

Discussions on the Pattern Development of Smart Home Design

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Abstract: Based on the analysis of the concepts related to the pattern of smart home design, this paper analyzes the functions and principles of the smart home design. At the same time, the present situation of the developing home design in China is expounded, and the prospect of its development is discussed based on the present situation.

1. Introduction

The concept of "smart home" is originally developed from the concept of "intelligent building", which extends from the concept of "intelligent building". Broadly speaking, the "intelligent Home Furnishing" integrated wiring technology, network communication technology, automation control technology, security technology, audio and video technology and computer technology will Home Furnishing and living environment is closely related to various facilities and equipment set connected based on the degree of coordination between the Home Furnishing reach [1-2]. The daily affairs management system to build efficient residential facilities and Home Furnishing in, so as to realize the intelligent management of Home Furnishing living environment, change people's way of life, enhance the safety, convenience, art, environmental protection and energy saving and intelligent Home Furnishing, provide a more humanized and intelligent living environment mass. Specifically, smart home design is based on hi-tech information platform, which connects the facilities or devices in the building with the personal terminals of the home users, and realizes the information communication between each other by intelligent design [3]. Through intelligent design Home Furnishing such Home Furnishing, users can control through personal terminal building's facilities or equipment, the Home Furnishing safety, convenience, comfort, art embodied in a great extent; at the same time, the public network can also be through this kind of intelligent design with users and facilities or Home Furnishing the equipment in the building of network security monitoring, health monitoring of the target. In conclusion, smart home design can be summarized as a new design concept and design method based on Internet of things technology [4]. It can make human living environment more environmentally friendly, energy saving, safety, humanization and comfort.

2. The Function of Smart Home

2.1 Intelligent lighting control

It is easy to control family lighting, with centralized control, lighting scene control, combination control, remote control and other functions. It can make personalized lighting settings and create different scene atmosphere according to its own preferences.

2.2 Intelligent household electrical appliances control

The intelligent control of electrical appliances at home can be realized by using a remote controller, and the remote control can be realized by household appliances such as televisions, air conditioners, water heaters and so on.

2.3 Telephone remote control

To connect the home phone line with the telephone remote controller, the voice control information from the remote phone can be received, according to the predetermined key operation.

Users can remotely control household appliances such as air conditioners, electric lights, water heaters and other household appliances by using fixed telephone or mobile phone everywhere [5]. At the same time, it does not affect the normal use of telephone.

2.4 Intelligent electric curtains

Users can manually and can use remote control, home intelligent terminal, telephone remote, network control curtains open.

2.5 Intelligent security

Indoor theft, robbery, fire, gas leakage and emergency rescue function, fully integrated voice telephone remote control, timing control, scene control, wireless transmitting intelligent lighting and appliances control function; easy implementation of smart home security; 6 preset anti-theft alarm telephone; 8 Cable zones; reliable quality, stable performance. No need to worry about the safety, property safety, safety of life.

3. Smart Home Design Principles

3.1 Practical convenience

The basic goal of smart home is to provide people with a comfortable, safe, convenient and efficient living environment. For intelligent Home Furnishing products, the most important thing is to use as the core, reject those who can only display as flashy without substance, function, products with practicability, usability and humanization. The operation process and program are too complicated to allow users to exclude psychology. So when designing smart home, we must give full consideration to user experience, pay attention to the facilitation and intuition of operation. It is better to use graphical and graphical control interface to make operation visible.

3.2 Security

The various intelligent subsystems of the whole building should be able to operate for twenty-four hours, and the security, reliability and fault tolerance of the system must be highly valued. For all subsystems, the corresponding fault tolerance measures should be taken in terms of power supply and system backup, so as to ensure normal and safe operation, quality and performance of the system, and have the ability to cope with all kinds of complex environmental changes. At the same time with large data technology, the author thinks that the security of data must be guaranteed in the design principle of smart home products. Intelligent data Home Furnishing face increasingly serious security problems, need the following five points: first, security businesses need to continuously improve the safety level of protection, improve data protection and data system; second, businesses need to enhance the data security protection technology from hardware, software and other aspects; third, businesses and operators should establish a sensitive monitoring server with the use of data system; fourth, network security standards and business server operators to develop specific scene; fifth, the implementation of the relevant standardization bodies or organizations need to assist in the development of safety testing standards.

3.3 Standardization

The design of smart home system should be carried out in accordance with the relevant national and regional standards to ensure the expansion and expansibility of the system. The standard TCP/IP protocol network technology is adopted in the system transmission to ensure that the system between different producers can be compatible and interconnected. The front end device of the system is a versatile, open, and scalable device [6]. The system and product designed can make this system interconnected with the third party controlled devices that are developing in the future.

3.4 Convenience

There is a notable feature of family intelligence, that is, the workload of installation, debugging and maintenance is very large, which requires a lot of manpower and material resources to invest. It

has become a bottleneck restricting the development of the industry. To solve this problem in the design of the system, they should consider the installation and maintenance convenience, through the network, not only the household can realize the control function of family intelligent system, also allows the engineering staff in the work of the remote inspection system, carry on the fault diagnosis system [7]. In this way, system settings and version update can be carried out in different places, which greatly facilitates the application and maintenance of the system, improves the response speed and reduces the maintenance cost. The convenience of product design based on large data includes three points: 1) Effectiveness. By compressing or deleting data information, we can simplify data presentation, which is clear and easy for users to understand, so that in a certain environment, the performance of products can achieve the desired results. 2) Easy to learn. By designing a multidimensional method, the data is displayed in different user groups. Through the classification and display of information data, the user's operation of products is limited to a certain range, which provides users with data operation and analysis results in this range. 3) Adaptability. New visual metaphorical methods are proposed to display data in a completely new way, so that different objects can be easily used.

3.5 Popularization

Family automation system should aim at low cost and high performance target design, and households are more sensitive to price, so the technology adopted by intelligent residence is more economical. At the same time, the home automation system should be able to maximize the compatibility of the user's original electrical equipment and protect the user's investment. Manufacturers at the beginning of product development or product upgrading, first ensure design goals, reduce unnecessary functions, the product to do subtraction to remove the redundant function, this is a necessary condition to win consumer products; secondly pay attention to reliability of smart products, the best matching relation between attention in technology and materials and costs, the pursuit of lifetime maximization, optimization of production, transportation and sales system, cost control so as to maximize the value of the product. In conclusion, cheap, good quality, long service life is the guarantee for smart home to have good market competitiveness [8]. Designers need to correctly handle the relationship between product function and cost in the process of design.

3.6 Patterning

The concept of pattern is mainly focused on the computer software technology in the Internet networking world. In theory, it is designed to divide a software into a number of parts separately, and then reassembled, and each part is a module. It is an important development method in software engineering, which is beneficial to control quality, to cooperate with many people and to expand function. In the design of smart home, the application of patterning is beginning to run through this design method. It can be said that it is the most basic technical means for the development of home design to intellectualization.

4. The Status Quo of the Development of Smart Home Design Pattern

The intellectualized home design's pattern development has been mentioned and applied to the home design for the first time and has been in the continuous development. For our country, smart home is still a new industry. It is still in the initial stage of growth, and has not occupied a large share in the home market. The general public's understanding and acceptance capacity is limited. However, with the further implementation of the popularization and popularization of smart home and the further cultivation and improvement of consumer habits, the smart home market will develop rapidly with great potential and bright future [9]. The designer of the home industry is looking at the good momentum of the intelligent home, so it began to pay attention to the intelligent home design work. At the same time, the research of intelligent home design is attracting more and more attention from home researchers, constantly applying the new Internet technology to intelligent home design.

According to the statistics, the popularity rate of computer network in China has reached 90% in

2013. The home industry of our country has also been popularizing the smart home in large area and multi direction since 2011 [10]. The idea and product of the smart home began to try to get into the mind and home of the general public. In today's smart home market, the following functions have been realized:

4.1 Remote control

The system can maintain and modify the settings by way of remote login, such as user functions need to be upgraded, can modify the program through the network. In addition, users can also through the user terminal remote control of indoor lighting, curtains, home appliances. Home network support video transmission system, it has a USB interface, can be directly connected to the camera and remote video transmission through the Internet, indoor monitoring and control.

4.2 Security alarm

The security system is started, all the doors and windows are in the best state of alert. When there are intruders, doors and windows closed automatically, intelligent infrared alarm and security system ringing siren, the alarm is transmitted to mobile phone users and security center. The user can through personal terminal remote access network camera observers. Home in case of fire or gas leak, smoke detector or gas detector response in time, the first time the alarm intelligent fortification.

4.3 Intelligent control apparatus

Installed in each room, body temperature and humidity, brightness induction infrared detector, according to the various scenarios users set in advance, the automatic acquisition of various environmental physical current room information input module, through the analysis of the chip sends electrical signals to the actuator, driving the corresponding electrical response.

4.4 Intelligent lighting control function

Through the induction of the human body in each room of the detector, the intelligent system is provided Home Furnishing induction control mode, users go directly to the corresponding region, a corresponding region of the lamp can be automatically opened, the user leaves, the lamp will delay off after a period of time.

4.5 Home video

This function has been widely accepted and applied. The movie just press the "cinema scene" button, automatically adjust the light projection screen down to the movie mode, open the audio and video playback and power amplifier.

Intelligent design Home Furnishing above has been widely accepted in the market has Home Furnishing and applications, and they are the main aspects, there are many small details and has been designed and made.

5. Prospects for the Development of Smart Home Design Pattern

Prospective analysis report of Home Furnishing products and technology of intelligent in China were analyzed and predicted China intelligent equipment industry Home Furnishing development environment and market demand, from the analysis we can see that we will Home Furnishing intelligent industry is a vibrant, full of strong vitality of the sunrise industry, the industry will enter a period of rapid development in the future a few years. According to the statistical analysis of the relevant data of the past development speed, the smart home equipment industry will grow at an annual average rate of 19.8%, and its output value will reach 124 billion yuan in 2015. In particular, it is visible that the smart home design has a good prospect for the development of the model, and there is a lot of space for development and development [11]. In view of the current development of our country and the development of foreign countries, the development of smart home in China in the next few years will develop from a single way to a pluralistic way, that is, the diversification,

integration and unification of functions. This requires smart home design to learn from advanced science and technology knowledge and integrate all aspects of technology, such as information technology, software technology, Internet of things technology and modeling methods into smart home design. Specifically, the development trend of smart home design pattern is:

5.1 Each subsystem can run independently from the interactive platform

In the smart home interaction platform, subsystems can run independently when they are separated from the interactive platform, such as building intercom, home alarm, various electrical control, access control, family entertainment and so on. Each subsystem is run under the management of interactive platform. The platform can collect the running data of each subsystem and the system linkage.

5.2 Different brands of products, different control transport protocols can interact through this platform

Because of the interaction platform, different subsystems can work together and run data exchange and sharing under the unified management of the user platform, giving users the maximum right to choose, fully embody the personalization of smart home. At the same time, it also has the function of gateway. Through interactive platform, it can connect with wide area network to realize remote control and remote management.

5.3 Various means of control.

In daily life Home Furnishing, in order to make our family control system can control the information needed at any time, acquisition, operation terminal form is very important, intelligent terminal of various forms is essential: intelligent remote controller, touch screen, mobile computer, mobile phone, PDA etc.

In summary, with the improvement of people's quality of life, the market share of intelligent home market has been increasing. The development of smart home design pattern is also very optimistic, its prospects are broad and there is a lot of space for development. The author thinks that the main direction of intelligent home design will be the design of operation system, the integration of different brands and the diversification of control means.

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