

A REVIEW ON DIFFERENT TECHNIQUES FOR HOME AUTOMATION SYSTEM (HAS)

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ABSTRACT

Home automation system (HAS) control the household equipments like light, fan, door, AC, TV, Webcam etc. automatically. In Home Automation system PC, Laptop, wireless switches or Smartphone are used for operating the appliance in the home. Various kinds of techniques have been adopted for home automation system like Automation, ZigBee, Bluetooth, ARM9, SMS, and Android ADK. This paper provides different techniques for Home automation system.

Keywords: Automation, ZigBee, Bluetooth, ARM9, SMS, Android ADK.

1. INTRODUCTION

Home automation system is used to control the home appliances remotely and there are many home automation technologies available. The HAS (home automation system) allows user to operate and control all the home appliances or can connect multiple devices such as home security system, lighting, access control system, air condition etc. when users are away from home.

In day-by-day life the use of automation system for house, hotels, office etc. is continuously increasing. Automation makes not only an economical but also an efficient use of the electricity and water and reduces much of the wastage. Home automation system (HAS) makes the housing activities more easy, accessible, secured and efficient. This type of system mainly consists of following components Controller (It is hardware interface that communicates with user interface by controlling home services), Mode of communication (wired connections or Wireless) Electronic Devices (A bulb, an AC or a heater etc.) and User interface (Give orders to control System for example as a monitor, computer, or Phone) [5].

This paper consists of 3 sections. Section 1 provides the information Home Automation System (HAS), section 2 provides the literature survey of existing system, and section 3 includes the conclusion on the different system.

2. RELATED WORK

Various kinds of techniques have been adopted for home automation system like Automation, ZigBee, Bluetooth, ARM9, SMS, and Android ADK etc. in this part we will discuss some of the techniques.

2.1 HAS Using Bluetooth

R. A. Ramlee et al. [1] presents the not only overall design of Home Automation System (HAS) but also this system is designed to assist and provide support in order to fulfill the needs of elderly and disabled in home. Figure 1 shows the overall control function of the system. This proposed system is directly installed beside the conventional electrical switches on the wall. User can communicate with this system via Bluetooth. Bluetooth is a wireless connection enabled the system communicates with graphical user interface (GUI) on PC/laptop or smart phone without cable. Main control board contains PIC Microcontroller (PIC18F2550 is chosen due to its capability to perform the both serial and USB features to establish the Bluetooth and USB connection to the GUIs), sensor (HSM-20G Sensor Module is chosen because it is the low cost 2-in-1 combination of humidity and temperature modules), Bluetooth module (low cost Cytron Bluebee Bluetooth module is chosen).

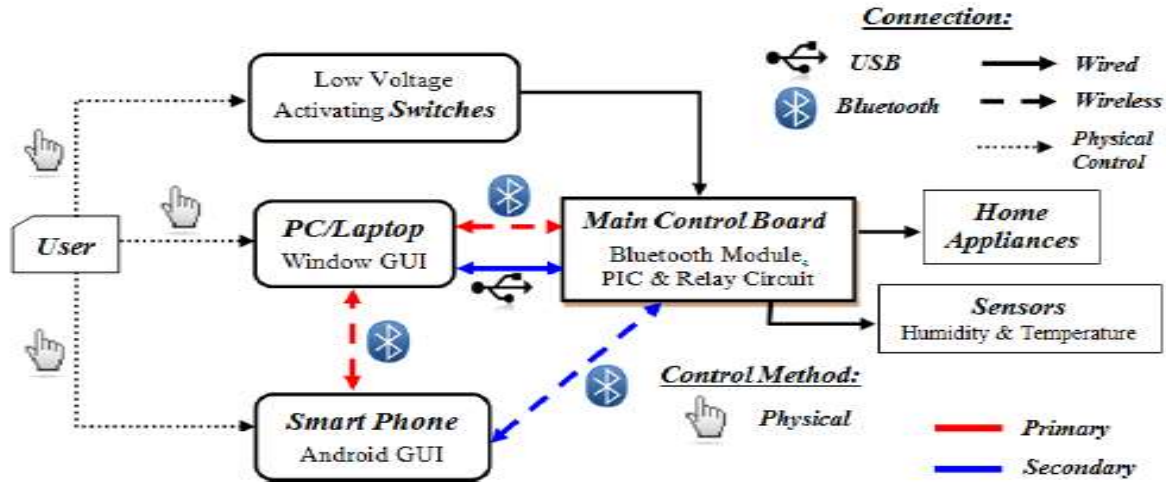


Fig-1 Functional Block Diagram of the System [1]

2.2 HAS USING GSM

Mahesh N. Jivani [2] developed GSM based home automation system using App-inventor for android mobile phone. For Android-based smart phones App Inventor is a latest visual programming platform for developing mobile applications. Figure 2 shows system architecture, which contains the App Inventor (allows Android Apps to be built and programmed highlighted colorful building blocks easy to understand), Arduino IDE (makes it easy to write code and upload it to the I/O board), GSM (Global System for Mobile Communications, originally Grouped Special Mobile).

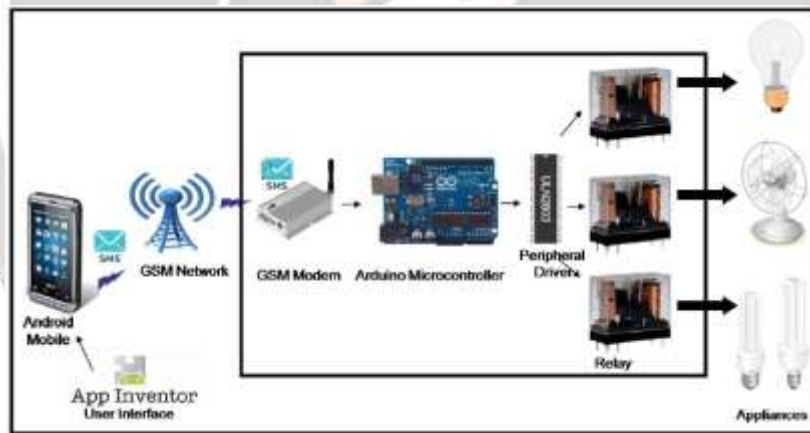


Fig-2 System Architecture

2.3 HAS USING ZIGBEE

S. Benjamin Arul [3] provides the overall design of a wireless home automation system (WHAS) which has been built and implemented and useful for elderly and disabled people with an easy-to-use home automation system that can be fully operated based on speech commands. In this system, the automation centers on recognition of voice commands of user and uses low-power RF ZigBee wireless communication modules for the communication between the automation center and the system. Figure 3 shows functional block diagram of the wireless Home Automation System, which consists of two modules: Handheld Microphone Module (which incorporates a microphone with RF module (ZigBee protocol) and voice recognition unit) and Appliance Control Modules (consists of relays controlling circuits). In the first module i.e. HANDHELD MICROPHONE MODULE; human voice is captured through micro phone and matched with the voice previously recorded in HM 2007, if matches

with stored command the corresponding signals are sending through Zigbee. In the Appliance Control Module; once the speech commands are recognized, control characterers are sent to the specified appliance address through ZigBee communication protocol and each appliance that has to be controlled has a relay controlling circuit. Figure 4 shows the components of appliance control module.

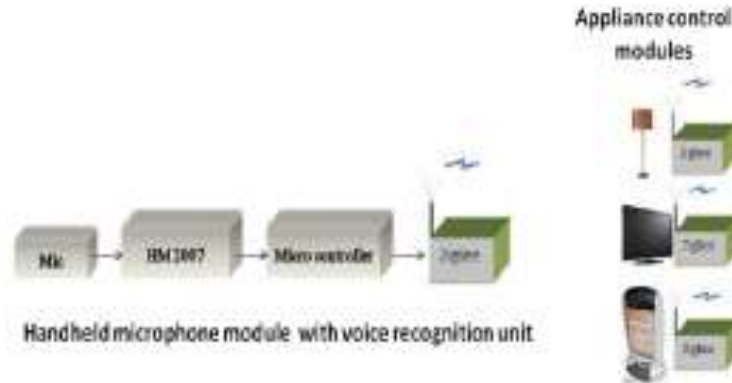


Fig-3 Functional block diagram of the wireless Home Automation System (WHAS) [3]

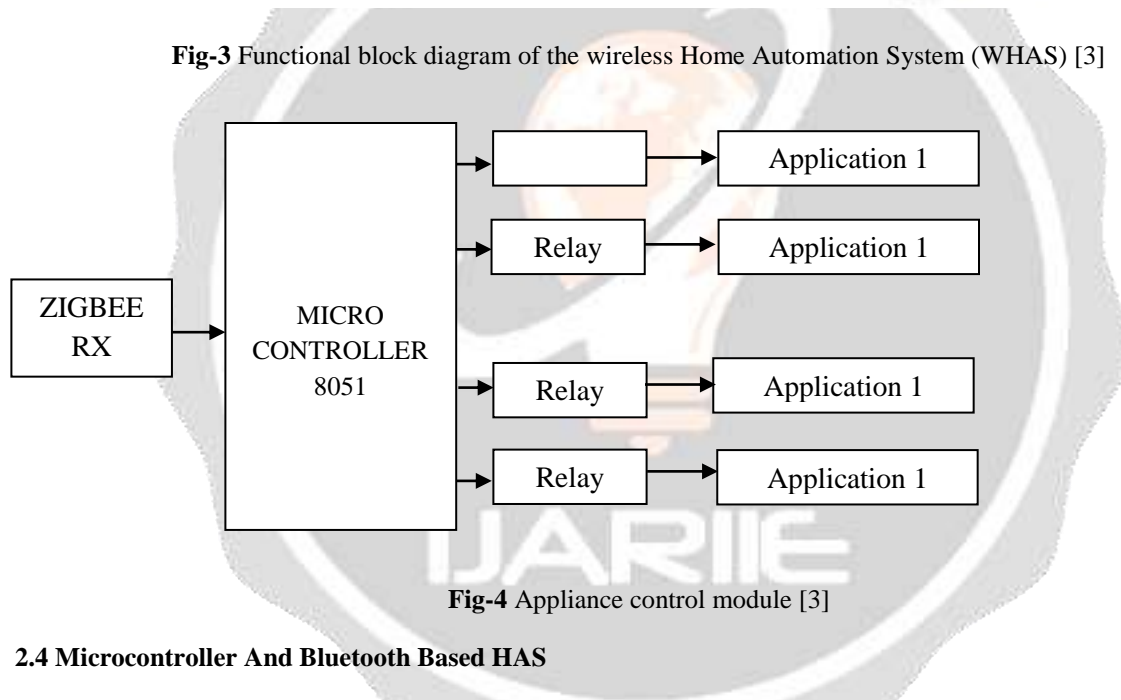


Fig-4 Appliance control module [3]

2.4 Microcontroller And Bluetooth Based HAS

Monika Rana and Ramandeep Singh [4] present smart home system using Bluetooth communication based on ATMEGA microcontroller. This paper presents design and implementation of an embedded system which can easily interface with the existing home appliances and communicate with a smart phone via Bluetooth using serial interfacing. Figure 5 shows Block diagram of controller device, which consists of two parts, one is android application (used for communicating with the controlling circuit through Bluetooth channel) and the other one is an electronic controlling circuitry, which consists of a microcontroller, a Bluetooth module, relay driver IC along with relays which will switch electrical loads on the circuit and to switch the power supply. In this proposed system, android device sends a command which is received by the receiver of the Bluetooth module and forwards it through its USART serial interface to the microcontroller. The microcontroller receives the command and takes the necessary action.

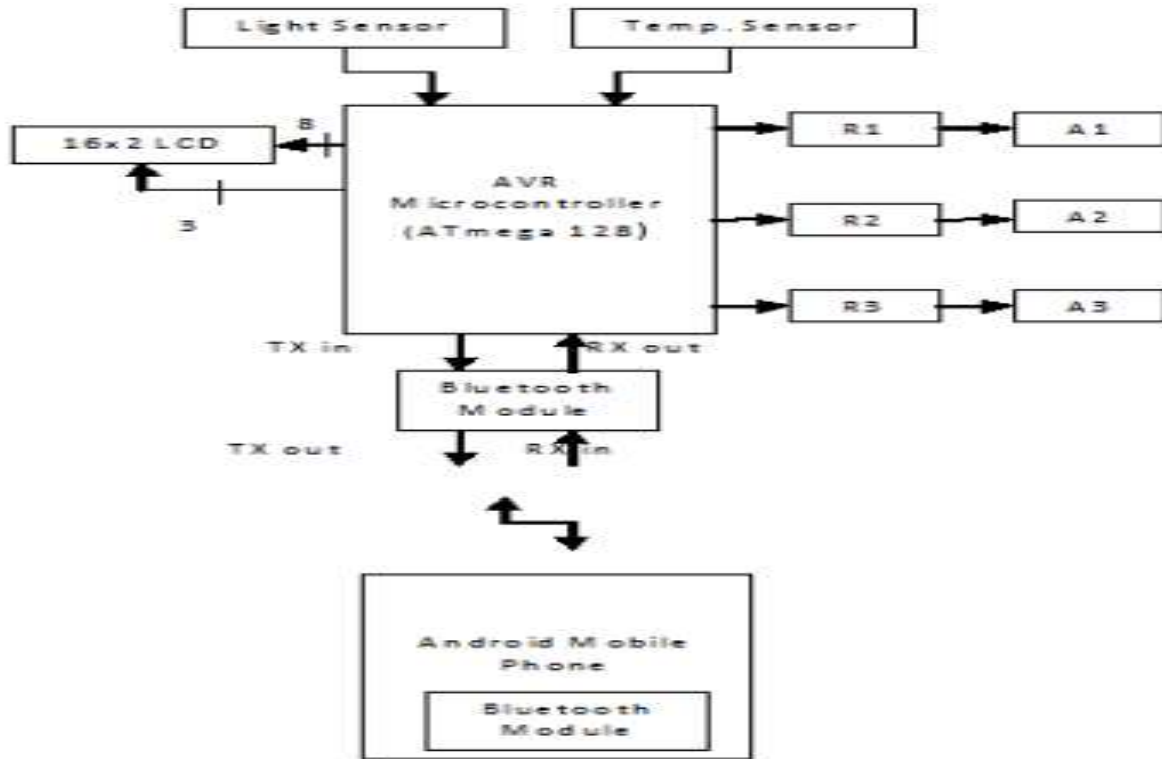


Fig-5 Block diagram of controller device [4]

3. CONCLUSION

Home Automation System (HAS) is the new era of the advanced home system and researchers used different techniques for the best performance. This paper provides the system architecture of HAS and Literature Survey provides or gives details about the system, the different existing Home automation system.

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