our homes. People are paying more attention to the development of smart home systems which is helping them to adopt to new technology and a wonderfu efficient exerience to the house owners. This content provides an overview of Node MCU which works as the heart of the a smart home automation system designed to operate lights and fans and detect gas and electricity leaks by ensuring personal safety from the use of gas and fire sensors which provides alert messages to the house owner. Node MCU based Smart home automation system receives instructions from the user and executes task as per the users instructions. At last, the RFID block is connected to MCU, then motor drive communicates with the gear motor as the valid RFID the gear motor rotates and door will open and close . The main purpose of the home automation is to work according to the user's instructions and to provide intimation back to the person.

Keywords: Node MCU, Fire Sensors, Gas Sensors, Motor Driver, RFID and Gear Motor.

I. INTRODUCTION

In recent years, the development of adopting the intelligent home automation system to get acesses to security and happiness in life has become common. This is because of the need to support the elderly and disabled people especially for those whohas to live alone. Adding this to the fact that the worlds population is getting older day by day. Home Automation is one of the most evolutionary and growing industry in today's world that can help to change the way people live and look at life.This wireless home automation system is allowing the people to control their home through wireless Central control unit. System can be combined as a portable device and allows user to control lights, fan, air conditioner, TV, security cameras, power doors, computer or other devices in the home according to their convience. This technology is allowing the user to wirelessly control the home appliances as per there coninvience and accoding to their requiremnts as needed. The system is portable and easy to install, configure, operate and manage. A perfect user interface does not yet exist, and creating a good interface requires knowledge in society and technology. In addition to household appliances it often control lighting, climate and entertainment. it will also include home security such as access control and alarms. Single people also need help at home. Therefore, the Android app controlled home automation system is designed in such a way that uses can perform certain task using only their phones. Using the mobile phone as a remote control will make the system more convenient and practical.

II. LITERATURE SURVEY

R. Rajalakshmi [1] as presented a comprehensive Survey on Home Automation systems which is associated with smart home system, IOT devices, which can be monitered and controlled ,and the user can interact with the system through a user friendly interface. The home appliance like light , fan, are remotedly controlled through a main control board.

Pankaj Bhardwaj et al [2] as presented a review paper on smart home automation which provides the importance to simply human interference with technology. Voice control automation system aims to further the cause of automation so has to achive the goal of simplicity.

Prameshwari.P et al [3] as provided a detailed survey on IOT based home automation and security which provides user to automate and control the home appliance via the internet. Home automation also includes safety measures if sensors sense any movement in front of home and sends the alert message.

Dr. Kamalesh Rana et al [4] as provided a detailed Literature Survey for IOT based smart home automation where any device can load the mobile application anf interact with the system, The commands to on\off the electrical equipemts such as light, fan can be delivered easily through any mobile device through a simple gesture.
Santwana Gudadhe et al [5] as presented a comprehensive Survey on home automation system using Android Applications where minimum human assistance is used to control the appliances in the home.This heterogenerous home automation is giving blissful experience to the house owner .
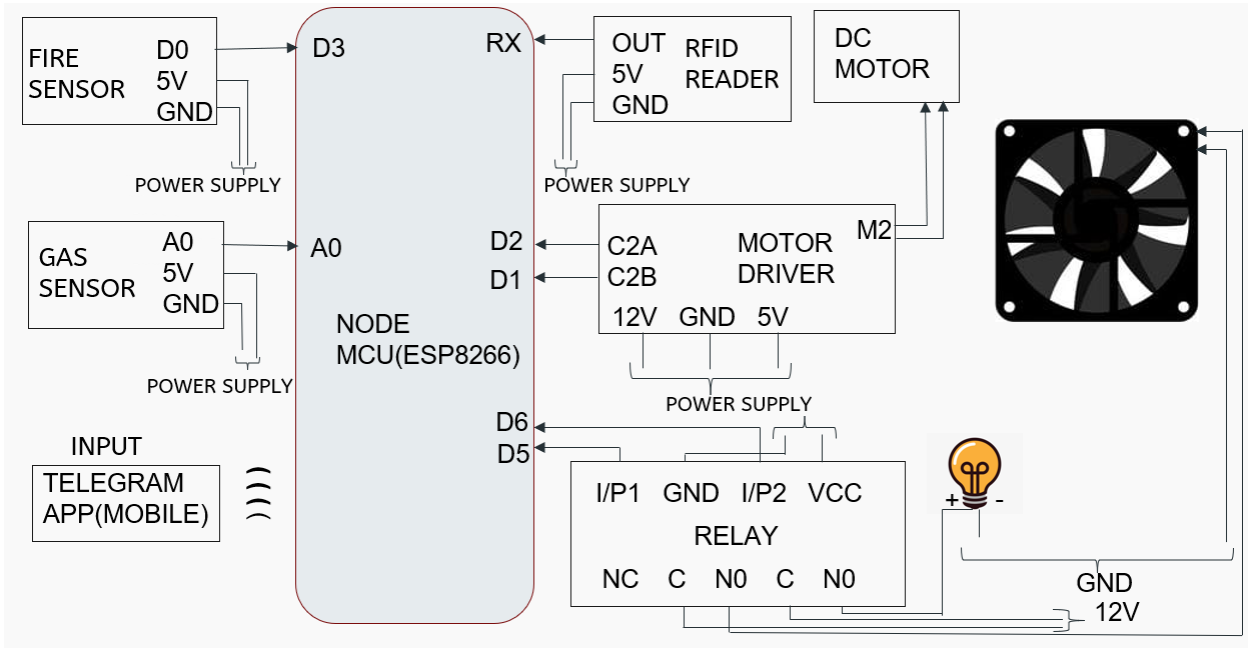
Fig.1.Block Diagram

This system is designed to detect and prevent fire and smoke in the home environment using the Aurdino application. The device, which can detect fire and smoke in the environment, works by turning on the lights and fans according to the users instructions.
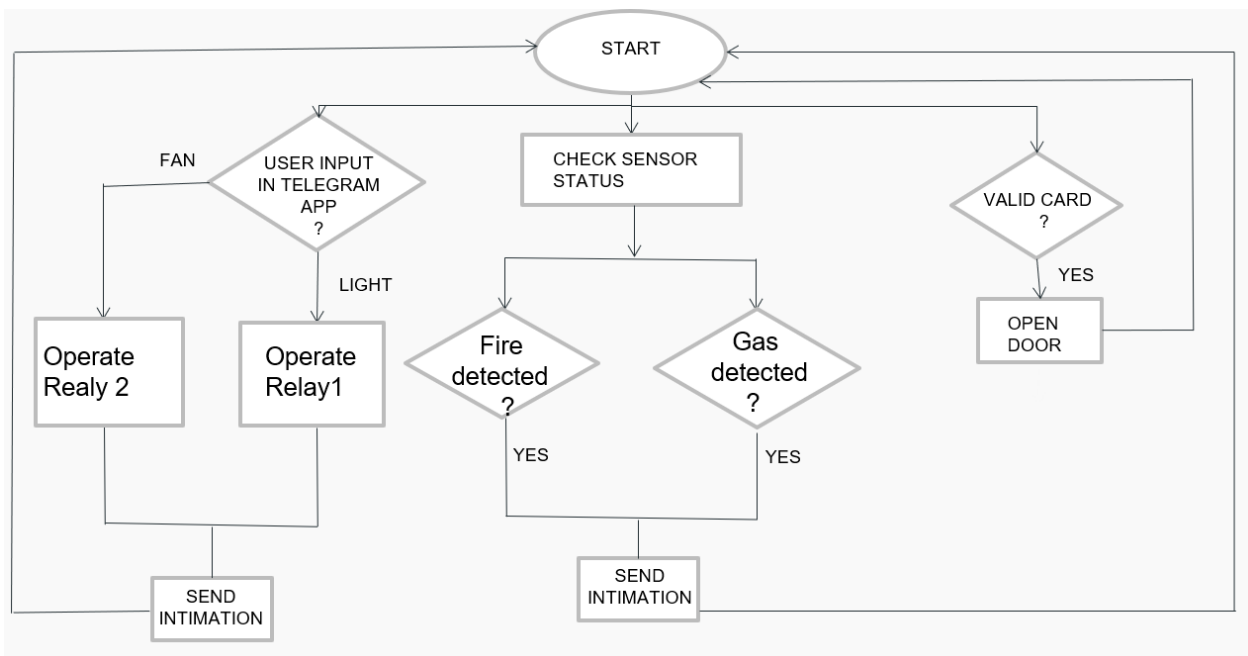

Fig.2.Flowchart

III. METHODOLOGY

The user first notices the working of light and fan and the rails. This can be done smartly at home using a mobile app. When this activity detected, feedback is sent to the user. This process is used to create and maintain the functionality of the product. In short, Hotspot is used to send data back and forth. We connect Node MCU using hotspot connection and send notifications from Telegram app. The door can be operated using RFID which identifies the valid card.

HARDWARE IMPLEMENTATION:

This home automation system has many types of sensors and Node MCU which is the core of home automation. Node MCU is a Wi-Fi module connected to relays.

1) Node MCU: Node MCU (Node Microcontroller Unit) is an open-source software and hardware development environment that includes an inexpensive System-on-Chip (SOC) named ESP8266. Designed and manufactured by Espressif System and the hardware which is based on the ESP-12 module.

2) Relay: A relay is an electrical switch. It has standard input terminals and standard operating contact terminals for single or multiple control signals. A switch can have many contacts of different contact types, such as closed contacts, open contacts, or parallel connections.

3) Gear motor: Gear motor is a combination of motor and gearbox. Adding a gearbox to the motor reduces speed and increases torque output. This has high resolution and shorter positioning time. The most important parameters of a gear drive are speed (rpm), torque (lb-in) and efficiency (%).

4) RFID: Radio Frequency Identification (RFID) refers to a wireless system with two components: a tag and a reader. A reader is a device with one or more antennas that emit weak radio waves and receive signals back from RFID tags.

IV. CONCLUSION

In this project, we aim to reduce the impact of cost and provide a good user experience. While influencing and managing our location. Homeowners can enjoy control and monitoring from the central system or smartphone app.

V. FUTURE SCOPE

The future of work includes Home automation, which can simplify daily tasks, increase energy savings and provide a personal and comfortable life. The future of home automation holds great potential for further development and integration with new technologies.

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