International Journal for Housing Science and Its Applications
Publish August 10, 2025. Volume 46, Issue 4 Pages 6090-6099

https://doi.org/10.70517/ijhsa464445

Construction of Home Care Services and Related Health System Based on Artificial Intelligence

Zhidan Wang[1,2,*]
[1] College of Management, Zhongyuan Institute of Science and Technology, Xuchang, Henan, 461000, China
[2] Department of International Relations, Yonsei University, Wonju, Gangwon State, 26493, South Korea
Corresponding authors: (e-mail: wzd840626@126.com).

Abstract As the aging process deepens, China's pension problem is becoming increasingly serious, and home-based pension services are also booming. Artificial intelligence (AI) has been well applied in the field of old-age care. In this article, the use of AI in home-based care (HBC) services and the construction of health system were reviewed. This article took the current situation of senior care in District X as the basis for an in-depth discussion on the connotation of its senior care services. On this basis, a corresponding intelligent service platform for old people at home was designed, which provided feasible countermeasures for the development of old people at home service in a larger scale. According to the experimental results in this paper, the largest weight value of old people's demand for the first type of services was medical care services, with a weight value of 0.289, and the smallest was spiritual comfort, with a weight value of 0.13. This also shows that old people have the greatest demand in medical care services, and the demand in spiritual comfort services is relatively small. Therefore, this paper focused on building a health care system during the design of a smart home service system.

Index Terms Artificial Intelligence, Home-based Care, Medical Care, Health System

I. Introduction

As information and communication technology develops rapidly, as well as China's own characteristics, family pension has become the most dominant form of retirement in China today. However, in actual operation, due to the fragmented and unstable characteristics of its services, the informatization and intelligent operation of home-based elderly care has become an inevitable trend. On the basis of the current situation, there are still some problems in promoting the intelligent operation of elderly care institutions, such as the low utilization of social service resources for old people, the lag in the construction of information platforms, the low level of government information on the senior care service industry, and the low scientific level of policy formulation and decision-making. This paper discusses the establishment of a system that can assist the government in making administrative decisions, taking into account the complex problems faced in the intelligent operation of aging in place. The social endowment service resources in the region, the smart service system and operation mode of home-based endowment with equal emphasis on service and management have been integrated.

With the intensification of the aging of the population, the pension problem is becoming increasingly complex. Traditional pension models such as pension institutions and family pension can no longer meet the current pension needs. Peng Yilun combined traditional culture with China's current national conditions to build the most suitable pension model for Chinese traditional and Chinese people [1]. Zhou Yang combed and improved the relevant literature of Chinese community home-based elderly care, which had important practical significance for the enhancement of the social elderly care service system in China [2]. To solve the problems of social concern, family burden, medical care and social resources that can not meet the pension needs, Liu Feng proposed to establish an ecosystem based on blockchain technology for HBC services, so that old people could enjoy intelligent and professional elderly care services at home without leaving the familiar family environment [3]. With the wide application of artificial intelligence in healthcare, AI can play a good application role for medical diagnosis, disease prevention and health management, improving the efficiency of medical resources such as hospitals, primary health clinics and community health sites, and providing more quality services for old people.

The development and application of AI has the potential to replace the labor force with intelligent equipment, thus reducing the labor demand to cope with the impact of aging. Based on this background, Chen Y B focused on whether AI could effectively cope with the negative impact of aging on China's economic growth. He found that AI could cope with the impact of aging on economic growth through three mechanisms [4]. Based on China's national conditions, Jin Xinyu put forward a method of taking large hospitals as the leading role in diagnosis and treatment.

He used the Internet to realize the organic connection with the three pension models of institutional pension, community pension and home-based pension, and integrated the “medical and nursing intelligence linkage” pension model of AI cloud diagnosis, treatment and rehabilitation of geriatric diseases [5]. However, they did not mention the construction of the relevant health system, nor did they study its demand weight.

To solve the deepening of aging, the change of population structure, the change of traditional family structure and population flow, as well as the financial pressure of the government, this paper introduced the utilization of AI in HBC services and the construction of related health systems based on the demand of HBC services. In HBC services, the introduction of AI has improved work efficiency and service quality. AI algorithms were used to enhance the allocation efficiency and precision matching of home-based pension resources. The experimental findings of this article showed that the largest demand in HBC was medical care services, and the construction of health system was analyzed later. The innovation of this article is that the article not only studies the five factors, but also describes their contents in detail to make the article more rigorous.

II. AI Home-based Elderly Care Service Platform

In recent years, with the deepening of the aging of the population, the miniaturization of the family structure and the intensification of the aging of old people, how to relieve the pressure of family pension has become a major social problem. In this context, the pace and scale of the development of HBC services in China has far exceeded expectations. From the demand side, China has entered an aging society. According to data from the Ministry of Civil Affairs, China’s elderly population aged 60 and above had reached about 212 million by the end of 2018. From the supply side, although China’s pension service system has formed a large professional service team and resource provider, its scale still cannot meet the actual demand. Therefore, how to meet the needs of old people by building an efficient, intelligent and convenient elderly care service system has become an urgent problem to be solved. This paper believes that the home-based pension system needs to use AI algorithms, big data, Internet of Things technology and other means to enhance the allocation efficiency and precision matching of home-based pension resources [6], [7]. To this end, this paper focuses on how to effectively supply and accurately match old people’s home-based elderly care needs by building an efficient, intelligent and convenient elderly care system, with a view to providing reference for China’s future home-based elderly care industry [8], [9].

II. A.Intelligent Resource Allocation Algorithm

This article studies the problem of resource allocation rate adjustment for multi-users, that is, under the condition of limited total power consumption, the system throughput can be maximized by adjusting the adaptive distribution of subcarriers and power. Definition $\mathrm{e_{m,r}}$ is that when subcarrier m is allocated to user r, $\mathrm{e_{m,r}}$ is 1, or 0, that is:

$$\mathrm{e_{m,r}} = \begin{cases} 1, \mathrm{if\ m\ = r} \\ 0, \mathrm{otherwise} \end{cases} \tag{1}$$

The Ant Colony Optimization (ACO) algorithm in the traditional problem is mapped to the allocation of multi-user resources. This problem uses a strategy based on random transition and pseudorandom state transition to determine the next arrival node. In the resource allocation problem, ants choose the current subcarrier allocation through random transition and pseudorandom state transition rules.

On this basis, this article proposes a ratio restriction algorithm based on ant algorithm, and its specific implementation steps are as follows:

(1) The initialization 0 of each sub-carrier is the same.

(2) During each repeated processing, each ant selects a user for each subcarrier according to the following formula. To reduce the complexity of subcarriers, this article assumes the average power distribution of each subcarrier m. Ants choose the best path of $p0$ with the greatest possibility, while ants also have a probability of $1-p0$ on other paths. It is supposed that Ant M is on the sub-carrier in the m column, that is, if it selects user r, the probability of sub-carrier being assigned to sub-carrier m is:

$$\begin{cases} arg\ \max\limits_{z \in M_m^n} \{\beta_{mz} * \alpha_{mz}^{\gamma}\}, if\ p \le p0 \\ q_{m,r} = \frac{\beta_{mr}^{\varepsilon} * \alpha_{mr}^{\gamma}}{\Sigma_{z \in M_m^n} \beta_{mz}^{\varepsilon} * \alpha_{mz}^{\gamma}} \end{cases} \tag{2}$$

Definition p is a random variable uniformly distributed in the interval [0, 1]. When subcarrier m is allocated, pheromone β_{mr} represents the attraction of user r to ants. This method defines heuristic information through specific algorithms, thus defining different heuristic information for different optimization objects. ε and γ are the weights of pheromone β_{mr} and α_{mr}, respectively.

Conceptually, it is necessary to consider not only the fairness of users' ratio, but also the capacity of the whole system. Therefore, the following formula is used to express heuristic information:

$$\theta_{m,r} = \frac{\log(1+k_{m,r}+{}^{K_r}/_{\delta_r})-\log(1+{}^{K_r}/_{\delta_r})}{\sum_{1\in M_m^n}\log(1+k_{m,1}+{}^{K_r}/_{\delta_r})-\log(1+{}^{K_1}/_{\delta_1})} \tag{3}$$

In M_m^n, M_m^n represents a group of selectable ant colony m. The user group is located on the sub-carrier n, and $k_{m,r}$ represents the information rate of user r obtained through the sub-carrier m. K_r represents the current sending speed of user r.

$$K_r = \sum_{m=1}^{M} e_{m,r} k_{m,r} \tag{4}$$

(3) To improve the query efficiency, this article proposes an update method based on global information. The optimal allocation on the current optimal path after each iteration of the ant colony is defined and recorded. If the subcarrier m is assigned to the user r, the information β_{mr} is updated as follows:

$$\beta_{mr} \leftarrow (1-\vartheta)\beta_{mr} + \vartheta\Delta\beta_{m,r}^{bs} \tag{5}$$

Parameter ϑ is the evaporation rate of the total pheromone, while parameter $\Delta\beta_{m,r}^{bs}$ is related to the initial value and optimal solution of the pheromone.

(4) The update of local pheromones is used to improve the exploration ability of ants, so that they can generate dynamic pheromones. After selecting user r of the current subcarrier m, each ant immediately updates β_{mr} as follows:

$$\beta_{mr} \leftarrow (1-\mu)\beta_{mr} + \mu\beta_0 \tag{6}$$

μ is the local pheromone evaporation rate, and β_0 is the initial value of pheromone.

II. B.Smart Service Platform for Home-based Elderly Care

There are three main models of China's current senior care system. The first is government-led, social participation, and market operation. The second is community home and institutional care. The third is the cooperation between the government and social forces, the government purchases services, and the senior care services provided by third-party institutions. In government purchase of services, most of them are hospitals, nursing homes or relevant social organizations. However, in the process of government purchasing services, there are some problems such as high financial pressure of local governments, shortage of primary nursing staff, and low work efficiency.

The smart HBC service platform collects the basic data of the elderly, service resources, service personnel, social welfare resources, and integrates, processes, and calculates them to form a data classifier for the use of the government, the elderly and their families, home-based elderly care institutions, and other institutions to achieve information sharing, as shown in Figure 1 [10], [11].

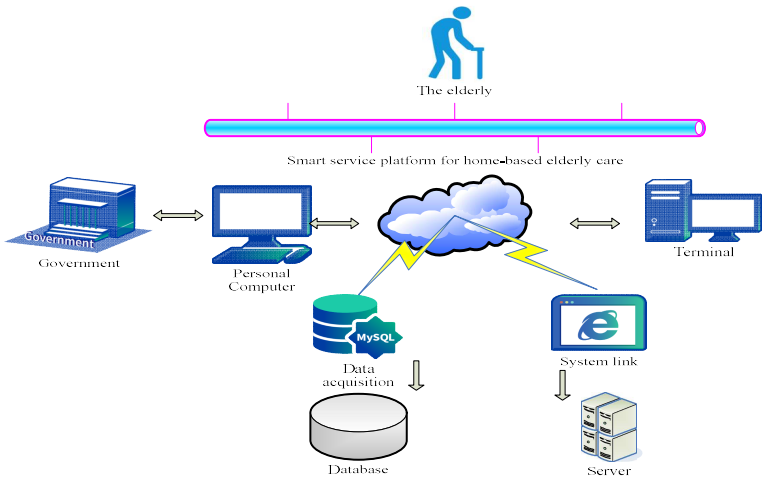


Figure 1: Smart HBC service platform

The intelligent ecosystem for home-based senior care refers to the integration with the government and enterprises as the main body, and on a larger scale to meet the government's demand for service units, as well as the acquisition of data, as shown in Figure 2.

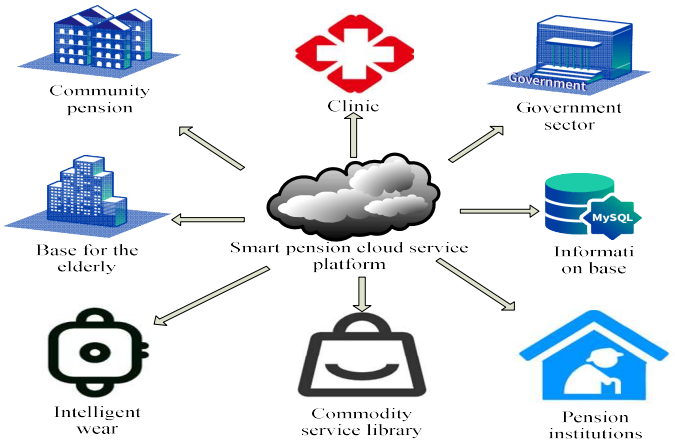


Figure 2: Smart pension ecosystem

Under the AI algorithm, the supply and demand sides of HBC service can achieve information matching and resource matching, making old people care service more efficient and fair [12], [13]. Information sharing between old people and HBC service institutions: Through the establishment of data sharing mechanism among old people, HBC service institutions, governments and data information interaction system between platforms, the efficient matching of information is realized. Vocational training is provided for HBC service personnel: Through vocational training activities, new professional talents such as domestic workers are cultivated and trained, so that they have a strong sense of service and service skills. The government provides corresponding financial support for home-based elderly care institutions, communities and families: By increasing financial support, reducing taxes and reducing loan interest rates and other measures, pension institutions, communities and families are provided with economic subsidies. A home-based pension demand response platform has been established: Through the platform-based management mechanism, the demanders can timely and effectively connect with the resource providers according to their own needs to meet their various pension needs in the home environment.

III. Construction of HBC Service and Health System in District X

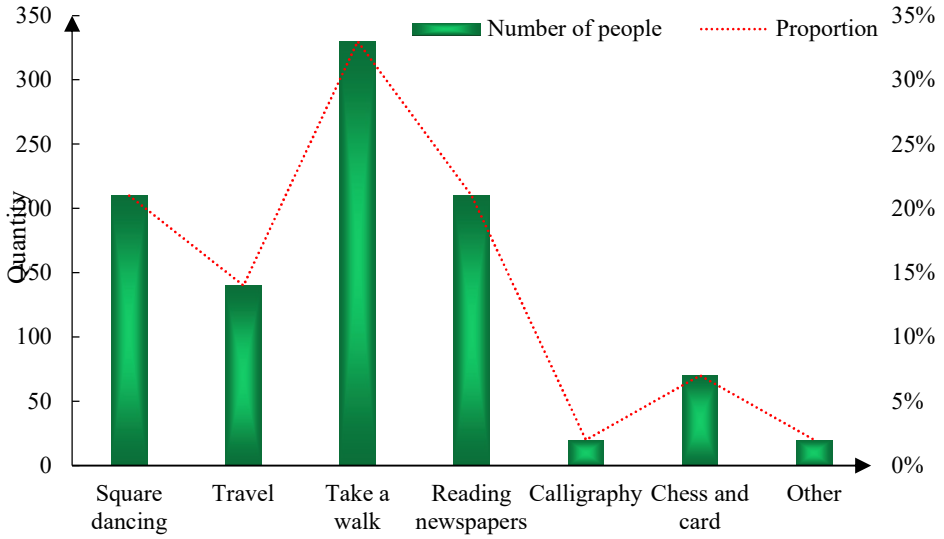
III. A. Demand for HBC Services

The survey of HBC service in District X is a survey commissioned by the government. A total of 1100 different types of questionnaires were collected. Among them, 1040 were for old people, and 1000 questionnaires were actually collected, with an effective recovery rate of 96.15%. 60 were community services, and 50 questionnaires were actually collected, with an effective recovery rate of 83.33%. The samples are mainly distributed in six busy blocks, and the survey results are very representative.

This paper divided the service needs of the elderly into health, food delivery, laundry, banking, maintenance, entertainment, spiritual comfort, medical rehabilitation and other services. The findings of the questionnaire survey on the daily leisure activities of the elderly and the demand for HBC services are shown in Figure 3.

As illustrated in Figure 3, Figure 3 (a) presents the details of the elderly's HBC needs, and Figure 3 (b) presents the elderly's HBC daily entertainment projects. According to the analysis of 1000 valid data, the result showed that the most popular service type of the elderly was sanitation. In the questionnaire, 210 people chose sanitation, accounting for 21%. There were also 160 people who chose to deliver meals, 150 people who chose entertainment, and 150 people who chose medical care, but only 50 and 30 people who chose laundry and banking. Through the analysis of the daily leisure activities of the elderly, the results showed that the daily activities of the elderly mainly included walking, reading newspapers, traveling, dancing in the square, and so on. Among them, walking accounted for 33% of the total, while reading newspapers, traveling and dancing square accounted for 21%, 14% and 21% respectively. The proportion of calligraphy was relatively small, and only 2% of the elderly chose calligraphy as their daily entertainment.

(a)



(b)

Figure 3: Home-based elderly care needs and daily entertainment projects

III. B. HBC Service Project

In this article, the HBC services are mainly divided into five categories and 15 service contents, of which the primary service category is safety monitoring (A), life care (B), medical care (C), cultural entertainment (D), and psychological comfort (E). Second-level service items: emergency call for help (A1), automatic alarm (A2), health data monitoring (A3), housekeeping (B1), personal hygiene (B2), catering and delivery (B3), door-to-door medical service (C1), hospital convenient medical treatment (C2), health consultation (C3), chess and card entertainment (D1), reading and reading newspapers (D2), outing (D3), legal consultation (E1), chat and heart-to-heart (E2), and family care (E3).

Based on the actual needs of community elderly care services, this paper established the service project system of community senior care institutions through the investigation and theoretical analysis of community senior care services. On this basis, the needs of community senior care institutions have been deeply discussed [14], [15].

Therefore, this paper used the questionnaire survey method to conduct a questionnaire survey on the senior population in X District. SPSS (Statistical Product and Service Solutions) software was used to quantitatively and qualitatively evaluate the needs of the elderly group to determine its importance, thus playing a guiding role in the orderly development of community elderly care institutions. The basic information of the elderly was mainly introduced. According to their cognitive differences and quantitative needs, the Likert 5-grade scale was used to classify them into five categories: unnecessary, relatively unnecessary, general, relatively needed and very needed, with five scores of 1, 2, 3, 4 and 5 in turn.

The respondents adopted a snowball-style sampling survey. A total of 200 questionnaires were collected, and 180 questionnaires were effectively recovered, accounting for 90% of the total. The collected data were analyzed by sample description and reliability and validity.

(1) Sample description

According to the age, living conditions and other data of the respondents, statistics are made in Table 1. From the age of the elderly, their age was mainly 60-80 years old, accounting for 77.8%. In the questionnaire, the living conditions of the elderly were mainly living with their spouses and children, and the proportion of living alone was relatively low.

Table 1: Statistics of basic information of respondents

	Age				Residence			
Option	60-69	70-79	80-89	Above 90	To live alone	Couple	To live alone and children	Couples and children
Number of people	90	50	30	10	25	55	40	60
Proportion	50%	27.8%	16.7%	5.5%	13.9%	30.6%	22.2%	33.3%

(2) Weight analysis

In the comprehensive evaluation, there are many methods to determine the weight of indicators. According to the source of its original data, it can be divided into subjective weighting method and objective weighting method. However, in practical application, it has limitations due to its advantages and disadvantages. When determining the weight of secondary service items, the product scale method is adopted based on the objective and subjective requirements. The product scaling method is an improvement and perfection of the analytic hierarchy process, which pays more attention to the internal objectivity between indicators. According to the actual measurement results, all indicators are compared and their importance is measured. If the deviation between indexes is less than 1%, it is called “the same”. If it is more than 1%, it is called “slightly larger”.

Since it is necessary to clearly distinguish the importance of primary service categories in the minds of each respondent, the comparative ranking method was adopted to determine the weight of primary service categories. In the questionnaire, the elderly interviewed were ranked according to the importance of the five first-level service categories, and the scores were 5, 4, 3, 2 and 1 from the first to the fifth, respectively. Based on the findings of the questionnaire, the total score of each type of service was obtained. The weight of each service category is calculated, as shown in Figure 4.

As illustrated in Figure 4, Figure 4 (a) presents the distribution of weighted scores of A, B and C, and Figure 4 (b) presents the distribution of weighted scores of D and E. It can be seen from the figures that the weight values of the elderly’s demand for the first type of services were 0.211, 0.222, 0.289, 0.157 and 0.13 respectively. The elderly have the greatest demand for medical care services, followed by the demand for life care and safety monitoring services. The demand for cultural entertainment and psychological comfort services is relatively low.

To more intuitively understand the requirements of the second-level service items under the target level, the weight of the second-level service items was calculated and standardized with the weight vector of the second-level service items under the first-level service category. The weight calculation results of HBC secondary service items are shown in Figure 5.

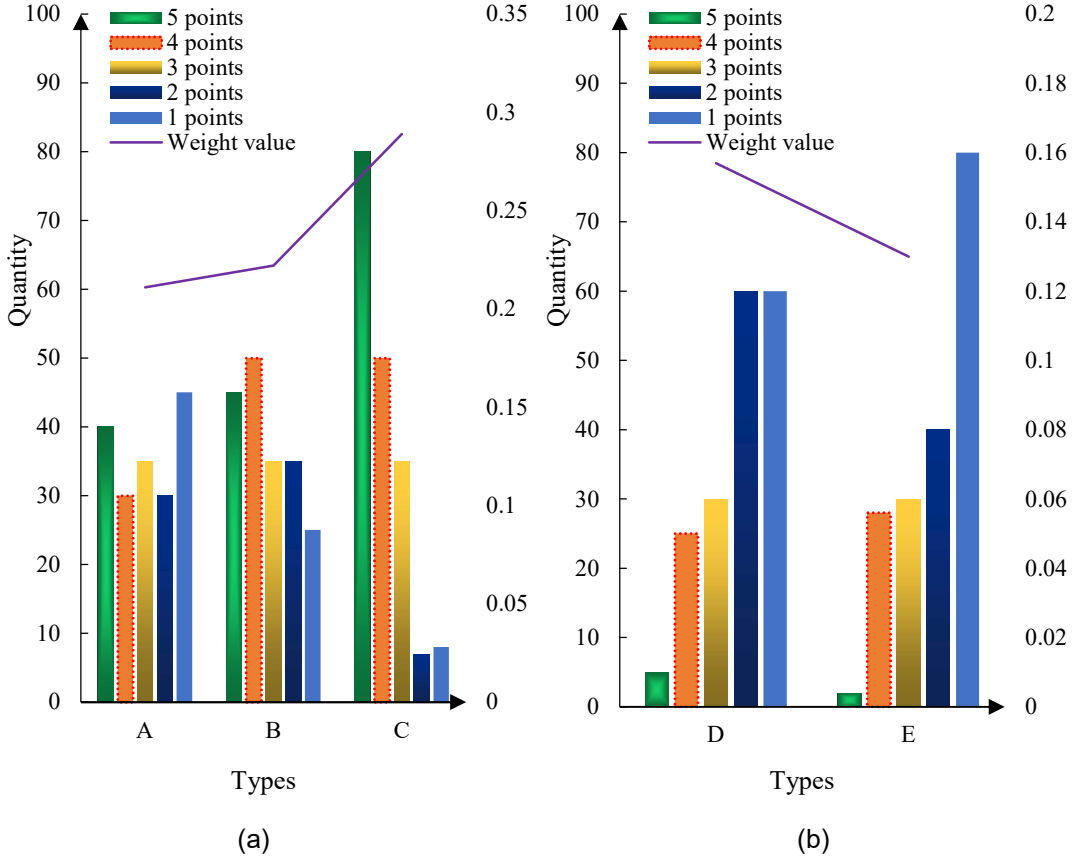


Figure 4: Weight distribution of primary service categories

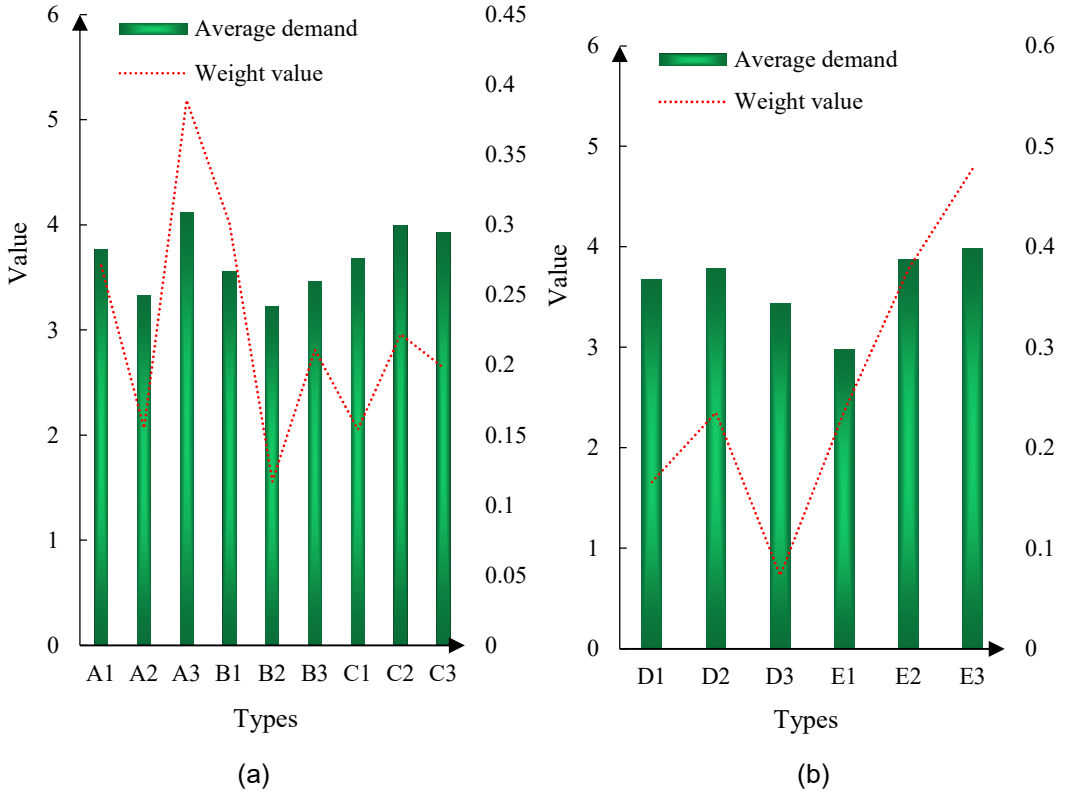


Figure 5: Statistics of weight distribution of HBC secondary service items

As illustrated in Figure 5, Figure 5 (a) presents the details of weight distribution of Class A, B and C secondary service items, and Figure 5 (b) presents the details of weight distribution of Class D and E secondary service items. It can be learned from the figures that A3 had the highest weight value in Class A, which was 0.389. In Class B, B1 had the highest weight value, which was 0.301. C2 had the highest weight value in Class C, which was 0.222. In Class D, D2 had the highest weight value, which was 0.235. E3 had the highest weight value of 0.478 in Class E. It can be explained that health data monitoring, housekeeping cleaning, convenient medical treatment in hospitals, reading and reading newspapers, and family care are very important in HBC services.

III. C. Construction of Smart Service System for Home-based Elderly Care

As the rapid growth of HBC, the promotion and application of information technology, communication technology and intelligent terminal technology have led to more and more practice and exploration of the construction and operation of HBC intelligent service system. The application of AI technology in HBC services can improve the quality and efficiency of elderly care services to provide better and professional elderly care services. This paper takes HBC as the research object, and takes the difference in the needs of the elderly at different stages as the starting point to conduct an in-depth study on the application of AI technology based on HBC services.

(1) Construction of ideas

With the participation of the government, non-profit social organizations and enterprises, the role of the government, non-profit social institutions and enterprises in the community elderly care service system is determined, so as to determine the role of the government, society and enterprises. On this basis, the community service platform is further promoted.

(2) Construction of objectives and principles

The goal of intelligent HBC service system and its operation mode is to take the elderly and families who purchase home-based elderly care as the core, and the government, enterprises and social groups as the main body. Intelligent terminal, Internet of Things, Internet and other information technologies are used to realize the efficient operation of the overall service process. The scattered social service resources for the elderly are integrated to promote the intelligent and standardized growth of HBC services. According to its construction objectives, three basic principles must be adhered to when building a smart HBC service system and operation mode:

The first is people-oriented. Centered on the elderly, according to their service needs, health status, education level, economic income level, religious belief and other factors, corresponding service modes are provided to achieve personalized and customized service purposes.

The second is to optimize the integration of resources. The fragmented and decentralized features of HBC services have been utilized, which not only has great requirements for the operation ability of senior care institutions, but also puts forward higher requirements for the management of community workers and the government. In the senior care service institutions, the equipment, personnel and time of the senior care service institutions should be highly integrated and optimized to ensure that scattered elderly care service objects can enjoy orderly and standardized elderly care services. For community workers and the government, they should play a macro-regulatory and auxiliary role to reasonably integrate and optimize the resources of various kinds of services for the elderly scattered throughout the society, so as to provide the maximum services for the elderly.

The third is the diversification of subjects. The responsibility subjects of the intelligent service system for the elderly in the family are various, among which the government, enterprises and social institutions are the main responsibility subjects. The government is mainly responsible for the formulation and supervision of policies and standards, as well as the macro coordination of social resources. Under the market mechanism, enterprises are the main body of family pension and bear the important function of family pension. Community institutions, as a supplement to family pension institutions, can fill the gaps of some functions in market competition and provide effective support for the government.

(3) System construction

One center has two systems. One is the city/district center for the elderly at home, and the other is online and offline service system. During the construction process, a unified database of service recipients and service providers is used for online service process management to accept government supervision and management and provide relevant decision data for the government, as shown in Figure 6.

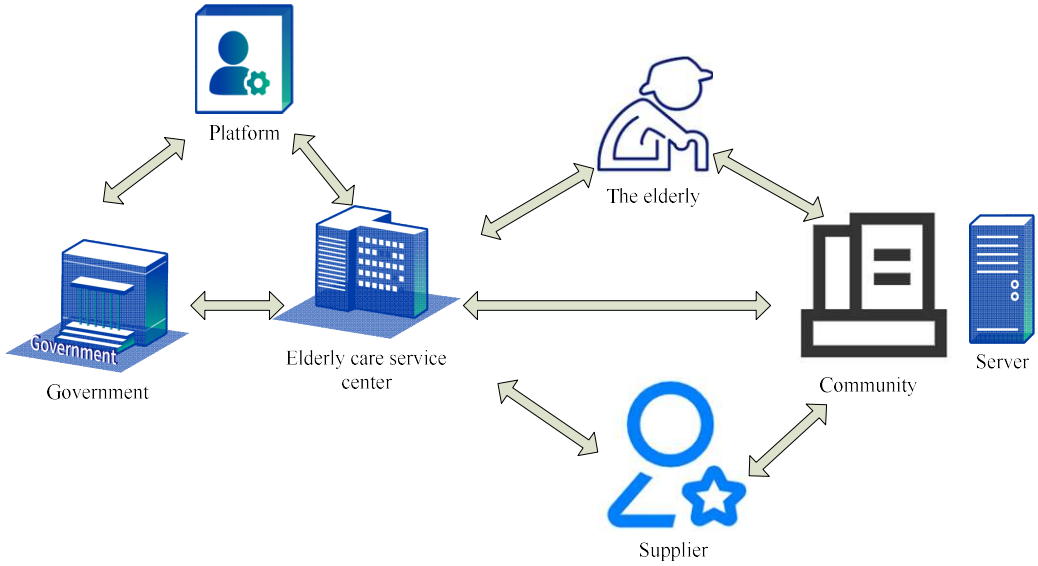


Figure 6: Framework of smart service system for home-based elderly care

III. D. Impact of Community Health Service Institutions on HBC Services

(1) Contract signing of occupational health teacher/family doctor

The contract status of occupational health practitioners/family doctors significantly affects the health care needs of the elderly. Due to the high health needs of the elderly, there should be at least one or more occupational health practitioners/family doctors in the community health service center. The signing of the occupational health teacher/family doctor can enable the relevant personnel to better carry out the work of healthy elderly care, care for the elderly, end of life, etc., to enhance the awareness of healthy elderly care.

In addition, the signing of occupational health teacher/family doctor can also improve the elderly's health awareness of their own body, thus improving their health care needs. To this end, the policy support for contract signing services should be further strengthened. The publicity of medical institutions has been strengthened, and the construction of hierarchical diagnosis and treatment system has been strengthened to comprehensively enhance the quality of contracted services of medical institutions and improve the physical quality of the elderly at home.

(2) Service attitude of community health service institutions

The higher the satisfaction of the elderly with community health services, the higher the demand for elderly health care. On the one hand, the elderly are more and more satisfied with the attitude of community health services. The higher the elderly's recognition of their elderly care services, the more positively they can improve their elderly care needs. On the other hand, a healthy aging community environment should be established at the provision level to stimulate their awareness of healthy aging and increase their healthy aging needs. Therefore, the attitude of community health services must be improved to promote the elderly to better play their health role.

(3) Medical expenses borne by the elderly at home

The demand for healthy elderly care of the elderly decreases with the increase of age. It is suggested that relevant parties take effective measures to reduce the medical burden of elderly patients. Social system has a great impact on individual behavior orientation, which can be incorporated into the elderly health care system. For this reason, the positive effects of the system should be actively used to reduce the burden of medical costs on the elderly and enable them to better fulfill their expectations.

IV. Conclusions

The purpose of this article was to provide useful enlightenment for the intelligent service mode of home-based elderly care. Based on the current situation of District X and the current national conditions, this paper discussed how to build a clear HBC intelligent service system and operation mode. According to the specific situation of District X, a smart service system and operation mode for home-based elderly care based on this mode was proposed. According to the demand for HBC services in District X, the senior care service project system has been established. The stratified quantitative analysis method was adopted and the questionnaire survey was adopted to obtain the basic data. The product proportion method was adopted to determine the need of senior care services, and determine the importance of their development according to the size of the weight, thus providing a certain

theoretical reference for the development of HBC service enterprises in District X. According to the experiment, the importance of medical health can be learned. At the end of the article, the medical health in detail was analyzed.

References

[1] Peng Yilun. "Analysis on the Development Mode of Home Based Pension Real Estate." Journal of Mechanical, Civil and Industrial Engineering 3.1 (2022): 01-06.

[2] Zhou Yang. "Review on the Research of Community Home-Based Pension in China: Based on the Domestic Literature Research from 2011 to 2020." Journal of Sociology and Ethnology 4.7 (2022): 45-53.

[3] Liu Feng, Mengke Wang, Jian Tang, Xuanyong Wu, Yidan Yuan. "Research on Home-Based Pension System Based on Blockchain Technology [J]." Software Engineering and Applications 8.6 (2019): 275-282.

[4] Chen Y. B., Chen Lin and X. L. Chen. "Artificial intelligence, aging and economic growth." Economic Research Journal 54.07 (2019): 47-63.

[5] Jin Xinyu, Qi Xia, Wei Zhang, Lanjuan Li. ""Medical-and-care wisdom linkage" pension model research and exploration." Strategic Study of Chinese Academy of Engineering 20.2 (2018): 92-98.

[6] Grunewald Aline. "From benefits and beneficiaries: the historical origins of old-age pensions from a political regime perspective." Comparative political studies 54.8 (2021): 1424-1458.

[7] Wang Xiaoshuang and Fu Weiquan. "Research on the Problems of Home-based Pension Service in Urban Communities in Daqing City." Frontiers in Economics and Management 1.2 (2020): 6-13.

[8] Komp Kathrin. "Shifts in the realized retirement age: Europe in times of pension reform and economic crisis." Journal of European social policy 28.2 (2018): 130-142.

[9] Bonizzi Bruno, Jennifer Churchill and Diego Guevara. "Variegated financialization and pension fund asset demand: the case of Colombia and Perú." Socio-economic review 19.2 (2021): 789-815.

[10] Javier Roberto E., Mitzie Irene Conchada and Melvin Jabar. "Anticipating aging and prospecting pension for retirement well-being." DLSU Business & Economics Review 28.2 (2019): 183-198.

[11] Hinrichs Karl. "Recent pension reforms in Europe: More challenges, new directions. An overview." Social Policy & Administration 55.3 (2021): 409-422.

[12] Zhu Huoyun and Alan Walker. "Pension system reform in China: Who gets what pensions?." Social Policy & Administration 52.7 (2018): 1410-1424.

[13] Huang Wei and Chuanchuan Zhang. "The power of social pensions: Evidence from China's new rural pension scheme." American Economic Journal: Applied Economics 13.2 (2021): 179-205.

[14] Komp Kathrin. "Shifts in the realized retirement age: Europe in times of pension reform and economic crisis." Journal of European social policy 28.2 (2018): 130-142.

[15] Galasso Vincenzo and Paola Profeta. "When the state mirrors the family: the design of pension systems." Journal of the European Economic Association 16.6 (2018): 1712-1763.