International Journal of Engineering & Technology, 9 (2) (2020) 515-519

International Journal of Engineering & Technology

Website: www.sciencepubco.com/index.php/IJET

Research paper

Significant role of internet of things (IoT) for designing smart home automation and privacy issues

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Abstract

In this research paper the researcher emphasized the significant role of internet of things (IoT) for designing smart home automation with high security. The IoT is based on the internet and automated devices which are controlled by remotely using a PC, Smart phone, Tablet or other devices. The IoT is an intelligently connected devices and system which comprised of smart machines, environment, objects, and in-frastructure, Radio Frequency Identification (RFID), and sensors which will lead to meet the new challenges of Home Automation. In this research paper the researcher review the current research issues on Internet of Things(IoT) and Home Automation devices which are signif-icant to design the smart home or offices gadgets interact , seamlessly, surely control, monitor and improve accessibility from any-where across the globe. The researcher used some of the statistical data from the STATISTA to show the current usage of smart home automation devices and it significant uses across the globe.

Keywords: *Internet of Things; Home Automation; IT.*

1. Introduction

Internet of Things in the headway of the automation innovation for getting simpler and less demanding in all spheres. The home automation is the modern technology that intended to home to performs different set of tasks automatically. In the center point the automatic framework which are designed by the components of Internet of Things(IoT) which are specially as the wave of second generation home to enhance the home automation operational works in excellent way with respect to more than shelters , water, and electricity.

The researcher pointed out the some of the significant factors which are essential for designing the smart home automation. The significant role of smart home automation is the comfort and convenience, as more gadgets, can deal with more operations including lighting and temperature. The smart home filled the connected product are loaded with the possibilities to make our life easier, more convenient, and more comfortable for reducing time in all aspect of their life and making convenient living standards.

There are less possibilities for smart home IoT devices as home automation seems to be the wave of the future enhancement of their life standards in all possible ways. The researcher stated that the requirement of the home automation arises due to advent of IoT, in a big way in homes and office space. The accessibilities of home automation from anywhere across the globe. The significant role of smart home automation devices which are intended for developing smart home and more security standards.

The information technology standards are playing significant role for making a bridges in between human limitation and technology capa-bilities. In the controlling mechanism the data are freely moving across the network beyond the all possible limitation in the context of the Internet of Things(IoT), by connecting the IP gateway directly to the Internet or through a home or residential gateway and router the system can manage remotely using a PC or a smart mobile phone. It can also be accessible by the Tablet or other devices are playing of the significant role for designing in the World Wide Web (WWW)

The research emphasized that Internet of Things (IoT) based home automation which are enable the user to use the Home automation System to control the home appliances over the internet. The researcher focused on the IoT where everyone is talking about Internet of Things which is the next big thing in the world of technology. In this configuration the Internet of Things devices are connected with energy and speed of data transmission to control the home heating devices temperature, with the devices like laptops, tablets, system, and devices connect sensors to a network. The researcher identified the significant usage of Internet of Things (IoT) is to implement in Home Automations segments including smart lighting, smart TV, and other appliances. .

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2. Literature review

Vandana Sharma and Ravi Tiwari (2016) focused on the new era of computing technology and services which are capable to control the universal global neural network intelligently to operate home based automations as much simpler and safer for the security point of view. [1]. Somayya Madakam (2015) emphasized that Internet of Things and Smart Things have been going for more than a decade for making ubiquitous computing which are popularity to imagine smartness or intelligence, identification, monitoring and controlling calibre for making and designing smart home appliances [2].Yuichi Kawamoto (2018) stated that network communication devices and multiple network segments including satellite networks are also playing one of the significant role for designing smart home automation[3].Falguni Jindal and Rishabh Jamar (2018) emphasized that digital word is moving at a fast pace that connect various non-living objects through the internet and enables them to share information with their community networks to automate process for human being life components and operated by Internet if Things [4].

Friedemann Mattern and Christian Floerkemeier (2018) focused challenges and research issues on possible usage scenario and technological building blocks of the Internet of Things (IoT) [5]. John A. Stankovic (2014) focused on the significant role of Internet of Things such as sensing, actuation, communication, and control which are applicable on for designing the smart home automation. J. Sathish Kumar and Dhiren R. Patel (2014) stated that rapid development of Internet of Things and communication technology the basic technological components which are significant for designing the smart home automation leads into the imaginary technological space of virtual world[6].M.U. Farooq et., al (2015) stated that Internet is an revolutionary invention for transferring into the Internet of Things for designing the smart home automation across the globe where machines are communication to other machines(M2M) [7].

Noura Aleisa and Karen Renaud (2017) discussed that Internet of Things is having potential power for major privacy invasion for designing smart home automation devices that satisfies the core privacy of Internet of Things operational works. [8]. Peter J. Ryan and Richard B. Watson (2018) emphasized that Internet of Things(IoT) is an expention of the Internet in which a large number of things are integrated such as sensors, actuators, and processors which are providing interoperability and scalability for designing the smart home devices[9]. Jayavardhana Gubbia et al., (2013) focused on Internet of Things (IoT) is shared a common platform in order to develop a common operating picture (COP) has stepped out infancy for next revolutionary technology in infrastructure for developing smart home automation [10]. Miao Yun and Bu Yuxin (2010) discussed on the area of embedded system, computing and networking which are leading to an infrastructure that supporting devices to present an effective integration of Internet of Things [11].

Li Da Xu et al., (2014) stated that Internet of Things (IoT) has a wide range of application which has been developed and deployed in major IoT application in smart home automation. The researcher identifies the research trends and challenges [13]. Leea Kyoochun Leeb (2015) stated that suggested that Internet of Things are everything's for designing a new paradigm for global network of machines and devices capable of interacting with each other's and one of the most deployment of successful IoT based product and services [14]. Rafiullah Khan et al., (2013) emphasized that internet is continuously changing and evolving the future dimension of information technology advances to automate the home appliances in efficient way [15]. Huansheng Ning and Ziou Wang (2011) stated that Internet of things is built from like human neural network to help and interpret the relationship between IoT and real world [16].

Michael Waidner (2011) emphasized that Internet of Things (IoT) providing of the innovative services to connect to the physical world with more productivity and efficient way [17]. Ahmad-Reza Sadeghi and Christian Wachsmann (2015) focused on the Internet of Things promised the innovative business model through strong connectivity and effective use of IoT based system which are provided security and privacy challenges [18]. Fei Tao et al., (2014) emphasized that Internet of Things (IoT) and cloud computing and can provide a new method of intelligent perception and connection from Machine to machine(M2M) on demand use and efficient services on the payment basis[19].Sabina Jeschke ET AL.,(2018) stated that Internet of Things (IoT) is an information network of physical objects that allows interaction and cooperation of this objects to provide smart home automation services into account for developing smart home automation [20]

3. Problem statement and research objectives

In this research paper the researcher stated that smart home is one in which the various electronic and electrical appliances which are integrated up to a central computer control system to operate and perform the home automation operational works. The researcher emphasised that privacy and confidentiality are the major factors of the smart home automation and appliances, and the researcher identifies some of the significant research issues which are stated as:

1) To study on various factors of Internet of Things (IoT) which are significant for smart home automation.
2) To study the technological components and devices which leads to designing Internet of Things (IoT) for smart Home Automation.
3) To study the confidentiality factors and privacy issues of smart home automation.

4. Conceptual framework of the research study

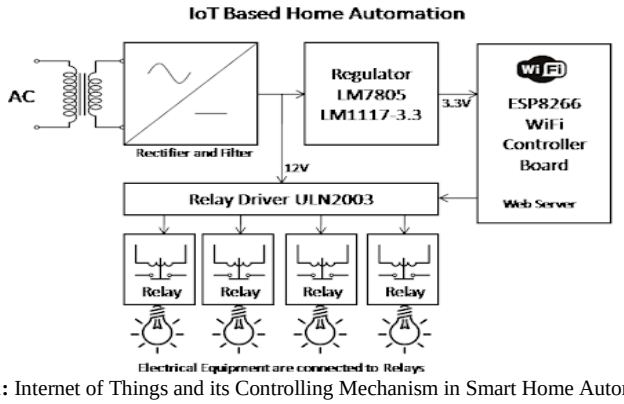


Fig. 1.1: Internet of Things and its Controlling Mechanism in Smart Home Automation.

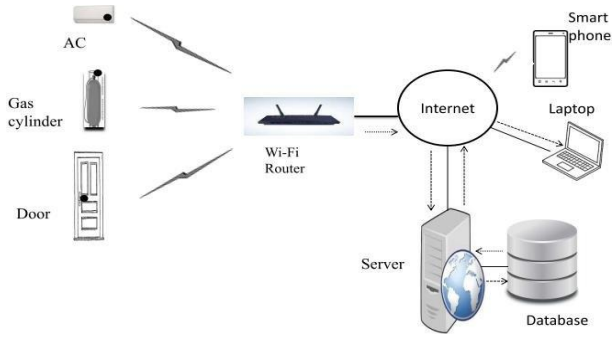


Fig. 1.2: Internet of Things and its Controlling Components in Smart Home Automation.

5. Research design and methodology

This research study is based on secondary data and significant role of Internet of Things (IoT) which are playing a significant for designing smart home automation to control the home appliances in all possible way across the globe. For the research design the researcher collected data from the different research portals, internet, journals and current research articles, and books. The secondary data are providing a base line and platform to discuss current research issues on Internet of Things and its significant role for designing smart home automation for controlling all possible home appliances and operate it by the technological components. The researcher also used and extracted some empirical data from statista on Internet of Things (IoT) with subject to Smart home security device shipments (IoT) worldwide from 2014 to 2019 (in millions).

6. Research issues and data analysis

Table 1.1: Estimated Smart Home Security (IoT) Device Shipments Worldwide 2014-2019 (Source: Statista)

Smart home security device shipments (IoT) worldwide from 2014 to 2019 (in millions)	
Years	worldwide from 2014 to 2019 (in millions)
2014	41
2015*	132
2016*	262
2017*	400
2018*	489
2019*	709

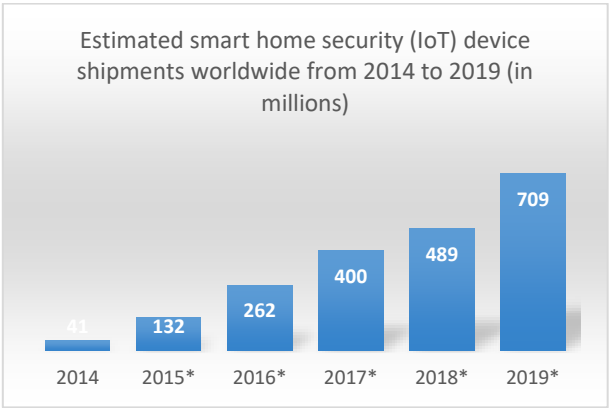


Fig. 1.1: Smart Home Security (IoT) Device Shipments Worldwide 2014-2019.

The above statistical analysis report shows the smart home security device shipments worldwide from 2014 to 2019. During the research study the researcher connected home (IoT) security device shipments are forecast to reach 489 million units globally in the world. As per the data analysis and there is a significant need for smart home security with the help of Internet of Things (IoT) devices for designing the smart home automation in the world (Table 1.1).

With the help of internet of Things the researcher is trying the map the basic needs of home appliances and its significant usage towards the smartness and neediness with respect to security point of view and enhancing the operation flexibility to operate the objects of home automation.

Table 1.2: Global Home Automation Market Size Projection 2020 (Source: Statista)

Forecast value of the global smart home automation market 2013 and 2020 (in billion U.S. dollars)	
Years	in billion U.S. dollars
2013	4.4
2020*	21

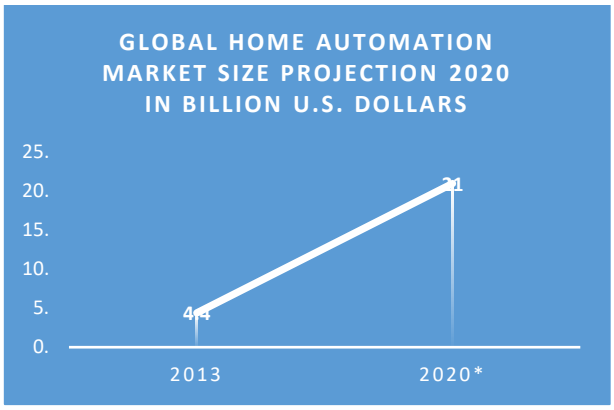


Fig. 1.2: Global Home Automation Market Size Projection 2020.

The above statistical analysis report shows a growth forecast for the global home automation market in 2020 and shows the actual projected market value of the home automation market in 2013. For 2020, the global smart home automation market is forecasted to reach 21 billion U.S. dollars. The predicted compound annual growth rate between 2013 and 2020 should be 26.3 percent.

7. Significance of the study

In this research study the researcher stated that the smart home automation systems are used for controlling the indoor & outdoor lights, heat, ventilation, air conditioning in the house, to lock or open the doors & gates, to control electrical & electronic appliances and so on using various control systems with appropriate sensors. The research study shows the significant usage of Internet of Things in smart home automation and appliances to operate all possible objects from anywhere across the globe. In this research study the researcher pointed out some of the significant usage of Internet of Things (IoT) which are stated as:

1) Featured Snippet from The Web: the researcher stated that Internet of Technology (IoT) control the devices of home automation as and when we want from anywhere across the globe and settings are in manageable from smart Phone, PC, and Tablets.
2) Useful in Monitoring – Monitoring is another significant factors of the Internet of Things (IoT) to provide of knowing the things in advanced with respect to quantity of supplies, water distribution and consumption, intelligent energy management and security alarm.
3) User Friendly Techonology: User friendly is also one of the significant factor of Internet of Things (IoT) to control home appliances with minimum interface, limited wireless transmission range and easily opera table by smart phone and PC/Tablets.

7.1. Privacy 1ssues

In this research paper the researcher pointed out the main concerns that smart home automation with Internet of Things are the breach of privacy, over-reliance on technology, and the loss of confidentiality. When anything is put on the internet it will always be there. Information, such as the data collected and stored by IoT, can be immensely beneficial to others and it is one of the biggest research issues in the real world.

8. Conclusion

Finally, the researcher concluded that smart home is one of the significant need in current scenario to automate home appliances through remotely with the help of PC and smart phones. Internet of Things is one of the intelligent technology to control the smart home appliances and designed in such a way that anyone can operate from anywhere in the world. The researcher shown some of the statistical reports on Internet of Things and technology usage for designing smart home automation. The researcher also emphasized the some of the limitation and drawback of this Internet of Things technology with respect to breach of privacy, over-reliance on technology, and the loss of confidentiality.

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