"IOT BASED HOME SECURITY SYSTEM AND HOME AUTOMATION SYSTEM"

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ABSTRACT

With the advancement of technology and more dependency of people on smart phone and increasing demands of easy and quick way of solving Daily life task, it has become very important to have a technology which can control over the domestic and industrial applications using IOT. In today's world IOT plays a vital role for performing day-to-day tasks. Also, the ongoing situation of covid-19 is risking person's health as well as risking the security of our homes. During this situation many people are not at home because of which theft has increased. Thus to overcome this situation we are going to implement an advanced smart security system with the help of ESP3826. This project presents a prototype security door that can be remotely controlled by ESP3826, Fingerprint Sensor and Hex keypad.

This system consists of three panels i.e. the user panel with facilities of keypad based password protection, fingerprint based password protection and voice based password security. The second panel is the relative wherein a password would be provided for a specific time and then it would vanish. The third panel is the thief intruder panel wherein if the PIR sensor senses someone then alarm buzzes also alert message or call is given to owner.

With security of home we also need a smart home for controlling the appliances remotely. To do so we are going to implement home automation system with the help of arduino-uno and blynk-app.

KEYWORDS – *Home Security, IOT, Sensors, ESP8266, GSM, FingerprintSensor, Hex Keypad, Arduino uno, Blynk app etc.*

INTRODUCTION

Security provides protection to our life and variable assets. Ensuring of safety and security of people and their valuable things in home are very important for avoiding the illegal protection from the intruders by theft which is not safety [1]. At present safety has become an essential issue for most of the people in rural and urban areas.

The things will try to cheat or steal the property which may endanger the safety of their belongings such as ornaments, important documents and money in the houses, offices and homes. To overcome this security threat, most of the people will install bunch of locks or closing systems. But at present the robbery will be easily happened due to the mechanical locks which are easily brake over by using advanced tools. Hence, we made an attempt to develop an advanced Home security system with fingerprint and soft password authentication. And also implementing the GSM Technology for sending alert message about the home locker which will be more secure than others as a low cost system to replace the present procedure as presented in

abstract for theoperation of home lockers used by the people.

Automation provides ease to our life. As whole world is moving towards digitalization. Where all kind of objects will get controlled and commanded.Some research shows IOT playing major role in that aspect. Due to large demand of smart home automation system we are going to develop a efficient system with affording price which will convert a home into a smart automated home. In this paper we proposed a low cost, less power consumption IoT based system.By using this system, the registered person can control his/her home appliances from anywhere anytime. By looking at the ridges andvalleys of the fingerprint, turning them into 1's and 0's, and creates the user's own personal code.

1. COMPONENTS FOR HOME SECURITY AND HOME AUTOMATION

1.1 ESP32 board

ESP32 can perform as a complete stand alone system or as a slave device to a host MCU, reducing communication stack overhead on the main application processor.ESP32 caninterface with other systems toprovide Wi-Fi and Bluetoothfunctionality through its SPI /SDIO or I2C / UART interfaces.
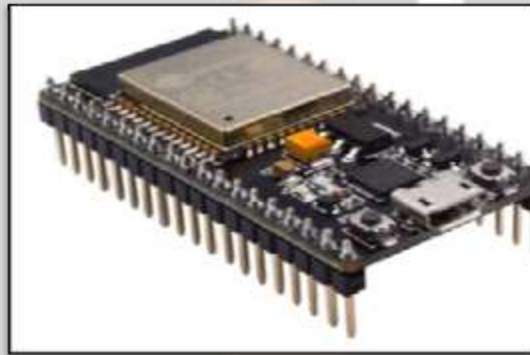
Fig-1 ESP32 board

1.2 Fingerprint Sensor

The way an optical scanner works is by shining a bright light over your fingerprint and taking a digital photo. The light-sensitive microchip makes the digital image by looking at the ridges andvalleys of the fingerprint, turning them into 1's and 0's, and creates the user's own personal code.

Fig-2 Fingerprint Sensor

1.3 Solenoid Door lock

The solenoid lock denotes a latch for electrical locking and unlocking. The power-on unlocking type enables unlocking only while the solenoid is powered on. A door with this type is locked and not opened in case of power failure or wire disconnection, ensuring excellent safety.

**Fig-3 Solenoid Door lock**

1.4 Hex Keypad

The hex keypad is a peripheral that connects to the DE2 through JP1 or JP2 via a 40-pin ribbon cable. Each key on the keypad is essentially a switch that connects a row wire to a column wire. When a key is pressed, it makes an electrical connection between the row and column.
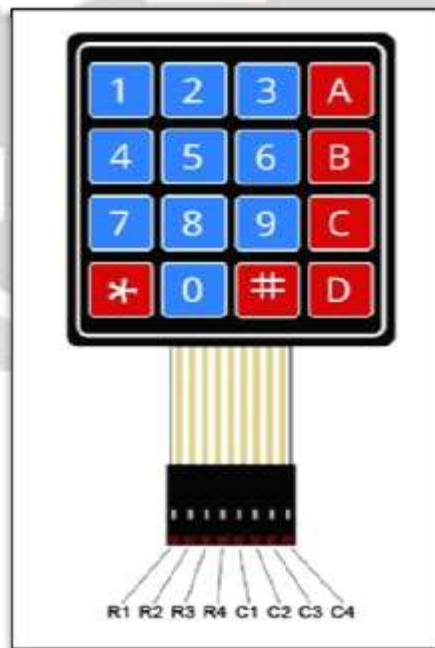
Fig- 4 Hex Keypad

1.5 OLED Display

An organic light-emitting diode (OLED or organic LED), also known as organic electroluminescent (organic EL) diode, is a light-emitting diode (LED) in which the emissive electroluminescent layer is a film of organic compound that emits light in response to an electric current.
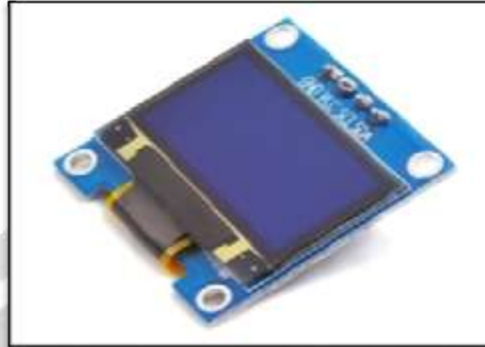
Fig-5 OLED Display
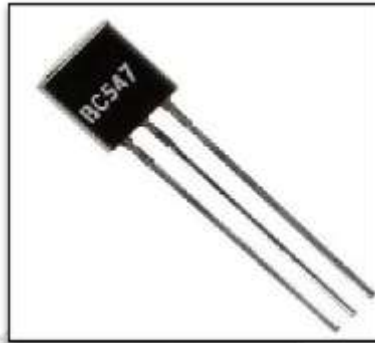
1.6 5V Relay

Triggering the relay operates the normally open or normally closed contacts. It is frequently used in an automatic control circuit.

Fig-6   5V Relay

1.7 BC547 transistor

The BC547 is a NPN transistormeaning when power is applied tothe base (control pin) it will flow from the collector to the emitter.

Fig-7 BC547 transistor

1.8 330 ohm Resistor

330 ohm resistor color code for 4-band is calculated as: (1st digit) = Orange = 3. (2nd digit) = Orange = 3. (multiplier) =Brown = 1 = 10^1 = 10. (tolerance) = Gold= ±5%

Fig-8 330 ohm Resistor

1.9 1N4007 diode

A 1N4007 is a widely used general purpose diode. It is normally build to use as rectifier in the power supplies section of electronic appliances for converting AC voltage to DC withother filter capacitors.

1.10 12V/1A Power Adapter

Professional 12 Volt DC 1 Amp power supply is suitable for powering a wide range of applications including CCTV cameras and wireless routers. This power supply is a regulated Center Positive power supply and has a 2.1mm x 5.5mm Jack It'splug   design   is   forIndian power socket.

Fig-10   12V/1A Power Adapter

2. ARCHITECTURE OF HOME SECURITY

In this architecture we are using ESP32, a finger-print sensor, Solenoid Door lock, Hex Keypad, OLED Display, 5V Relay,BC547 transistor,330 ohm Resistor,1n4007 diode,12V/1A Power Adapter.
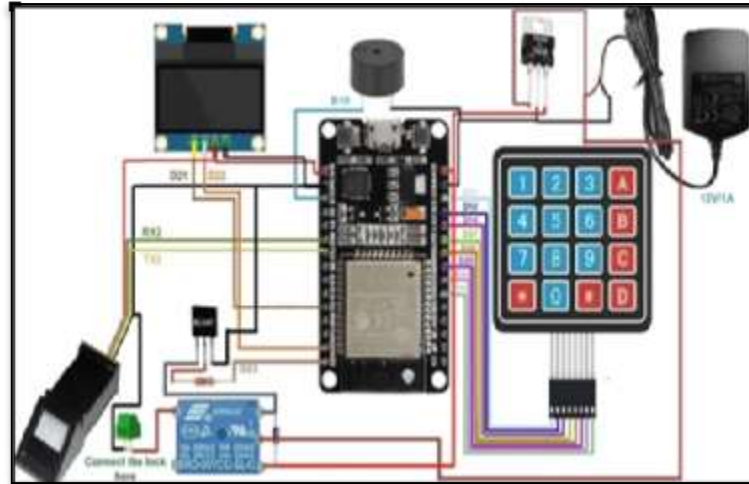
Fig-10 Architecture Of Home Security

At First we are connecting a fingerprint sensor to the D21 Port of esp then the hex pad will be connected to the D13,D12,D14,D27,D26,D25,D33,D35 Ports respectively. Now the BC547 transistor to D23 with ohm resistor, now the connection of door lock is done.

3. ARCHITECTURE OF HOME AUTOMATION

In this architecture we are using ESP32 , 5V 2A power adapter , 5V Relay , 1n4007 , 330e Resistor , BC547 transistor , 2 pin screw terminal connector , Buzzer. In this architecture we have used the 5V 2A power adapter which is sufficient for providing the power to relay.
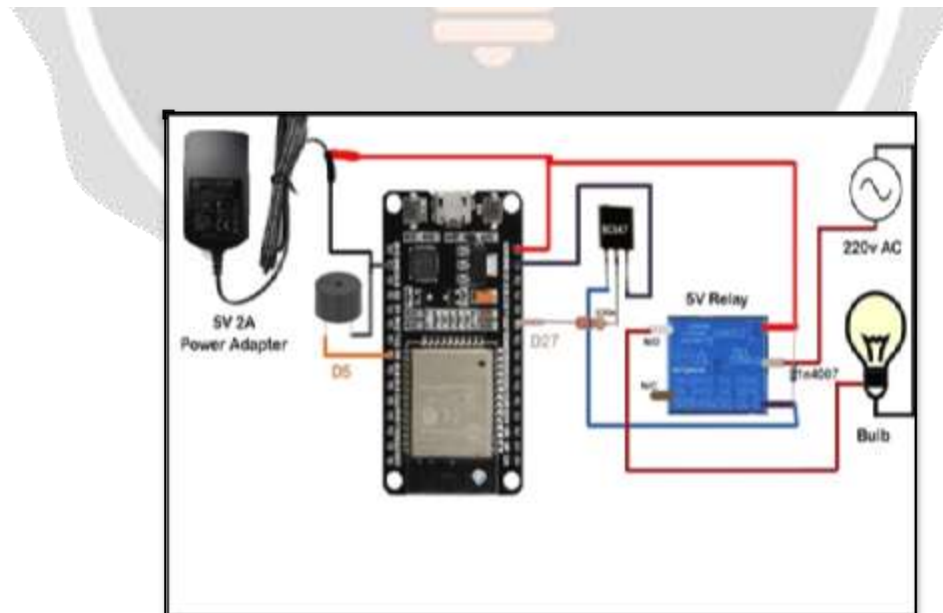
Fig-11 Architecture Of Home Automation

In the circuit diagram we have shown the connection of relay with ESP32 and also attached one buzzer at D5 pin which will give feedback of internet connectivity.

4. CONCLUSION AND FUTURE WORK

We will be successful in developing a system through which the user will give the ability toeither control their household appliances through application or by using voice commands. The user is connected to the same network as the module so exchange of signal takes place frequently. This gives users the ability to automate his home without the need to buy expensive smart appliances, many advancements can be added to this project like adding motor to control window drapes, fire sensor to prevent mishaps etc. The project we have undertaken can beused as a reference and can be used as to develop project such asindicating weather forecasting, temperature updates, device synchronization, bank locker system, punch-card system, electronic safe for home security system and secure some important sections in company and government offices, etc.

5. REFERENCES

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