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A REVIEW OF HOME AUTOMATION AND WELLNESS SYSTEM USING DIFFERENT COMMUNICATION TECHNIQUES

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ABSTRACT: **In this paper author is trying to review various techniques presented so far. In the coming days home automation system (HAS), has gain popularity not only in foreign countries but also in metro politician cities of India. In these paper three different aspects of home automation system is reviewed and commented. The various researches have worked on HAS by using different methods e.g. Bluetooth technology, internet based service (android application) and wireless sensor network. This paper will review all techniques mentioned above and will try to analyze the factors affecting them in upcoming research.**

KEYWORDS: Home automation system, Smart homes, Bluetooth, internet based service and wireless sensor networks.

I. INTRODUCTION: In this modern era of 21st Century, where comfort and time is more important a need of home automation have become an emerging trend. Implementation of these systems will not just increase the comfort level of modern generation but also help elderly and physically disabled people. All researchers are trying to put some handheld device (e.g. mobile or some battery operated device) in hand on people to increase level.

The system of "home automation" exist from almost a two decade and now this is followed by various terms like "green house" , "intelligent home" or "smart homes". Various wireless technologies are available Wi-Fi, ZIGBEE, Bluetooth & GSM, However android app will be also will be useful tool for making this system operational. Android app will serve a purpose of interface between human and automation channel/system. Bluetooth technology is most popular out of above four techniques because of its capability. Global Bluetooth frequency is 2.4 KHz and at this frequency we can communicate up to 100mtrs at a speed of 3Mbps [1]. The capabilities of Bluetooth are sufficient for home automation system. Another most significant system introduced by IEEE is zigbee protocol (IEEE 802.15 Zigbee protocol). Zigbee communication link will be found very useful for home and office automation, because of its wide range and protocol authentication system. IOTs (Internet of things) are significant development in wireless sensor network. Due to dominance of IOTs and distributed intelligence are gaining popularity day by day. The use of IOTs will control household objects, especially electrical and electronics appliances by using a WWW (World Wide Web) [2, 3].

II. LITERATURE REVIEW:

R.A.RAMLEE, M.A.OTHMAN, M.H. LEONG , M.M.ISMAIL, S.S.S.RANJIT: This paper uses an Bluetooth technology for human interface with the system, as there are various advantages of Bluetooth technology e.g. range of 100mtrs and speed up to 3Mbps also every android mobile has a Bluetooth capability. The proposed method talk about three different control, by using an low voltage activating switch of about 5-10V DC, which will reduce danger to human life. The other two methods are GUI base systems windows GUI and android GUI. In this method we can also measure temperature and humidity and this parameters we will used to control the centralized AC's or HVAC system in offices, shopping mall, large public places etc.

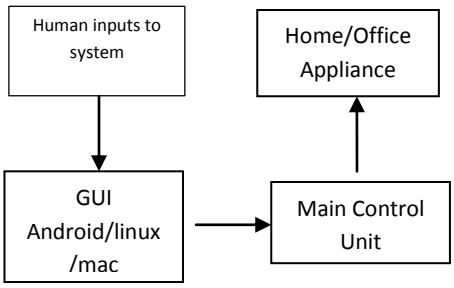

Fig.1 Architecture of the system

In this method while designing a main control board PIC18F2550 microcontroller is used as it has USB as well as RS-232 type of communication. For humidity and temperature, combination module HSM-20G is used. Cytron Bluetooth module is chosen as it is cheaper, reliable and it can establish connection with main control unit and GUI. In conclusion this system is low and designed to improve comfort living in a home. The smart phone based approach is rich in providing assistance to disabled and elderly people. Considering safety of human being low voltage activating switch is provided. The main control unit is mounted nearby the electrical switches it provides the easy connection. The GUI designed is very user friendly and indicates real time switches status. Android and windows GUI provides comfy living the people of 21st century.

HEMANT GHAYVAT, SUBHAS MUKHOPADHYAY, XIANG GUI AND NAGENDER SURYADEVARA: Innovation are driven by need of human. The 21st century modern generation people want more comfortable lifestyle and this prompt advancement of digital technologies. Most of the recent advancement in technologies are proficient not only controlling but also helps in monitory the different activities. By using this system we can also monitor an energy consumed by certain devices/appliances. To accommodate need of 21st century modern hardware is required in this paper wireless sensor networks is used. Wireless sensor network devices are invariably used in home automation and monitoring, where different types of heterogeneous sensors are deployed for monitoring and controlling purpose. In Taiwan is suggested use of home automation system for achieving energy conservation. There are various big houses or industries which have shifted from conventional techniques to home automation system some of them are, Toyota's dream house in Japan, e – house by McDonough in USA, crystal house at Taichung[4].

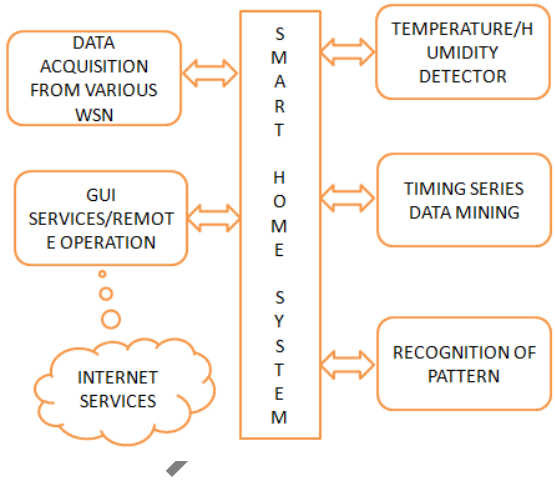

Fig.2 Schematic of the developed system [5]

The wellness system by using an home automation system can be used to observe and health of the elderly people. Monitoring of physical activities and daily routine of an individual has become possible with wireless sensor networks. The continuous monitoring and controlling can be achieved by a single computer situated at home which will have developed analysis and decision making software. By using an internet function we access a wellness of physically disable or elderly people.

Wireless sensor networks and IOTs are becoming popular day by day and plays vital role in home automation system. A old house built in 19th century can be converted to smart home by using an home automation system and it is proven that there is always scope of improvement.

MING WANG, GUIQING ZHANG, CHENGHUI ZHANG, JIANBIN ZHANG, CHENGDONG LI: The most of the wireless technologies used for home

automation system, such as Wi-Fi, RF Channel, the Kim has developed an another communication technologies with network IEEE 802.15.4 which is called Zigbee communication channel. There are various research papers for uses of Zigbee for home automation system [6],[7],[8],[9].

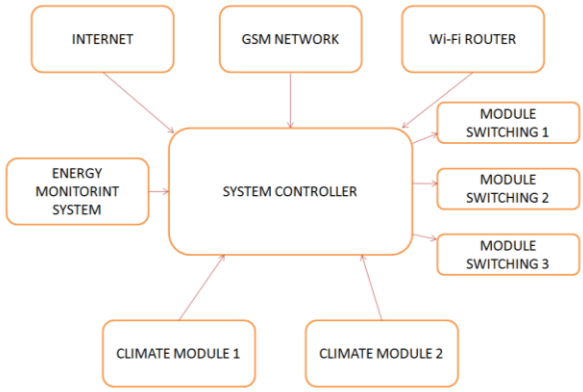

Fig.3 The scheme of IOTs base home automation system

The scheme presented above can be divided in upper side system and lower side system. The upper side has a Wi-Fi router, internet connectivity, tablets, smart phones etc.. The lower side consists of system controller, climate modules and module for switching on/off home appliances. The system is a main controller which provided the link between user and devices. It is also responsible for setting up RF 433 MHz WSAN network in office, home and industry. Use of home automation system is very important, with development of advance techniques in communication, harnessing is reduced drastically and everyone wants to go wireless.

III. CONCLUSION: This paper review various techniques used for home automation and wellness function. The researchers are working harder to improve communication channel, which will help in improvement of home automation system. Many researchers are also trying to integrate many other systems to home automation system. In most of the situations is proven that implementation of home automation system will reduce an energy consumption. This review paper will help to upcoming researchers to understand different techniques of home automation that exists, which will help them in doing upcoming projects.

IV. FUTURE WORK AND SCOPE

Authors have studied the different present system for house automation. The purpose of this study is to develop the final year project for under graduate studies. The authors have finalized the area of home automation for project work. The various techniques will be implemented and final paper will be prepared on actual work done.

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