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Review on Immanent Smart Home Automation System

Rajguru Pandurang V[1], Mansukh Dnyanraj D[2], Dhobale Shivaji S[3]

B.E. Students, Dept. of Computer Engineering, Jaihind College of Engineering, Pune, India

ABSTRACT: Now a day we are living in 21st century where automation is playing important role in human life Home automation allows us to control household appliances like light, door, fan, AC etc. In this paper represent a smart home automation system which is based on android app that communicate with the server which provide more than the switching functionalities, from the past few years there is huge development in the field of computer electronic &electrical system. Various smart & intelligence devices such as mobile phone, home security devices, air conditioner are set to meet the concept of smart home. To remove the use of personal computer we use AVR controller, so the cost the system should be less. Home appliances such as light, power plugs, temperature sensor, fan, smoke/gas sensor are integrated in the proposed smart home system to demonstrate the feasibility and effectiveness of the system.

KEYWORDS Smart home, Android mobile, AVR microcontroller, Ubiquitous system, Android SDK.

I.INTRODUCTION

As day to day the popularity and functionality of the mobile devices are continuously increasing, the demand for advanced embedded mobile application in people daily life is continuously increasing. We can connect everyday object like smart phone, smart television system, actuators to the internet where the devices are smartly connect together to make the new forms of communication among the people and themselves. The significant advancement of internet over the last few years has created a new way to the world of information and communication technologies. Smart Home Systems is the term commonly used to define a residence that uses a Home Controller to integrate the residence's various home automation systems.

The most Popular Home Controllers are those that are connected to a Windows based PC during Programming only, and are then left to perform the home control duties on a standalone basis. Integrating the home systems allows them to communicate with one another through the home controller, thereby enabling single button and voice control of the various home systems simultaneously, in pre programmed scenarios or operating Models. Smart home is a very promising field ,which has various advantage such as provide greater comfort, increased security and safety, the more rational use of energy saving. This research application is very important as in future it offers a powerful means for helping and supporting special needs of the elderly and people with disabilities, for controlling and monitoring the environment. There are number of things that need to be considered while designing a smart home automation system. The system should be affordable, scalable so the new devices can be easily integrated into the system, and it should be user friendly .In this paper a low cost, wireless smart home system for control and track the home devices is presented. Real time IP connectivity is use with server for controlling and monitoring devices remotely through an android app, which can be used by any android device.

II.SYSTEM MODEL AND ASSUMPTIONS

In a proposed system design, a low cost smart home system which remotely controlling and monitoring smart home appliances presented. The overview of the proposed system architecture is show in fig 1. The system consist of server (PHP & Java sever) and android apps developed using android SDK.

The main controller of the system is AVR microcontroller that hosts with server and can perform all the necessary action need to be carried out. The sensors and actuators are directly connected to the main controller using smart home apps we can remotely controlled and monitored smart home environment, which will communicate with the server via the internet. By using any internet connection 3G/4G network or Wi-Fi can be used on the device .The proposed system offers control of energy management system such as lighting, power plugs and HVAC (heating, ventilation and air conditioning) system. Here we can control the home equipment's like fan, Air conditioner, gate(open/close) etc .By using our android mobile phone. We doesn't need to carry remote control for ac, remote

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control for gate automation, remote control for fan control etc .Because all of this things are connected to a single unit & control through our mobile phone.

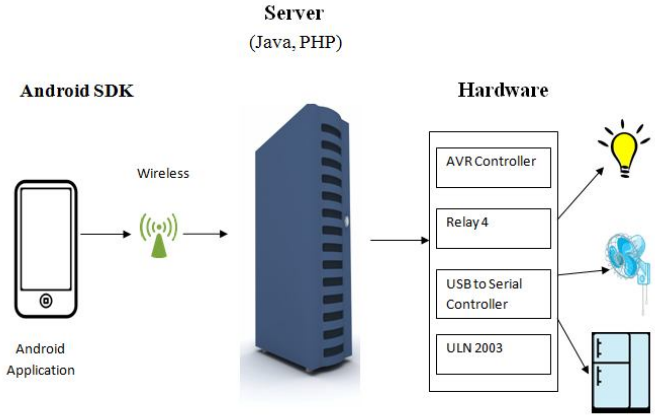

Fig 1. Proposed system architecture

Android platform:

Today there are several platform for developing smart phone application such as android, windows mobile, Symbian , iOS etc.In the proposed system we developed a application on android platform because most f the phone support android OS. Fr development and implementation of smart home app Android Software Development Kit(SDK) has used.SDK contain complete set of development tool such as libraries, debugger, sample code and tutorials for developing android app.

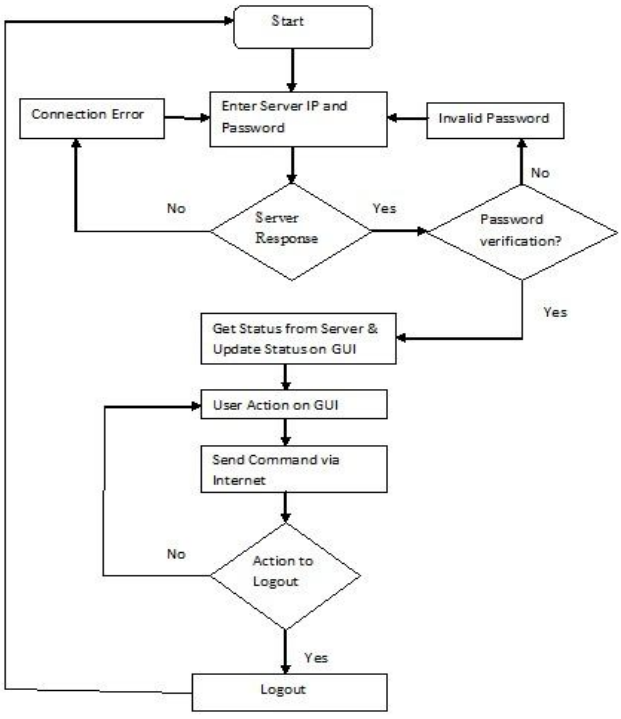

Fig 2. Flowchart for Controlling and Monitoring Home appliances.

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Initially successfully to connect and access the smart home web-server, the user has to enter the real IP address and password. If the web-server grants access to the smart home app, response packet containing response will be accepted. This app processes the response packet to determine the web-server's response. Response indicates the password is valid then the app will switch to the next controlling page and synchronize using the data from the response packet to show the real time status of the smart home devices. If the password is incorrect, response will be received. Automatic mode can be activated where the smart home environment will be controlled automatically, for example maintaining a particular room temperature and turning on/off certain light during night/day. When the user is performs an action on the smart home app, command packet is sent to the web-server via the internet. The command packet if formatted in such a way that web-server is easily able to read and extract the information from the packet.

III. LITERATURE SURVEY

Smart home is a new term, however many people does not have any idea of this. The area of home automation is increasing. Various smart system is have been proposed which is control via Bluetooth, internet, short message service(SMS) based. Bluetooth capabilities are good and most of the new laptop, notebook, tablets and mobile phone have inbuilt adaptor that will indirectly minimize the cost of the system, however there is some limitation of this system as the range of the Bluetooth is limited.

A Wi-Fi based home automation system is presented. It uses a pc which has a built in Wi-Fi card. .in these system a pc act as a web server that manage the connected home devices. The user can manage and control the system locally using LAN or remotely throw internet. This system support a broad range of devices such as power management components and security components. Another system is also developed which is internet controlled which has a dedicated web server, a database and a web page which are use for managing and interconnecting the home devices, but such a system require a pc which directly increased the overall cost of the system and power consummation. And also developing and hosting the web page will result in the additional cost.

A microcontroller based voice activated wireless automation system is presented. Using microphone user speaks the voice commands ,which is send wirelessly throw radio frequency(RF) link to the main control receiver unit. To extract the feature of vice command voice recognition module is used. The microcontroller processed the extracted signal to perform the desire action. The disadvantage of this system is it can only controlled from within the RF range. Also another one voice activation smart home automation system is developed in which a graphical user interface(GUI) is provided using Microsoft Visual Basic software installed in a pc and use Microsoft speech recognition system engine. A pc is used in this system which lead the cost and power consumption .The above discuss system can made a significant contribution to smart home system, however, a pc is used as a server which increased the power consumption and cost while the other require web page hosting which also increase the cost.

IV.CONCLUSION

In this paper we proposed a smart home system which can remotely controlled by using android application. The android based smart application communicates with the web server via internet. Install the android application on any android support device and easily control and monitored the home appliances.

The design consists of Android phone with home automation application ARM microcontroller. User can interact with the android phone and send control signal to the server which in turn will control other embedded devices/sensors. We have discussed a simple prototype in this paper but in future it can be expanded to many other areas.

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