

A Study on Home Automation Systems

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Abstract— In this eon we can proudly announce that homes have the capability to be self-controlled and automated. It provides, comfort and ease of operating appliances especially when employed in a private home. Imagine if an individual is away from home yet has an access to change the status of the appliances such as light bulbs, fans, air-conditioners situated at home. This article describes about the contribution of internet of things (iot) technology in developing home.

Keywords— *Automation, remote, appliances, lock, wireless communication, internet of things(iot), security*

I. INTRODUCTION

Home automation system enables users to control electric appliances of various kinds to be operated from a distance. Most of the existing home automation systems are based on wired communication. This system must be planned well in advance and embedded during the physical construction of the building. To implement them on already existing buildings would be expensive. Wireless systems act as the backbone for automation systems. With the evolution of wireless technologies such as Wi-Fi, cloud networks, Iot wireless systems are used every day and everywhere. Few Programmable devices, that support iot are thermostats and sprinkler systems but home automation more accurately includes homes in which nearly everything such as heating and cooling systems appliances, lights, electrical outlets etc are hooked up to a remotely controllable network. Iot also helps in securing your house having a control over the alarm system, doors, windows, locks, smoke detectors, surveillance cameras and any other sensors that are linked to it.

II. TWO WAYS TO CONTROL CONTROL HOME AUTOMATION SYSTEMS

A. Automation

Automation is the first method of handling a home automation system. Automation works on the concept of storing a program or schedule events for the devices on the network. The program may include time-related commands, such as having your lights turn on or off at specific time slot every day.[1][5] It can also include scenarios when you prefer to turn on all the lights in your home when your security system alarm is triggered which is a non-scheduled event. Is that west-facing window letting in too much light? Plug your motorized blinds into a "smart" curtain and program it to close during afternoons each day. If you have someone to come by at the same time each day to walk the dog, you can program your home automation system to unlock the front door for them, and lock it up again when they're done.

B. Remote Control

The second method to handle a home automation system is a remote control. While remote controls are confined to a one-way monitoring approach, smartphones and tablets have the ability to truly connect to our home networks while we're away. With the help of any Internet-connected devices the home automation system can be viewed and controlled. Apps used in this system can provide a wealth of information about your home, from the current to a detailed history of what has happened up to now.[1]

You can check your security system's status, whether the doors are locked, whether the lights are on, what the current temperature of your home is and much more. With cameras as a major aspect of your home automation framework, you can even draw up ongoing videos with which you could observe what's happening in your home even while you're away. The system can be programmed to send a text message or email whenever the alarm system registers a problem of concern, from warnings to fire alarms to severe weather alerts. It can also notify the users about mundane events, such as programming your "smart" front door lock to inform you about when your child returns home from school. [4] Apart from arming and disarming the security system, it can be reprogram the scheduling of locking and unlocking doors, resetting the thermostat and adjusting the lights with the use of phone, from anywhere in the world.

III. COMPONENTS OF HOME AUTOMATION SYSTEMS

A home automation system ideally consists of anything that can be connected to a network which could enable it to be automated and controlled remotely. The most common control unit is the home pc, which was used earlier in home automation systems.[2][3] As of today home automation systems can distribute programming and monitoring control between a device placed at home and a user-friendly app interface that can be accessed via an Internet enabled smartphone, tablet or PC.

IV. TYPES OF HOME AUTOMATION SYSTEMS

A. Lighting and Scenes Control



Fig. 1. Lighting control as per the user's desire

Home Automation allows you to define the lighting or scenes. It provides Lightings, Weather, Music etc that welcomes you, says Good Night, Serene Atmosphere. Automation is all about providing the ambience of your home to respond based our requirement. This is possible with the lighting dimming option. This shall not only provide you the required ambience in the room but also saves the energy by using the lighting as desired.

B. Temperature control based on climatic conditions



Fig. 2. Monitoring the temperature of the atmosphere automatically during a time period.

The air conditioner can adjust the temperature based on the current weather or based on the room condition. Which helps in Saving Energy by automatically closing or opening the curtain & blinds based on cold or hot weather.

C. Audio and Music System



Fig. 3. Controlling your television or music systems hands-free

Provides option for single source music or choice of music that can be played in the selected rooms or the whole house.

Depending on the user's requirement, a particular track can be played for a particular room for a particular interval of time.[5]

D. Video Control, Ultimate multimedia experience Smart

Phone acts as a universal remote with which you can have that most wonderful experience with control that you always needed. To manage all your gadgets with one remote is accomplished with the help of home automation

E. Security and Surveillance Control



Fig. 5. Managing your security surveillance cameras from office or from any corner of the globe

Home Automat allows you to keep track of your house and its surroundings even when you're away. The Video Surveillance System connected to your phones allows you to have a watch over your house even if you're away. The automated alerts installed in your houses can keep you in touch with the home for better safety through SMS/Alarms.

F. Curtain Control



Fig. 6. Curtains that can be remotely controlled or automated

According to the temperature based on the room condition or based on the current weather the curtains use the smart home automation technology to automatically close or open the curtain & blinds.

G. Water & Garden Control Real-time, Save Water



Fig .7. Maintaining the intake of water and nutrients required for your garden remotely.

CONCLUSION

Existence gets to be far more comfortable with home automation systems. All devices in your villas/home/apartment can be monitored remotely from any part of the world. You can have power over the lights, Television, air conditioner, microwave, electronic window blinds, coffee maker, motorization and even the security system in your home. As manufacturers are creating

more and more "smart" devices and appliances all the time, the possibilities for home automation are virtually limitless.

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