Android App to Control Switch Board via Bluetooth

Ninad N. Deshpande[1] Mitesh Y. Anandpara[2] Ajay V. Bansod[3] Shubham S. Khedkar[4] Chitralekha R. Kachhawa[5]

[1,2,3,4,5]Department of Computer Technology

[1,2,3,4,5]Rajiv Gandhi College of Engineering and Research Nagpur, India

Abstract— in this era of technology luxury is obtained from automation technique. Home automation integrate the controlling of all appliances. Today everyone wants to take advantage of home automation to simplify their lives, enjoy luxury of wealth and tech-savvy. Considering the fact of increasing demand of home automation, an Android based control system is presented in this project where the proposed system is capable of controlling home appliances using an android device over Bluetooth. User will only have to install an android application in his / her android device, then he/she can switch ON or OFF any electrical appliances by simply touching the screen of android device. In the application, user will see some device buttons. Each button will be for any one appliances like Tube light, Bulb, Fan etc. This project can be used in various places like inside home, commercial buildings, auditoriums and classrooms etc. This is very user-friendly, cheap or worthwhile approach for implementing home automation.

Key words: Traditional Switch Board, Control Switch Board via Bluetooth

I. INTRODUCTION

The traditional switch board is used to On/Off the appliances. These traditional switches are not safe for children. If any person is physically challenged, then he/she faces some problems for accessing traditional switch board. Thus, it is not easily accessible to handicap or elderly person.

Existing advance home automations systems comprises of sensors, wall mounted terminals and many other costly components. Which also require internet and hence they are very costly. User can obtain home automation by buying automated appliances like smart AC, smart fridge etc. But that also requires exorbitant price.

Wireless type of home automation system is expensive due to replacement of conventional fixtures such as power socket and light switch to 'smart' fixtures in order to adapt to the system. These 'smart' fixtures are much more expensive than the conventional fixtures. Therefore, there is a need of a home automation system without replacement or modification of existing fixtures to reduce the cost.

II. EASE OF USE

A. Uses and Benefits

This project can enable user to remotely access switchboard connected to appliances. By providing them a very user friendly UI, so that user can efficiently operate the android app to control appliances. And another useful feature is that it user can use it not only for home appliances but also for machineries of commercial sectors. At last the ultimate benefit of this project is that it can make home automation low priced and increase its availability.

B. Motivation

According to the survey, the smart home market is expected to grow at a rate of 30 present year-on-year. With the growing economy, the home automation is surely going to get bigger and better with each year.

Nowadays people have their smartphones with most of the time, since the smartphones have Bluetooth facility in them, thus it's better to use Bluetooth for home automation. Android is the world's most widely used smartphone operating system with 80.7 percent market share, while IOS recorded just 17.7 percent market share, windows and black berry smartphones accounted for 1.1 percent.

Hence keeping all above points in mind this project proposes an approach to obtain home automation using an android smart phone via Bluetooth.

III. DESIGN AND ARCHITECTURE

The system is includes directly installed software application and conventional electrical switches on the wall. For the connectivity Bluetooth wireless connection is used which enabled the system communicates with graphical user interface (GUI) on smart phone without any cable.

This system will provide three different types of physical control methods to the Main Control Board. The first one is by pressing on the modified Low Voltage Activating Switches. The conventional high voltages switches will be replaced by some modified 5 Volt push buttons as the activating switches. The low voltage switch is to eliminate the risk of dangerous electrical shock by wet hand. The second method is to done by Android GUI installed in Smart Phone. The user can easily touch on the screen of the phone to control the home appliances. This portable method is able to assist the disabled people who have problem with locomotion difficulty.

A. Hardware Design

This section mainly discusses about the hardware construction of main control board. The hardware design includes main control board and Bluetooth module. In the Bluetooth module, low HC-05 Bluetooth module is chosen to establish the Bluetooth connection between main control board and the GUIs.

The existing switch connection is connected and controlled by the relay circuit inside main control board. Furthermore, multiple control boards can be installed in home. Bluetooth master device in PC/laptop is mostly able connect up to 7 devices in a "Pico-net". With these simple and low cost components, the main control board is constructed in pretty small size but still performs the strong functions and features of the system.

B. Software Design

Software design section includes the main functions of the

system designed Arduino circuit. The switches detection function is performed. The activating switches are designed by push buttons. Any input switch is pressed, it will interrupt the main function loop of the Arduino. Then, the Arduino will activate the relay and toggle the current appliance's switch status. At the moment, it also informs the change of switch status to all the GUIs that connected to the main board.

ACKNOWLEDGMENT

Bluetooth Based Home Automation System Using Android Phone is successfully implemented. This prototype consists of an Arduino, Voltage relays and HC-05 Bluetooth module, Android application provides user interface for remotely controlling the home appliances.

This Android application is able to control home appliances accordingly within house area. The home appliance is turned ON/OFF immediately without any delay when the button is pressed.

This system designed can provide benefit the physically challenged and differently abled people, who won't now require an extra helping hand for switching ON/OFF various home environment appliances.

REFERENCES

[1] The Official Android developer website: http://www.developer.android.com
[2] J. Mander and D. Picopoulos, "Bluetooth Piconet Applications," pp. 1-25.
[3] R.A.Ramlee, M.A.Othman, M.H. Leong, M.M.Ismail, S.S.S.Ranjit "Smart Home System Using Android Application" 2013 International Conference of Information and Communication Technology (ICoICT)
[4] Neng- Shiang Liang; Li-Chen Fu; Chao-Lin Wu. "An integrated, flexible, and Internet-based control architecture for home automation system in the internet era". Proceedings ICRA `02. IEEE International Conference on Robotics andAutomation, Vol. 2, pp.1101-1106, 2002.
[5] R. Piyare and M. Tazil, "Bluetooth Based Home Automation System using Cell Phone," in Consumer Electronics, 2011, pp.192-195.
[6] Kailash Pati Dutta, Pankaj Rai and Vineet Shekher, "Microcontroller Based Voice Activated Wireless Automation System:, VSRD-IJEECE", Vol. 2(8), 2012, 642-649
[7] Baris Yuksekkaya, A. Alper Kayalar, M. Bilgehan Tosun, M.Kaan Ozcan, and Ali Ziya Alkar, "A GSM, Internet and Speech Controlled Wireless Internet Home Automation System", IEEE Transactions on Consumer Electronics, Vol. 52, No. 3, AUGUST 2006
[8] N. Sriskanthan and Tan Karande, "Bluetooth Based Home Automation Systems," Journal of Microprocessors and Microsystems, 2002, Vol. 26, pp. 281-289
[9] Kwang Yeol Lee & Jae Weon Choi, "Remote-Controlled Home Automation System via Bluetooth Home Network" in SICE Annual Conference in Fukui, 2003, Vol. 3, pp. 2824-2829.
[10] Wijetunge S.P., Wijetunge U.S., Peiris G.R.V, Aluthgedara C.S. & Samarasinghe A.T.L.K., "Design and Implementation of a Bluetooth based General Purpose Controlling Module", in IEEE, 2008, pp. 206-211
[11] Sandeep Kumar & Mohammed A Qadeer, "Universal Digital Device Automation and Control", in IEEE, 2009, pp. 490-494 [10] Hiroshi Kanma, Noboru Wakabayashi, Ritsuko Kanazawa & Hirimichi Ito, "Home Appliance Control System over Bluetooth with a Cellular Phone", in IEEE, 2003, pp. 1049- 1053.
[12] Hiroshi Kanma, Noboru Wakabayashi, Ritsuko Kanazawa & Hirimichi Ito, "Home Appliance Control System over Bluetooth with a Cellular Phone", in IEEE, 2003, pp. 1049-1053.
[13] Laisa C. P. Costa, Nicholas S. Almeida, Ana G. D. Correa, Roseli D. Lopes and Marcelo K. Zuffo "Accessible Display Design to Control Home Area Networks" IEEE Transactions on Consumer Electronics, Vol. 59, No. 2, May 2013.

