Analysis of Smart Elderly Care Services Model Based on Smart City Theory——Taking the Smart Elderly Care Service in Harbin as An Example

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Abstract—With the continuous development of Internet, Internet of things, cloud computing and other technologies, in order to meet the needs of social development, "smart city" was born.Through the development of smart cities, smart elderly services will be provided. This paper uses VISIO software to build the operation mode of smart elderly care in Harbin. By expounding its development status, this paper points out that there are insufficient construction of smart elderly care service information platforms and insufficient research and development of intelligent terminals in Harbin, and puts forward the solutions to strengthen the construction of information technology and the cultivation of smart elderly care service talents, so as to improve the service level of elderly care and further build the development of smart elderly care.

Key words—Smart city; Smart senior care; Smart elderly care service model

1   INTRODUCTION

After entering the 21st century, China's urbanization level has been continuously improved, the scale of urban construction has been continuously increased, and the people's beautiful vision of urban life has been strengthened. With the rapid development of information technology, in 2010, IBM officially put forward the concept of "smart city". As shown in Figure 1,smart city is the re upgrading of the concept of information-based city, digital city and other cities. Through the use of a variety of new advanced information technologies such as Internet and cloud computing to collect information and integrate resources, and then through data analysis and processing selection of relevant systems, smart city is a management mode that makes intelligent response to the people's livelihood, government affairs and social construction of the city, so as to improve the efficiency of resource utilization and optimize urban management and services, And improve the quality of life of citizens[1].
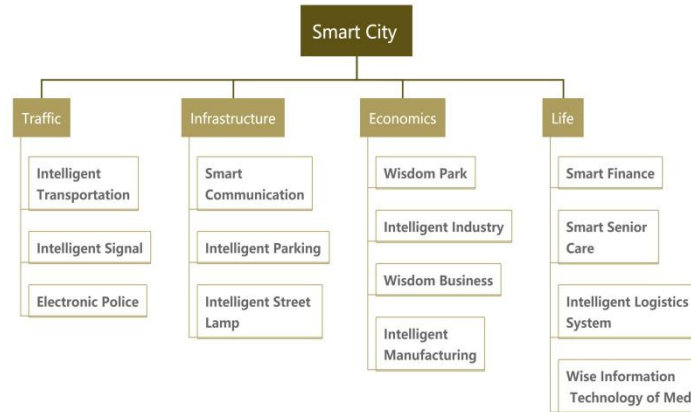
Figure 1 Schematic diagram of "smart city"

With the rising trend of aging in China, pension has become a hot topic in today's society. With the development of the Internet and the continuous upgrading of science and technology, the way of providing for the aged has gradually transformed. China put forward the concept of "intelligent elderly care" in 2012. Its purpose is to better improve the quality of life of the elderly in their later years, so as to solve or alleviate the loneliness caused by the empty nest of the elderly to a certain extent. Therefore, in terms of pension mode, smart senior care has become a new development trend in China. With the continuous development of smart senior care, its own good operation mode and development speed have been widely concerned and recognized by the government, the pension industry, the public and the media.

1.1 Types of smart senior care service modes

1.1.1 The community smart senior care service model

The community elderly care service refers to the home-based elderly care service system with family as the core, community as the basis, day care, life care, housekeeping services and spiritual comfort of the elderly as the main content, door-to-door services and community day care as the main form, and integrated into the professional service mode of elderly care organizations. With the continuous development of information technologies such as big data, Internet of things, cloud computing and artificial intelligence, community smart care also comes into being. The community smart care service is based on the Internet plus community endowment, and it is the creative application of community endowment to Internet information technology. Adopt information technologies such as big data, network and intelligent equipment to optimize community elderly care service resources, so as to provide daily life security for the elderly in the community, and establish an intelligent, efficient and professional community elderly care service model[2].

1.1.2 The institutional smart elderly care service model

Elderly care institutions refer to social organizations that provide comprehensive business

services for the elderly, such as diet and daily health preservation, cleanliness and health, life care, rehabilitation management, sports and entertainment activities. In the context of smart elderly care, elderly care institutions are also endowed with the connotation of "wisdom", which mainly refers to that elderly care institutions use modern computer technology, cooperate with medical institutions and use the interconnection advantages of big data platforms and intelligent products to enhance the information connection between the elderly, their children and elderly care institutions, so as to provide more professional, targeted and accurate service quality for the elderly, At the same time, achieve the standardized management of elderly care institutions[3].

1.1.3 The home based smart elderly care service model

Home care is the most traditional way of providing for the aged in China, and it is also the mainstream choice of providing for the aged at present. Home based smart elderly care provides home-based elderly care services for the elderly at home based on the Internet, Internet of things and intelligent elderly care equipment. Based on the intelligent elderly care service platform, the diversified elderly care service are integrated together to provide diversified and high-quality elderly care service modes such as daily care, nursing and spiritual care for the majority of the elderly at home, so that the elderly can enjoy more, better and up-to-date elderly care services at home[4].The relationship of the three pension modes is shown in Figure 2.
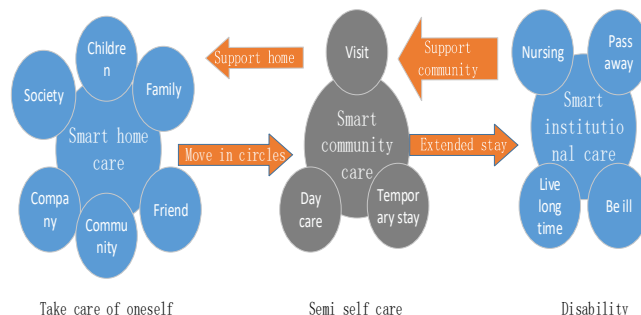

Figure 2 The connection between the three smart elderly care services

2 CURRENT SITUATION OF SMART SENIOR CARE SERVICE MODELS IN HARBIN

As can be seen from the Figure 3, according to the data of Harbin Municipal Bureau of statistics, from 2016 to 2020, the number of people over 60 years old in Harbin increased from 1924200 to 2.2 million in five years, showing an increasing trend year by year, with an average annual growth rate of 2.7% and a total increase of 275800. The proportion of the elderly in the total population increased from 20% to 21.98%, an increase of 1.98 percentage points. From the perspective of the whole of China, the aging level of Harbin is in a leading position, and the elderly population is large, so the elderly care service needed are more urgent. Since the construction of smart city in 2013, Harbin has introduced big data and Internet technology into the elderly care service industry.
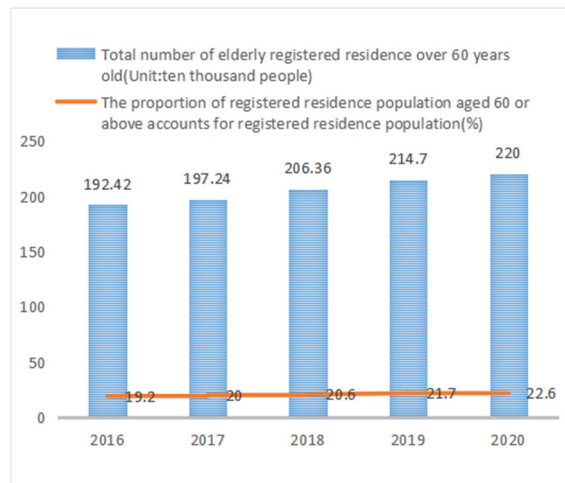
Figure 3 Number of elderly in 2016-2020

From the perspective of smart elderly care service policies, in 2015, Harbin People's government issued and implemented the Implementation Opinions of Harbin Municipal Government on Accelerating the Development of Elderly Care Service Industry, and proposed five projects focusing on cultivating the supply capacity of elderly care services, improving the support system of elderly care services, perfecting the security system of elderly care services, promoting the upgrading of elderly care service industries and strengthening policy support for elderly care service industries, Promote the rapid development of elderly care services. By 2020, it is planned to basically realize the interactive and rapid development of aging life services in the fields of medicine and health, culture and education, family life services, tourism and entertainment, financial service security and other application fields, and form a number of elderly care service institutions and industrial bases with outstanding economic and social benefits. The quality of employees will be significantly improved, the service supply will be diversified, and the life of the elderly living in the community will receive comprehensive services.

From the perspective of smart elderly care service projects, in May 2017, Harbin "12349" elderly care public service center was officially established, which was undertaken by Shou Zhiyuan Elderly Care Service Co., Ltd. on the basis of life services and charities, the platform aims to facilitate the elderly, is led by the government, relies on the information call platform, and is supported by the integration of various offline service resources; With "12349" service hotline as the carrier and app, WeChat, website and intelligent terminal as the link, it provides comprehensive, multi field and deep-seated home-based elderly care services for the elderly, and constructs a "comprehensive information service platform" integrating life services, government services and public welfare services.Its workflow is shown in Figure 4.
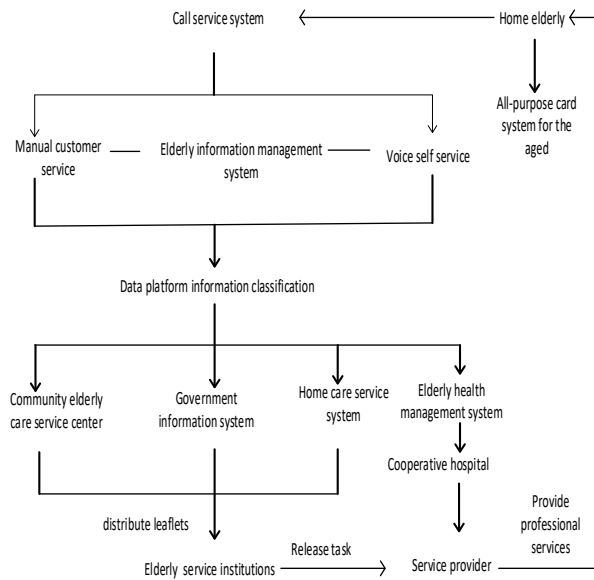
Figure 4 The workflow of "12349" elderly care service platform

In addition, Shou Zhiyuan Nangang District Elderly Care Service Center is also the largest and most comprehensive community smart elderly care institution in Nangang District, Harbin, including convenience canteens, comprehensive activity rooms, bathrooms, free clinic rooms, day care rooms, etc., with all kinds of services. As can be seen from the Figure 5,the company cooperated with Harbin civil affairs bureau to establish a special database for the elderly for data analysis, so as to achieve overall planning and unified management. It not only provides services in the material aspects of life, but also establishes a university for the elderly and organizes members to care about the spiritual life such as the most beautiful "331" travel for the elderly, leading the new model of community home-based elderly care services in Harbin.
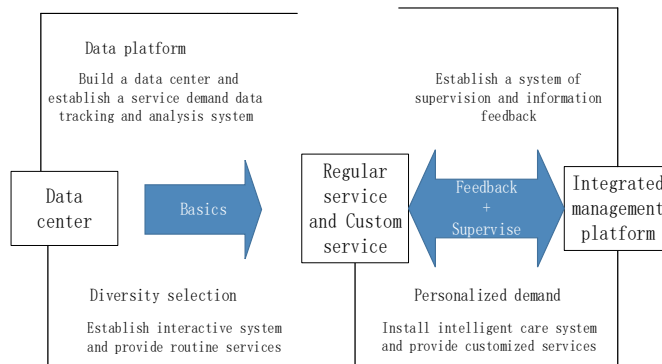

Figure 5 Nangang community smart elderly care service model

3 PROBLEMS OF SMART ELDERLY CARE SERVICE IN HARBIN

Advanced infrastructure is the prerequisite and cornerstone for the development of smart elderly care services. The hardware equipment and software infrastructure of intelligent elderly care have wider service coverage and higher types of scientific and technological characteristics. Although the current infrastructure construction in Harbin has produced a considerable scale, its relatively weak infrastructure construction is still the bottleneck of intelligent development compared with the requirements of intelligent elderly care development, which is mainly reflected in three aspects: information platform construction and intelligent terminal research.

3.1 Insufficient construction of the information platform

The information platform is the core of smart elderly care. It can effectively solve various needs of the elderly. Therefore, it is very critical to establish an intelligent and information platform. However, on the whole, although the information platform construction of smart elderly care in Harbin has made some progress, there are still some shortcomings, such as small scale of information platforms, low degree of service specialization, insufficient intelligence, requiring a lot of manual processing and so on. For example, relying on the front end of the "big housekeeper" virtual elderly care service platform, Harbin municipal government has built the basic elderly care database and service provider information database, but its radiation area is not much, just the whole Nangang District. Due to the continuous expansion of the radiation area, the lack of function of the network platform is becoming more and more prominent, and it is gradually unable to meet the diversified needs of the urban elderly in the actual operation process.

3.2 Insufficient research and development of the intelligent terminal

The Smart terminal is the only way to connect the life of the elderly with the platform. Therefore, the product design and development of smart terminal should focus on solving the weaknesses such as inconvenient hand and foot movement of the elderly and old glasses, and emphasize the convenience and applicability of product design. The research and development of this kind of intelligent terminal equipment can not meet the needs of the elderly, and the design is not personalized enough and the function is single. At present, the intelligent terminal products used for smart elderly care in Harbin are relatively single, and most of the products are limited to computers and smart phones. The communication between people is insufficient, so that the humanistic care is insufficient; In addition, there are few professional enterprises that independently develop smart elderly care products in Harbin, and there are no locally independently developed products. They mainly rely on foreign enterprises for development.

4   COUNTERMEASURES TO IMPROVE THE SMART ELDERLY CARE SERVICE IN HARBIN

4.1 Strengthen the construction of information technology and improve the smart level of elderly care services

Scientific and technological innovation is not only a necessary guarantee for building a smart city, but also a necessary prerequisite for improving the service level of smart elderly care. In order to improve the intelligent level of elderly care services, we must continue to study the construction of intelligent elderly care, which requires all departments, social organizations, enterprises and other functions to work together to build an smart elderly care technology research center. The scientific research department draws lessons from foreign advanced technologies and equipment for smart elderly care, and continuously develops the hardware and software required by the elderly. According to the behavior habits and characteristics of the elderly, the material, appearance and use methods of intelligent elderly care service equipment are designed to facilitate the intelligent life of the elderly. At the same time, combined with image and voice sensing, radio frequency identification technology, indoor and outdoor high-precision positioning, infrared sensors and other modern information technologies, develop smart elderly care service terminal equipment suitable for the elderly[5]. Government departments should fully integrate the information system resources of social services and convenience services, accelerate the informatization and standardization of home-based elderly care in a smart society, and establish the elderly service population information database, elderly health archives information database and elderly service organization resource database on the premise of ensuring safety and privacy of the elderly, so as to promote the optimal allocation of intelligent elderly care resources and improve the level of elderly care services in a smart society.

4.2 Strengthen the training of smart elderly care service talents and improve the professional level of employees

The development of any industry is inseparable from the value created by talents. Strengthening the construction of talent team is one of the guarantees for the development level of intelligent elderly care service industry. First of all, we should give full play to the education and training work of various colleges and universities, and set up professional courses related to elderly care services in secondary vocational education and higher education. Science and engineering colleges and universities can carry out the training of scientific and technological workers such as software development, robot manufacturing and Internet data analysis; Medical colleges and universities can carry out geriatrics, psychological counseling, elderly care services and other medical work. These two colleges and universities should communicate frequently, send each other regularly, promote the construction of elderly care service training base, and jointly cultivate compound high-end talents who are proficient in network knowledge and nursing service knowledge, so as to realize the real combination of medical care and nursing. Colleagues should also improve the policy treatment of elderly care service talents. They can implement the entry subsidy for nursing posts in elderly care institutions and the certificate subsidy for the professional skill level of nursing staff in elderly care institutions according to their academic qualifications, establish a commendation mechanism for elderly care service talents, improve the social status of elderly care service talents, strengthen the social publicity of the advanced

deeds and dedication of elderly care service employees, and improve their sense of social identity and professional honor.

5   CONCLUSION

Smart elderly care is an emerging concept. With the process of smart city construction, in order to promote the high-level and high-quality development of smart elderly care services, government of Harbin integrates the Internet of things, big data, cloud computing, database, intelligent terminal and other scientific and technological means into elderly care service resources, at the same time emphasizes on the cultivation of professionals, constantly optimizes and improves elderly care services，which sets a good example for other cities.

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