The smart home can improve the quality of people's life

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Abstract: In recent years, the intelligent home with its unique function has caused people's extensive attention. Smart home is based on the residential platform, using a variety of emerging technologies to integrate the facilities related to home life, to build an efficient management system of residential facilities and family schedule affairs. This paper aims to study the application of smart home is conducive to improving people's quality of life, making people's life more comfortable, safe and convenient, and cites a large number of examples in life for demonstration.

1. Introduction

Nowadays, the smart homes plays an essential role in the information society, which also greatly facilitates people's life. Smart home technologies refer to devices that provide some degree of digitally connected or enhanced services to occupants (Sovacool & Furszyfer Del Rio, 2020). With the development of society, intelligent home has been widely recognized by people for its safety and comfort and it has realized the functions of home appliance control, lighting control, indoor and outdoor remote control, curtain automatic control, anti-theft alarm and telephone remote control. Indeed, Shin, Park, & Lee have already estimated that smart home technologies had diffused to 7.5% of households globally and generated expected revenues of $44.2 billion in 2018(2018). Smart homes takes the residence as the platform, using the network communication technology, integrated wiring technology and automatic control technology and a variety of new technologies to provide people with a comfortable, safe and convenient environment. This essay aims to show that smart home not only provides a full range of information exchange functions, but also optimizes people's lifestyle and living environment, helps people effectively arrange their time, saves all kinds of energy, and improves people's quality of life. First, I will briefly introduce the background of smart homes and the current technologies used in smart home. Secondly, I'll go into more detail about the four typical features of the smart home. Thirdly, I will use practical examples to focus on analyzing the benefits of smart homes to our lives. Finally, I will explore the future prospects of smart homes so that smart homes can better serve people in the future.

2. The overview of smart home.

Smart home systems include User Interface, Mode of Transmission, Central Controller and Electronic Devices and the remote control is very common in smart home systems (Gunge & Yalagi, 2016). It can be seen that the intelligent home system integrates a variety of emerging technologies and bears the major task of the construction of modern cities. It is based on a set of advanced, safe, stable, intelligent system and intelligent products. It also based on the science and technology network, users, residential, intelligent products connected and organic integration, to create a comfortable, convenient, safe, intelligent and happy home living environment. According to Malche and Maheshwary (2017), the smart home is a place with highly advanced automated systems that control and monitor lighting and temperature, home appliances, multimedia devices, security systems and many other features. Indeed, the smart home system uses a large number of new technologies to achieve a variety of functions.

3. The functions of smart home.

The first is the alarm function. The smart home system can perceive the surrounding environment through the sensor module and send an alarm to the user who registered the device or account after processing. The alarm consists of information related to environmental data, which may include the temperature, humidity, and light intensity in the environment. By alerting users, people can be reminded to take precautions against some potential risk problems.

Secondly, the smart home has a certain monitoring function. It can monitor the surrounding environment with the help of sensors and cameras, and make corresponding judgments on the collected data. This is also the primary requirement for any walking movement. For example, the relevant module monitors the indoor temperature, and when the temperature is higher than the threshold, it sends an alarm to the user to remind the user to turn on the air conditioner.

The third function is to control, the user can from the same place or from a remote location control, by using intelligent electrical plug seat infrared partner, time controller, the combination of intelligent product and voice telephone remote controller, realize the timing control of household appliances, wireless remote control, centralized control, telephone remote control, scene control and computer control, a variety of intelligent control. Controllable appliances and devices include heating and hot water systems, lighting, windows, curtains, garage doors, fridges, TVs, and washing machines (Robles and Kim, 2010). It can be seen that smart home is widely used in control. People can control home appliances remotely through mobile phones or other devices, which saves energy consumption and greatly facilitates people's life.

The last function is also the most important: Home Intelligence (HI). Bregman claimed that HI relies on the artificial intelligence (Al) mechanism in the smart home environment and creates an integrated environment in the smart home, where the Al mechanism can recognize and respond appropriately to changing conditions and events (2010). I can't agree more. If there is no HI, the smart home system cannot respond to the outside, and it cannot work normally.

4. The concrete application of intelligent home in life

4.1 Smart home can improve the comfort and security of people's life.

After understanding the basic functions of the smart home, it is obvious that the smart home is conducive to improving the comfort and safety of people's lives. Smart home based on the home network can make life easier, more convenient, and at the same time more reassuring. Whether you are working or on vacation, smart homes will tell you what is happening at home, and the security system in smart homes can also provide a lot of help in emergency situations. For example, when a fire occurs, residents will not only be awakened by the fire alarm notification, but at the same time, smart homes will also open the door to quickly provide a safe and reliable passage. The phone number of the fire department will also be dialed so that the fire department can implement rescue more quickly.

4.2 Smart home can save energy.

Smart homes can also save energy and improve energy efficiency. Because systems like Z-Wave and ZigBee can reduce the power level of some devices, they can go to sleep or wake up when instructed. When people leave the room, the lights will automatically turn off and energy consumption will be reduced. Another way to save energy is to measure the energy consumption of home appliances and lamps based on ZigBee. The home server will receive the collected data and calculate the household energy usage pattern to control the household energy usage plan and minimize energy costs (Han et al., 2014). It can be seen from the above that smart homes can not only save energy and improve energy efficiency, but also save money and improve the overall quality of life. Lower electricity bills mean larger budgets and more funds can be used to replace existing equipment or upgrade other household equipment to achieve more sustainable development. The initial cost of a smart home may be slightly higher, but most energy-saving smart devices will pay for themselves

over time, and tax credits are also applicable to certain smart products, such as solar panels and geothermal heat pumps. In addition, energy-efficient housing puts much less pressure on the environment and provides a better living environment for all of us. So when we replace those old devices with smart, sustainable devices, these devices will actually make us and others happier.

4.3 Smart homes can help the elderly.

Smart homes have brought huge benefits to elderly people living alone. Smart homes can alert family members and hospitals when the elderly accidentally fall. It is claimed that a smart phone-based remote fall detection system uses the accelerometer in the smart phone to detect the user's movement. Once the user is found to have fallen, the sound and image of the fallen person will be captured by the activated microphone and camera and responded through the system, sending messages to medical staff and relatives as needed (Majumder et al., 2017). This is conducive to timely and effective rescue of fallen persons and avoid unnecessary injuries. In addition, the smart home can also notify the elderly to take medicine at a specific time, track the body temperature and food intake of the elderly, and ensure the health of the elderly. If the elderly are a little forgetful, smart homes can take the initiative to perform some tasks, such as turning off the faucet before the bathtub overflows, or turning off the oven when no one is using it. Therefore, the easy-to-control smart home automation system improves the safety factor of the home.

4.4 Smart home can effectively prevent theft.

Family anti-theft is a concern of many families. The smart home anti-theft system subsystem has indoor anti-theft and anti-robbing functions. It is noted that smoke detectors, zone intrusion detectors, burglar alarms, surveillance cameras, interconnected and integrated with the communication infrastructure and the information systems are included in the safety system of a smart home (Lee et al., 2014). Security codes, motion detectors, and cameras provide information for the smart home security system to detect whether the person who needs to enter the house is a homeowner, a visitor who is allowed to enter, or an intruder. At the same time, the motion detector will respond, letting the artificial intelligence program know that there is someone or something that needs to be evaluated. The facial recognition software and security code are controlled by the security system. Only with the permission of the security system can the person enter the residence, and restrict others from entering the residence based on pre-programmed information. When the smart home security system detects a stranger, it can provide a video of the visitor to the homeowner. If permission is obtained from the homeowner, visitors will be allowed to enter the residence, unwelcome visitors will be ignored, and the security system will issue an alarm for suspected intruders trying to break in. Smart home makes us no longer need to worry about personal safety and property safety in the home.

5. The Internet of Things and the Smart Home.

Above we have introduced the comfort, convenience and safety that smart home brings to our lives, which greatly improves our quality of life. Of course, with the advancement of science and technology in the world today and the increase in people's needs, smart homes will not stand still. It is supported that the Internet of Things originated from the needs of people to connect, communicate and interact with homes, factories and other items. The smart home based on the Internet of Things is actually a collection of related intelligent and possibly autonomous things, and home appliances, home entertainment, safety and security, and Vehicles are included (Halvorsen et al., 2017). Thus, the development potential of smart home is very huge, especially smart home systems based on the Internet of Things.

Before the concept of the Internet of Things was formally put forward, smart homes were actually dominated by "digital homes", which was to interconnect a variety of home appliances through computer technology and network technology to achieve rapid and convenient exchange of various types of data, thereby improving residential living comfort, control and entertainment, such as remote control of air-conditioning, digital TV and computer video sharing, online real-time lighting and

curtain sensing control applications, home life in this period is still in the stage of obtaining data. After the rise of the Internet of Things, its development concept has made a great leap. In this period, home life is no longer passive data reception, but instead has been transformed into active control and interaction through radio frequency identification, infrared sensors, GPS, GIS, audio and video, technical defense and other information sensing equipment, according to the agreed agreement to connect any item to the Internet for information exchange and communication, in order to achieve intelligent identification, positioning, tracking, monitoring and linkage alarm management, so that the previous abstract concept turn it into a real application, thereby promoting the development of smart home to a higher level. Therefore, smart home can integrate a variety of emerging technologies, especially based on the Internet of things smart home development prospects.

6. Summary

This essay from the background of the development of smart home technology, the resulting functions, the benefits to people and the development prospects of a systematic elaboration. We can see that smart home adapts to the needs of modern social development, changes the user's way of life and living environment, helps the user to manage time more effectively, saves energy consumption, and increases the safety factor of living, improves people's quality of life and work efficiency.

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