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Research Paper Casa Automatics an Automated Home System

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Abstract **- Home automation system achieved great popularity in the last decades and it increases the comfort and quality of life. In this paper an overview of current and emerging home automation systems is discussed. Nowadays most home automation systems consist of a Smartphone and microcontroller. A smart phone application is used to control and monitor the home appliances using different type of communication techniques. with no customization or training. We talk about kinds of information investigation that have been performed by the CASAS gathering and can be sought after later on by utilizing this way to deal with planning and executing shrewd home advances. Innovation is a ceaseless procedure. To have the capacity to structure an item utilizing the present innovation that will be useful to the lives of others is a colossal commitment to the network. It shows the structure and usage of a minimal effort however yet adaptable and secure wireless based home mechanization framework. The structure depends on an independent Arduino BT board and the home apparatuses are associated with the info/yield ports of this board by means of transfers. The correspondence between the mobile phone and the Arduino BT board is remote. This framework is intended to be ease and versatile enabling assortment of gadgets to be controlled with least changes to its center. To build up a Bluetooth based home mechanization framework with Arduino UNO Board and an Android application. Remote controlled home automation system provides a simpler solution with Android application technology. Remote operation is achieved by any smart phone/Tablet etc., with Android OS, upon a GUI (Graphical User Interface) based touch screen operation.**

Keywords-**Home automation, CASAS, Arduino, Smart Home.**

I. INTRODUCTION

1. Overview

Home mechanization framework is developing quickly they are utilized to give comfort, accommodation, personal satisfaction and security for inhabitants. These days, most home mechanization frameworks are utilized to give straightforwardness to older and debilitated individuals and they lessen the human work in the creation of administrations and products [1-2]. Home mechanization framework can be structured and created by utilizing a solitary controller which can control and screen diverse interconnected machines, for example, control plugs, lights, temperature and dampness sensors, smoke, gas and fire finders just as crisis and security frameworks [3].

One of the greatest advantage of home automation system is that it can be controlled and managed easily from an array of devices such as smart phone, tablet, desktop and laptop [4]. The rapid growth of wireless technologies influences us to use smart phones to remotely control and monitor the home appliances around the world [5-6]. Several home automation systems use smart phones to communicate with microcontrollers using various wireless communication techniques such as Bluetooth [7]. Smartphone applications are used to connect to the network so that the authorized users can adjust the setting of system on their personal devices. Distinctive kind of home computerization frameworks offer a wide scope of capacities and administrations, a portion of the normal highlights are machine control, indoor regulator control, remote control lighting, live video reconnaissance, screen surveillance camera, constant text-based notifications [10-13].

This paper portrays the usage and working standards of some current home computerization procedures and it thinks about their cost, speed, ongoing presence and other functionalities. There are different home automation technologies accessible in market but guidelines about these technology is very low, in this research work a comparison of some existing home automation technologies is discussed so users can choose their own choice of technology. This paper also discuss the comparison of some popular home automation techniques and highlight their advantages and drawbacks.

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2. Objective

- To develop and gathering knowledge on home automation and smart living.
- To improve inhabitant experience, made easy and convenient.
- To achieve cost savings by energy savings.
- To enhance home security with all day interconnecting.

3. Advantages

- It is a robust and easy to use system.
- There is no requirement for additional preparation of that individual who is utilizing it.
- All the control would be in your grasp by utilizing this home robotization framework.
- This undertaking can give the office of checking every one of the apparatuses with in the correspondence go through Bluetooth.
- By utilizing this framework the clients can check the status of the apparatuses at whatever time.
- Manual control is additionally given in this task so the untalented change the status.

4. Disadvantages

- Bluetooth is used in this home automation system, which have a rage 10 to 20 meters so the control cannot be achieved from outside this range.
- Application is connected after disconnect of the Bluetooth.
- when the new users want to connect the first download application software then the code and configuration must be done.

II. RELATED WORK

Over the most recent couple of years, the enthusiasm for growing new Home Automation System (HAS) models has been consistently developing. This marvels is generally because of the longing of incorporating the recently formed idea of IoT into HAS. In [1] a home mechanization framework is proposed, which utilizes the combination of remote correspondence, cell phones, cloud systems administration and electrical cable correspondence in order to provide the user with remote control over their appliances and various devices around and within their home. Another similar solution is proposed in [2], which makes use of the LabView software to remotely control the smart devices in the HAS. Javale et al. describe in [3] a home automation system and an Android based application, which comes to help the elder people.

The system contains a hardware device acting as gateway and interface between the targeted devices and the Android powered devices used for accessing the system. Paper [4] shows the need of extending the classical HAS architectures as the one in [3], by enhancing the communication and the mobility. It highlights the potentials of using the Hierarchical Mobile IP in this sense. This approach offers the owner an autonomous control of the appliances and devices even if he changes location or network provider, since the system is installed with IP addresses. Another approach is presented in [5], where a hierarchical architecture for a wireless HAS is proposed. The system uses an Intel Galileo board and a router to connect a series of devices to the internet. The system also uses a web bases application to control the devices and cloud storage to store the data collected from the sensors.

Article [6] pushes the architecture development a little further by proposing a scalable general architecture for a better integration of the Internet of Things with the Cloud Computing. Basically, this architecture, called CloudThings, offers its functionalities as cloud based services.

Architectures like the one in [6] can be a bridge for even more complex systems like the one proposed in [7, 8] for smart cities.

Thus, the HAS system architectures have been in continuous development in recent years, making this systems to go beyond independent architectures, becoming parts of greater interconnected systems. Thus, HAS can interconnect with healthcare systems [9], with energy management systems [10] or smart cities, as already mentioned.

III. METHODOLOGIES

1. Methodologies

Home computerization frameworks utilizing cell phone, Arduino board and Bluetooth innovation are verified and minimal effort. A Bluetooth based home mechanization framework proposed by R.Piyare and M.Tazil [14]. The equipment engineering of this framework comprises of the Arduino BT board and a mobile phone, the correspondence between Arduino BT board and PDA is remotely utilizing Bluetooth innovation. The Arduino BT board has a scope of 10 to 100 meters, 3 Mbps information rate and 2.4 GHz transmission capacity.

In this framework home apparatuses are associated with the Arduino BT board by means of hand-off.. The cell phone use a software application which allows the user to control the home appliances.

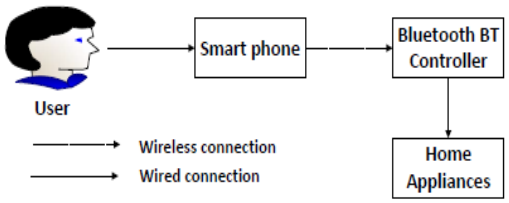

Fig. 1 Block diagram of home automation system

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Similar research was carried out by [15]. A low cost and user friendly, smart living system is presented which also use android application to control home appliances. The wireless connection between android device and home appliances is developed via Bluetooth technology.

2. Project Implementation

Today in this century home and offices are equipped with various machineries. Besides, people have various devices for surfing in web. That's why we have introduced a system that can be accessed from all sorts of devices and database can be updated from anywhere. If particular device works on, the other means of devices will be easily operated. The database is developed such a way that can be accessed from any sort of device that supports internet. In such manner movement and vibration sensor is brought here due to its excellent detecting. The framework is anything but difficult to introduce. For this, simply need HD spy camera association for chronicle and for movement recognition a movement sensor and vibration sensor, the ultrasonic range indicator is to distinguish the separation of the article, temperature and dampness sensors to keep up the room temperature. Water level sensor to filling the overhead tank. sensor, the ultrasonic range detector is to detect the distance of the object, temperature and humidity sensors to maintain the room temperature. Water level sensor to filling the overhead tank. These are constrained by arduino controller. Home Automation is certainly an asset which is equipped for make a home setting computerized. Individuals can be in order of their electrical gadgets by means of these Home Automation gadgets and set up the controlling activities in the workstation. We think this device have high potential for marketing in the future.

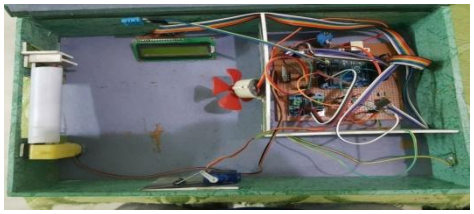

Fig. 2 Picture of the whole project using arduino depicting home automation.

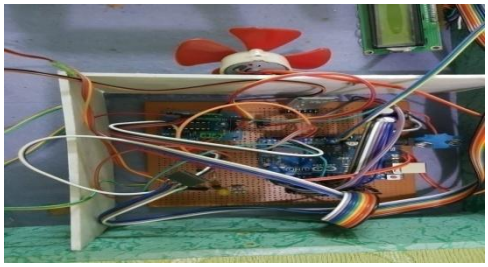

Fig. 3 Details about how to connect different devices to arduino through wire.

3. Hardware

- SERVOMOTOR
- HC-05
- ARDUINO
- DHT 11
- DC MOTOR
- L293D
- CAPACITORS
- Transistor
- LED

4. Software

- Arduino Ide.

IV. RESULT AND DISCUSSION

The final outcome of this project is a prototype for a simple home automation system which can control home appliances with a touch of a finger on a button corresponding to different devices. On the front end, there is an android app to control the home appliances and PCB board to which a number of home appliances are connected thereby controlling the appliances.

The results of this project have been up to the mark as expected when the project began initially. The user can remotely control the appliances on the same mobile app. Hence, the target we set was successfully reached on time effectively.

1. Key Points

- The app we are using is BluControl. In this there are 8 keys A, B, C, D, E, F, G, H and directions button UP, DOWN, RIGHT, LEFT. The key should be multiple of 1200 .here it is 9600.
- To switch on and off LED you have to use A and B button respectively.
- To open and close door you have to use C and D button respectively.
- To switch on and off button you have to use L and R button respectively.
- To open and close garage u have to use U and D button respectively.
- LCD displays humidity and temperature recorded by DHT11.
- If temperature goes beyond 30, then fan automatically is switched on. If it is sitched off once then it is manually controlled by buttons.

V. CONCLUSION

Hence, the idea to create a fully working home automation system with facility to control and monitor appliances has been finally realized. The output of this project is an array of home appliances that are controlled over the internet with the help of a mobile app . This project is a successful outcome of continuous and tireless effort from supervisors, college faculty, colleagues and other helping hands. This project has been a really great experience and opportunity to learn and to experiment.

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Moreover, the authors got the chance to closely experiment and learn about what goes into designing and developing home automation systems. We are very much delighted that we explored this topic as our major project title and in a way, created a version of home automation system of our own, and to be closely related with the technology that is of a great interest of study and research today and is sure to revolutionize the way of living of people in the days to come.

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