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SMART HOUSE

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Abstract **– We know that there are a lot of works in this world, that we can't do at a time like when a person comes at the door, we don't know that who is knocking at the door then we have to go to open the door by discontinuing our ongoing works. So, these types of problem can be reduced by making our house smart by using ESP 32 for video streaming. Finger print sensor is used for security purpose. Smart house will help us to make our work easy by verifying the person. Smart home is basically called as automated house. We use rain alarm to detect the rain. In smart house automatic water tap are also can add, which is basically use to conserve the water. And it has also a very basic circuit which detect the motion, and basically these circuit can be used in the washrooms too for automatic light ON and OFF operations, when a person enter into the room the then light automatically ON, and when man goes outside the room then light will OFF.**

Keywords- Smart House, Automatic, Esp32, security etc.

I. INTRODUCTION

As we know that in this world, all human beings are busy they have a lot of work. They have busy schedule at home or at office. Also, there are less security for home or for office. In this digital era, to save their time and to make the work easy and smartly, we have presented an idea. This idea also useful for the security. So, for solving all these issues we use some smarter way to make our house or office smart. Our idea will known as Smart House. Firstly we will use a camera at the door if house members come Infront of the camera than it will recognize the picture and open the door for that known face. And if unknown person will knock the door than that capture the persons picture and then that captured picture will be sent to the house owners phone via social media. And also we will on and off electric fan and light according to our need by using sensors and relays.

II. THEORY

In smart homes, automation is frequently employed as a method of lowering stress, which has led to a significant increase in research articles. Life's most crucial component is a smart home. Smart homes utilize security applications or devices. It is a component of IOT cloud computing systems.

Benefit in Automation

- You may utilize sophisticated analytics to find new business insights and prospects by taking advantage of new business opportunities, which can provide you access to network data.
- Improved capacity for acting and predicting.
- Quick reaction.
- Additional sources of income.
- Enhance operational process controls.
- Increasing productivity.
- Analysis that makes predictions.
- Reducing human mistakes.

- Smart home gadgets and enhanced monitoring systems provide you the capacity to control a network of physical items.

III. SMART-HOUSE

By enabling homeowners to operate smart equipment, typically through a smart house application on their smartphone or other networked device, smart house technology, also known as home automation, provides homeowners with security, comfort, convenience, and energy efficiency.

Fig1.Design for Smart House

IV. NEED FOR SMART-HOUSE

- Controlling all of your home's appliances with swift sensations using various spatial techniques.
- Modularity to accommodate new appliances and gadgets.
- Increasing home security.
- Our home's functionalities can be controlled remotely.
- Increasing the functionality of appliances.
- Insights on household management.

V. ADVANTAGES AND DISADVANTAGES FOR SMART HOUSE

A. Advantages for smart-house:

- Increased interaction with customers.
- Innovative tools and applications for improvements.
- Improvements in technology.
- Less garbage produced.
- AI-related tools.
- Improved information gathering.

B. Disadvantages for smart-house:

- The learning curve for technology.
- Security and confidentiality.
- An inactive way of life.
- Costly.

VI. BLOCK DIAGRAM

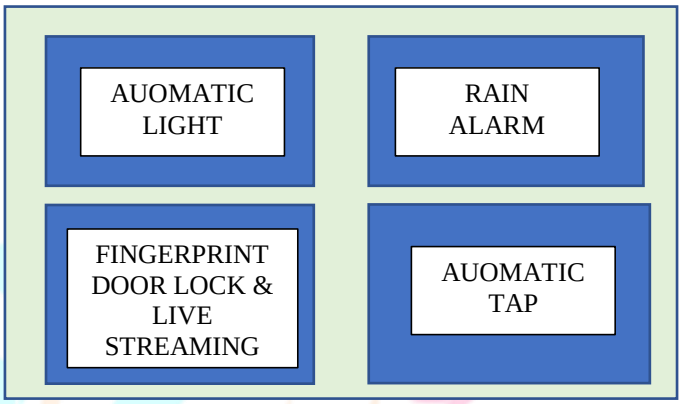

Fig2. Block Diagram of Smart House

VII. CIRCUIT DIAGRAM

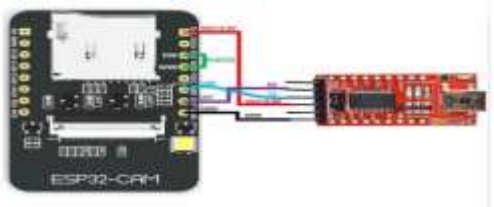

Fig3. Circuit Design Of ESP32 CAM with TTL Programmer for video Streaming

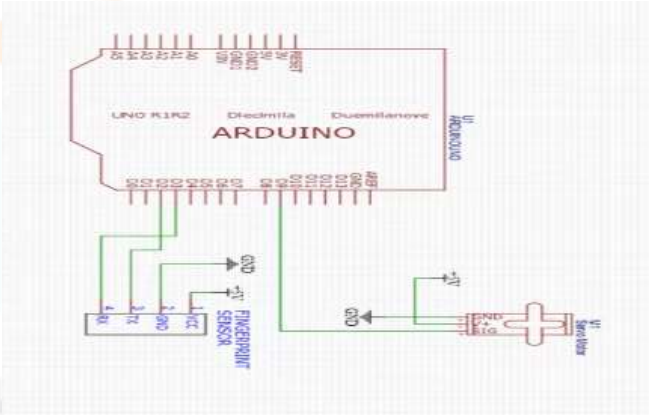

Fig4. Circuit Design of fingerprint door Lock

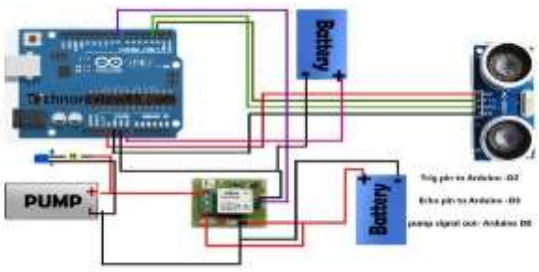

Fig5.Circuit Design of Automatic Tap

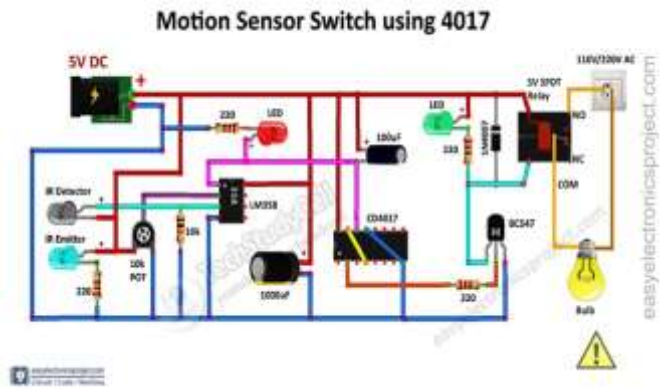

Fig6. Circuit Design of Automatic Washroom Light

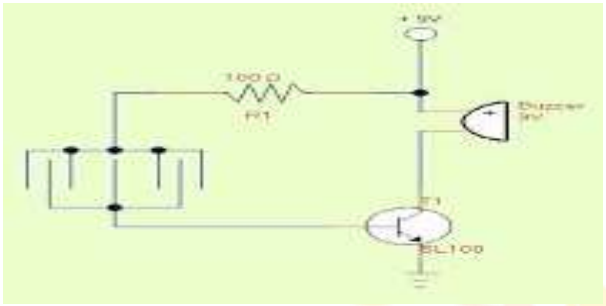

Fig7. Circuit Design of Rain Alarm

VIII. COMPONENTS

- ESP32
- UART TTL Programmer
- Arduino Uno
- Arduino mega 2560
- Fingerprint Sensor R307
- Ultrasonic Sensor
- IR Sensor
- Power Supply
- Jumper Wire
- Keypad
- Servomotor
- Resistor
- Capacitor
- LED and Lights
- ESP32 Cam
- Buzzer
- LDR Sensor

1. ESP32:

Fig8. ESP32

Using this SPI / SDIO or I2C / UART (Universal Asynchronous Receiver and Transmitter) connections, the ESP32 can link to other devices and provide Wi-Fi and Bluetooth abilities. The ESP32 can operate as an entire independent system as well as a slave device to the host the main control unit which reduces the load on the main application's CPU caused by interaction stack overhead. This device is used for the live streaming in our project.

2. UART TTL PROGRAMMER:

Fig9. UART TTL

Modern microcontrollers typically employ the Transistor-Transistor Logic, or TTL, serial communication format employing the UART (universally asynchronous receiver/transmitter) transfer method.

3. ARDUINO UNO:

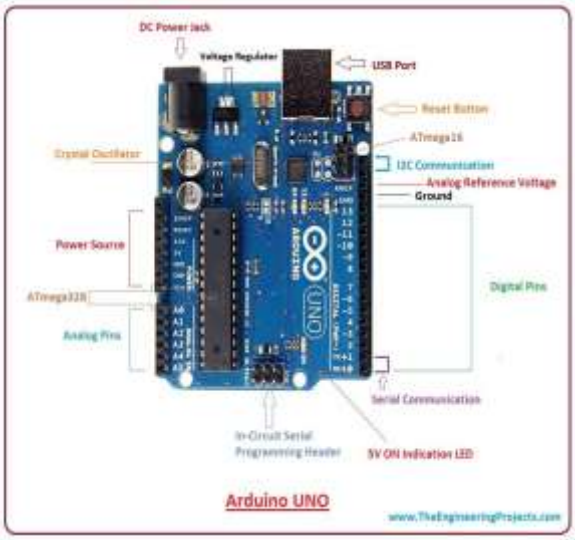

Fig10. Arduino Uno

The Arduino Uno is built on the ATmega328P microcontroller. There is a microcontroller on this board. In addition to having a power connector, it also has 6 analogue the inputs, a quartz crystal with a frequency of 16 MHz, fourteen pins for digital input and output, a header for ICSP, a reset button, and a USB connection.

4. ARDUINO MEGA 2560:

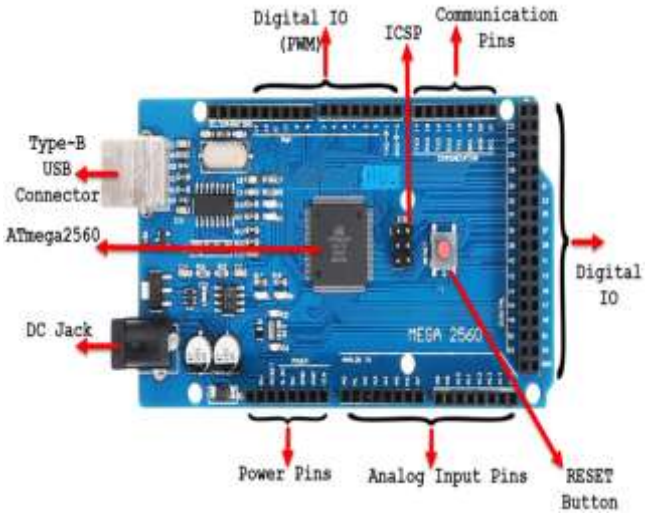

Fig11. Arduino Mega 2560

The ATmega2560 is the platform upon which the Mega 2560 is built. It is a board for microcontrollers. It contains 16 analogue inputs, 4 hardware serial ports, a 16 MHz crystal oscillator, 54 digital input/output pins, 15 of which may be used as PWM outputs, a USB connector, an ICSP header, a power jack, and a reset button.

5. FINGERPRINT SENSOR:

Fig12. Fingerprint Sensor

Fingerprint scanners can photograph and scan the ridges and valleys of a finger. The device's pattern analysis or matching software processes the collected data and compares it to the stored fingerprints on file.

In our project finger print is used at the door to open and close the door.

6. ULTRISONIC SENSOR:

Fig13. Ultrasonic Sensor

The existence and vicinity of things can be detected using an ultrasonic sensor, a component that employs sound waves. It does this by emitting high-frequency sound waves, which then reverberate off of things, and timing how long it takes for them to return. This device is used in our project for automatic tap.

7. IR SENSOR:

Fig14. IR Sensor

A radiation-sensitive optoelectronic component with spectral responsiveness in the infrared light spectrum of 780 nm to 50 m is known as an infrared detector (also referred to as an IR sensor). It is becoming more and more popular to use IR sensors as motion detection equipment, which are used in construction services to switch on light bulbs or in alarm systems to identify unauthorised intruders. In our project, we have used this to light on or off after sensing the human.

8. BATTERY:

Fig15. Battery

A battery converts chemical energy into electrical energy through a redox, or electrochemical, cycle. In this type of reaction, electrons go through an electric circuit from one material to another. The system will operate on power supplied by the battery. For this, a 9 volt battery was employed.

9. JUMPER WIRES:

Fig16. Jumper Wire

Jumper wires are mostly used to link two locations in a circuit. There are many different lengths of jumper wire available from all Electronics. These wires make it simple to alter the circuit as needed and are typically used with a breadboard as well as other prototyping equipment. Jumper wires are used in our system for the connection of all the components to each other.

10. SERVOMOTOR:

Fig17. Servomotor

A servomotor is an actuator that comes in two varieties: rotary and linear. The rotational and linear position, velocity, and acceleration may all be controlled precisely. A motor and a sensor that's used for position feedback make up the device.

It is used for the opening and closing the door after the certain time.

XI. DESIGN

This is designed in two parts. First part is designed by Arduino mega, fingerprint, servomotor, power supply, LED and ESP32 Cam. Second part was designed by the Ultrasonic Sensor, LED, Arduino Uno. Third part designed by so many small components like Resistor, Capacitor, Transistor, LDR Sensor and LED. And the last section consist of two blades, one Buzzer and power supply.

Some sections are separately connecting by the programming with the help of Arduino.

X. METHEDOLOGY

The methodology for all four parts are individually operate First part is the important because it is for the security purpose which we assembled at the main door of the house. Which will do live streaming around the house whatever going around and based on fingerprint too. If the persons finger print will matches to the already feed prints then door will open automatically if not then LED will glow as alert.

Second part is automatic handwash tap that will sense the hand's motion when it comes in front of sensor then it operate and water will come from tap.

Third section is washroom's light that will be operate when person enters and exit through door, at the door LDR sensor is assembled which by detect shadows of people through sensor and light get ON. And the last one will operate by sensing the rain drops and give alert sound.

XI. RESULT

In these days all persons are busy in their own work, they are unable to manage their time. By using this, we can save efficient energy and time. Using this project, we can do all work automatic and smarter way. It will helps to the old people who are not able to do all work. By using this, we can save efficient energy and time.

Fig18. Working Model of Smart House

XII. FUTURE SCOPE

In future, we will make a smart house with smart rooms using AI. Here smart means automation without any help of human being.

We will use a camera at the door if house members come Infront of the camera than it will recognize the picture and open the door for that known face. And if unknown person will knock the door than that capture the persons picture and then that captured picture will send to the house owners phone via social media.In future, we will make food Automatic or Automatic Kitchen.

In future, Detect the Vehicle and Open the door.

We will use google assistance and we will discuss how to combine cloud computing, IOT, and smart homes—three loosely linked components. Our recommendation is to use a centralised actual time event processing program to

efficiently and fairly manage the large data flow while maximizing the potential of each component.

XIII. CONCLUSION

Topic for smart-house is important in this generations, but this is very costly and totally based on intelligent devices and newly applications. These days, everyone is too preoccupied with their own work to be unable to effectively utilise their time. We can effectively conserve time and energy by employing this. This project will allow us to carry out activities more efficiently and automatically. The elderly who are unable to do all tasks will benefit from it. We can effectively conserve time and energy by employing this. We take into account the advantages and benefits of each individual component along with any complements that may be produced by integrating it with the other parts, which would lead to additional advantages that were generated by the full compound system. Since these sections are still in the growth stage, the integration between them may change and provide a stable paradigm that results in a whole different kind of applications and infrastructure.

XIV. REFERENCES

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