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Omnipresent Smart Home Automation System

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ABSTRACT: Now a day's automation is playing significant role in human life Home automation allows us to control home devices like light, door, fan, AC etc. In this paper represent a smart home automation system which is base on android app that interface with the server which provide more than the altering functionalities, from the long-ago years there is vast growth in the field of computer electronic &electrical system. A variety of smart & intelligence appliances such as mobile phone, home security appliances, air conditioner are set to meet the concept of smart home. The use of AVR controller, so the cost the system should be low. Home appliances such as light, power plugs, temperature sensor, fan, smoke/gas sensor are integrated in the projected smart home system to express the possibility and effectiveness of the system.

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

I. INTRODUCTION

As day to day the popularity and functionality of the mobile appliances are continuously increasing, the demand for advanced embedded mobile application in people day by day life is constantly increasing. In this connect everyday object like smart phone, smart TV system, actuators to the internet where the appliances are smartly connect together to make the new forms of communication with the people and themselves. The momentous progression of internet over the last few years has created a new mode to the world of information and communiqué technology. Smart Home Systems is the term commonly used to describe a house that uses a Home regulator to integrate the residence's various home automation systems.

The primarily admired Home Controllers are individuals that are connected to a Windows base PC through Programming only, and are then left to perform the home control duty on a individual basis. Integrating the home systems allows them to communicate with each other through the home controller, thereby enabling only one button and voice control of the various home systems concurrently, in pre programmed scenario or operating Models Smart home is a very capable field, which has various benefit such as provide better comfort, increased security and safety, the more rational use of power saving. This examine 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 control and monitor the environment.

There are number of things that need to be measured while manipulative a smart home automation system. The system should be affordable, scalable so the new appliances can be easily integrated into the system, and it should be user friendly .In this paper a inexpensive, wireless smart home system for control and track the home appliances is presented. Real time IP connectivity is use with server for controlling and monitoring appliances remotely through an android app, which can be used by any android device.

II. RELATED WORK

Smart home is a latest concept, however many people does not have any proposal of this. The region of home automation is growing. Different smart system is have been projected which is handled by using Bluetooth, internet, short message service (SMS) based. Bluetooth capability are fine and most of the new laptop, tablets, notebook and mobile phone have integral adaptor that will ultimately minimize the cost of the system, however there is some drawback of this system as the range of the Bluetooth is narrow.

A Wi-Fi based home automation system is presented. It uses a pc which has a built in Wi-Fi card. In that system a pc proceeds as a web server that manages the communicated home appliances. The user can monitor and control the system nearby using LAN or remotely throw internet. This system supports a broad range of appliances such as power

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management devices and security components. Another system is also urbanized which is internet controlled which has a devoted web server, a database and a web page which are use for organizing and interconnecting the home appliances, but such a system have a personal computer which sprightly increased the whole cost of the system and power consummation. And also building and hosting the web pages will result in the additional cost. A microcontroller based voice activate wireless automation system is existed. Using microphone user speaks the voice commands, which are send wirelessly from radio frequency (RF) link to the core control receiver unit. To extract the feature of vice command voice recognition unit is used. The microcontroller process the extract signal to perform the desire action. The disadvantage of this system is it can only controlled from inside 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 personal computer and apply Microsoft speech recognition system engine. A pc is used in this system which lead the cost and power utilization .The above confer system can made a important contribution to smart home system, however, a pc is used as a server which bigger the power utilization and charge while the other require web page hosting which also increase the cost.

III. PROPOSED SYSTEM

In a planned system design, a low cost smart home system which remotely calculating and monitor smart home appliances presented. The overview of the proposed system architecture is show in fig 1. The system includes a server (PHP & Java sever) and android apps developed using android SDK. The major manager 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 straightforwardly connected to the key controller using smart home apps can remotely controlled and monitored smart house atmosphere, which will interface with the server via the internet. By using any internet connection 3G and 4G n\w or Wi-Fi can be used on the appliances. The projected system offers control of energy management system such as light, power plug and HVAC (heating, ventilation and air conditioning) system. Here can handle the home equipment's like Air conditioner, gate (open/close), fan, motor etc with the help of android phone mobile. In this there is no need carry remote control for ac, remote control for gate automation, remote control for fan control etc .Because all of this equipment are connected to a single unit & control through our mobile phone.

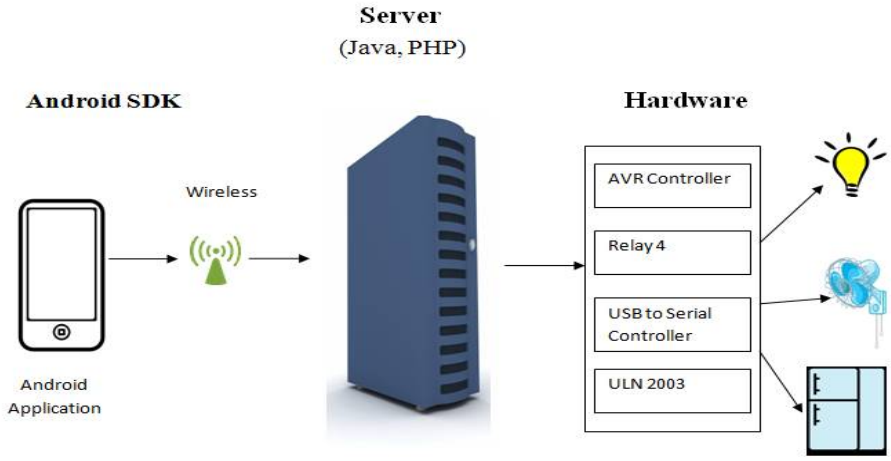

Fig.1.Proposed system architecture.

Android platform:

Nowadays there are a number of platform for developing smart phone application like android, black berry windows mobile, Symbian , iOS etc. In the projected system developed a purpose on android platform because most of the phone supports android OS. From development and implementation of smart home app Android Software Development Kit (SDK) has used. SDK enclose complete set of improvement tool such as libraries, debugger, sample

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code and tutorials for developing android app Firstly connect successfully and accessing the smart home web-server, the user has to enter the actual IP address and password. If the web-server grant permission to access the smart home app, response packet including response will be granted. This app processes the response packet to find out the web-server's response. Response indicates the password is legal then the app will switch to the next controlling page and match using the data from the response packet to display the real time status of the smart home appliances. If the password is wrong, response will be received. Automatic mode can be activated where the smart home atmosphere will be controlled robotically, 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 format in such a way that web-server is easily capable to read and remove the information from the packet.

Flow chart:

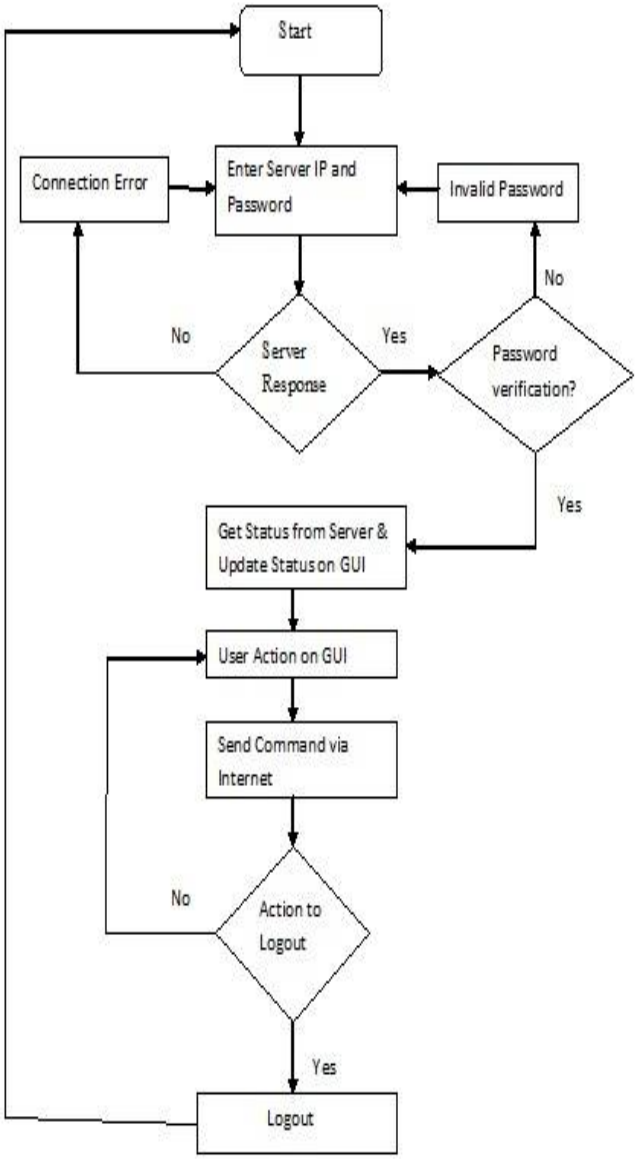

Fig.2.Flowchart for Controlling and Monitoring Home appliances.

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IV. SIMULATION RESULTS

This is the Sever GUI from user can interact with the server by using android app. Server check the user authentication and grant or denied access .

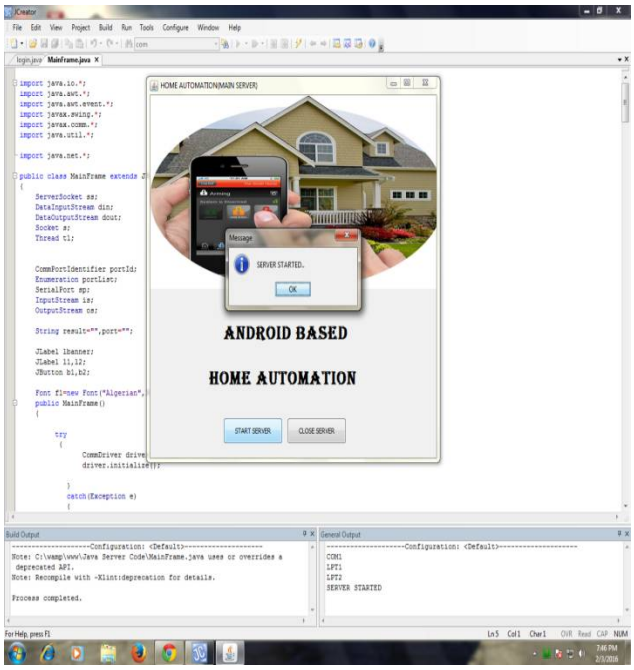

Fig.3 Server Machine GUI.

In the second screen shot it shows the command accessed by the user of system. Here user can enter the IP address on android application After successfully Authentication user can see the different devices connected to the system.

Fig 4. Devices connected to the system.

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After successfully Authentication user can see the different devices connected to the system, User can select particular device and change the status of device as per requirement.

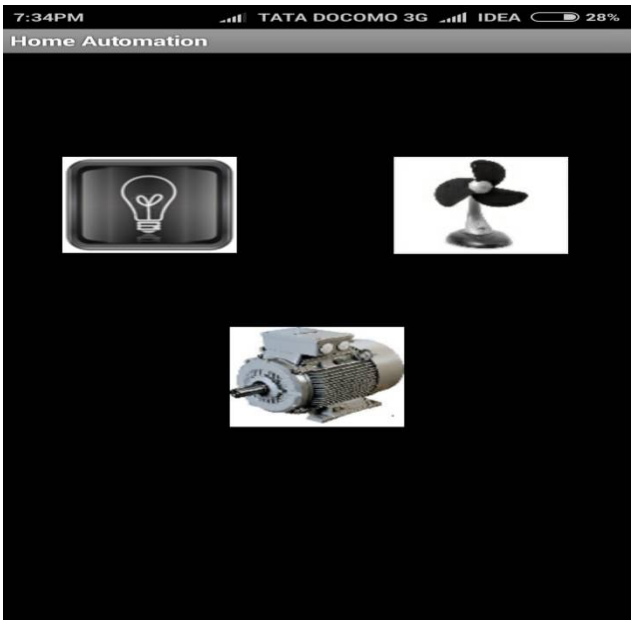

Fig 5.Devices connected to the system.

User select particular device and change the status of device in the following fig 6.user select fan and make necessary changes as per requirement .When user select a particular device user get status of device where the device is on or off.

Fig 6.Status of device(Bulb) .

User select particular device and change the status of device in the following fig 6.user select fan and make necessary changes as per requirement .When user select a particular device user get status of device where the device is on or off.

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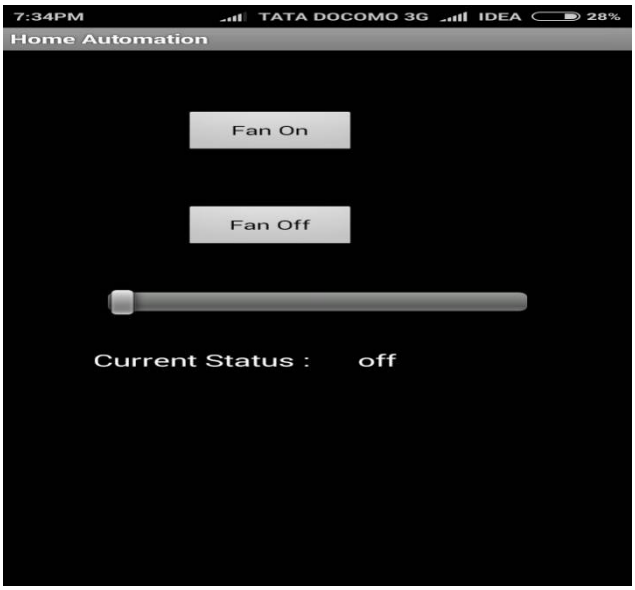

Fig 7.Status of device (Fan).

User select particular device and change the status of device in the following fig 7.user select motor and make necessary changes as per requirement.

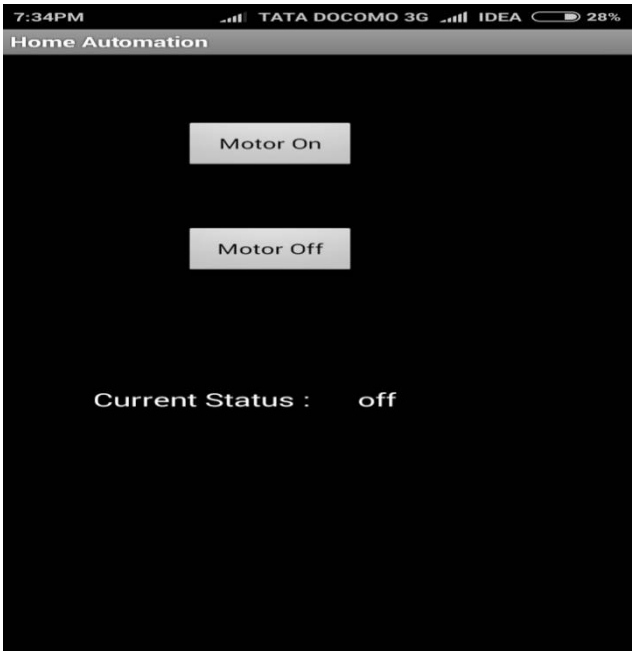

Fig 8.Status of device(Motor) .

In the above screen shot it shows the command accessed by the user of system. Here user can enter the IP address on android application, After successfully Authentication user can see the different devices connected to the system, user can select particular device and change the status of device as per requirement.

V. CONCLUSION AND FUTURE WORK

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In this paper a projected smart home system which can remotely controlled by using android application. The android base smart application interface with the web server by using internet. Install the android application on several android support device and simply manage and track the home appliances.

The design consists of Android phone with home automation relevance. ARM microcontroller. Person can interact with the android phone and send control signal to the server which will control other implanted appliances/sensors. In this discuss about a simple prototype but in upcoming it can be extended to many other area.

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BIOGRAPHY

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