ENET-AUTOMATION

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ABSTRACT

I. Introduction

Electronic - Home automation structures have gotten commonness of late, paralleling advances in the possibility of the Internet of Things. The current endeavor exhibits the utilization of an unobtrusive home computerization system, inside the structure of assistive advancement. The system utilization relies upon the Arduino microcontroller along with Bluetooth correspondences capacity, and it is proposed for use by the elderly and people with insufficiencies. The structure is anything but difficult to use, with an instinctual interface executed on an Android based propelled cell phone. Showings exhibit that the structure empowers control of home devices, lights, warming, cooling systems and security devices by the arranged customers, i.e., the elderly and crippled. In order standards of human's comfort in homes can be categorized into several types. Among these categories, the most significant ones are the thermal comfort, which is related to temperature and humidity, followed by the visual comfort, related to colors and light, and hygienic comfort, associated with air quality.

II LITERATURE REVIEW

1. Smart home automation system

This project aims to create a concept for a home-automation system with the use of existing technologies. Control of a vast area of existing devices should be taken into consideration; however, as a limitation of the prototype, only functionality to control power supply to existing devices will be implemented. In order for users to control the system, this project will develop an Android application. [1]

2. Bluetooth relay bot

The concept Internet Of Things (IoT) can be closely tied together with home automation. IoT devices, such as smart thermometers, can be controlled by, for example, a smartphone and thus possibly providing worldwide range through the Internet. These devices together with the rising popularity of the smartphone account for one of the reasons to the increase in home automation. Home automation with IoT devices provides great convenience and means of optimizing energy consumption by, for example, enabling automatic energy saving or presenting power consumption data to a user in real time. However, it could become expensive if conventional devices were to be replaced by their IoT equivalents. Therefore, when converting to a smart house, a major issue is making all non-IoT devices compatible with a home-automation system. Gill et al. identify the intrusiveness of installations as one of the areas that have hindered consumer adoption of home automation technologies. [2]

3. A comprehensive Technique for Autonomous Home automation.

A quartz crystal oscillator is connected to inputs XTAL1 (pin19) and XTAL2 (pin18) The quartz crystal oscillator(11.0592MHz) also needs two capacitors of 33 pF value. RESET (Pin 9) pin is an input and is active high (normally low). Upon applying a high pulse to this pin, the microcontroller will reset and terminate all activities. The four 8-bit I/O ports P0, P1, P2 and P3 each uses 8 pins. PORT 0 can be used for input or output, each pin must be connected externally to a 4.7K ohm pull-up resistor. This is due to the fact that P0 is an open drain, unlike P1, P2, and P3. Open drain is a term used for MOS chips in the same way that open collector is used for TTL chips.

4. serial communication

D. Serial Communication Computers transfer data in two ways:1) Parallel: Often 8 or more lines (wire conductors) are used to transfer data to a device that is only a few feet away 2) Serial: To transfer to a device located many meters away, the serial method is used. The data is sent one bit at a time. PC use RS232 interfacing standard for Serial Communication. An interfacing standard RS232 was set by the Electronics Industries Association (EIA) in 1960.The standard was set long before the advent of the TTL logic family, its input and output voltage levels are not TTL compatible. In RS232, a 1 is represented by -3 ~ -25 V, while a 0 bit is +3 ~ +25 V, making -3 to +3 undefined.

5. Application for home controlling system

GPRS-based Home Automation and images of the house to its owner's mobile through GPRS. The webcam detects movement by comparing frames and also light intensity. Video streaming of the proposed work is done using the home Internet connection, not the GSM modem. U. Ali proposes another home and office automation system using GPRS in mobile phones. The user interacts with the home via a client/server architecture implemented at home using a PC and a micro-Java application. Home devices are controlled by a controller, which is connected to the computers parallel port [5]

III IMPLEMENTATION

Fig.1 Architecture Diagram

Our proposed system uses as we enter the twenty first century, the transaction among individuals and pc is breaking vintage confinements and coming into another domain. inside the massively innovation driven worldwide of these days' phones have develop as a piece of our ways of life. cell phones are not simply discussion device. Our endeavor attempts to infer arrangement furnishing better oversee on local machine with assistance of cell phone. the current contraption incorporates substantially machines in our home which can be been controlled through switches. those gadgets can be turned ON and OFF physically at whatever point needed. This contraption is substantially less verified and subject to electric threats. likewise, the wastage of vitality tends to a central point of subject. The proposed task is considered systems administration our cell mobile to all machines through a smart trustworthiness circuit. The proposed gadget incorporates astute practical insight Circuit associated with the home hardware. notoriety of every single home apparatus may be made do with the guide of buyer from distant with help of individual's cell phone The end individual can

utilize their mobile phone or PC to sign into the machine. A fundamental test is accomplished for whether the equipment instrument is ON or not. handiest on the off chance that the equipment is approved and ON, at that point the individual is verified. when the confirmation is done accurately, individual is then equipped for send the control alarms to the equipment machine. at the equipment device the SL intention power program will always follow for the change inside the distinction and will thusly transport the markers to the Circuit

LIST OF MODULES

Our proposed system is made up of these following modules:
Module 1: Choosing the Input
Module 2: inter connection of microcontroller
Module 3: Pre-processing steps
        3.1: Installing and importing libraries
        3.2: Controlling the system of each electronic
Module 4: Blynk application
Module 5: interconnect system to cloud
        5.1: ubidots cloud
        5.2: application blynk.
Module 6: relay switch to control
        6.1: google assistant and manual control.
        6.2: Channel connected with system
        6.3: output result for condition 1&2
Module 7: system implementation.

MODULE 1: CHOOSING THE INPUT

ZigBee, much like 6LoWPAN, is a low-cost, low-power, wireless mesh network) and has received ample attention as an up-and-coming protocol technology. Advances in ZigBee include connecting to the Internet using low-power, low-cost ZigBee radios. The idea is to leverage the ZigBee radio send and receive IPv6 packets to enable applications to send data back to the user via the Internet. This has broad potential for home applications, but ZigBee's prime drawback is its inability to communicate easily with other IP protocols.

MODULE 2: INTERCONNECTION OF MICROCONTROLLER

In this project, we designed to control home devices by remote, app and IP address.

Remote is connected with central controller and IRDA (Infra-red Data Association) is connected to both central connector and IRDA Decoder, a local wi-fi sensor to process in the Dom server to give the output.IP address is connected with cloud via internet, the given IP address is moved to the local network by detecting information's from cloud network, then it processes under the main Dom server to give the output.

MODULE 3: PRE-PROCESSING STEPS

we make use of three important libraries of python. First of all, for installing these libraries we should have the latest version of pip installed in our system. Those three important libraries are as follows:

The end individual can utilize their mobile phone or PC to sign into the machine. A fundamental test is accomplished for whether the equipment instrument is ON or not. handiest on the off chance that the equipment is approved and ON, at that point the individual is verified. when the confirmation is done accurately, individual is then equipped for send the control alarms to the equipment machine. at the equipment device the SL intention power program will always follow for the change inside the distinction and will thusly transport the markers to the Circuit. while a client chooses an exchange inside the notoriety for any of the instrument [I. e. ON or Off], the records from the hand-held is sent to the web Server in a string design, wherein the web – site is the host. at the server the status is spared in the database of their non-open device field. at the equipment end, the circuit power program a web website page is utilized to rescue the notoriety of the contraptions in a reasonable example [for each 10sec]. those changes come quite close to treats [which are transitory web files] from the web server and are spared at the PC inside the name of the net site on the web. thusly every 10 sec on the grounds that the site page is revived and the new treat esteems are modernized.4.6.3Proposed Home Automation System Functions

MODULE 4: CRACK DETECTION Communication via the network In this mechanism communication is done via the network with the use of network cables and a switch. This medium is accurate since equipment's can be distinguished with unique ip addresses assigned to them and also it does not impose any limitation on the number of equipment's that can be connected. Though this mechanism requires wiring of equipment to the home computer this can be avoided with the use of Ethernet over power (EOP) mechanism.
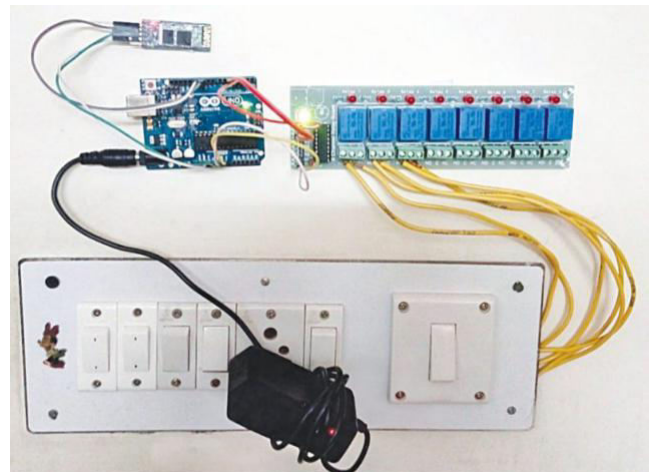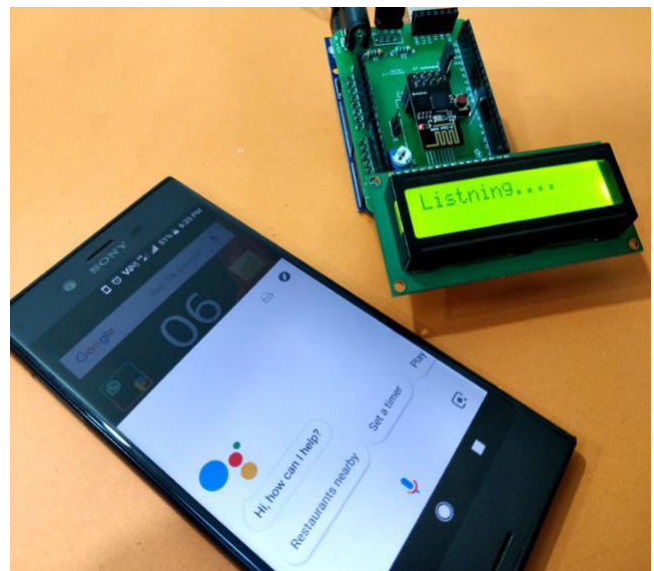

Fig.2 electric circuit

Fig.3 google assistant response

MODULE 5: INTERCONNECTION OF CLOUD

A.   *Cloud Server*

Cloud server is used for central storage. Centralization gives cloud service providers complete control over the versions of the browser-based applications provided to clients, which removes the need for version upgrades or license management on individual client computing devices. Cloud server contains user databases, glass fish sever, glassfish is an open source application server which is designed to make the web services accessible in an efficient and easy way

Client

This is the remote user who wants to automate home appliances by using android mobile device or the client pc. Android is a Linux-based operating system primarily designed for mobile devices such as smart phones and tablet computers utilizing ARM processors

89C51 I Microcontroller

The AT89C51 provides the following standard features:

4K bytes of Flash, 128 bytes of RAM, 32 I/O lines, two 16-bit timer/counters, a five vector two level interrupt architecture, a full duplex serial port.XTAL1 and XTAL2 are the input and output, respectively, of an inverting amplifier which can be configured for use as an on-chip oscillator ,A quartz crystal oscillator is connected to inputs XTAL1 (pin19) and XTAL2 (pin18) The quartz crystal oscillator(11.0592MHz) also needs two capacitors of 33 pF value. RESET (Pin 9) pin is an input and is active high (normally low). Upon applying a high pulse to this pin, the microcontroller will reset and terminate all activities. The four 8-bit I/O ports P0, P1, P2 and P3 each uses 8 pins. PORT 0 can be used for input or output, each pin must be connected externally to a 4.7K ohm pull-up resistor .This is due to the fact that P0 is an open drain, unlike P1, P2, and P3. Open drain is a term used for MOS chips in the same way that open collector is used for TTL chips.

MODULE 6: GOOGLE ASSIATANT AND MANUAL

. Communication via the serial port In computing, a serial port is a serial communication physical interface through which information transfers in or out one bit at a time. But in most of the occasions only one of the equipment's can be controlled through this mechanism. This is a major weakness in serial port communication. Another limitation of this mechanism is the requirement to connect a hardware device to the other end in order to synchronizes the communication. This is another drawback in serial port communication. B. Communication via the parallel port This is similar to the serial port but this mechanism does not require additional hardware for the synchronization of communication because data sent through these ports are already synchronized. But there is a limitation on the number of equipment's that can be connected to this port. And also the parallel ports cannot tolerate uncontrolled inputs. This is another major weakness of this mechanism.

CHANNEL CONNECTED WITH THE SYSTEM

Cloud Server Cloud server is used for central storage. Centralization gives cloud service providers complete control over the versions of the browser-based applications provided to clients, which removes the need for version upgrades or license management on individual client computing devices. Cloud server contains user databases, glass fish sever, glassfish is an open-source application server which is designed to make the web services accessible in an efficient and easy way B. Client This is the remote user who wants to automate home appliances by using android mobile device or the client pc. Android is a Linux-based operating system primarily designed for mobile devices such as smart phones and tablet computers utilizing ARM processors. 89C51 I Microcontroller The AT89C51 provides the following standard features: 4K bytes of Flash, 128 bytes of RAM, 32 I/O lines, two 16-bit timer/counters, a five vector two level interrupt architecture, a full duplex serial port.XTAL1 and XTAL2 are the input and output, respectively, of an inverting amplifier which can be configured for use as an on-chip oscillator ,

MODULE 7: SYSTEM IMPLEMENTATION

The first step to get started is to install the operating system Raspbian in a Raspberry Pi computer. Raspbian is a Debian-based computer operating system for Raspberry Pi. There are several versions of Raspbian including Raspbian Stretch and Raspbian Jessie. Since 2015 it has been officially provided by the Raspberry Pi Foundation as the primary operating system for the family of Raspberry Pi single-board computers. Raspbian uses PIXEL, Pi Improved Windows Environment, Lightweight as its main desktop environment as of the latest update. It is composed of a modified LXDE desktop 18 environment and the Open box stacking window manager with a new theme and few other changes. Raspbian is a free operating system based on Debian, optimized for the Raspberry Pi hardware. Raspbian comes with over 35,000 packages: precompiled software bundled in a nice format for easy installation on Raspberry Pi. Next step is to install the Apache Web Server on Raspberry Pi which will allow it to serve web pages. On its own, Apache can serve HTML files over HTTP, and with additional modules can serve dynamic web pages using scripting languages such as PHP. So, the PHP library is installed through the Apache. Now it's time to create the PHP file which will be the front end and it will show all the buttons which will turn home appliances and devices ON/OFF on clicking as shown in figure

5.3. Each button on the file will send commands to the relay and then from the relay these commands will be sent to the GPIO pins on Raspberry Pi. To control the GPIO pins through PHP file, Wiring is installed. Wiring is a PIN based GPIO access library written in C for the BCM2835, BCM2836 and BCM2837 SoC devices used in all Raspberry Pi versions. It's released under the GNULGPLv3 license and is usable from C, C++ and RTB (BASIC) as well as many other languages with suitable wrappers (See below) It's designed to be familiar to people who have used the Arduino "wiring" system. Wiring includes a command-line utility gpio which can be used to program and setup the GPIO pins. You can use this to read and write the pins and even use it to control them from shell scripts.

Fig.4 Input Image\ Frame

Fig.5 Output

IV. CONCLUSION

In the home automation system, by integrating multi-touch mobile devices, cloud networking, wireless communication, and power-line will be able to design and build a fully functional home automation system. It will allow the user to control various appliances and lights within their home from any location in the world through cloud network using 1) mobile devices, 2) PCs, or 3) in-home graphics user interface (GUI) on their home servers. Using this

system as framework, the system can be expanded to include various other options which could include home security feature such as open-door and motion detection, energy monitoring, or weather stations. We propose a scalable architecture, by using remote access, different communication channels, as well as various ways of offering the functionality to multiple user interfaces. We hide the complexity of the notions involved in the home automation system by including them into a simple, but comprehensive set of related concepts. Thus we have design an internet based home automation system which will enable one to remotely manage his/her appliances from anywhere, anytime.

V. REFERENCES

[1] Nicholas D., Darrell B., Somsak S., "Home Automation using Cloud Network and Mobile Devices," IEEE Southeastcon 2012, Proceedings of IEEE.

[2] Chan, M., Campo, E., Esteve, D., Fourniols, J.Y., "Smart homes-current features and future perspectives," Maturitas, vol. 64, issue 2, pp. 90-97, 2009.

[3] Das, S.R., Chita, S., Peterson, N., Shirazi, B.A., Bhadkamkar, M., "Home automation and security for mobile devices," IEEE PERCOM Workshops, pp. 141- 146, 2011.

[4] Laur, I., "Microcontroller based home automation system with security," International Journal of Advanced Computer Science and Applications, vol. 1, no. 6, pp. 60-65, 2010.

[5] Piyare, R., Tazil, M., "Bluetooth based home automation system using cell phone," IEEE ISCE, pp. 192-195, 2011.