

Research on Intelligent Elderly Care Path Based on Data Information

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Abstract: Our country is moving into a deeper population ageing. With the deepening of our aging population and the development of modern smart technologies, the Internet has reshaped the way older people interact and live, it has become an important engine to optimize the development and innovation of the old-age service model. Based on the analysis of the existing problems in the current intelligent pension model, this paper takes the Community Intelligent project of Nanjing Positive Health Eldercare Service Center as an example to show how to realize the intellectualization and informationization of endowment service in community. Smart pension information construction path includes establishing a community elderly personal information database, realization of intelligent processing of multichannel massive data, and establishing real-time monitoring with the aid of artificial intelligence. We should make use of modern communication technology and information technology to innovate the mode of old-age service and promote the organic integration of internet and old age service industry, so as to realize the digitalization, informationization and technicalization of old-age service.

Key words: Intelligent Elderly Care; Data Informatization; Intelligent Model; Information Database

1. Background and Significance

According to the 7th population census data show that in 2020, the population of our country 60 years old and above is 264.02 million people, accounting for 18.5% of the total population. 7%, the population of the

aged in our country is expected to reach 4.5% in 2050. 8.7 billion, or 3.4% of the population. 9%.^[1]Under the background of "Internet", information technology and all walks of life are integrated with each other, therefore, in the elderly service optimization work, it is necessary to realize intelligent elderly service under the background of "Internet", effectively deal with and study some details, so that intelligent elderly service can play its due value and effect in practice, and promote the harmonious development of society. The combination of intelligence and community pension has become the trend of the development of the current pension service, how to make full use of the advantages of the elderly service through information technology and the Internet is the focus of current research.

The action plan for the development of the smart and healthy care industry (2021-2025) states that the smart and healthy care industry is based on smart products and information system platforms, people-oriented health and care services require a deep integration of the Internet of things, Big Data, cloud computing, artificial intelligence and other new generation of information technology emerging industry forms. In order to further promote the development of intelligent endowment industry, we should strengthen cross-disciplinary and cross-sectoral cooperation, to promote the integration of Internet of things, artificial intelligence, ultra-high-definition video, Virtual Reality and other new information technologies in the field of elderly care, so as to enhance the level of intelligent elderly products and services.^[2]The aim of the intelligent endowment model is to integrate the resources of the online and offline endowment service, to improve the

adaptability of the endowment supply and the endowment demand, and to collect the vital signs and health data of the customers through the intelligent terminal, collect, sort out and analyze customers' needs for diversified old-age services, and utilize modern network information technologies such as big data, cloud computing and Internet of Things to allocate social old-age resources effectively, in order to meet the increasing demand for high-quality, diversified and individualized services for the aged, the efficient use of the resources for the aged should be maximized, to promote the sustainable development of the old-age care industry.^[3]

2. Research Status

The establishment of intelligent service model for the aged can not be separated from the development of information management technologies such as Internet, Internet of things, Big Data Analysis, cloud computing and so on.^[4]When the scholars design the intelligent endowment equipment, they fully consider the needs of the elderly, and can provide services to the elderly in need.^[5-7]Meiyun Zuo point out through“Supply side” research that only by solving the digital gap between the elderly group and the digital, can we promote the development of intelligent endowment. At present, intelligent endowment in China is mainly embodied in the wearing of intelligent terminal equipment and some community-based intelligent endowment projects and individual institution projects. However, it is difficult to popularize the intelligent terminal products because of the decline of the learning ability of the elderly.^[8]Junjie Zhu proposed that the core of the smart retirement service plan is to integrate the resources of the cloud-based smart retirement service network platform on the basis of the traditional social retirement and individual service reform, and to diversify the business modules, the service information of the platform is systematized to realize a convenient cloud-based intelligent life service platform for the aged, which can carry out flexible maintenance and promotion for the quality of life and mental state of the aged, and improve the quality of life of the aged.^[9]Lirong Xia studied the Internet + intelligent endowment industry and proposed that intelligent endowment can help the elderly

in daily life, health care, emotional communication, entertainment, learning and other aspects of the application. ^[10]Sintonen built a basic model of intelligent service for the aged in the design of intelligent service equipment for the aged. The terminal pays attention to the needs of the aged, through the collection of the daily data information of the aged and the information exchange between the intelligent terminal equipment, the integration of data analysis, combined with the actual needs of the elderly, the establishment of data networks, design in line with the needs of the elderly life of intelligent equipment. ^[11]

3. The Existing Problems of the current Intelligent Pension Model

The development of smart elderly care in communities in China is facing various problems, such as insufficient information sharing, difficulty in technical support, and inconsistent standards for intelligent services. Secondly, various "Internet+" elderly care service information platforms are still lacking, so the terminal and themselves stay in a situation of being independent. For the influence of the above problems, it is more difficult to integrate the "Internet+" and the elderly care service. From the perspective of the elderly themselves, the elderly know little about the Internet and do not have a high degree of acceptance. Among all Internet users, the elderly account for only 5.2%. ^[12] and the information transmission between the supply and demand of medical and pension resources is adversely affected. As the terminal of information circulation and feedback, the correct transmission of their own needs is of great significance to the operation of the whole service chain. At present, the cognition and acceptance degree of the elderly to the intelligent endowment is very limited. From the physiological point of view of the elderly, the vision and physical strength of the elderly than the young, so it is difficult to frequent use of smart terminals for a long time. The sensitivity of neurons in the brain of the elderly is reduced, as is the ability to 2023 all sorts of things in public administration, there is often a lack of enthusiasm for using smart devices and smart terminals.^[13]In the aspect of intelligent pension data, the ability of data collection, storage and processing is insufficient, so the ability of data integration

and application should be improved. For example, in the operation of intelligent elderly services, the elderly services information platform can not achieve mutual compatibility, resulting in the sharing of information and services resources, the exchange of obstacles. At present, the intelligent service for the aged mostly covers the life service, which has not paid enough attention to the psychological and social participation of the aged. The lack of informationization and intelligentization leads to the weakening of the social utility of the service, and to a certain extent, affects the acceptance and trust of the elderly, it is difficult to better meet the needs of old-age care.^[14]

4. Smart Pension Information Construction Path

4.1 Establish a Community Elderly Personal Information Database.

In addition to the basic information of the elderly in the community, the personal information database of the elderly should also reflect their service demand information, health records and so on.. Communities need to define their responsibilities, take into account local realities, add valuable databases and select personnel to manage them. At the same time, for basic data, information sharing should be realized between relevant data departments and elderly care service institutions.

4.2 Realization of Intelligent Processing of Multichannel Massive Data

Relying on System operator, Nanjing Positive Health Eldercare Service Center realize

multi-channel mass data intelligent processing. The multi-channel, multi-physical quantity synchronization and high-frequency sampling result in huge data amount. The traditional method is to collect all the data (including the empty data of the force sensor that has not been touched) and then delete the invalid data artificially. This process is complicated to operate, and the collection of invalid data can greatly reduce the data acquisition transmission efficiency and limit the sampling frequency. Therefore, the high-quality data acquisition and transmission technology needs the function of intelligent data processing. The project has creatively developed the signal intelligent processing and acquisition technology based on window detection. The signal detection window is designed in the signal processing module. The specific parameters of the window are set according to the sampling requirements. When the signal is in the window, it is considered as no-load signal and will not be processed. Once the signal exceeds the window boundary, the sampling clock will be triggered, and the system will record the amplitude and absolute time scale of the signal. When the collected data enters the storage end, the system automatically matches the data of each channel according to the absolute time scale to realize synchronous sampling. For the condition of constant transmission bandwidth and rate, this method can significantly improve the efficiency of signal acquisition and transmission, greatly improve the sampling frequency, and effectively solve the problems of data packet loss and storage space waste with the condition of high-frequency sampling.(Figure 1)

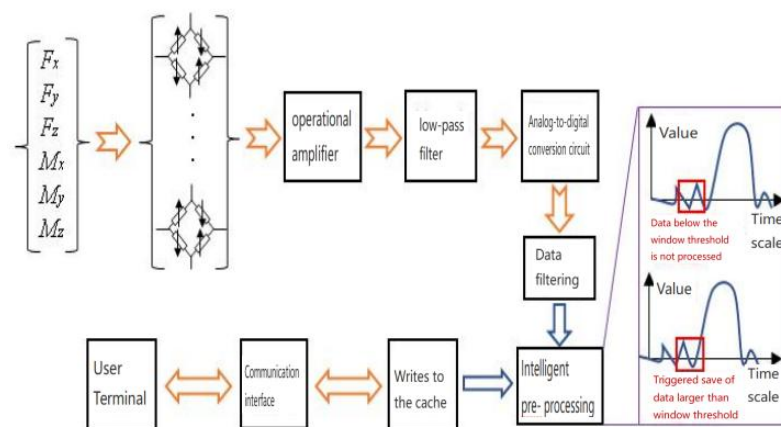


Figure 1 Data processing flow chart

Through the development of data acquisition technology to achieve multi-channel mass data intelligent processing, so as to realize the intelligent combination of community medical care.

4.3 Establish Real-time Monitoring with the aid of Artificial Intelligence.

With the help of artificial intelligence remote real-time ECG machine, ambulatory blood pressure equipment and containment monitoring equipment, intelligent real-time monitoring, emergency value early warning and daily management are carried out. Using the data center of Heart, we can diagnose the ECG of patients at different stages of illness, and recognize the interference signal of ECG automatically with the aid of artificial intelligence, objective to obtain more perfect and accurate diagnosis results, and can break

through the traditional algorithm accuracy is generally less than 80% of the limit, the ECG analysis of the diagnostic accuracy increased to 95.2% or more.

The dynamic ECG information system based on artificial intelligence technology breaks down the barrier of traditional retrospective analysis of dynamic ECG and provides 7 * 24-hour real-time monitoring, monitoring the changes of ECG rhythm, rate and ST segment shape in real time, and finding the abnormal data reaching the threshold in time, can not only find the incidences that are difficult to record by resting ECG machine. Short-term arrhythmia and transient myocardial ischemia, and can give real-time abnormal ECG alarm, while 24-hour monitoring after the completion of professional analysis of dynamic ECG report.(Figure 2)

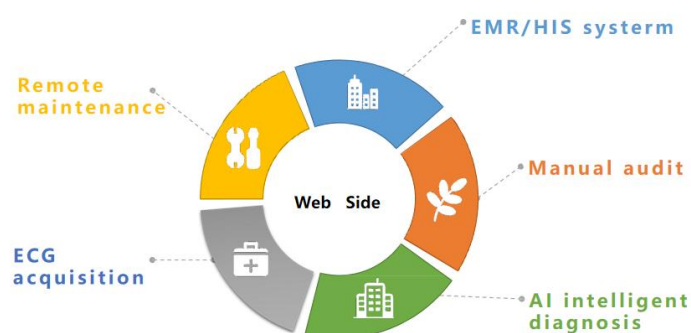


Figure 2 AI intelligent monitoring process

5. Conclusion

The aging of population is worsening, and medical resources are in short supply. So, the application of intelligent medical care is inevitable. This article takes the project of Nanjing Positive Health Eldercare Service Center as an example, this paper puts forward the path of constructing community-based intelligent endowment service center: Establish a community elderly personal information database. Through the development of data acquisition technology to achieve multi-channel mass data intelligent processing, Establish real-time monitoring with AI so as to realize the intelligent combination of community medical care. In the era of rapid development of intelligence, Using high-tech Internet of Things Technology, cloud computing and big data and other information technology to upgrade the old-age care services, the actual needs of the elderly as a

starting point, tailor-made for the elderly to meet their needs of personalized intelligent care, elderly services products, the offline elderly care services through network technology to the online, It is the trend of the application of intelligent endowment in community.

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