DESIGN AND IMPLEMENTATION OF SMART HOME AUTOMATION USING INTERNET OF

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Abstract: Home automation may be a topic which is gaining popularity day by day, due to large advantages. One are able to do home automation by simply connecting household appliance electrical devices to the web or cloud storage. The reason for the demand of home automation is reaching the pinnacle in recent days for its simplicity and comparable affordability. The biggest disadvantage of a Home Automation System is cost. A simple and low cost home automation system will be designed and developed using IoT technology that controls electrical devices at home from a remote location by a simple android smart phone. This is achieved by sending an SMS to receiver present reception which is successively connected to a hardware kit. The SMS is received which is transmitted to the microcontroller that reads the message and controls the appropriate device. Future Homes are the space for digital natives. With the invention of a lot of automation technologies featuring IoT, Home Automation has become a reality. One can implement several of their tasks with just one command of verbal instructions. These technologies can wont to build fully functional home automation system and control smart home devices.

Index Terms – **Node Mcu, Internet of things, Home automation, Arduino, Telegram**

I. INTRODUCTION

The home animation is control of home device form a central control point automation is today s facts where more things are being completed a day automatically. Usually the essential tasks of turning on or off certain device and beyond is either remotely or in close proximity. The concept of the RF-based system is to use the underlying wireless data network like IEEE 802.11 (Wi-Fi). The popularity of wireless networks reception has increased in recent years, and therefore the advanced technology has made the private digital device to commonly have the potential to communicate through the wireless network. Hence, **it's** suitable to use RF-based location determination system to estimate location of the private digital device during a home environment with high rate transmission, supporting multimedia application may be feasible in WLAN. One if the possible application is wireless network for home automation. Imagine a personal home equipped with motion light temperature and other sensor actuators for opining the door dimming lights with a foreign control as complex as fixing a network of things in your home (such as thermostat, security system lighting and appliances) which will be programmed employing a main controller. The basic idea of home automation is to employ sensor and control system to monitor dwelling and accordingly adjust the various mechanism that provide heat ventilation lighting and other service. The automated "intelligent" home can provide a safer easier and more economical dwelling. In an intelligent home automation system there are many possible solutions for a way and form where to regulate the automation system and single device an interface area often a computer-based system a mechanical switch one light a loudspeaker with a microphone or a some quite personal remote controller using normal PC, laptop or table PC by standalone software or web-based user interface. In the near future all electronic appliances in a home will be networked. The internet of things (IOT) is that the network of physical objects or "Things" embedded with electronics, software, sensors and network connectivity, which enable these objects to gather and exchanging data. IOT allows objects to be sensed and controlled remotely across existing network infrastructure, creating opportunity for more direct integration between the physical world and computer based system, and resulting in improve efficiency, accuracy and economic benefits.

II. OBJECTIVE

The objective of the mentioned project is as follows:

- To implement a low cost, reliable, scalable and easily accessible home automation system
- To control devices through a wireless network
- It gives the user complete control to all the devices
- To develop an Automation system for the people to have easy access to the appliances at home.

III. PROPOSED SYSTEM

The System proposed uses a Wi-Fi module to control the switches at home. The number of sensing devices is increased to improve the efficiency of the system. The ON and OFF switches are controlled via the Telegram app. This makes the system handier. Even if the person is not at home and if he wants to control the lights at home for their elderly parents, he can do it with ease using the Telegram app. He can send a message "Bulb1 ON" and the bulb gets ON. In the same way he can send "Bulb1 OFF" and the bulb gets OFF. Telegram is a commonly used messenger app used for communication. There is not any need to download a separate app to control the switches. This will helpful for the common people. Also Portico lights are fixed where LDR sensors are used to make the bulb glow. The principle behind the LDR sensors is that it absorbs the light and stores the energy. It automatically gets illuminated in the dark.

IV. WORKING METHODOLOGY

The Smart Home Automation System enables ease of work. It enables easy access to appliances at home. The System works based on the collection of data. The data collected is further used for transferring the information to other devices. The data collected is used for monitoring, controlling and transferring the information to other appliances and the information is transferred via the Internet. Because of this, the System gets automatically activated when a crisis occurs. Here, the automatic garage system opens on sensing the person in front of the garage door. It might even send an alert to the user. The light, fan and door works similar to the garage system but can also be turned ON and OFF manually by using the TELEGRAM app. The smart gardening system is done in order to ease the work of the resident. A time delay is given and a submersible motor is fixed. It waters the garden at given time intervals.

V. HARDWARE DESCRIPTION

1. Node mcu(ESP8266)

Fig 5.1

Presently ESP8266EX is a chip with which the manufacturers are making wireless networkable micro-controller modules. More specifically, ESP8266 is a system-on-a-chip (Soc) with capability for 2.4Ghz Wi-Fi (802.11b/g/n, supporting (WPA/WPA2), general-purpose input/output (16 GPIO), inter-integrated circuit, Analog-to-digital conversion (10bit ADC), serial peripheral interface(SPI), I2S interfaces with DMA (sharing pins with GPIO), UART (on dedicated pins, plus a transit only UART are often enabled on GPIO2). It employs a 32-bit RISC CPU supported the tensilica Xtensa L106 running at 80MHz. it has a 64KB boot RAM. External Flash memory can be accessed through SPI.

2. Relay

Fig 5.2

A relay is an electrically operated device which has a control system (input circuit or input contactor) and a controlled system (output circuit or output contactor). It is frequently used in the automatic control circuit and it is an automatic switch to control a high-current circuit with a low-current signal.

3. **LDR sensors**

Fig 5.3

LDRs (light-dependent resistors) are wont to detect light levels, for instance, in automatic security lights. Their resistance decreases as the light intensity increases. In the dark and at low light levels, the resistance of an LDR is high and little current can flow through it In bright light, the resistance of an LDR is low and more current can flow through it.

**4. Servo Motor**

Fig 5.4

A servo motor is a rotary actuator that allows for precise control of angular position. It consists of a motor coupled to a sensor for position feedback. It also requires a servo drive to complete the system. The drive uses the feedback sensor to precisely control the rotary position of the motor.

5. DC motor:

A direct current (DC) motor is a type of electric machine that converts electrical energy into mechanical energy. DC motors take electrical power through direct current, and convert this energy into mechanical rotation. DC motors use magnetic fields that occur from the electrical currents generated, which powers the movement of a rotor fixed within the output shaft.

6. **IR sensor**
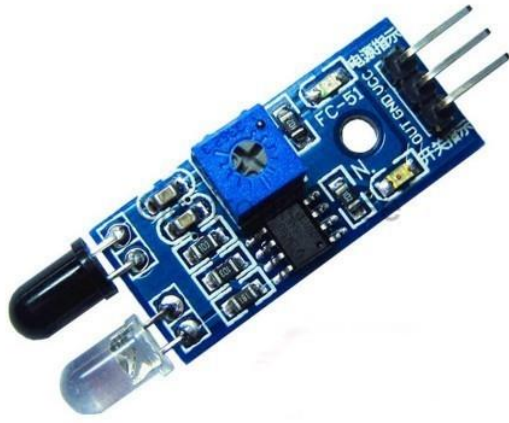
IR sensor is an electronic device, that emits the light in order to sense some object of the surroundings. An IR sensor can measure the heat of an object as well as detects the motion. Usually, in the infrared spectrum, all the objects radiate some form of thermal radiation. These types of radiations are invisible to our eyes, but infrared sensor can detect these radiations.

7. Submersible motor
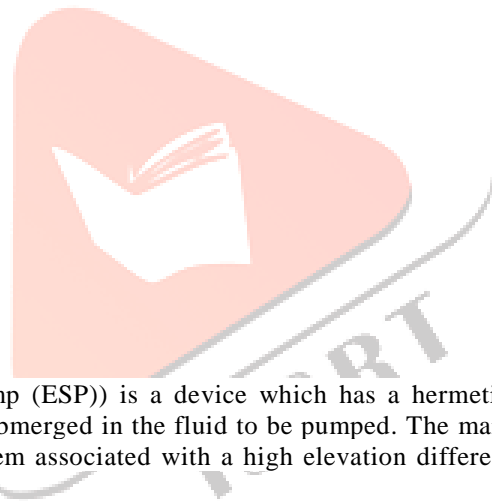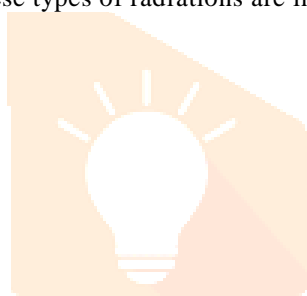
A submersible pump (or sub pump, electric submersible pump (ESP)) is a device which has a hermetically sealed motor close-coupled to the pump body. The whole assembly is submerged in the fluid to be pumped. The main advantage of this type of pump is that it prevents pump cavitation, a problem associated with a high elevation difference between pump and the fluid surface.
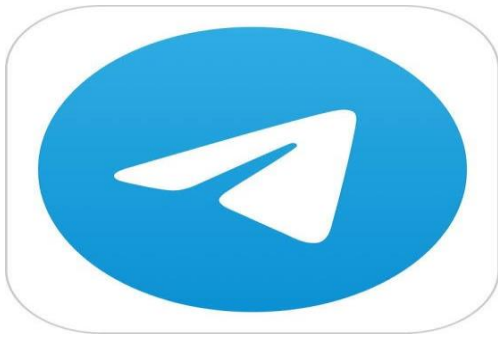
IV.SOFTWARE DESCRIPTION:
1. Arduino IDE

The Arduino Integrated Development Environment - or Arduino Software (IDE) - contains a text editor for writing code, a message area, a text console, a toolbar with buttons for common functions and a series of menus. It connects to the Arduino and Genuine hardware to upload programs and communicate with them.

2. Telegram

Telegram is a freeware, cross-platform, cloud-based instant messaging software and application service. The service also provides end-to-end encrypted video calling, VoIP, file sharing and several other features.

VII. CONCLUSION:

To conclude the Smart Home Automation proposed eases our work. The devices can be turned OFF even if you are not present inside the house. The number of sensors used is increased in order to make the system more efficient. It would help people to easily monitor the elderly people at their house. And for the Elderly people operating the devices would be very handy so that they need not to walk all the way to operate the devices. It is very cost efficient, reliable, scalable and easily accessible. It is a wireless network. It provides complete control to the remotely accessible aspects. It is completely safe and easily accessible those even the person who doesn't have deep knowledge of this can be able to easily access the devices. This system was to give people an easy access to the devices in the home.

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