

Home Automation: Life is One Click away from being better

Hemant Sonawane

Department of MCA, YMT College of Management, Kharghar, Navi Mumbai, Maharashtra, India

ABSTRACT

Internet of Things (IoT) is augmentation of modern-day internet to give communication, connection, and interconnectivity between different gadgets or physical articles otherwise called "Things". The term IoT gives us a simple idea about the ability of system of gadgets to detect and gather information from our general surroundings, and sends that information over the Web where it can be processed and used for different purposes.

In the simplest of terms automation means 'to auto' thus avoiding manual interface with the machine or. In simpler words automation means 'control without direct interference'. Home the place where human beings dwell is the second important part of this paper.

Home automation is playing a vital role in today's lifestyle. Day by day the use of home automation is increasing. GSM, Bluetooth, WIFI, IOT etc. are the various technologies used for home automation such as. From anywhere and anytime it is possible to control home appliances like fan, lights, TV, A/C etc. and due to this it is widely used throughout the world.

For outdoor control we have used GSM technology and Bluetooth module for indoor control. This system is useful for old aged people and handicapped. For security purpose Fingerprint sensor is used.

KEYWORDS: Home Automation, Devices, IoT, Bluetooth, GSM, Smart, Devices, Automation

INTRODUCTION

Connection between different kinds of devices like smart phones, PC and Tablets to internet, which brings in advanced kind of communication amongst things and individuals and furthermore between things are being categorized by IOT. We can see that the research and development of home Automation is gaining popularity, with introduction of IoT. To enhance the quality of life IoT is utilized to bring in creative ideas and extraordinary growth of smart homes to enhance the quality of life. With prompt solution to many issues Internet helps us to come up and additionally make us able to stay connected even from faraway places which minimizes the overall cost and energy overhead.

In between 1915 and 1920 the Electrical Home appliances concept was introduced but in 1960 actual integrated smart home concept was built up by some hobbyist. General Electric Company was the first company to develop the products made for smart automated homes was. Nowadays lots of research are going on in this home automation subject.

Recently, it can be seen that more and more consumers are inclined towards the idea of smart home. Homes of the 21st century will turn out to be progressively self-controlled also, mechanized because of the comfort it gives, particularly when utilized in a private home. Home automation system communicates with and reports the status of the connected devices in a collaborating, easy to use interface enabling the consumer to connect and control different gadgets with the touch of a button. A home automation system is a medium

through which the user can connect together different kinds of devices and electrical appliances and which in turn generates an ecosystem such that all the components can be connected centrally. Some of the communication technologies used in creation of the present day's home automation systems are Bluetooth, Wi-MAX and Wireless LAN (Wi-Fi), ZigBee, and Global System for Mobile Communication (GSM).

Methodology:

GSM based Home Automation System

The system proposed in figure 1 provides 3 means to control the home: the GSM network, the Internet and through speech. GSM is used as a communication medium to help establish connection in places where there may not be proper internet connectivity.

A system based on GSM network via SMS is used to control the home appliances as shown in figure 1. An Arduino board is the controller used to interface the appliances. It uses certain peripheral drivers and relays to achieve this interfacing. The smartphone is the user interface device. The system uses the 'App Inventor' visual programming tool to develop the interface and other tools to deploy the app. The app generates SMS messages based on the user commands and sends it to the GSM modem attached to the Arduino. This allows the user to control the home appliances. The system suffers from the same drawbacks of cost and reliability of SMS. Also the interface is preprogrammed and cannot be customized based on devices.

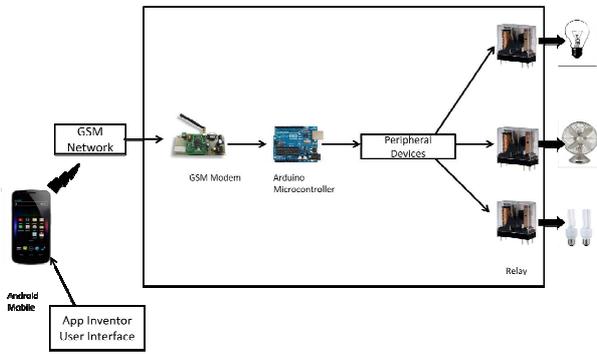
How to cite this paper: Hemant Sonawane "Home Automation: Life is One Click away from being better" Published in International Journal of Trend in Scientific Research and Development (ijtsrd), ISSN: 2456-6470, Volume-4 | Issue-3, April 2020, pp.349-352, URL: www.ijtsrd.com/papers/ijtsrd30431.pdf



IJTSRD30431

Copyright © 2020 by author(s) and International Journal of Trend in Scientific Research and Development Journal. This is an Open Access article distributed under the terms of the Creative Commons Attribution License (CC BY 4.0) (<http://creativecommons.org/licenses/by/4.0>)





Bluetooth Based Home Automation System

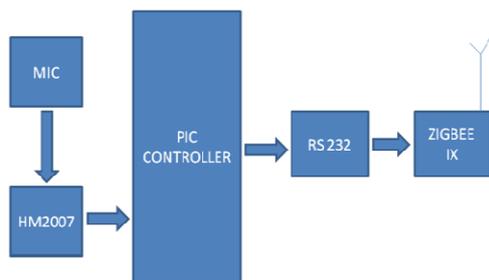
To control home appliances Bluetooth technology is used. To the Bluetooth module the client is a Computer that is linked via USB, sensor circuit and a pulse width modulation circuit. Devices and actuators are used to control the circuit. The Bluetooth module that is connected to it will allow it to collect various instructions via Bluetooth. Bluetooth devices can scan and sense other devices easily. It might also be possible to check whether devices are functioning properly or not. The system also has a lighting sensor that can turn on lights when external light is dull and a temperature sensor. This system also suffers from the disadvantage of the range of Bluetooth being around 10 meters only. This system has the advantage of being able to fit onto a present system. There is also low price involved in this system.



Figure 2 Block Diagram of Home Automation

ZigBee Based Home Automation

For home automation the ZigBee wireless communication technology can be applied. PIC microcontroller and voice recognition are used in the system for this purpose. From a mic the voice commands are taken. They are correlated with a voice store and processed. The PIC microcontroller then communicates the commands through ZigBee to the receiver. The receiver unit has extra PIC microcontroller that can process the command. It uses relays to control the individual appliances. This system has the drawback that ZigBee is a short-range communication medium. So remote access is delayed from faraway locations. Also, the voice recognition module could become clumsy. This system has the additional feature of integrating a smoke detector to the system. When smoke is detected, it sends a message to the user’s built-in mobile number.



Literature Review:

A radical advancement of the present Internet into a Network of unified objects that not just gains data from surrounding (sensing) and interacts with the physical world (actuation/command/control), but also utilizes existing Internet norms to give service to data exchange, analysis, applications, and communication. Powered by the predominance of devices empowered by open wireless technology, for example, Bluetooth, radio frequency identification (RFID), Wi-Fi, and telephonic data services and also embedded sensor and actuator nodes, IoT has stepped out of nascent stage and is on the verge of changing the present static Internet into a completely unified Future Internet. The Internet revolution led to the interconnection between people at an unprecedented scale and step. The succeeding revolution will be the interconnection between objects to create a smart environment. Many technical groups are thoroughly pursuing research topics and are in turn contributing to the IoT. Today, as sensing, communication, and control turn out to be cultured and omnipresent, there is noteworthy overlap in these groups; some of the time from somewhat alternate points of view. More teamwork between groups is encouraged to give a premise for talking about open research issues in IoT, a dream for how IoT could change the world in the near future. Lately, there has been an evolving interest among buyers in the idea of smart home. Smart homes contain many varieties of interconnected devices, for example, home entertainment system, security systems, lighting, access control system and surveillance. Intelligent home automation system is incorporated into smart homes to provide ease, convenience, and safety to homeowners. Home automation system connects with and reports the status of the connected devices in an interactive, easy to use interface enabling the consumer to connect and control different gadgets with the touch of a button. A home automation system is an intermediate through which the user can connect together different kinds of devices and electrical appliances and which in turn creates an ecosystem such that all the components can be connected centrally. Some of the communication technologies utilized in creation of the existing day’s home automation systems are Bluetooth, Wi-MAX and Wireless LAN (Wi-Fi), ZigBee, and Global System for Mobile Communication (GSM).

Advantages of Home Automation:

Handling all of your home devices from one place: The ease factor here is enormous. A huge step forward for technology and home management is being able to keep all of the technology in your home linked through one interface. Theoretically, all you’ll have to do is learn how to use one app on your smartphone and tablet, and you’ll be able to tap into uncountable functions and devices throughout your home. This cuts way back on the learning curve for new users, makes it simpler to access the functionality you truly want for your home.

New devices and appliances have Flexibility: Smart home systems tend to be wonderfully flexible when it comes to the space of new devices and appliances and other technology. No matter how state-of-the-art your appliances seem today, there will be newer, more inspiring models developed as time goes on. Beyond that, you’ll probably progress to your suite of devices as you replace the older ones or learn new technology to accompany your indoor and outdoor spaces. Being able to integrate these newcomers flawlessly will

make your job as a homeowner much easier, and allow you to keep upgrading to the latest lifestyle technology.

Make the most of home security: When you integrate security and surveillance features in your smart home network, your home security can skyrocket. There are tons of options here -- only a few dozen of which are currently being discovered. For example, home automation systems can connect motion sensors, surveillance cameras, automated door locks, and other concrete security measures throughout your home so you can activate them from one mobile device before heading to bed. You can also choose to receive security warnings on your various devices depending on the time of day an alert goes off, and monitor activities in real-time whether you're in the house or halfway around the globe.

Remote controller of home functions: Don't misjudge the power of being able to control your home's functions from a distance. On an exceptionally hot day, you can command your house to become cooler in just enough time before you get home from work. If you're in a rush to get dinner started but you're still at the store, you can have your oven start to preheat while you're still on your way home. You can even check to see if you left the lights on, or make sure you turned off all your media while you're away.

Improved energy efficiency: Depending on how you use your smart-home technology, it's likely to make your space more energy-efficient. For example, you can have more precise control over the heating and cooling of your household with a programmable smart thermostat that learns your timetable and temperature preferences, and then suggests the best energy effective settings throughout the day. Lights and motorized shades can be programmed to switch to an sundown mode as the sun sets, or lights can turn on and off automatically when you enter or leave the room, so you never have to worry about deteriorating energy.

Improved appliance functionality: Smart homes can also support you run your appliances better. A smart TV will help you find improved apps and channels to locate your favourite programming. A smart oven will support you with cooking your chicken to precision without ever worrying about overcooking or undercooking it. An intelligently designed home theatre and audio system can make managing your movie and music collection effortless when entertaining visitors. Linking your appliances with automation technology will progress your appliance efficiency and overall make your home life much easier and more enjoyable!

Home management visions: There's also something to be said for your ability to tap into insights on how your home functions. You can monitor how often you watch TV (and what you watch), what kind of meals you cook in your oven, the type of foods you keep in your refrigerator, and your energy consumption ways over time. From these insights, you may be able to analyse your daily habits and behaviours, and make adjustments to live the lifestyle you desire.

Applications of Home Automation:

Put off the toilet Fan Automatically:

We all have a bent to go away the toilet fans on. Also, many a times we forget to place it off which consist us tons of

electricity wastage. Now if you've got a home automation system you'll probably set a timer inside the toilet which will automatically stop the fan at the set time. this manner the fan will explode even if you forget to place it off manually. If you're worried that the fan will explode when an individual is inside the toilet then you'll fix a motion detector too in order that the fan doesn't explode when there's motion inside the space.

Turn Your Webcam into a Security Camera:

Instead of installing a surveillance camera you'll always use the webcam for keeping track on your children because it can successfully perform the activity of listening of all activities. Also it's cheap and really minute and therefore the activities are often checked with the assistance of the web.

Install a Wireless Intercom:

You are eating your food and suddenly you see the vegetables are over. You call bent your spouse to offer you some who is busy in some work. you've got to scream at the highest of your voice which is extremely embarrassing, rather than shouting you'll simply attach a wireless intercom and call bent her and ask her for the vegetable. during this way you'll save your energy and time too.

Capture Party Moments without using your camera or DSLR:

The best thanks to capture party moments without your DSLR would be with the assistance of a webcam. Set the time and let it continue capturing videos and pictures. There are software's available for windows. The software helps in saving the captured pictures as JPEG files. therein case you no more got to worry to require your camera along if you've got a webcam with you.

Use Automatic Sprinklers to Water your Garden:

You can make your own DIY automatic sprinkler which will reduce your effort of dragging the sprinklers call at the garden. Again, you'll set a time in order that the sprinkler automatically sprinkles water within the yard at the set time. Now that you simply know what a home automation system can do and the way it is often make your life easy, confirm you put in one soon at your home as I'm sure you're thrilled about the system after reading its works.

Future Enhancement:

As we can detect that there are quite a few issues in existing approaches. In this segment we principally concentrate on, the use of IoT for the enhanced, energy effective and self-learning home automation system. The principle objective is to plot and implement cost-effective and smart home automated system. We can utilize Wi-Fi based method for connection amongst Server and Home appliances. This smart home automated system will describe the implementation of related software and hardware. The user can run the home appliances like lights, fans, TV, etc. through their mobiles remotely.

Conclusion:

Based on all the systems measured and their advantages and disadvantages, this paper presents the features to be possessed by a perfect system for home automation with remote access. a perfect system should be available from everywhere the planet to a user and in real time. A GSM network is recognized as a candidate for this. However, the

info channel of GSM must be used, to supply internet access. Only the web can make sure that access is often made available in the least times. this may produce to a typical access method for the house appliances using the web protocol. The interface should be an internet application that has an associated mobile application. in order that people of all types can access the system. Such a system should even have the feature of being easy to put in. Only then can automated homes become commercially viable. There should be tons of thought put into the planning of the interface for these apps. Plug and play capabilities are going to be another bonus for the system. simple adding a replacement device to an automatic house will play a crucial role in taking forward the systems commercially

References:

- [1] http://www.idc-online.com/technical_references/pdfs/electronic_engineering/Home%20Automation%20System%20and%20Its%20Applications.pdf
- [2] https://www.academia.edu/33830389/SMART_HOME_AUTOMATION
- [3] https://www.academia.edu/9196249/HOME_AUTOMATION
- [4] https://www.academia.edu/35628337/Home_Automation_System
- [5] <https://bluespeedav.com/blog/item/7-greatest-advantages-of-smart-home-automation>
- [6] <https://bluespeedav.com/blog/item/7-greatest-advantages-of-smart-home-automation>

