

# A Study of Home Automation

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## ABSTRACT

This paper deals with the theory of Home automation. Home automation is where you install a server in your home, and you connect it to the Internet. You can connect all the lights, air conditions, home security, and curtains and so on. Then you install a program on your phone so you can control whatever is connected to the server through your phone. You are able to control it. If you left the lights open, the application will directly send you a notification that the lights are still on; therefore you can turn it off through your phone. Also, if anyone breaks into your house the cameras or sensors will automatically appear on your phone.

**Key words:** home automation.

## Introduction:

We live in a time, where so many technological advancements are at our fingertips and our lives are made extremely easier. Recently, great efforts have been made in making homes a bit more “tech savvy.” In short, this technology allows people to view and run their homes through a remote on an iPad or Smartphone. Home automation is the control and use of home appliances automatically or remotely. Early home automation began with labour-saving machines such as washing machines. Some home automation appliances do not communicate and stand alone, for instance a programmable light switch, while others are networked for data transfer, remote control and part of the internet of things. Hard devices may include sensors (like thermometers and cameras), actuators, controllers and communication system. There is different range of remote control system from a simple remote control to a computer connected by internet on the other side of the world and a SmartPhone with Bluetooth (Piyare, & Tazil, 2011). Generally, home automation system provide convenience to people, as they can control everything happening at their homes, from everywhere whether workplace, events and so on (Gill, Yang, Yao, & Lu, 2009). Different advancements are being made in home

automations appliances, in order to make them more useful and beneficial. In this paper, we are going to discuss the home automation systems, its features, types and benefits occurring.

Research aims and objectives:

- To analyze the features and benefits of home automation system
- To explore functions of home automation system
- Analyze potential drawback of home automation system

## Literature Review:

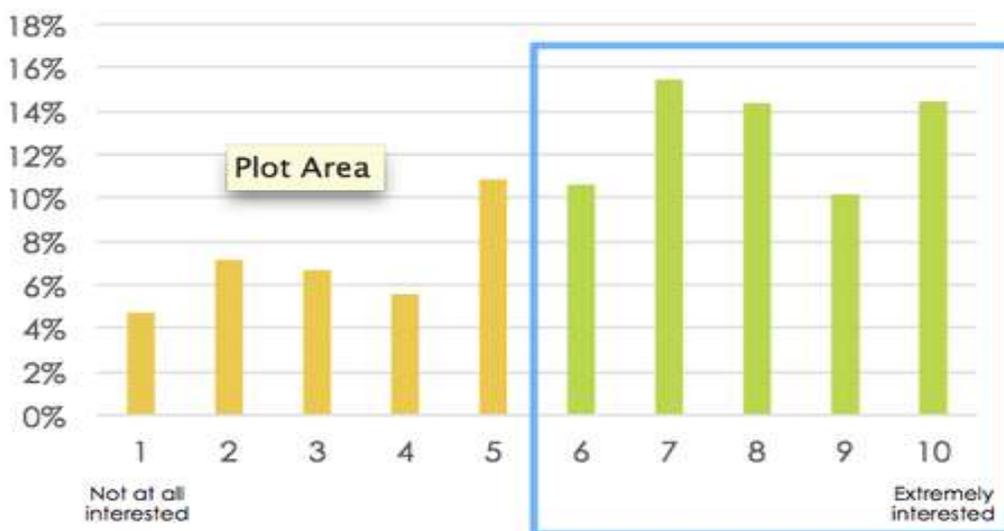
Home automation is a recent boom in the smart-home tech drive it straight into the spotlight. For the past two years, sensors, Smart-home kits and gadgets remained a dominated presence at CES with big names like Google, Microsoft, Apple and GE. Home automation system consists of a set of products which have designed to work together. Typically, these are connected through power line communication or Wi-Fi to a hub which then required with a software application. Popular applications include security systems, thermostats, door locks, blinds and lighting. Popular set of products include Zigbee, X10 and Z-Wave and all of them are contrary with each

other. In general, home automation is the domestic application of building automation(Piyare, &Tazil, 2011).

It has predicted by the market experts that within the next few years, the market share of home automation system will be worth tens billions. Along with different platforms, entire of that action adds up to a growing number of things

in the "Internet of Things" competing to control all of them(Gill, Yang, Yao, & Lu, 2009). Home automation is basically work like a human body, such as sense things, process information and react accordingly, although, different home automation devices do different things, but all of them at least fall under one of those three functions.

## Interest in Adopting Smart Home Solutions



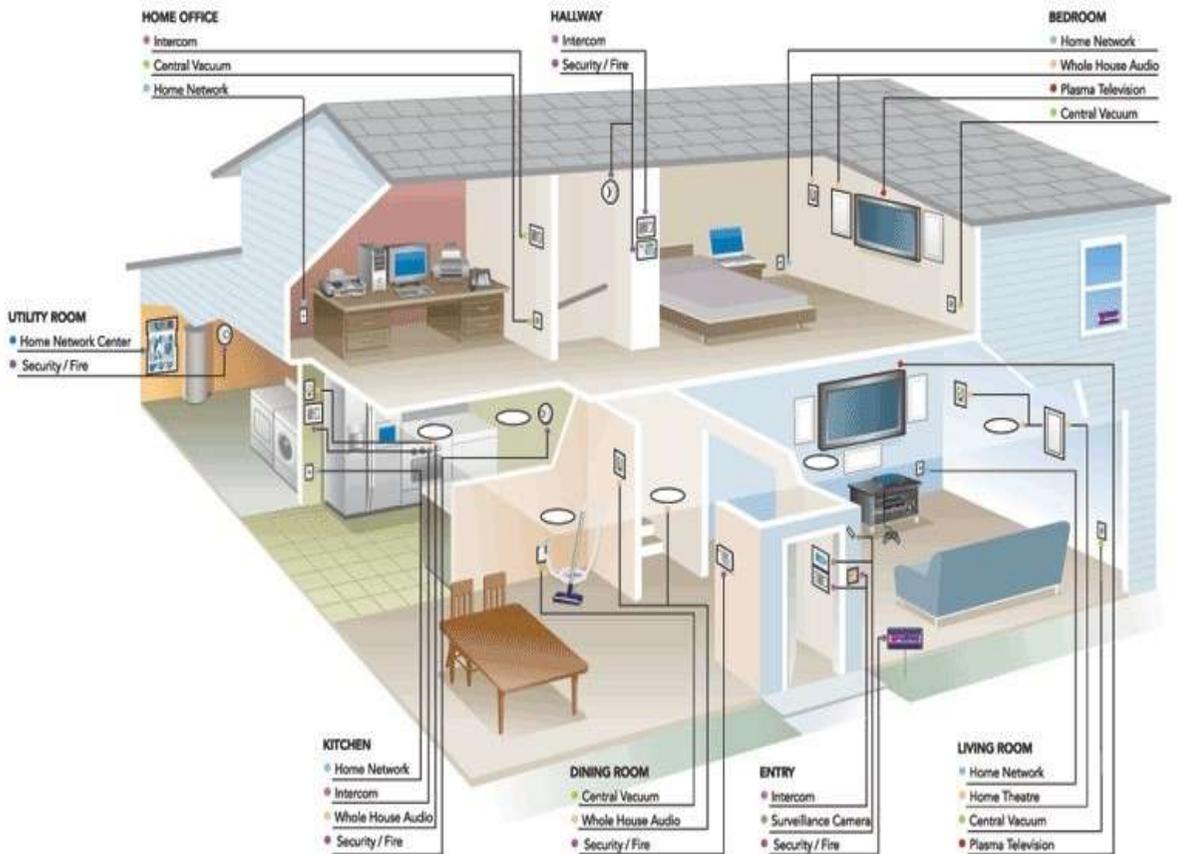
Q1. What is your level of interest in adopting smart home solutions? Smart home solutions refers to being able to control home settings and security through electronic devices such as smartphones, tablets, and PCs. (Scale of 1-10)

("Welcome", 2016)

The first function sense is the most important as seen in so many smart-home appliances with built-in sensors for things like temperature and motion. Also, gadgets dedicated exclusively to monitoring them. Generally, these devices are considered the nervous system of the home automation. They are able to see the environment and hence provide a critical context for the decisions, which is going to be made by the home automation. More elaborate and large setups with a different number of "muscles" and "nerves" might need a separate accessory or device to process and manage entire of that information. Smart hubs are designed to control various

devices and a good one will integrate every smart thing into a seamless, single home automation experience. Within a single app, it offer consolidated controls.

A hub typically will include multiple radios for popular protocols of smartphone like Zigbee and Z-Wave, the wireless "languages" of smart-home gadgetry. Then hub talks everything in the required native language and translates that into a Wi-Fi signal which understands by the router and put to use. With support of an appropriate hub, people can expand system dramatically without of any difficulty.



("Audio / Video Contractor, Low Voltage, Fort Worth Samsung Crestron&Extron, Smart Board", 2016)

Another way to give brain to automate home is to unite devices behind a singular software platform. Therefore, iOS-based software architecture, Apple's attempting to do with HomeKit will manage multiple third-party devices, with voice control via Siri through iPhone.

With the broad selection of home automation products, people can control everything at their homes. Once installed, it provides the ability to easily control entire lighting, security, entertainment and heating, through SmartPhone, iPad or PC. Some people use home automation system just to run simple scenes like integrating

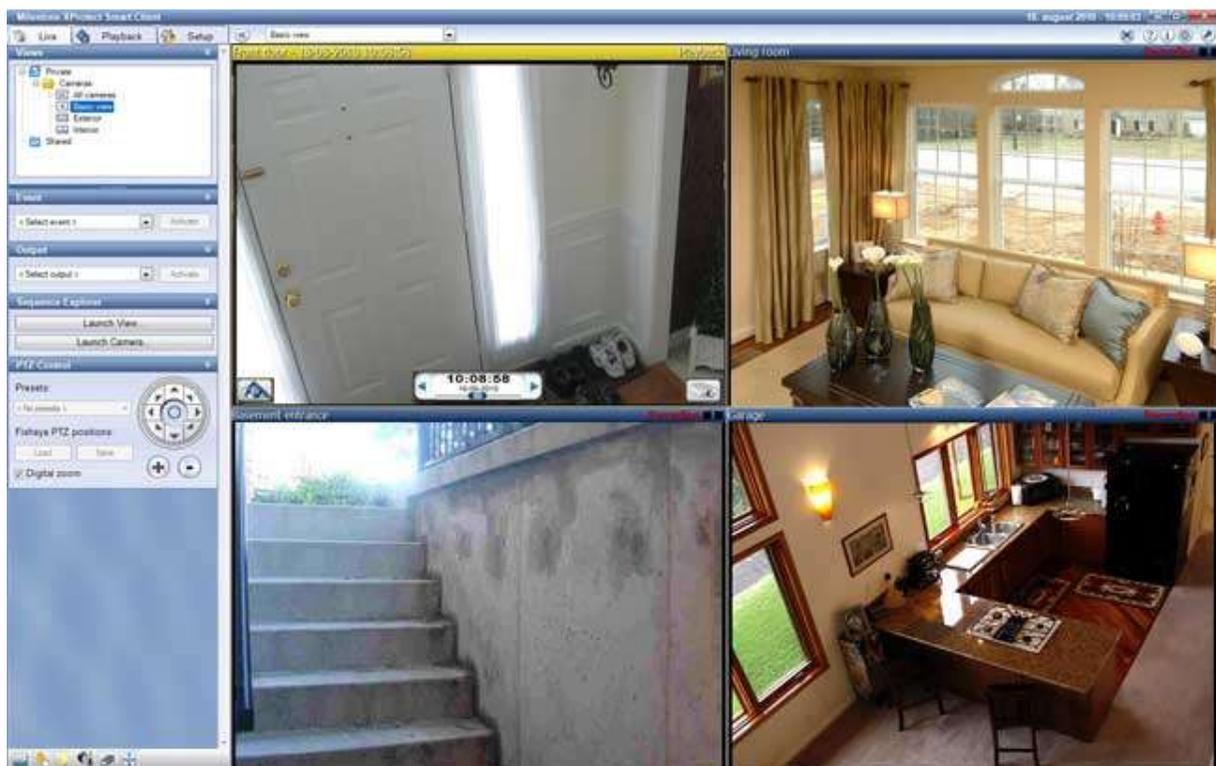
various command to their TVs with instructions to dim lights in the room. So, when going to bed it would be useful to tap the button of Lights Off on tablet or smartphone. It is not required to walk around and switch off entire button at a time. People can set up encouraging scenes as well for the kids to get them out of their bed at a reasonable, by automatic little bit of background music and turning on the lights in their rooms. With an effective home automation system it becomes very easy to assign a scene on smartphone.



("Smart D Home Store's Blog", 2016)

Moreover, there are safety benefits are also associated with home automation system. For instance, instant notification, if an interloper steps on property. There are alarm capabilities being supported by the home automation system. It is very useful when people leave for a weekend or on holidays, then home automation system guards property, as alarm system remains alert. If something happened such as a fire starts or an intruder breaks, then people find about this immediately through telephone, SMS text message

or email notifications. Home automation system also provides camera images on a secure server, if required it can be used as an evidence for the police (Brush, Lee, Mahajan, Agarwal, Saroiu, & Dixon, 2011). Nowadays, home automation allows turning tire lights around the house when any kind of smoke is detected. People can activate lights when reach their homes, as lots of smartphone Apps are available in order to facilitate this safety feature (Brush, Lee, Mahajan, Agarwal, Saroiu, & Dixon, 2011).



("Copybook - Global Business Network", 2016)

Despite of having so many advantages, home automation system has some drawbacks as well. For instance installation burden, there would be significant burden to the homeowner by installing a home automation system (AlShu'eili, Gupta, & Mukhopadhyay, 2011). These burdens can be in the area of price and time. Self-installing requires a familiarity with the various software applications and with the X10 protocol system. Future remodeling plan could be another issue while installing home automation system. If people want to plan a remodel a room in future then they need to incur an added cost while updating automation connections in that part of the house (Javale, Mohsin, Nandanwar, & Shingate, 2013). Moreover, there is the chance of obsolescence, as home automation system may increase the value and cachet of the house, if the owner is willing to sell the house in the next couple years. But if an owner plan on staying in the residence for decades to come, then there is a chance that system falls out of synch with new technologies. So it needs to be upgraded regularly.

#### **Methodology:**

In a research a significant role is played by the research methodology, as it proposes a system of conducting it. Basically, research methodology guides the process of research or it also can be said a working plan. Methodology is depending on the type of subject and research topic, so it should be chosen carefully. For this paper, secondary research methodology is selected which includes qualitative analysis of the data been extracted including journals, articles, research reports, books etc. All of these sources are relevant and related to the research topic.

#### **Discussion:**

According to the data collected through various authentic resources, numerous benefits and features of home automation system analyzed. Home automation system allows people to have control over their homes just by using their Smartphones, PC or Tablet. Control and automation systems help to create a comfortable and safe living environment. Automated home products are easy to use whether it is managing the home entertainment system or managing the lighting system of home. Home automation system can

encounter the freezing and flooding issues, for instance by interfacing a flood sensor with home automation system; people may enable notifications to smartphones of flooding, as they start to occur. Furthermore, it saves energy, environment and money as well.

On the other hand home automation system may have different issues like Installation burden on the owner of the home in terms of money and time. Future remodeling plans are another issue which needs to be considered at the time of installation. Moreover, there is a Chance of obsolescence.

The automation system allows to switch off lights and equipment which are turned on and hence drawing some power. It added safety to home, as we have the ability to control the lighting, appliances just with a simple tap of finger on technological device. An added measure of safety is being enjoyed by people and people can save electricity by turning them off whenever required. The automated door locks is one of the greatest benefits of an automated system, because sometimes people forget to lock their home doors. By locking the door from your workplace or office, people may have control of the situation. Moreover, through security cameras, people can increase awareness by watching what is happening at their homes. The safety of the family can be increased by recording clips, while detecting movement at particular times. Home automation system can increase convenience through temperature adjustment. People can easily adjust the thermostat from their workplace or anywhere.

#### **Conclusion:**

Today's world is busier than from the past days. People are continuously running from place to place and working to accomplish everything. Therefore, with the help of a home automation system, people do not have to be worried about home to open the door for their children and can adjust the household items easily. In short, it can save precious time and increase convenience. It can save money and electricity, as people can easily switch off the unnecessary household appliances from anywhere. By purchasing home automation system people are basically

contributing to the economy. Although there are some drawbacks as well but they cannot prevail over the benefits of home automation system. Home automation system allows staying in control of the situation. Through security cameras one can keep their eyes over the home and investing in a home automation system will benefit people in several ways. It is cost effective and keep homes save and secure.

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**Leadership is the capacity to translate vision into reality.**

**~ Warren G. Bennis**