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# Smart Energy Efficient Home Automation System Using IOT

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**ABSTRACT:** For several years, the Internet of Things (IoT) has attracted attention, with both start-ups and established businesses betting on the industry's growth. IoT has been important in linking items to the internet, in addition to the economic solutions. As a result, contact between the connected devices is established. In recent years, the Internet of Things (IoT) has gained more popularity. The home automation system is one of the IoT's applications. Smart homes effectively provide home automation for installed devices such as thermostats, lighting, and air conditioning, and allow users to access devices connected to the Internet remotely. They still lack important IoT applications, such as energy conservation, energy control, protection, and privacy management. This paper proposes a smart home system with a microcontroller as the backend that not only performs home automation and switch replacement, but also records and reports valuable information to the home's owner, such as when someone trespasses the property. (Security perimeter), or to record a calculation of how much money was spent on electrical appliances consumption. Telegram Bot is used to communicate between the user and the device.

## I. INTRODUCTION

Generally, when we go out of the house we switch off the light or electrical equipment's to avoid accidents such as short circuit, firing etc. But sometimes we forget to switched them off, we have to come back home to do so. This is wastage of time and creates lots of chaos and tension. So to avoid any such kind of situation the latest technology coming up worldwide is the smart home technology. Smart home is one in which all electrical equipment around the home technologically smart or intelligent or automated with highly advanced automatic system for security in other system. Smart home is useful for everyone and can also be used in everyday life at home. Smart home is consisting of three parts - network, controlling device, and home automation.

Network can be wire or wireless. It is used for connecting the automation to control devices. Controlling devices can be used for managing the system. Home automation is the devices which control the physical environment. It can be used in kitchen, home or offices etc. These three parts will be discussed in detail in the "Smart Home Technology Section".

## II. PROJECT AND THE WORLD

When we leave the building, we usually switch off the lights and electrical devices to prevent incidents such as short circuits and fires. However, we sometimes fail to turn them off and must return home to do so. This is a waste of time that causes a lot of confusion and tension. To prevent such a scenario, the most recent technology to emerge globally is smart home technology. A smart home is one in which all of the electrical equipment in and around the house is technologically smart, intelligent, or automated, with a highly advanced automatic security system. All would benefit from a smart home, and it can be used in daily life at home. A smart home has three components: a network, a controlling system, and home automation.

There are two types of networks: wired and wireless. It's used to connect the automation to the control devices. The system can be controlled with the help of control devices. The devices that monitor the physical environment are



referred to as home automation. It can be used in the kitchen, at home, or in the workplace, among other places. In the "Smart Home Technology Section," these three components will be addressed in greater depth.

### III. WORKING OF SYSTEM

The ESP32 board and PIR sensor operate at 3.3 V, while the IR Flame Sensor and IR Sensor Door Sensor operate at 5V DC. The ESP32 can be operated by a USB link or a 12V Adaptor with a 5V voltage regulator. Since the other modules' voltage supply and ground pins are connected to the standard VCC and ground, the rest of the components are operated by the 5V supply the on-board power supply's production The DC fan and light in the Loads use +12V to operate.

A flame detector is a sensor that senses the presence of a flame or fire and responds accordingly. To obtain flame presence, it is linked to the ESP32's D2 Pin. PIR is attached to the ESP32's D1 pin to detect intruders by sending a pulse as an output signal. Then, since pin number D3 is attached to the IR sensor, the IR sensor senses the door opening and closing.

The ESP32's Pin numbers D6 and D5 are used to connect the DC loads Fan and Light. The Siren UM3561 is also attached to the Controller's D7th pin.

Telegram Bot integrates and controls the entire device via a protected id interface. The embedded device sends out alarms in the event of a fire, a door opening without our knowledge, or intruders in the building. Home automation can be done by sending pre-programmed commands to a Telegram bot, which can control loads remotely without the need for human interaction.

The ESP32 WI-FI module is used to link embedded systems to the internet in real time via wifi hotspot tethering with a pre-defined network that has its own SSID and Security Code.

### IV. PROTEUS SIMULATION

- a) In normal mode, it does not shows any detected indications in the virtual terminal as shown in figure 1

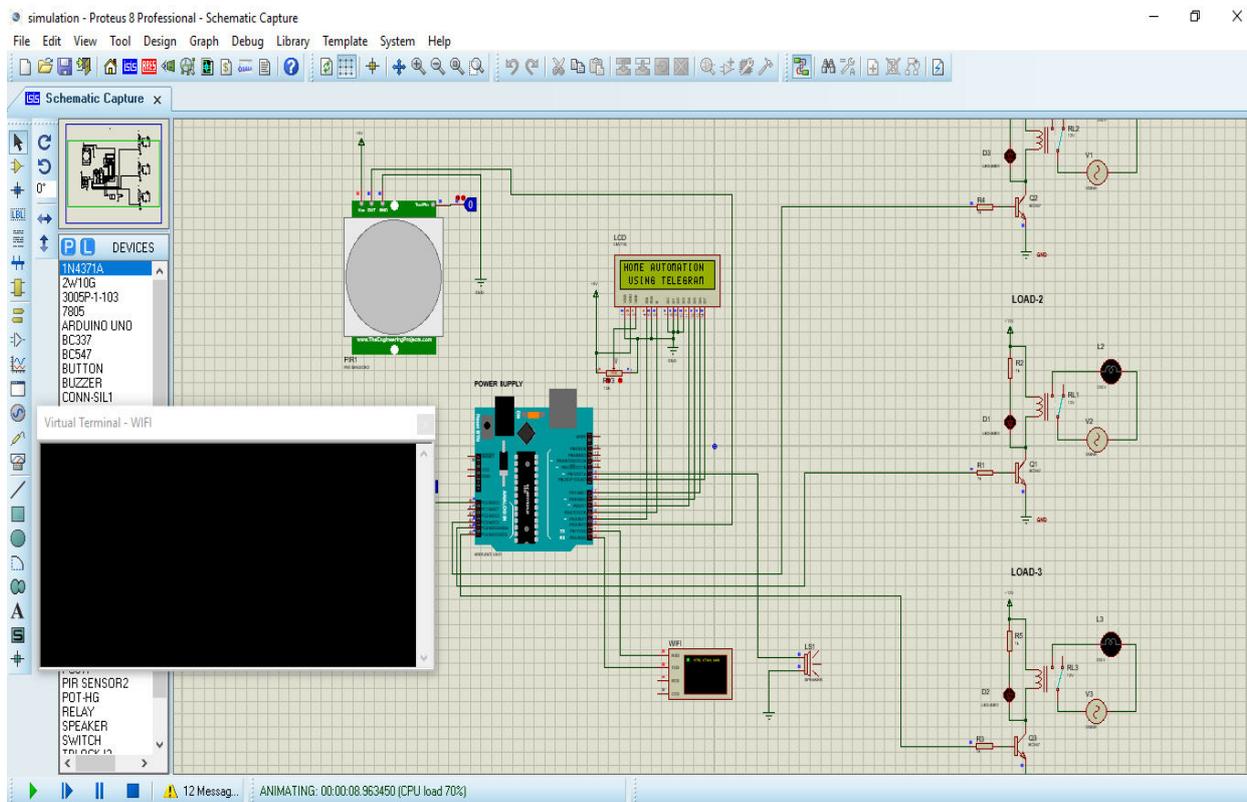


Fig.1 Normal mode of operation



b) When any detection occurs, it shows alert message in the virtual terminal on the output side as shown in Fig 2



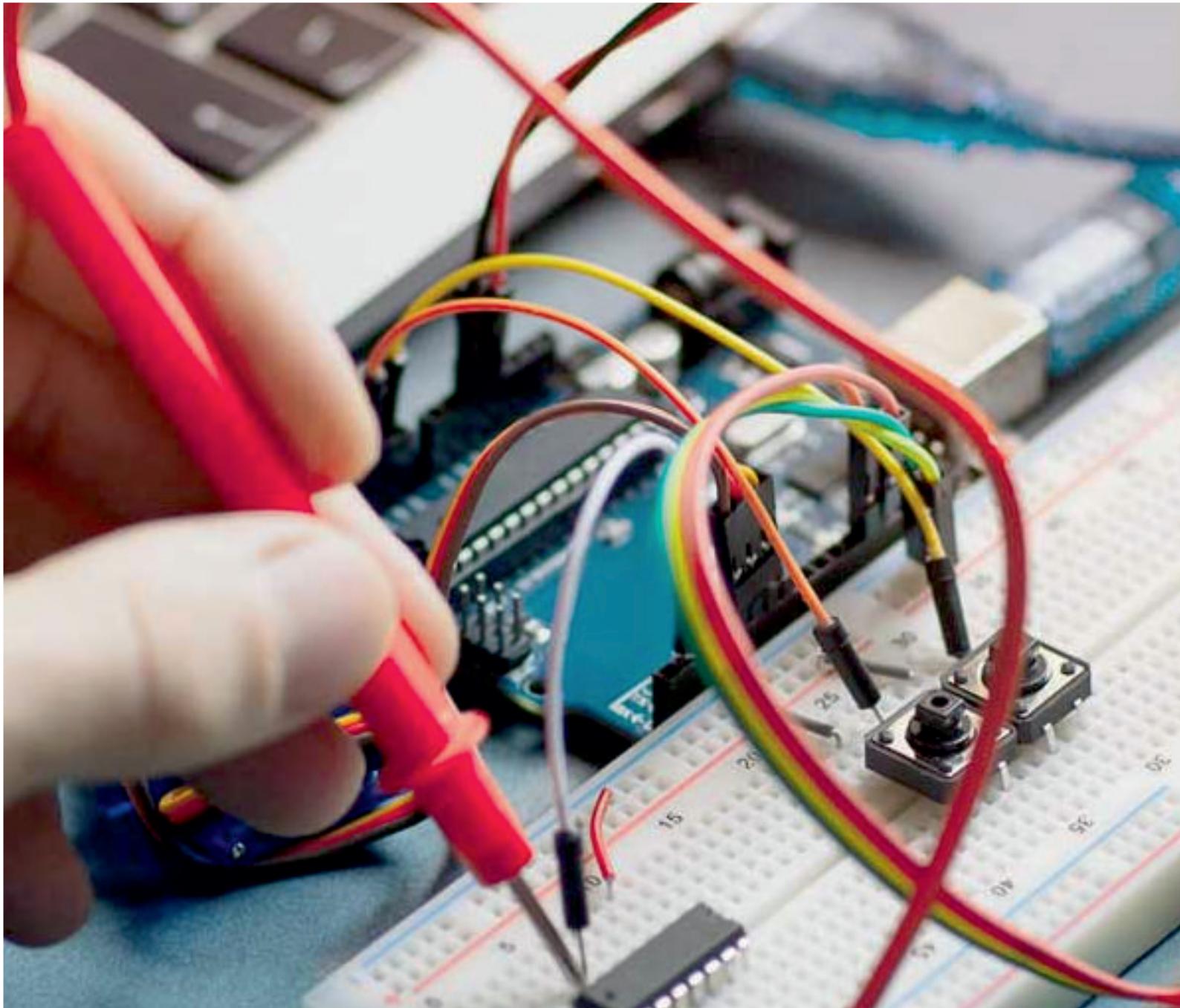
Fig.2 Detected indication

## V. CONCLUSION

This paper is based on the meaning of smart phones and all the details of smart home elements projects and challenges. main objectives is to give a survey on smart phone research. Many new technologies are exploring more and more and day by day. Smart is the good and beneficial who is very much easy with their professional life and also for those who are about security and comfort but they want to save their electrical energy that is wasted by many people in regular span of time. With the introduction of smart home people are living and will obviously live more comfortable life. All the time home can be save from automation so that we will have much more time work on the other things or pursuits.

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