INTELLIGENT HOME APPLIANCES CONTROL SYSTEM

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ABSTRACT

Home automation refers to control appliances and their parameters like ON and OFF, speed, volume and dimming in a home. ICT (Information Communication Technology) have been increasingly visible into our surroundings in the past few years. Home automation is judged on the basis of simplicity, protection and power consumption effectiveness. Pattern password based protection is being implemented to allow only authorized users to control the appliances. With the availability of mobile device integrated products and cloud networking rapidly increasing, many users see how new technology can impact their everyday lives. The proposed systems make use of wireless communications techniques to minimize the invasion of new devices.

Keywords*: Automation and control systems, Home automation technologies, Smart-home, Voice Recognition, Mobile Phone.*

I. INTRODUCTION

Life is constantly changing; now adays lifestyle is completely altered as compared to that of 10 years ago. The main reason is the introduction of few technologies in our lives. Technology provides us a more comfortable life. Since ancient times, technology has been influencing our lifestyles. Achievements such as the discovery of fire, hunting techniques or language have made our lives more easy and comfortable. Nowadays, the most common ones are result of aggregation of different techniques with technology having results like cars, phones, airplanes, fridges, microwaves, clothes and etc.

Typically, it is easier to more fully outfit a house during construction due to the accessibility of the walls, outlets, and storage rooms, and the ability to make design changes specifically to accommodate certain technologies. Wireless systems are commonly installed when outfitting a pre-existing house, as they obviate the need to make major structural changes. These communicate via radio or infrared signals with a central controller [1].

There is already a lot of electronic equipment in private homes with features which can help to manage and reduce energy consumption and improve comfort in the home. Unfortunately, only a few people can find ways to apply it in everyday life. This means that there is a large untapped potential for energy savings and amendment of energy-using behaviour and habits in the home without compromising the comfort of the users.

In order to exploit this potential for energy savings a number of challenges must be solved. First of all many different notions of communication are used between home automation equipment, both in terms of standards as well as proprietary protocols. This limits the interoperability between devices significantly. Secondly, the configuration of the devices such that energy savings can be achieved is challenging for average users. As a

consequence costs for installation and reconfiguration can be prohibitive. The high cost of the majority of home automation devices is also a limitation at the moment, but experience from the electronics industry shows that once the quantity of products go up, the prices for these products will decline substantially[2].

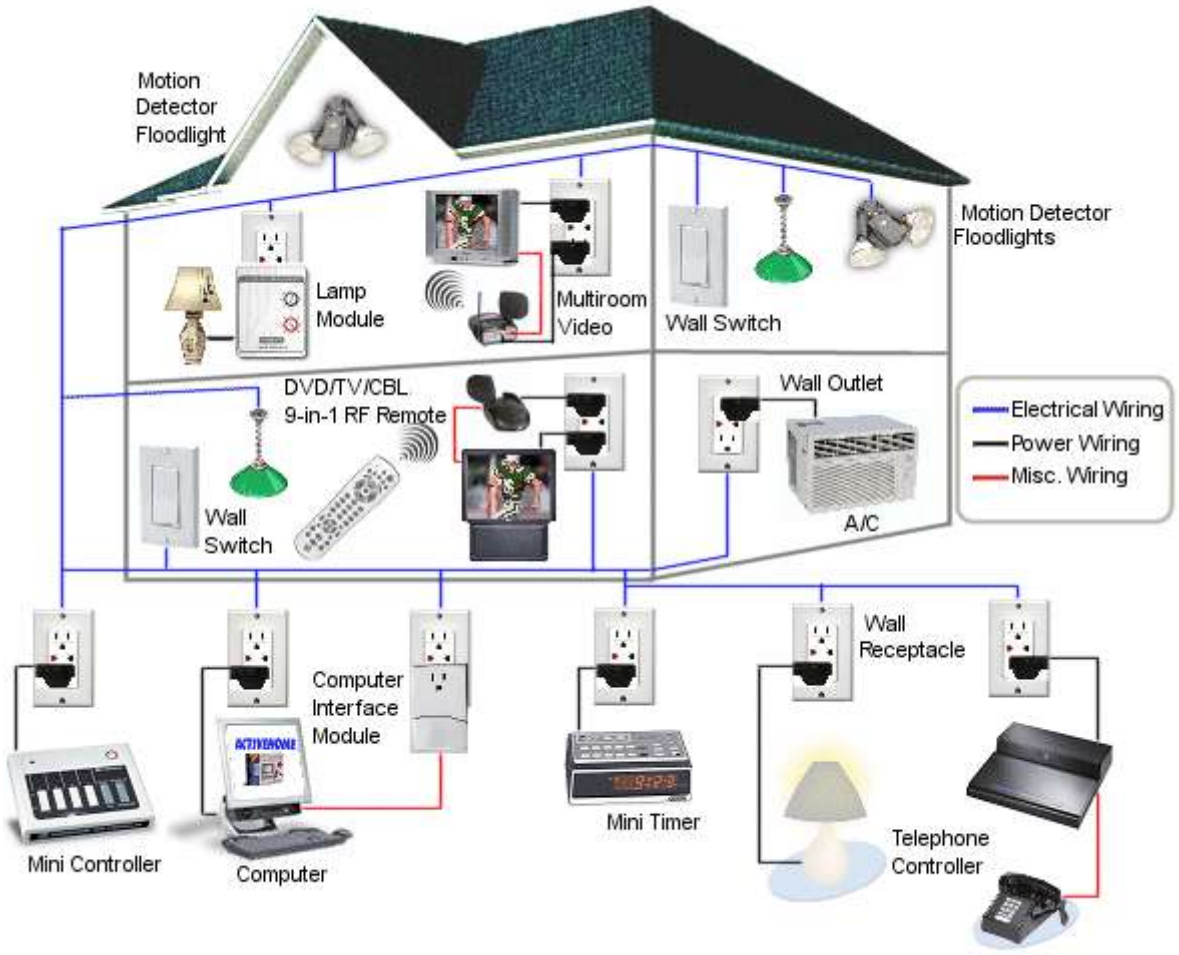

Fig. 1: General Home Automation Schema

II. PROPOSED SYSTEM

In this paper we discuss proposed Home Automation system that provides a perfect example for the integration of smart mobile phones, cloud networking, power-line communication, and wireless communication to equip a home with remote controlled appliances, garages, lights, air conditioner and similar devices. This project covers mobile phone application, handheld wireless remote, and PC program to provide user interface for the home automation. The home automation system differs from other systems by allowing the user to operate the system without the dependency of a mobile carrier or Internet connection via the in-home wireless remote [3]. This system is cheap, expandable allowing a variety of devices to be controlled and can be produced in mass number on a larger scale.

Home Automation is the domestic from of the automation of corporate buildings. Home automation may include centralized control of brightness of lighting, controlling on/off of lighting, heating, ventilation and air

conditioning, appliances, alarm systems, and other systems, to provide more convenience, comfort, energy efficiency and security. A home automation system integrates different utility devices in a house with each other through wired or wireless electronic systems. The techniques employed in home automation include those in building automation as well as the

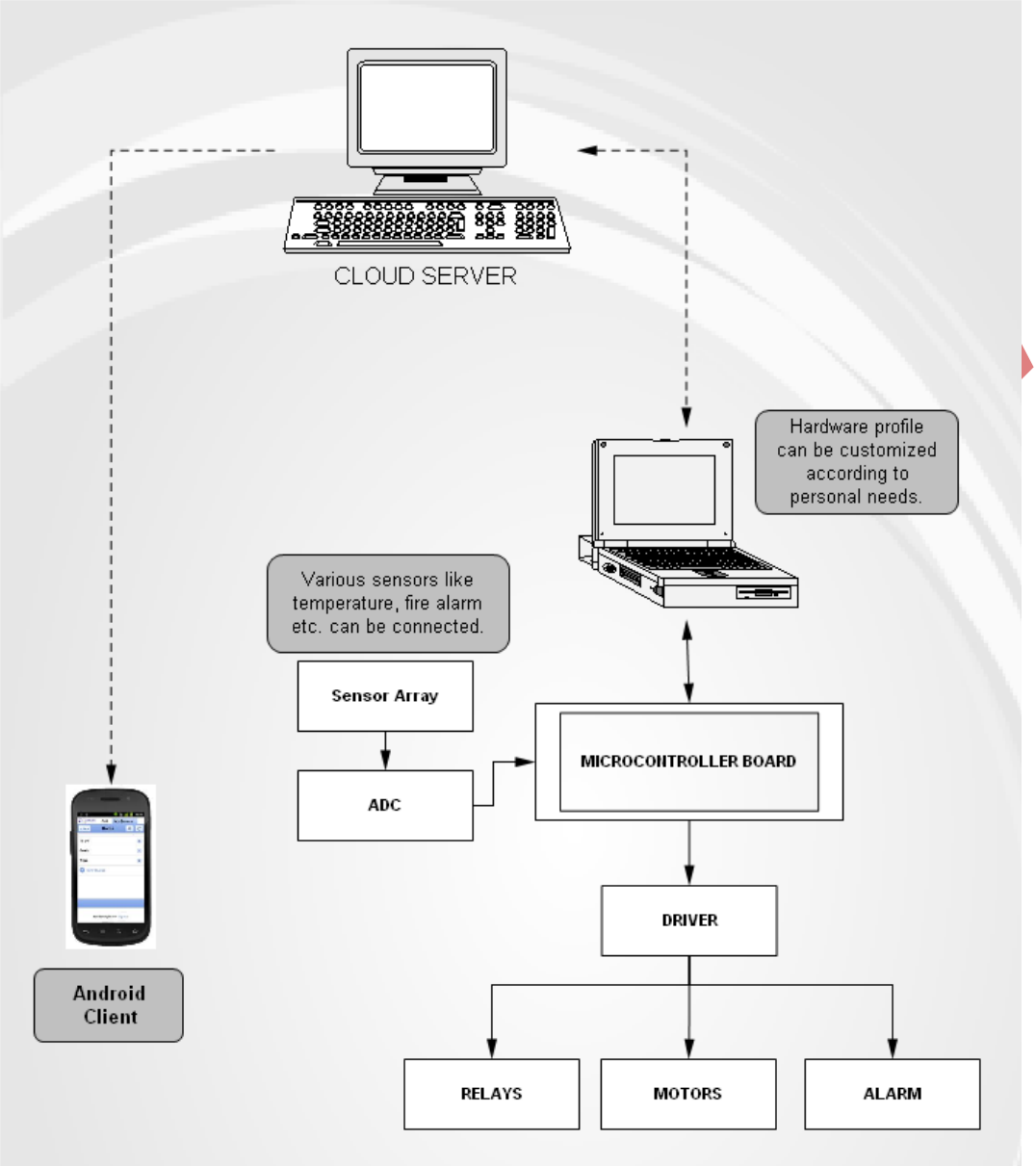

Fig. 2: Block Diagram of Proposed System

control of domestic activities, such as TV, fan, electric tubes, refrigerator and washing machine. The system allows the user to keep track of appliances and lights in their home from anywhere in the world through an internet connection on mobile devices. It also allows the user to control the automated system within their home through a remote. The wireless remote has main control over the system; therefore if the remote is active, any mobile device will not be able to control the units in the home. This design prevents from the android, PC, and

wireless remote all trying to control the system at the same time. The system refreshes on the Smartphone and PC every time the user chooses an option to control or monitor a specific unit. The in-home remote is updated on the LCD monitor every time the system receives a command. The project did run into a memory problem. After research, we found that the ATmega32Duemilanove's flash drive does not operate well with the ATmega32 Ethernet Shield connected. Therefore all the incoming data from had to be saved on the ATmega32 EEPROM data storage. This posed a problem as the EEPROM only allows the user to rewrite over data for a certain number of times. An external ATmega32 flash drive is considered for the option for further work [3].

III. RESULTS

The project as described in this paper was completed and was working. The project allows the user to control appliances and lights from a smart phones and PC from anywhere in the world using an internet connection. It also allows the user to control their appliances and lighting within their home from a remote control. The wireless remote has parent control over the system, therefore if the remote is active neither of the devices will be able to control the units of the home. This design prevents the signals from remote, smart phone and PC to intermix while controlling the units. The project was tested on appliances such as: radio, fan, coffee maker, and television. It also was tested to change the brightness of various light structures. The application refreshes on the Smartphone and PC every time an option is chosen from the smart phone, PC or remote.

IV. CONCLUSION

In this paper, we have discussed the designing and implementation of a smart phone based home automation system. This system can be easily produced on a large scale for mass adoption due to its simplicity and innovative design. Major advantage of this project is that the application software is Android based, which today has the largest smart phone base. Cheap smart phones (as low as INR 3400) can be used in the controller of our project, making the total production cost affordable for mass adoption. Further improvements can be done in the system such as the integration of environment sensitive control of the appliances.

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