Research on the Development Situation and Countermeasure of Intelligent Home in Wenzhou

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Abstract
Through investigation of users and enterprises, Wenzhou smart home has no unified standards, high maintenance cost, immature products, high threshold of product users. Considering both Wenzhou and domestic actual situation, it is proposed to increase training of smart home knowledge, improve codes and standards of smart home, and strengthen human-centered compatibility design of smart home products to help overcome yards times of smart home development at the present stage.

Keywords
Smart home; Development; Measures.

1. Introduction
Smart home refers to the interconnection of various devices in the home through networking technology to provide various functions, e.g., home appliance control, lighting control, tele-remote control, indoor and outdoor remote control, burglar alarm, environmental monitoring, and heating ventilating and air conditioning (HVAC) control. The rapid spread of the mobile Internet has brought smart home market into a rapidly increasing period.

Smart home can be divided into the following subsystems:
(1). Lighting control system
Provide lighting dimming and scene control;
(2). Home security system
Realization of theft prevention, disaster prevention and seeking help through various sensors and security modes;
(3). Electrical control system
Including infrared appliance control, connecting network appliances and other functions;
(4). Environmental control system
Unified management of curtains, ventilation equipment, heating equipment, air conditioners, etc.;
(5). Internet remote monitoring
Remote control of home appliances via web browsers;
(6). Telephone remote control
Control of home equipment anytime, anywhere by phone, mobile phone, or even text message;
(7). Network video surveillance
Through browsers, scene at home is seen in the office;
(8). Indoor wireless remote control
Remote control of the whole family equipment through wireless radio frequency, infrared remote control and others.
(9) HTPC (refers to Home Theater Personal Compute)

Home theater with computer as the signal source and control, that is, a pre-installed various multimedia decoding and playing software, is used to play various audio-visual media, and has various interfaces to connect various display devices, e.g., televisions, projectors, etc.

With the rapid development of technology and the great improvement of people living standards, people in Wenzhou are increasingly dissatisfied with existing living conditions, replaced by an urgent pursuit of a more comfortable and high-quality living environment. Through media publicity, smart home is not only accepted by some residents, but also becomes a focus pursued by real estate developers.

2. Wenzhou Smart Home Development Status

Wenzhou smart home construction started late, but the development is very rapid. In October 2017, 450 owners, who had renovated their house in Oasis Garden, Nature, Jiahong Garden, Binjiang Jiuli, Zhixin Villa, Xiangyu Peninsula, Greentown Plaza and other residential areas, were surveyed. The investigation found that many owners did not understand the smart home, thinking that the smart home appliances are smart home. The smart home applications are shown and seen in Table 1.

<table>
<thead>
<tr>
<th>Subsystems of smart home applications</th>
<th>Number of installations</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lighting control system</td>
<td>36</td>
<td>8%</td>
</tr>
<tr>
<td>Home security system</td>
<td>351</td>
<td>78%</td>
</tr>
<tr>
<td>Electrical control system</td>
<td>3</td>
<td>0.67%</td>
</tr>
<tr>
<td>Environmental control system</td>
<td>6</td>
<td>1.33%</td>
</tr>
<tr>
<td>Internet remote monitoring</td>
<td>6</td>
<td>0.44%</td>
</tr>
<tr>
<td>Telephone remote control</td>
<td>2</td>
<td>0.00%</td>
</tr>
<tr>
<td>Network video surveillance</td>
<td>0</td>
<td>0.01%</td>
</tr>
<tr>
<td>Indoor wireless remote control</td>
<td>57</td>
<td>0.03%</td>
</tr>
<tr>
<td>Home Theater Personal Compute</td>
<td>80</td>
<td>0.18%</td>
</tr>
</tbody>
</table>

The data show that home security system is widely used, and telephone remote monitoring has not been used yet, and other systems are also used less. Smart home control methods are various, including computer control, message control, telephone control, timing control, scene control, motion sequence, linkage control, trigger control, wall control, handheld remote control, message, telephone alarm, remote monitoring, shouting, lighting dimming, soft start, scene, memory and other functions.

Wenzhou Smart Home has the following problems:

(1) The technology is immature, and the product maintenance cost is high, no standard is formed;

(2) With insufficient investment and insufficient promotion, this industry has not yet matured;

(3) The product is not good enough and hits a bottleneck. Many people want to make smart home, but after picking and choosing, they find products on the market are not mature enough.

(4) The price is also a problem. Now quantity of each manufacturer has not gone up, price is not coming down, and the channel establishment is not perfect.
3. Development Potential of Wenzhou Smart Home

The development of Wenzhou smart home started late. In 1999, the concept design of smart home was introduced, which was slow to develop due to various reasons. In recent years, smart home industry has attached great importance. At present, domestic relevant industries and fields have made some standard specifications. For example, for video surveillance industry, the standard GB/T28181 Technical Requirements for Information Transmission, Exchange, and Control of Security Surveillance Video Surveillance Networking Systems was officially launched in June 2012. In 2014, it was called the first year of smart home development by industry insiders. In August 2014, Zhejiang Provincial Industry Association and industry community promoted the establishment of smart home special committee. More than 500 representatives from nearly 100 enterprises, engineering companies, agents and design institutes attended the conference.

The Proposal for the Development and Standardization of Smart Home Products was released on the spot. As more and more enterprises enter smart home market and plough into the development and promotion of smart home products, the development space of the entire industry will be further expanded. The unified industry standards and good enterprise cooperation will bring an infinite development platform to smart home.

The development potential of smart home is great. According to The China Smart Home Industry Development Trend and Investment Potential Research and Analysis Report in 2013 to 2018” released by China Industrial Information Network, from 2006 to 2011, the average annual growth rate of China smart home market is 20%. It is expected that from 2012 to 2020 the annual growth rate will reach 25%. In 2020, the market size will reach 357.6 billion yuan. Apple HomeKit, Google Smart Home Platform, Samsung Smart Home, Haier U+ Smart Open Platform and Xiaomi Smart Home Control Center have become the main players in the smart home industry.

Smart home is a system that connects home appliances into Internet, enabling users to remotely control home appliances. It involves close range communication technology, cloud services, mobile intelligent terminal control, etc., and more relates to mobile Internet and traditional home appliances. The cooperation between Internet companies and traditional home appliance companies has brought new development impetus of smart home. However, at present, smart home still lack uniform industry standards, and the interconnection and interoperability between smart home products and platforms is still pending. According to the survey data, degree of interest in smart home increase up to 95.2%, but 87.5% of users are dissatisfied with the current status of smart home, indicating that the smart home is completely inconsistent with expectations or lower than expected.

4. Smart Home Security Case Study

Security systems in smart home are widely used. A schematic diagram of smart home security system is seen in Figure 1.
Security systems have several features below:

(1) Theft prevention: if there is an illegal burglary at home, the burglar alarm will send an alarm signal.

(2) Burglar prevention: when it happens robbery, the security system sends an alarm signal.

(3) Seeking help: the system can be used for elderly, children and emergency call to seek help.

(4) Fire prevention: the smoke detector detects the indoor smoke in time and issues a fire alarm.

(5) Gas alarm: when the leakage of gas and liquefied petroleum gas is detected, the alarm is issued in time.

(6) Automatic alarm: after receiving an alarm signal, the system host calls automatically alarm center by circulating six group settings

(7) Remote monitoring: after the alarm call is connected, the system monitors immediately scene in order to take some action soon.

(8) Remote control: users can remotely operate the system host to defend or retreat by mobile phone or telephone.

Smart home security alarm system is based on the reliability of the system, combined with burglar alarm, fire alarm and gas leakage alarm system. All the safety detection devices in home are connected to the home intelligent terminal and connected to the security center. When going out, users simply press the remote control in his hand and the alarm system automatically enters the arming state. While users are away, if a gangster attempts to open the door and window, door magnetic sensor will be triggered; at this time, the alarm system will send out alarm sound, and the alarm will be sent to several designated telephones through telephone line, and the users can monitor the home situation in time to quickly take countermeasures to make the gangster obtain appropriate sanctions to protect property and life.

At present, security system has become a security protection measure for some public and important places. It transmits the live image, voice and alarm data to the police station though Internet, thus fighting crime and maintaining social order. One point that cannot be ignored is that some security systems still have some defects. Some alarm systems even have false
positives or false negatives, which brings hidden dangers to users’ home security. At the same time, due to the complicated system and inconvenient operation, the elderly and children in home are not easy to master, which brings many inconveniences to life. Therefore, the home security system should be developed towards be simple and practical.

5. Existing Problems and Corresponding Measures

Although the concept of smart home has already entered the vision of Wenzhou people, it still cannot achieve a long-term development. According to the development situation of Wenzhou smart home above, this paper proposes several suggestions:

(1) The overall planning of smart home products is not perfect, the product compatibility of different manufacturers is poor, and the technical level of system integrators is low. Based on a survey of 15 domestic smart home companies, it was discovered that thousands of incompatible standards have emerged as the smart home industry has just emerged. The manufacturer’s smart home system is only compatible with the products produced by them, which limits the user's choice and is expensive, thus limiting the promotion of smart home market.

Compared with international brands, domestic brands have relatively simple functions and do not have good signal transmission capabilities, resulting in multiple failures during service stage. Domestic products lack comprehensive plan and unified standards, resulting in many foreign integrators and products occupying the market of smart products and energy-saving products in China.

To this end, we need to accelerate the design and development of smart products and energy-saving products, unify product standards, break industry protection, and enhance the compatibility of different brands of products.

(2) The construction expectation is high, the design quality is low, and the smart home construction specifications and acceptance criteria are incomplete. At present, the smart home industry should establish a whole set of smart product standards and build smart home technology verification platform and integrated service platform based on the Internet of Things as soon as possible.

(3) Property managers and users are dissatisfied with usage of smart products, which is divided into two parts. On the one hand, they feel that the operation is not smart enough, on the other hand, they feel that the function is not ideal enough. Users and property managers generally reflect that smart home devices are often idle or abandoned and they cause waste in various degrees.

At this stage, in order to improve the awareness of Wenzhou property management personnel and users on smart home, we can organize various technical exchange activities of building home, promote and popularize the knowledge and technology of smart home, and further enhance the understanding of the whole industry, especially for investors, otherwise it will be impossible to create smart home that meets the requirements of the information age. These measures can help users improve the understanding of Wenzhou smart home.

6. Conclusion

Through investigating the basic conditions and situation of Wenzhou smart home, some suggestions are given and should be carried out. The construction administrative department should accelerate produce the design specifications of smart home, strengthen the theoretical research and publicity of smart home, raise people's understanding of smart home, and then bring up property management talents and professional design talents of smart home. In
addition, smart home system integration products should be researched, which provides guidance for real estate developers to develop smart home.

The investigation and analysis of Wenzhou smart home has promoted the popularity of smart home and improve people life quality, and also provides reference for setting up smart home. The whole process has deeper guiding significance for the construction of smart home, and provides reference and suggestions for shaping the urban personality of Wenzhou. After overcoming the above-mentioned problems, the information industry will be promoted to a higher level, and Wenzhou smart home will also be promoted to a new stage.

References

