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IOT Based Automatic Control of Electrical Devices Using Smart Switch

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Abstract*: The development of a firmware for a Smart Switch, which can control the on-off of any electrical device at home by using Internet. The Smart Switch is connected to Internet via Wi-Fi TM, through a computer, smart phone, tablet or any device with Internet access. This connection is perform by using IP per-programmed into the smart switch in a web browser like firebox, chrome that is use for load the smart switch server, which will open a configuration page to write the data of the user's network. Then, the user will select in automatic mode the network, the security type, and the user must have written a pass phrase. It is necessary to restart the Smart Switch in order to get access to Internet, from which the user can control the Smart Switch simply sending to the electrical device, this process is done in principle via the Internet. As a medium to work to perform operation remotely.

Keywords: Home automation, Internet of things, smart switch, Wi-Fi technology

I. INTRODUCTION

A home application control system (HACS) is a system which is controlled by a remote system. In order to activate home appliances and to allow for different ways of cooking, the home appliances control system needs
mechanism for communication between the different devices in the system, and for coordination among the various processes running on such devices.

Microwave, Oven, TV, and garage door etc. these home appliances are operate by remotely. This home appliances are controlled by remote devices such as mobile phone, Desktop, and palm-top. They are connected through wireless application control protocol. The home appliance control system receive command and this command are manipulated by user. At that time system dispatch command to respective appliances that will perform action. This home appliance helpful for human need, when the user is very hungry, then microwave oven may need to respond to the user's request that it operate maximally to cook the food as it can for example if the user is tired, may come home late, hungry then the system may be asked to full cook or not and periodic warming up every 10 minutes afterward.

The home appliance control system also be safe. When the microwave oven should now too hot or blow up then user can automatically off that system. From anywhere we can controlled the system. It protect home from the home the outsider's.

We are living in the world of automation where most of the system are getting automated, such as industrial automation, homes and other business sectors .Home automation system involves automatic controlling of home appliances using different technology and controllers over smart phone or tablets.

It saves energy and makes the operation of various home appliances more convenient .It involve automatic controlling of electrical devices in homes or even remotely through wireless communication. All equipment like audio and video system, security system, and kitchen appliances used in home system is possible with this system.

I. LITERATURE REVIEW

Kanma is developed home appliances in 2003 control system by using Bluetooth with android phone. is developed in java. This system consist of Bluetooth, phone, and electrical devices. The hardware consists of a SRAM and a Bluetooth 20MHz 16bit CPU .The communication adapter board is connected to the cellular phone and to the home appliance through serial ports. The appliances can communicate with the cellular phone control by using Bluetooth. Wijetunge et 2008 describe Zigbee and Bluetooth, RF, Wi-Fi are wireless technology .Today this technology is rapidly increase it's aim is implementing control system and monitoring particular system. The communication between the remote server and controlling module is done using wireless technology. The server can communicate with this wireless technology. The controller is based on Bluetooth and ATMega64 microcontroller. The designed controller was deployed in a home automation application for a selected set of electrical devices.

Malleswaran, 2010 decribe the embedded system consists of A/D, ARM7 based LPC 2148 microcontroller board, sensors, signal

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conditioning, and communications interface. The main function of web based system is to collect the real time data information and remotely send the data in the form of user defined data transmission style. Remote Computer collects running status and the data through the network and provides the comparison on the historical data. If the parameter value is not matched from the original set value, then corrected signal is sent to the control unit. Flammini 2007, this paper suggest architecture for environmental telemonitoring that based on GSM. It delocalise point. Local subnets contain two major blocks; AS means Acquisition Station where actuators and sensor are located and TM means Transmitting Module i.e., the module that handles several stations and sends data to the control center. Each Acquisition Station acts as a data logger, storing in its internal memory device field data; communications between Acquisition Station and Transmitting Module are cyclic round robin, with a cycle time of about 1–10 min. This network basically used all over the word .As this network rapidly growing, with the rapid expansion of the Internet, there is the potential for the monitoring and remote control of such network enabled appliances. However, the new and exciting opportunities to increase the connectivity of devices within the home for the purpose of home automation through Internet are yet to be explored. Bronle et at describes home automation as the "introduction of technology within the home to enhance the quality of life of its occupants, through the provision of different services such as tele health, multimedia entertainment and energy conservation". There has been significant research into the field of home automation with many other communication protocols like hand gestures, blue tooth etc. The XlO industry standard, for communication between electronic devices,is the oldest standard identified from the author's review, providing limited control over household devices through the home's power lines. Srikanthm at introduced a Blue tooth based home automation system, consisting of a primary controller and a number of Blue tooth sub-controllers. AI-Ali et at developed a Java based home automation system. The use of Java technology, which incorporates built-in network security features, produces a secure solution. However, the system requires an intrusive and expensive wired installation and the use of a high end Pc. Baudel et at proposed a novel control network, using hand gestures. The controller uses a glove to relay hand gestures to the system. Ardem et at introduced a phone based remote controller for office and home automation.occur over a fixed telephone line and not over the Internet. The system can be accessed using any telephone that supports dual tone multiple frequency (DTMF). Sirsath N. S, proposed a Home Automation system integrated of multi-touch mobile devices, networking,power line communication , and wireless communication to provide the user with remote control of various lights and appliances within their home.e. System uses a consolidation of a handheld wireless remote,mobile phone application, and computer based program to provide a means of user interface to the consumer . Basil Hamed, described the design and implement a control and monitor system for smart house. Smart house system consists of many systems that controlled by LabVIEW software as the main controlling system in the paper. Also, the smart house system was supported by remote control system. The system also is connected to the internet to monitor and control the house equipment's from anywhere in the world using LabVIEW. Deepali Javale, presents assist to handicapped/old aged people. It gives basic idea of how to control various home appliances to provide a security using Android phone and tab. The design consists of Android phone with home automation application, Arduino Mega ADK. User can interact with phone and send control signal to the Arduino which in turn will control other embedded devices and sensors. Mohammad El-Basioni, proposed a new design for the smart home using the wireless sensor network and the biometric technologies. The system employs the biometric in the authentication for home entrance which enhances easiness as well as home security of home entering process the structure of the system is described and the incorporated communications are analyzed, also estimation for the whole system cost is given. WB-SH is designed to be capable of incorporating in a building automation system and it can be applied to clinics,offices and other places.

I. PROPOSED SYSTEM

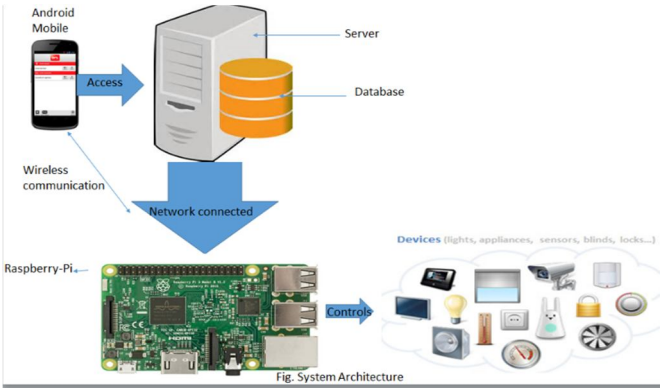


Fig: connection from user to home appliances

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We have developed an android application which will pass signal to server through Internet by which we can controlled our home appliances as the shown in fig. An android application will allow user to control their home appliance. We are also managing a centralized server for secure database which will provide a sequential flow to the system. To handle all operation we are using micro-controller, which allows to pass the signal to home appliance in a efficient way. Firstly user will create a unique user-name and password.

By using remotely controlled system, we can overcome the disadvantages of existing system. We have developed a android application which will pass signal to server through Internet by which we can controlled our home appliances as the shown in fig. An android application will allow user to control their home appliance. We are also managing a centralized server for secure database which will provide a sequential flow to the system. To handle all operation we are using micro-controller, which allows to pass the signal to home appliance in a efficient way. Firstly user will create a unique user-name and password

Firstly we are creating an android application which helps user to operate their home appliances through their mobile. In which we are using micro-controller and a centralized server which will help to pass the signals to home appliances .We are using the internet as medium perform our operation



Fig. Raspberry Pi

The Raspberry Pi is developed in the United Kingdom. It consumes power 1.5W to 6.7W. It provides 1GB LPDDR2 RAM at 900 MHz. It is series of small single-board computer. A free Debian-based OS. Raspbian comes with all the basic programs and utilities you expect from a general-purpose operating system.

It work fast than other. It is also known as ras pi or rpi.

I. MATHEMATICAL MODEL

A. System Description:

Let, S be the System such that,

S = {I, O, F, Success, Failure}

Where,

I=Set of Input

O=Set of Output

F=Set of Function

B. Input

I = {I1, I2, I3, I4}

Where,

I1=User information

I2=User login

I3=Password

I4=ON OR OFF status

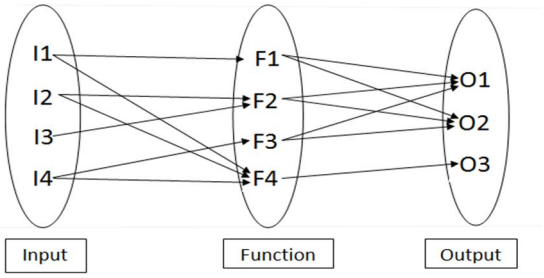
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C. Functions

F = {F1, F2, F3, F4}
Where,
F1=Register
F2=Login
F3=Select and Checking Appliance Status
F4=View user detail

D. Outpu:

O = {Appliance status, O1, O2, O3}
Where;
O1 = Success Case (Successfully device on; successfully device off)
O2 = Failure Case (Incorrect Input OR Incorrect operation)
O3 = Report



I. OBJECTIVE

Provide the home automation is very important now-a-days. The main aim of project s protect home by using remote devices such as by using phone, Desktop and laptop .In this project we are using Raspberry pi. Raspberry pi identify different type of electrical devices.

I. FUTURE WORK

In future, we can use the LPC2148 micro-controller, it has been inbuilt Wi-Fi module and there is no need of GPRS module. Besides that we can also detect the fault load and inform the user through the alert message.

I. APPLICATION

Household and security application, Industrial and used for lab monitoring system. Home automation results in satisfaction, safety benefits, and energy efficiency leading to improved quality of life.
also increase energy efficiency by remotely powering of system and appliances when they are not in use. It also use for saving purpose that is no more wasting money on light lift on when you are not in home. It also save time. We can also on and off store, iron, washer, or desktop computer after leaving home for a long trip. Many companies have been introducing lights that are connected wirelessly via. Wi-Fi to allow user to access them remotely.

I. CONCLUSION

Raspberry Pi proves to be a smart, economic and efficient platform for implementing the home automation .By using Raspberry Pi which can be easily implemented and used efficiently. The code provided is generic and flexible in a user friendly manner and can be extended for any future applications like surveillance, power control, etc. easily. Moreover, this technique is better than other home automation methods is several ways.
It identify different type of electrical devices. It is easy to implement.

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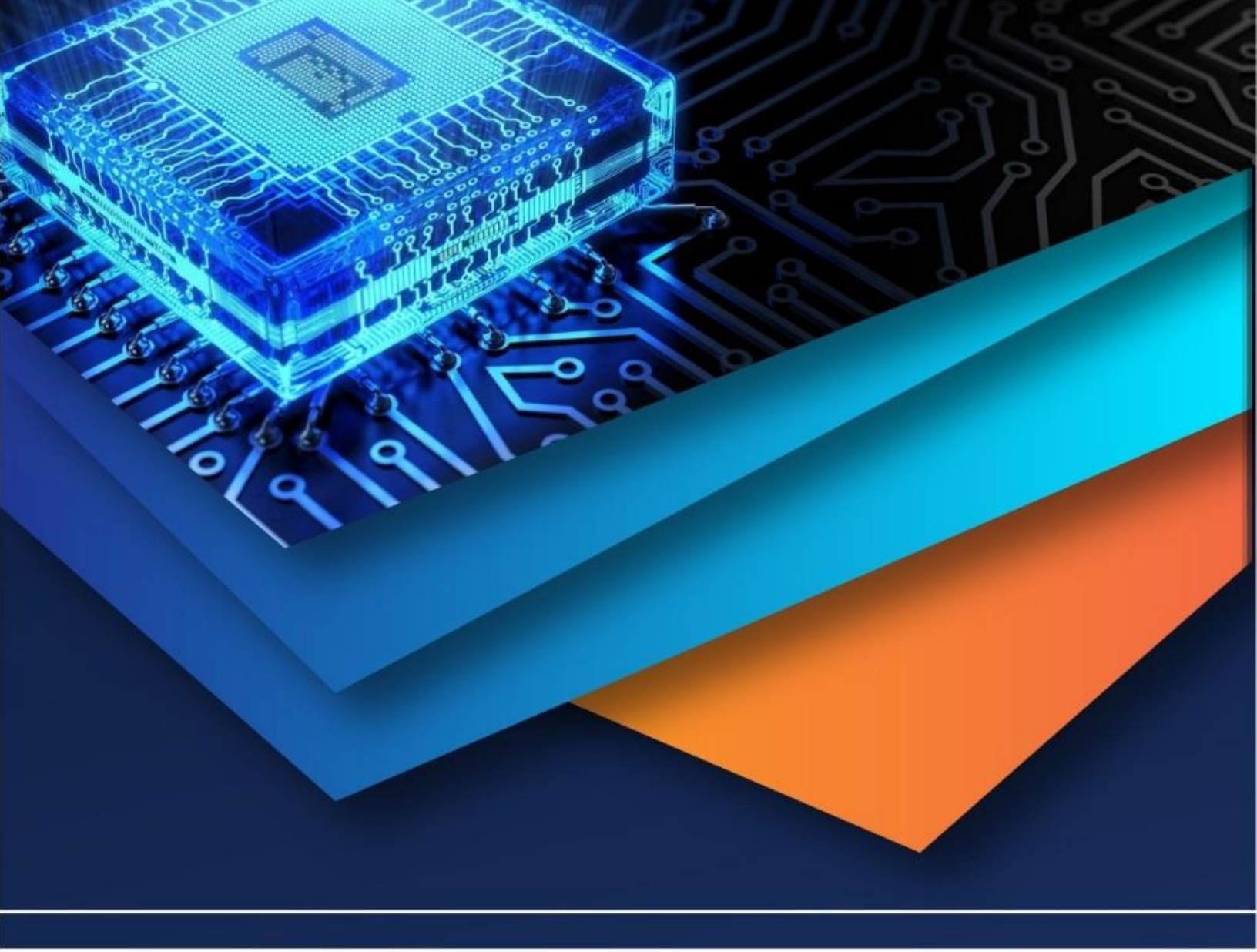
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