SMART HOME AUTOMATIONS SYSTEM USING INTERNET OF THINGS

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Abstract : - With advancement of Automation technology, life is getting simpler and easier in all aspects. In today's world Automatic systems are being preferred over manual system. With the rapid increase in the number of users of internet over the past decade has made Internet a part and parcel of life, and IoT isthe latest and emerging internet technology. Internet of things is a growing network of everyday object-from industrial machine to consumer goods that can share information and complete tasks while you are busy with other activities. Wireless Home Automation system(WHAS) using IoT is a system that uses computers or mobile devices to control basic home functions and features automatically through internet from anywhere around the world, an automated home is sometimes called a smart home. It is meant to save the electric power and human energy. The home automation system differs from other system by allowing the user to operate the system from anywhere around the world through internet connection. The revolution of Internet of Things (IoT) is pervading many facets of our everyday life. Among the multiple IoT application domains, well-being is becoming one of the popular scenarios in IoT, which aims to offer new services including smart homes. Smart homes or to turn on only the music, no longer to switch to the lighting of purple in the kitchen. In recent years, a smart system to learn habits and routines use them to save energy in the home, improve the quality of life, and make a home more effective. To understand the impact of smart technology on interior design, the key is to create a good design by providing benefit to the customer. It is to give an advantage over competitors. The recent boom in the Internet of Things (IoT) will turn Smart Cities and Smart Homes (SH) from hype to reality. SH is the major building block for Smart Cities and have long been a dream for decades, hobbyists in the late 1970s made Home Automation (HA) possible when personal computers started invading home spaces.

Keywords :- Internet of Things (IoT), Smart Home (SM), Home Automation, Smart Cities

1. INTRODUCTION

Interior design and technology are not usually discussed, every move, and even before, but the smart home gadgets attack led many designers to incorporate something on the digital focus. Networking Internet of Things (IoT) brings intelligent devices to the home design element. With the rapid market growth within the family, the industry also uses something like "Interior" and its layout "Internet of Things - Interior" aspects of the use of Internet of Things development of innovative products. According to the Gartner survey, more than a million digital devices will be connected through IOT. Equipment of the connected home like a stove and the Internet refrigerator's idea is not a piece of very ground breaking news. The possibility of smart technology has been promoting the development of the internet of things. It's home the decoration industry has been stimulated.

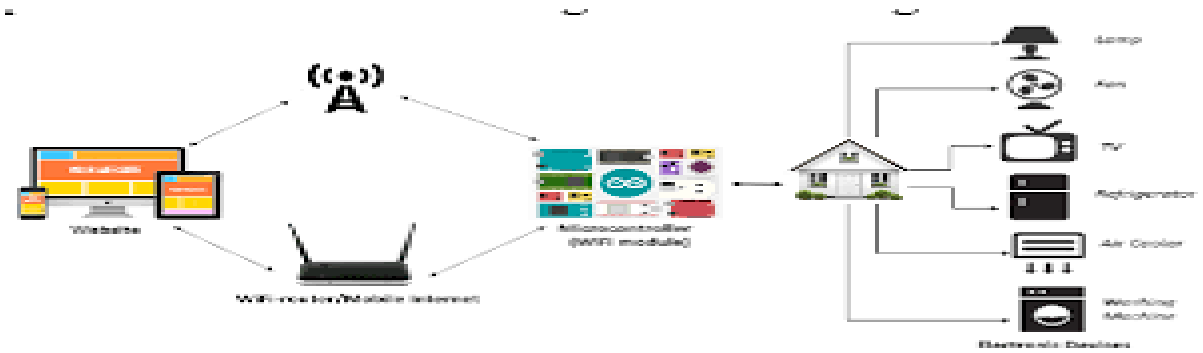

Figure 1 Smart Home in Interior Decoration Based on the Internet of Things [1]

Figure 1, shown as the internet of things, not only the home and surroundings' space, will affect the roadhouse's device interaction. Internet of Things (IoT) product of the collection is, in part, on the failure may occur in the home, can be detected if there is a need to maintain, such as the importance of the data. It is possible to provide several advantages. This is, give the property of the decision and the insurance company confidence in the home's value. The introduction of the Internet of Things is not only at an affordable price to the design of the house, but can also save money by using energy-saving technology.

Most smart home implementations are composed of hardware and software units that allow the user to control the lights, temperature, humidity, doors, and smart devices of the house locally or remotely [2]. However, expectations from a smart home are currently far beyond these control mechanisms. It led us to implement a flexible, multi-layer, Fog computing oriented, and multi-container included platform. In order to better emphasize the distinctive features of FOGHA, we divided this Section into three parts: control-based home automation systems, Fog computing based architectures, and containerization-based services

2. LITERATURE REVIEW

2.1 Automation

With the development of Cloud technologies and Wi-Fi enabled appliances, Internet-based remote control architectures for home automation were proposed at the beginning of 2000s [3]. These works generally emphasize the energy management aspect of home environments; however, the variety and novelty of provided services draw more attention. They can be considered as initial steps towards modern smart homes that lack complex and attractive services.

In the home automation domain, most of the proposed systems, not only the mentioned ones are behind the current technological improvements and user demands. They generally utilize an Internet-connected SBCs and user interfaces to turn on/off home appliances. Such features are very trivial to categorize them as novel complex services. Another common approach is publishing data to the Cloud for processing purposes via gateways, which has the aforementioned critical disadvantages. Mainly for these reasons, utilization of innovative technologies and architectures are required for the IoT based systems [4]

Beginning of the keen home framework is situated in the savvy can give data to assemble a savvy home framework As individuals of intuitive highlights can see the house Data and hand
which can control a few gadgets The external the home, as a canny control of the lighting, Clever control of shopper gadgets items, video talk, canny security. It contains the keen home framework: Web, savvy apparatuses, regulator, home organization. [5]

Savvy home, speaks to a house that can fulfill the necessities Canny and adaptable bundling technique to react to request solace of its occupants, will have the option to control and oversee them utilizing its own environmentally friendly power energy. Indeed, the term Keen home is wide as a moderate innovation. There are situations where the explicit meaning of keen home exists. [6]

Smart Cities apply the technologies into a much wider scale by connecting people in a city to all ‘‘Smart Technologies’’ mentioned above in order to deliver real time information for selected users with correct details at the right time. Figure 2 shows a typical integration of smart technologies in a Smart City architecture.

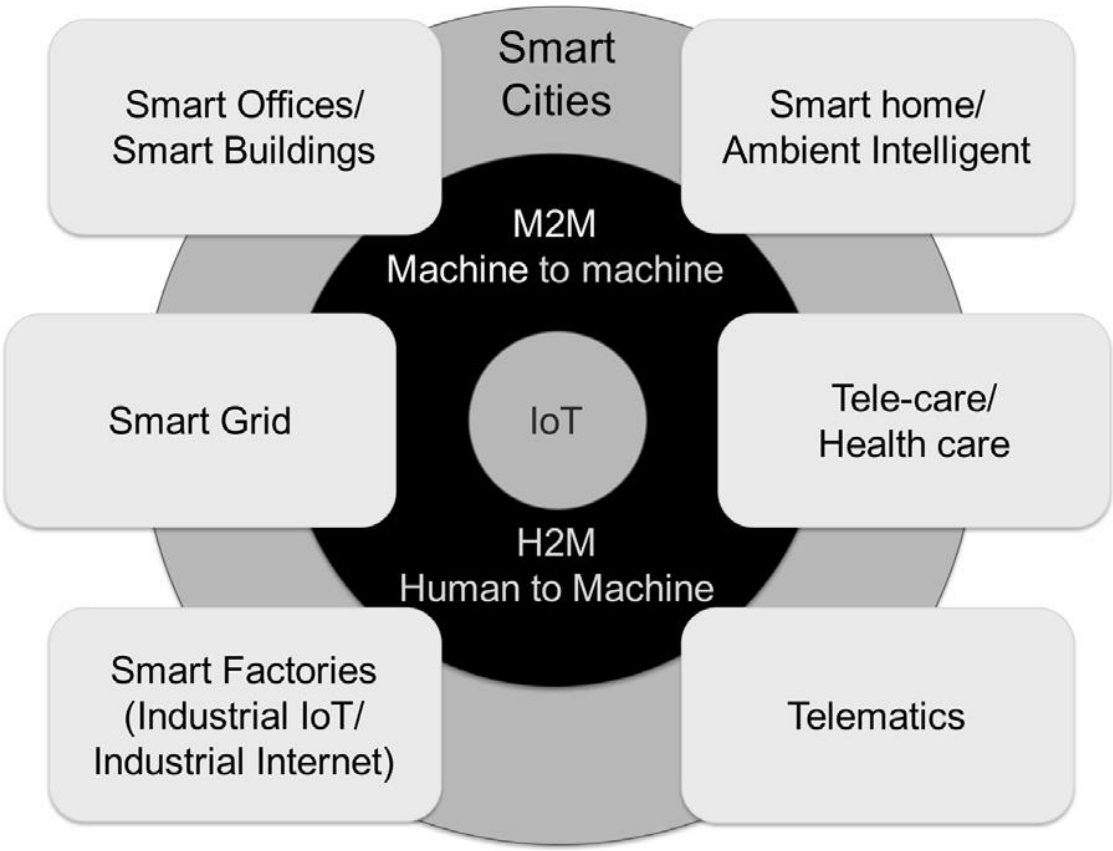

Figure 2. Typical architecture of a Smart City [7]

2.2 Internet of Thing (IoT)

The revolution of Internet of Things (IoT) is pervading many facets of our everyday life. Among the multiple IoT application domains, well-being is becoming one of the popular scenarios in IoT which aims to offer new services including smart fitness.

The Internet of Things (IoT), and related technology such as wireless sensor networks (WSN) [8] are progressing rapidly and their new developments and applications are shaping our daily life. According to [9] there are about 30 billion devices and over 7.7 people connected to IoT networks in early months of 2020 and it is estimated that this number will be raised up to 75.44 billion connected devices [10]. There are several definitions for the IoT, but a universal definition describes it as a global network of sensors, devices and objects that can connect to each other automatically and sense data, thereby allowing to measure, control and process an environment and make it perform in an intelligent manner [11–17]. All these recent advancements made it possible to offer a large number of applications in many different domains including home automation, e-healthcare, environment monitoring, transportation systems, and other commercial areas [8,10].

Internet of Things (IoT), the internet, there is a nonstop future innovation Unrest, will influence the entirety of the application area. Estimate pervasive. It influences and is an enormous scope numerous applications from agribusiness, savvy reference, industry, energy, transport. This can be certain that it would have developed hugely. IoT applications and direct the desire to improve innovation. Furthermore, to defeat the current conveyed capacity, Fathom the arrangements that can be exceptionally related to Sending's enormous scope. [18]

Internet of things (IoT) is situated in both the social and social effects of life and work. Moreover, the internet of things opens a thorough the upside of the new possibilities. With the goal that can profit from the web of things, there are some specialized issues to be unraveled:
heterogeneity, versatility, and interoperability to take care of these specialized issues. [19]

3. APPLICATIONS AREA OF IOT

Internet of things technology, it is possible to control lighting through the cell phone or
Alexa and Google's assistant has led to the development of connected devices such as smart light bulbs. Besides, at any time, program them to turn on and be darker without using a dimmer switch. For those number of lights and hidden lighting is large, it is recommended a smart lighting switch without changing all the existing light bulb light, these controls have been connected to the smart switch that allows to turn on the schedule, and smart assistant on and off of the light technology and interior design are usually not a concept coupled from the beginning to the end. After the inside of the decision, additional technical is obtained by inverting the building, still occupied the space, it is usually at the end of the process. Smart home appearance and the Internet of things technology than the digital layer's combination to the elements of the connection inside has led the designer. The internet and other field companies develop the internet of things technology and apply it to the office of design.

3.1 Smart Home

The safety and security of data collected by home sensors and detectors is a significant concern. Data is stored at various locations, such as centralized servers in the cloud, fog, and local networks. The findings of the analysis by cyber security researchers identifying vulnerabilities in the IoT networks (e.g., a smart city) often result in the hacking of consumer data, thus jeopardising the customer's security and safety.[20-21] Only authorized operators of IoT mainly work in a smart home domain to monitor all smart things in the home [22].

3.2 Smart Cities

In smart city applications, the information is transmitted and used by various groups interacting and acquiring access to the data. From the developers of smart sensors to the city's transport administration including consumers interacting with the smart city (via smart mobiles, for instance), each entity distinctively utilizes and manages information, which might jeopardize an individual's privacy [23]. Additionally, as every smart city partner would have diverse prime concerns, differences exist amongst diverse partners' privacy regulations. Therefore, secure connections and authentication are equally significant in smart cities [24].

3.3 Smart Health

The IoT concept incorporates authentication, automated data aggregation, and discrimination of fetched/processed data in the medical field. In general, health services in IoT applications handle patient data, which is vulnerable to a data leak if appropriate preventive controls are not taken [25].

3.4 Smart agriculture and environment

Agriculture and the environment can be managed using smart networking/devices, as they can furnish several principle characteristics: i) the potential of gathering data from surroundings, ii) the feasibility of transferring instructions and feedback distantly, along with the real-time mode, and iii) the accessibility of the equipment to manage the significant quantity of information. [26]

3.5 Smart energy

With the assistance of Information and Communications Technology (ICT), smart energy users can use and manage objectives based on the information obtained from distant services. Due to the collection, receiving, and exchange of data, smart grids essentially need protection against privacy breaches. If an attack succeeds, it can lead to cascading consequences [27] such as degradation of public utilities including telecommunication companies, energy delivery, and other associated services [28].

Table 1 Smart Home in Interior Decoration Based on the Internet of Things [1].

Interior Decoration styles	Most Popular	Traditional Contemporary
Kitchen Style	28.57%	26.96%
Bedroom Style	43.20%	24.72%
Bathroom Style	30.50%	28.23%
Living room Style	28.4%	24.87%

Table 1 shown as here, there is a simple table for each room, which is one of the top three design styles. It includes these detailed settings. Do not think that surprised since it is not all of the very beneficial, the almost same for all of the room.

4. CHALLENGES

Research corporations around the world have been heavily promoting IoT and Smart Home (SH) by predicting the huge potential of businesses in almost every market. Governments and institutions are investing immense amounts of resources to put the technologies in place for delivering IoT and SH services to the general public. However, there are still challenges that need to be addressed prior to a full SH and IoT implementation.

4.1 Standardisation

Although SH systems are domestic systems with most connected devices, such as appliances or sensors, locally installed. Mobile devices for instance smart phones, tablets and wearables travel from home to home, countries to countries. International standards must be established to govern from hardware interface, to communication protocols, to ontology description language, to semantic rules, to middleware.

4.2 Security and privacy for Smart Homes

Enough examples of security and privacy violation have demonstrated the vulnerability of the existing Internet. IoT actually expands the Internet to a much wider scale which represents an even higher degree of risk. As we have described in the previous sections, new threats will become obvious when heterogeneous technologies are connected together.

4.3 Internet of people

With the help of IoT, the Internet is expanding at an unprecedented scale connecting people all over the globe and even outside the globe. Internet connectivity has become an integral part of our daily life, especially the millennial generation. IoT pushes the Internet connectivity to a new level that people are connected no matter them like it or not.

5. CONCLUSION

There is still very little research on auto-setup for Smart Home (SH) up to now, only methods on easy configuration or easy setup are found. The adoption rate is still low because there is no incentive for users to upgrade from ordinary homes to SHs, the remote controlling of heaters from offices is a hype rather than a necessity. However, real benefits are seen from saving energy through smart automation, from remote health monitoring for the elderly through tele-care services, and from controlling appliances for disabled persons through gesture interface or BCI. Most of the current research and products related to smart homes lack proper orchestration mechanisms and are constructed for a few specific scenarios. They are not flexible enough for integrating new services, and scalability is their major problem.

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