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Research on Application of Smart Home in Interior Design

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Abstract: The continuous development of human civilization and the continuous progress of science and technology have played a decisive role in the evolution of the human living environment, and the continuous improvement of the human living environment and the increasing development of human production technology have jointly promoted the emergence and development of "smart home". The popularization and application of smart homes in interior design is imperative. From the perspective of interior design under the background of the "Internet +" era, this article first defines the meaning and types of smart homes, analyzes the reasons for the rapid development of smart homes, and then analyzes the relationship between smart homes and interior design, and reveals the problem of applying smart home in interior design, and finally provides suggestions for the integration of smart home and interior design from the perspective of human settlement environment design.

The smart home uses computer and network communication technology, according to ergonomic principles, through the integration of various home life elements, so as to achieve a variety of advantages, such as comprehensiveness, round-the-clock, security, intelligence, etc. The application of smart home in interior design can realize the combination of design art and technology intelligence, which is in line with the concept of modern interior design. The essence of design is to serve people, and smart homes, which are scientific and technological achievements, are a means to improve the living environment. If "smart homes" can be applied to interior design, it will definitely improve people's living environment physically and psychologically and make life full of art and technology.

1. The meaning, type and development motivation of smart home

1.1 The meaning of smart home

In the 1980s, the concept of "smart home" became well-known, and home products with intelligent characteristics began to appear in the markets of developed countries. Smart home refers to a smart home system based on the main body of the building, integrated application of network platforms, information technology and other scientific and technological achievements [1]. Compared with traditional homes, the design goal of smart homes is to use a variety of technological means to provide

people with a sense of safety, convenience and comfort in their home life. The formation of smart homes mainly relies on cutting-edge technological achievements such as network technology and information technology. The functional feature of smart home is to meet the needs of modern people's personalized home.

1.2 Types of smart home

The general classification of smart homes mainly includes two types: products aimed at ensuring user safety and products aimed at improving the quality of the living environment [2]. The former is represented by products such as remote monitoring systems and smart door locks. Such products can not only guarantee the safety of ordinary users' home life, but also use intelligent safety protection design to provide safe and reliable security for special users such as children and the elderly. The latter is represented by products such as sweeping robots and Bluetooth speakers in Figure 1, which can not only decorate the interior, thereby bringing users a static beauty, but also support users' intelligent operations, thereby bringing users a dynamic beauty [3].

Figure 1: Common smart home products

1.3 The development motivation of smart home

Smart home fully confirms the truth that "technology changes life", technology is not a superior existence, but a tool that goes deep into life and serve life [4]. The pace of modern society is compact, people's life is accelerating, and people are unwilling to spend time on household chores. In this context, smart homes are very useful with their smart service functions for home life.

First of all, network technology has played a role in promoting the formation of smart homes. The network technology realizes the mutual connection and synchronization control of a variety of household products, and a complete, comprehensive and unified household system is constructed as a whole.

Secondly, smart devices have played a guiding role in the development of smart homes. Smart devices are an important part of smart homes. Smart devices have contributed to the era of smart homes. From this perspective, smart devices play a leading role in the development of smart homes.

2. The problems faced by smart home applications in interior design

2.1 The relationship between smart home and interior design

First of all, the goals of functional home and interior design are both to serve humans. The two have the same goals. Their difference is reflected in the fact that smart homes mainly rely on the network and information technology to provide convenient services for humans, while the interior design is through carrying out design and transformation of indoor space to improve human living environment [5]. The mathematical language of target convergence is expressed as follows:

$$An = Afather + Cskip(d) * Rm + n \quad (1)$$

Secondly, smart home has changed the thinking of interior design. Smart home represents an

advanced design concept. The introduction of smart home into the field of interior design will inevitably bring positive and negative effects on interior design [6]. In terms of application advantages, smart home has promoted the personalized and standardized development of interior design; in terms of application disadvantages, smart home has increased the complexity of interior design and greatly increased the design workload, and even minor design errors may cause obstacles to the entire smart home system.

Finally, smart homes put forward higher requirements for design work. On the one hand, interior designers must change their design concepts and clarify the relationship between smart home and interior design; on the other hand, interior designers should master the professional methods of applying smart homes, and adopt a scientific and harmonious way to achieve two fusion design.

2.2 Problems of smart homes used in interior design

First, the maintenance cost of the smart home system is relatively high. Smart home still belongs to the category of technology and equipment in essence, and various forms of failure and loss will inevitably occur during long-term operation. In addition, the smart home system applies high-end control systems and technologies, which requires routine overhaul and maintenance work, and the system maintenance cost is relatively high [7]. Most smart home systems use the system master control method. If the master control system fails, it may cause the entire smart home system to fall into an abnormal state, which will cause joint failures and cause high maintenance costs.

Second, there is a risk of leaks in smart homes. Smart homes rely on network platforms and technologies, and the circulation and openness of network platforms will inevitably invade the smart home system. The home environment has extremely high requirements for confidentiality and privacy, but smart homes may become a dangerous source of leaking user privacy, which has caused many consumers' concerns.

Third, a unified quality control standard has not yet been formulated. Smart home is a new thing in the home market. It has not formulated a unified standard for the quality certification, quality evaluation, and quality control of smart homes. This makes smart homes in a state of uneven product quality, and after-sales service and maintenance are difficult to be guaranteed. In the absence of quality monitoring, if inferior smart home products are applied into the interior design, it will inevitably impair the effect of the interior design due to the quality of the smart home.

3. Application integration countermeasures of smart home and interior design

First of all, with the support of the network, flexibly use wireless communication equipment to close the integration of smart home and interior design. Network communication technology realizes the collaborative operation of smart home products, so it is an important foundation for creating a smart home environment. In addition, only by ensuring the cooperative operation of smart home products can a good interior design effect be achieved. The rapid development of network communication technology can meet the design requirements of smart home products, which has promoted the joint application of network technology and smart home, and laid the foundation for the application of smart home in the design of interiors. It can be seen that network platforms and wireless communication devices have played an important role in supporting the deep integration of smart home and interior design. For example, the Xiaomi smart patch panel is connected to the user's mobile phone through a wireless communication device, and the user can remotely control the smart patch panel through the mobile phone to prevent danger.

Second, advocate environmental protection awareness and promote the simultaneous development of intelligence and green. Incorporating smart home into the interior design is actually deploying intelligent technical achievements in the living environment to provide convenience for home life.

Making full use of natural factors in the interior design, and better use of natural resources with the help of intelligent technology, such as the use of smart curtains for reasonable daylighting, and the use of smart water tanks to save water, makes smart and green perfectly integrated in the interior environment design. In addition, the concept of green and environmental protection is also an important realization path for the security and convenience that the smart home system pursues. Through the application of green environmental protection materials, the smart home system also has corresponding green environmental protection attributes, which not only saves the cost, but also strengthens the safety and convenience of the application.

Finally, practice humanistic thinking and incorporate emotional factors. While focusing on intelligent design, the humanization of design effects should also be considered. In terms of product functions, smart homes must not only meet users' daily application needs, but also their emotional appeals, which is in line with the basic concept of interior design. Smart homes satisfy users' emotional appeals mainly through the rich artistic features of smart homes. To achieve this effect, it is naturally inseparable from the exquisite interior design. Starting from the user's emotional level, through the thoughtful and intelligent services that intelligent products can provide, users can feel the flexible characteristics of a relatively fixed interior design through smart homes, which is an ideal effect of humanistic thinking of the interior design in practice.

4. Conclusion

The development of interior design has promoted the innovation and progress of smart homes. The application of smart homes provides new ideas for interior design, which ultimately improves the comfort of the living environment and gives the interior a sense of design. The integration of smart home and interior design is not just a simple combination of technology and space, they rely on each other and develop together around the needs of living environment. Although the application of smart home in interior design still faces many problems, with the innovation of design concepts and advances in science and technology, the integration of smart home and interior design is unstoppable. Therefore, while vigorously developing smart homes, we should also explore scientific ways to integrate them with interior design.

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