

IOT and Bluetooth Based Home Automation Systems that works with & without Internet with scheduling and timer feature

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ABSTRACT

Home automation systems are very common nowadays and commonly installed in Banks, shops, offices, home etc. In this proposed paper we shows that how we can control all home appliance over IOT application and Bluetooth application also. As many time when internet is not available[1]. we cannot controlled appliance by iot and its major issue with IoT to solve this we add Bluetooth application feature so our project firstly check whether internet connection available or not if it is available then we can controlled by IoT application but if internet not available it switch control to android application that based on Bluetooth[2]. Even we can automate our task by applying scheduling feature means we can on/off any device by on specific time just by applying scheduling its time table also we can set timer for turn off that device by our scheduling and timer feature when its connect on internet and it helps to make our task autonomous.

Keywords : NodeMcu, Bluetooth Module, Home Automation, IoT, Relay

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I. INTRODUCTION

Home automation system makes the operations of various home appliances more convenient and saves energy. With the energy saving concept, home automation or building automation makes life very simple nowadays. It involves automatic controlling of all electrical or electronic devices in homes or even remotely through wireless communication. Centralized control of lighting equipment's, air conditioning and heating, audio/video systems,

security systems, kitchen appliances and all other equipment's used in home systems is possible with this system. Home robotization frameworks have gotten inescapability beginning late, paralleling the advances in the likelihood of Internet of Things. Notwithstanding the manner in which that robotization for business structures is a make improvement, computerization applications for habitations are a decently new upgrade, which is being gotten a handle on by customers. Home robotization joins the checking and control of

exercises, for example, lighting, warming, ventilation, cooling (HVAC), electrical mechanical gatherings, sound frameworks, perception cameras, passage shocks, and cautions. Home robotization has various focal points, for instance, comfort, extended security, and essentialness viability.

In a period of remote development, for instance, Bluetooth, WiFi, Zigbee, and GSM, customers need home mechanical assemblies to be related remotely. All of these remote developments has its very own giganticness and subtleties. This endeavor adequately uses Bluetooth with an open repeat of 2400 Hz, an extent of 100 meters, and a speed of around 3 Mbps. There are two or three stresses to be kept an eye on while organizing a home computerization structure. The system should be arranged such facilitates new devices, with the target that these devices should't be an issue at a later stage. On the host side, the framework should be straightforward, with the objective that the devices are often checked and controlled viably. In the occasion of any issues later on, the interface of the structure should give definite organizations. Finally, the structure should be smart with the target that it might be commonly used by anyone in the market.

II. LITRECTURE SURVEY

Home automation, often referred to as domestics is building automation for a home, called a smart home or smart house. The scope of home automation is no more limited to just controlling lights and heaters, it has spread its domain to the world of smart devices including TV, Laptop, Tabs etc. and even automated pet feeding machines. With the rapid increase in usage and reliance on the features of several smart devices, the need for interconnecting them has become genuine. As it is said, 'Necessity is the mother of invention', working towards home automation has become a new accepted challenge. The past few years have witnessed a lot of solutions being proposed and

implemented successfully for the same. The initiative started in 1975, when the first general purpose home automation network technology, X10 was developed. X10 is a communication protocol for electronic devices and is used widely. Home robotization was first brought into the world market amid the 1970s, anyway it fail to meet the wants for people and was fruitless. There were various reasons related with the mistake of the home robotization system. The system was neither straightforward nor cost capable. At present, the main point to be recalled when arranging a home computerization system is that it should be cost-capable and easy to present[1].

The fundamental thought behind this paper become to form a flexible application on a phone framework so the buyer are often in expense of computerized approach; see the quantity of float that has been utilized in the amount of dollars, therefore the issue is that the multifaceted nature in sparing power which could be resolved. advancement and format transformed into brought out through gathering measurements the use of poll to the respondents format strategy utilizing explanations to convey polls and to dissect writing, and after that thereafter doing the structuring in equipment (that is that the microcontroller) made United rendition Language (UML), database planning, code usage and presentation of UIs on an IOS and on the Android. The consequence of this view is that the usage of a foreign household robotization cause in cell that would help the clients in rate to controlling the house and making sense of the fees of solidarity that has been used in each advanced device all at once that the enhancement is completed[1][2].

A existing Zigbee based wireless router for home automation systems applications, which is capable of smart devices monitoring, controlling and enabling has been proposed. When a smart device is joined to the domain of the home automation system, the system will automatically require the related basic

information of this device using which the device can be monitored and controlled. Speech based home automation that uses human voice control to operate electrical appliances in the home is also being implemented using the HS-05 Bluetooth module and Arduino Bluetooth controller mobile application for switching on or off the appliances[3].

Here in this proposed paper we are Implemented Iot and Bluetooth base hybrid home automation system. In proposed research project we have controlled all home appliances using IoT switches which could be controlled and could be monitor from anywhere through anywhere and for multiusers we have used Bluetooth feature in hybrid. The Bluetooth connectivity is given for the multiuser interface as there in home anyone could connect with this system using Bluetooth connectivity and could be control these home appliances from this particular range of Bluetooth this will be low rage local area network communication.

III. SYSTEM ARCHITECTURE

In this proposed paper we have controlled all home appliance over IOT application and Bluetooth application also. As many time when internet is not available we cannot controlled appliance by iot and its major issue with iot to solve this we add Bluetooth application feature so our project firstly check whether internet connection available or not if it is available then we can controlled by iot app but if internet not available it switch control to android application that based on Bluetooth.

Even we can automate our task by applying scheduling feature means we can on/off any device by on specific time just by applying scheduling its time table also we can set timer for turn off that device by our scheduling and timer feature when its connect on internet and it helps to make our task autonomous.

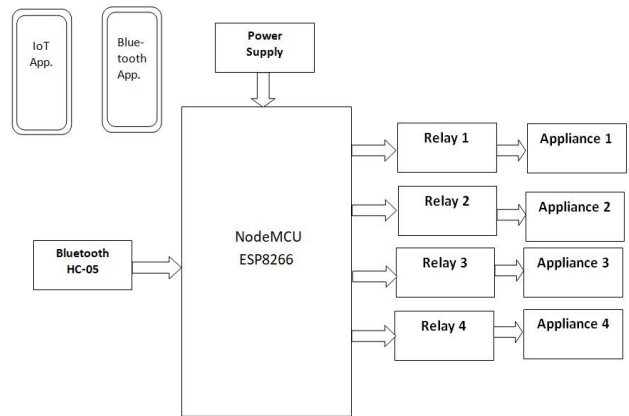


Fig.1 Block Diagram

3.1 Hardware

- NodeMcu Esp8266 Controller
- Bluetooth Module HC-05
- 4 Channel Relay Board

3.2 Flow Chart

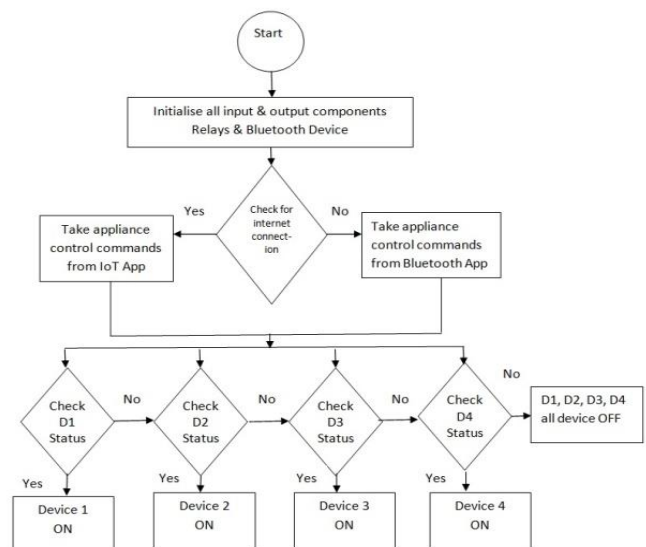


Fig.2 Flow Chart of working

This Bluetooth and IoT base home automation system is hybrid home automation system only which provide multiusers features with both IoT and bluetooth connectivity feature. In existing home automation product we have to replace the existing switches with the IoT switches thereafter thi switch

become Automates. It couldn't be operated by manually or other user.

Here in this hybrid home automation system we have replace this IoT switches with this hybrid switches. So that in this hybrid home automation system user can operate their home appliances from anywhere also they could monitor that whether any appliances is remains on and also control it by IoT application.

In this project we have created an IoT application interface whereas there 4 buttons which could be used on and off the home appliances. In IoT application Named blynk when user press on or off button in application this command sends to the internet cloud of this IoT application Through this IoT cloud it sends the command for on or off to Microcontroller Esp8266. This Microcontroller operate all the home appliances by sending the output signals through relay.

In Bluetooth base home automation system when user press on or off button in mobile application which is connected with Bluetooth connectivity. When user gives the command through bluetooth application it send directly to the microcontroller by the bluetooth module interfaced in this system. Then after this microcontroller forward this command to the relay module through the output signals

NodeMcu Controller



Fig.3 Node MCU

NodeMCU is an open-source Lua based firmware and development board specially targeted for IoT based Applications. It includes firmware that runs on the ESP8266 Wi-Fi SoC from Expressive Systems, and hardware which is based on the ESP-12 module.

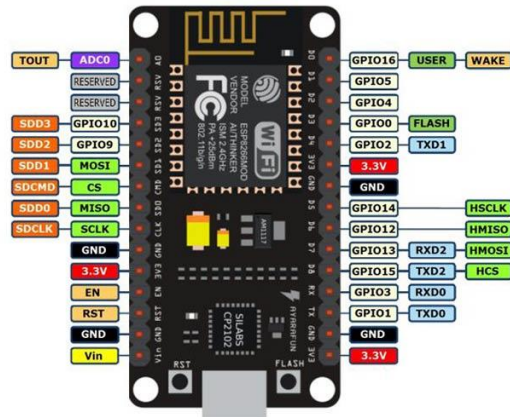


Fig.4 Node MCU Pinmode

HC-05 - Bluetooth Module

The HC-05 is a very cool module which can add two-way (full-duplex) wireless functionality to your projects. You can use this module to communicate between two microcontrollers like Arduino or communicate with any device with Bluetooth functionality like a Phone or Laptop. There are many android applications that are already available which makes this process a lot easier. The module communicates with the help of USART at 9600 baud rate hence it is easy to interface with any microcontroller that supports USART. We can also configure the default values of the module by using the command mode. So if you looking for a Wireless module that could transfer data from your computer or mobile phone to microcontroller or vice versa then this module might be the right choice for you. However do not expect this module to transfer multimedia like photos or songs; you might have to look into the CSR8645 module for that.



Fig.5 HC-05 - Bluetooth Module

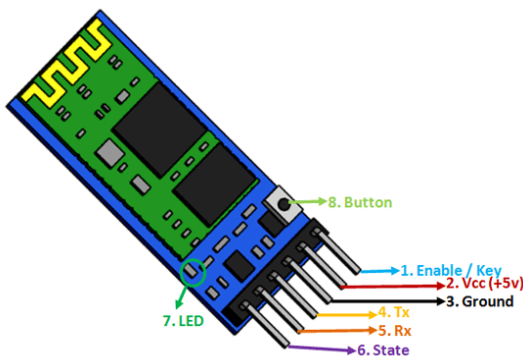


Fig.6 HC-05 - Bluetooth Module Pin mode

HC-05 Default Settings

Default Bluetooth Name: "HC-05"

Default Password: 1234 or 0000

Default Communication: Slave

Default Mode: Data Mode

Relay

Relays are simple switches which are operated both electrically and mechanically. Relays consist of an electromagnet and also a set of contacts. The switching mechanism is carried out with the help of the electromagnet.



Fig. 7 5v Relay switch

Features of 5-Pin 5V Relay

- Trigger Voltage (Voltage across coil) : 5V DC
- Trigger Current (Nominal current) : 70mA
- Maximum AC load current: 10A @ 250/125V AC
- Maximum DC load current: 10A @ 30/28V DC
- Compact 5-pin configuration with plastic moulding
- Operating time: 10msec Release time: 5msec
- Maximum switching: 300 operating/minute (mechanically)

Equivalent Relays 3V Relay, [12V Relay](#), 1-channel Relay module, 4-channel Relay Module.

IV. Results

In this project we have proposed hybrid home automation system which could be controlled by smartphone through IoT application and also it could be controlled from home there self from Bluetooth application. Also it could be monitor weather any home appliances status whether it is on or off.



Fig.8 IoT Application

V. CONCLUSION

In our system we have successfully made implemented hybrid home automation system which beats the existing Iot base home automation system which are working only on the IoT interface. so here by we have proposed this hybrid home automation system. By using this Hybrid home automation system we have saved electricity by monitoring and controlling our home appliances from anywhere and also gives feature of multiuser from Bluetooth interface.

Fig. 8 shows the user interface of IoT application have to separate buttons for shows real-time status and controlling this devices.

Fig. 9 shows the user interface of Bluetooth application with separate buttons for separate appliances.

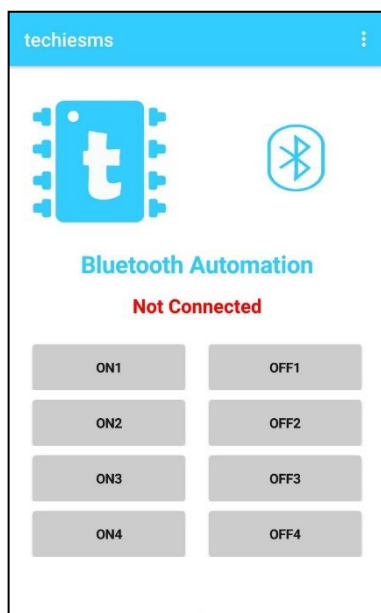


Fig.9 Bluetooth Application Mobile Interface

VI. REFERENCES

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