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A Highly Secured System for Home Appliances Embedded with Electronics, Software and Sensors

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Abstract – Now all people require security for their homes. To provide security, there are many advanced technologies. The Raspberry Pi is now presented to this world to provide security to home which often is called smart home. This paper revolves this security problem by creating a home automation system with the main focus being controlling automatically, such as the bulbs, fans, TVs etc by smart phone. This security can be achieved by using raspberry pi as the control device, and the smart phone which acts as user interface. The mobile device will be interfaced with a home appliance network through the internet gateway. The android device would control the home appliances using the internet and raspberry pi as the server system. The relay circuit board is interfaced to the raspberry pi which controls the home appliances.

*Keywords–***Android, Embedded System, IoT, Raspberry Pi.**

I. INTRODUCTION ToIoT

The (IoT) Internet of things is the internet based working of physical home appliances, vehicles, buildings, and other items embedded or combined with the electronics, software, actuators, sensors, and network connectivity that activate these objects for collecting the data and exchanging data. In 2013, the Global Standards had initiatived on IoT which is defined as "the infrastructure of information society". The IoT allows objects to be sensed through internet or controlled remotely across existing network infrastructure and creating the opportunities for integration of the world into the computer based systems. It would be resulting in improved accuracy, efficiency and financial benefit in addition to the human intervention.

So many problems would be solved by IoT. A thing in the internet of things, can be a heart patient can be checked with a heart monitor implant regularly, a farm animal can have a biochip transponder by which it can be identified automatically, an automobile that has been built in electronic sensors to alert the driver when he was tired with pressure or any other manmade or natural object that can be assigned with an IP address and is provided with ability to transfer the data over that network. Commonly, an IoT is expected to contain advanced connectivity of systems, devices and services that should be beyond the M2M communications and covers a no. of areas, protocols and applications.

II. EXISTING SYSTEM

So many existing methods are there by which we can implement home automation system for security purpose. Little of them include,
a) We can control home Appliances by using a Remote Control.

The bulbs, fans can be turned on or off automatically with remote. There will be an electronic sensor instead of going near to the switch board and putting on or off the switch manually. The top companies such as Philips and Gold Medal had already implemented this kind of control system.
b) The control of Home Appliance l using free handed gestures.

To control home appliances in this type, the person has to be present in sight to the appliance that should be needed to control and a predefined gesture. One must be used to make the device turn on and other gesture must be used by human to make the device turn off.
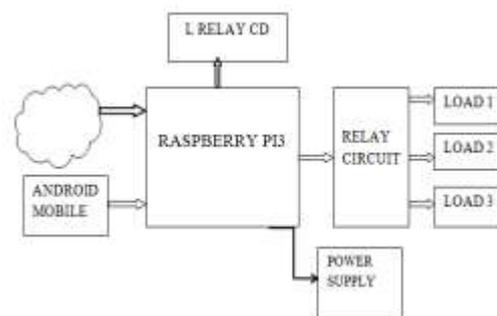
III. PROPOSED SYSTEM

Fig.1. Block Diagram

In this paper, we introduce a system, which is somewhat different than the existing system. We now, are going to implement the security system by using direct Wi-Fi with the raspberry pi3 board. The advantage of this proposed system is that the home appliances can be monitored and controlled from the long distances. The Raspberry Pi is a small sized computer that can be plugged into your TV. It is a little capable computer which can be mainly used in implementation of the electronics projects, and for many of those things that your personal computer does, like word-processing, spreadsheets and playing games. The videos can also be played with high-definition.
• Our paper deals with design, monitor and control of

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the home automation using raspberry-pi3 as the central processing device, and any smart phone, android based which would act as a interface.

- This system mainly helps us in monitoring and controlling the home appliances from the long distances when compared to Bluetooth based system

IV. RASPBERRY PI

The Raspberry-Pi is a low cost, **small sized computer** that can be plugged into a computer monitor or smart TV, and uses a keyboard and also mouse. It is a little device that enables people for exploring computing, and learning how to program in languages such as Scratch and Python. It has the capability to do everything we could expect a personal computer to do, from browsing the internet, playing high definition videos, for making spread sheets, word-processing and also playing the games.

What's more, the Raspberry Pi has the extra ability to interact with the outside world, and can be used in social networks such as tweeting, chating etc. It can be also used in sending mails to others.

There are four Raspberry Pi models currently. They are the Model A, the Model B (these computers ranged in spec and abilities), the Model B+ and the Compute Module. All models can be used on same CPU, but their hardware features are different.

To get the OS for the device, the Rasberry-Pi website created two images that could be installed in SD card, one of them was based off of Debian a popular lightweight Linux OS and was called Raspbian, the another was called Raspbmc and was based off the popular media centre software Kodi (Formally known as XBMC).
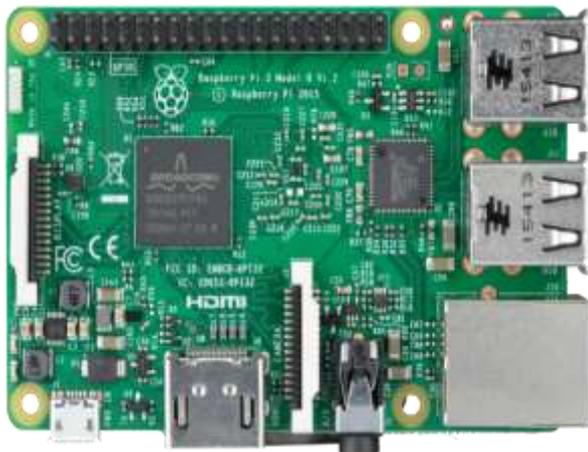

Fig. 2. RASPBERRY PI3 Board

V. IMPLEMENTATION OF PROJECT

Heart of this project is raspberry pi minicomputer. The Wi-Fi module scans for the available network and connects to the network with pass-word. To implement the project, we have to write the appropriate program for the

required result. For this we are writing the code in python language. Firstly after connecting the raspberry pi to the system we have to configure the keyboard and configure the Wi-Fi by writing the username and password to which the board has to connect.

- Open Lx terminal and type "sudonano home automation.py" and press enter.
- Start the program with importing all the supporting files, initialize LCD for displaying the output. Then initialize the Wi-Fi for the working of project.
- Initialize the GPIO pins for different inputs and outputs for controlling the home appliances.
- Now write the program and press CTRL+X for saving the program.
- To execute the program type "sudo python home automation.py" and press enter.
- Interface the LCD to Raspberry Pi for displaying the output after execution.
- Make the connections such as relay circuit for switching the loads and L293D for driving the motor to be opened or closed the door.

VI. RESULT AND APPLICATIONS

- This project can be executed by giving the power supply for the Raspberry pi board, relays and LCD. Configure Wi-Fi with user name as "project" and password as "project 1235". Then the Raspberry pi connects for the Wi-Fi automatically and is ready to use.
- By using the android mobile give the appropriate input with the URL written in the program. For example, when the input given is X=1 then the raspberry pi switches the allotted relay, displaying the result on LCD as LOAD 1 ON and turning the allotted light ON. When the give the input as 2 then load1 gets turned off and is displayed on LCD as LOAD I OFF.

Fig. 3. Project output when load1 is on

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VII. CONCLUSION

The conclusion would be that the home appliances can be controlled by raspberry-pi with Wi-Fi connection. We can also monitor the status of the electrical bulbs, fans etc. By this technology, we can reduce the power in home and industry. We can also enhance the project to monitor the weather condition, to estimate the toofans, tsunami etc.

REFERENCES

[1] Hari Charan Tadimeti, Manas Pulipati, "Overview of Automation Systems and Home Appliances Control using PC and Microcontroller", Volume 2 Issue 4, April 2013
[2] Stevens, Tim, "The smart office", ISBN 0965708101(1994)
[3] Prof. M. B. Salunke, Darshan Sonar, Nilesh Dengle, Sachin Kangude, Dattatraya Gawade, "Home Automation Using Cloud Computing and Mobile Devices", Vol. 3, Issue 2 (Feb. 2013), ||V2|| PP 35-37
[4] Zekeriyakeskin, Yunus Emrekocaturk, okan Bingol, kubilay Tasdelen, "Web-based smart home automation: PLC controlled implementation", vol11,NO 3,2014
[5] Sajidullah S.Khan, Anuja Khoduskar, Dr. N.A,Koli,"Home automation system", IJAET/Vol.II/April-June,2011/129-132
[6] Volume 6, Issue 1 (May. - Jun. 2013), PP 65-75 www.iosrjournals.org www.iosrjournal.orgVoice Recognition Wireless Home Automation System Based On Zigbee Dhawan S. Thakur1 and Aditi Sharma2. Eternal University, Himachal Pradesh, India
[7] R. A. Ramlee, M. H. Leong, R. S. S. Singh, M. M. Ismail, M. A. Othman, H. A. Sulaiman, et al., "Bluetooth remote Home Automation System Using Android Application," The International Journal of Engineering And Science, vol. 2, pp. 149-153, 11, January 2013.
[8] A. ElShafee and K. A. Hamed, "Design and Implementation of a Wi-Fi Based Home Automation System," World Academy of Science, Engineering and Technology, vol. 68, pp. 2177-2180, 2012.
[9] R. Piyare and M. Tazil, "Bluetooth Based Home Automation System Using Cell phone," in IEEE 15th International Symposium on Consumer Electronics, Singapore 2011, pp. 192 – 195.

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