

Smart Home Care Service Platform Based on Cloud Computing



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Abstract China will face the problem of population aging over the next few decades. From the software point of view, combined with the advantages of information integration and information sharing of cloud computing, this paper constructs a smart pension service platform, which can be analyzed from the aspects of community, hospital, shopping, positioning, entertainment, communication, and education. To meet the integration needs of the elderly, the platform uses cloud computing and Internet of things technologies to provide rich online functions, efficiently manage user health data, and intelligently push old-age services, which can greatly improve service efficiency, save social resources, and solve the problem of old before rich in our country.

Keywords Cloud computing · Internet of things · Resource sharing

1 Introduction

According to the survey data, as of December 2016, the number of elderly people aged 60 and over in China exceeded 230 million, accounting for 16.7% of the total population. It is estimated that by 2020, the population of China's 60-year-old population will reach 255 million, accounting for 17.8% of China's population; therefore, the social security expenditure of the elderly will maintain a steady growth trend; among them, rural residents are very old. It may be more serious. The issue of aging will bring new challenges to China's social and economic development and transformation. The plight of old-age has become a real problem that Chinese society has to take seriously. How to confront the increasingly serious problem of aging will become the focus of government work for a long time now and in the future.

The traditional pension mode is mainly based on family pension and institutional pension. It weighs the needs of the elderly and the needs of social development. The "home-based pension" service mode combining the two traditional pension modes is

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widely accepted. With the population aging, aging population, empty-nesters elderly, 4-2-1 families [1] and other changes in family population structure and people's lifestyle, the current service mode has been unable to meet the needs of the elderly at home and children and other relevant people, there are many practical problems. With the rise of smart cities, home-based care has opened a new mode of exploration across the country. In this process, "smart care" shows its special concept connotation. Wisdom house refers to satisfy the old people's physiological and psychological needs as the goal, using the Internet, the Internet of things, cloud computing, and other now builds endowment service platform of science and technology, integration of resources endowment, real time, fast, and efficient for the elderly, instrumentation and intelligent home endowment service, is a new exploration of response to social endowment severe pressure, is a new application in the field of information technology in pension, with information interactivity, resource integration, personalized services, and products, such as intelligent features [2].

2 Cloud Computing

Cloud computing is the increase of the related services based on Internet, use and delivery mode, usually involves using the Internet to provide dynamic easy extension and often virtualized resources. In the narrow sense, cloud computing refers to the delivery and use mode of IT Infrastructure, and refers to the acquisition of required resources through the network in an on-demand and easy to expand way, which is generally referred to as infrastructure as a service (IaaS). Generalized cloud computing refers to the delivery of services and usage patterns, refers to through the network to obtain the required in the form of on-demand, easy extension services. This service can be IT related to software, the Internet, or other services. Broad cloud computing can be divided into platform as a service (PaaS) and software as a service (SaaS). It means that computing power can also flow as a commodity over the Internet. To be brief, cloud computing is a kind of supercomputing model based on the Internet, it will be computer resources together and make unified management and coordination, in order to provide better data storage and network computing services.

3 Advantages of Cloud Computing in Smart Home-Based Care

3.1 The Scale Effect of Cloud Computing Can Reduce the Cost of Home-Based Care

In the face of our country occupy the explosive growth of the pension information and data of the status quo, using cloud computing at a lower cost to deal with huge amounts of data that advantage, can reduce the cost of home endowment of data processing. As the service scale of the platform continues to expand, the unit price of cloud computing resources is constantly reduced. In other words, the scale effect of cloud service platform can save expenses and to some extent solve the problem of underfunded pension informatization [3]. Therefore, cloud computing is referred to the home-based care model, which integrates the home-based elderly and all elements related to the elderly to form a big Internet of things [4].

3.2 Cloud Computing Is Conducive to Intelligent Resource Allocation in Home-Based Care

Cloud computing is naturally equipped with intelligent resource allocation ability. In the face of high concurrent elastic demand, resource allocation can be intelligently and dynamically adjusted according to the number of concurrent business [5]. At the same time, since the evolution of cloud computing technology, its broad ease of use has greatly reduced the demand for information technology professionals, which can be used to solve the problem of the shortage of professional information technology personnel in the current home-based care scene [6]. The intelligent resource configuration of cloud service platform can flexibly respond to the changing needs of users in a different time and different regions.

3.3 Cloud Computing Can Provide Integrated Home-Based Care Services

Home-based old-age care service is different from institutional old-age care. Under the home-based old-age care mode, the service objects are widely distributed and scattered, requiring old-age care services with a higher degree of sharing. Through the application of cloud computing in home-based care, the elderly and all elements associated with them are integrated together to establish an integrated service model to solve the problem of poor participation and socialization of the elderly [7].

4 Cloud Service Platform Architecture

As shown in Fig. 1, the overall cloud service platform adopts the architecture of “cloud” plus “end”. Users can choose the cloud services they need to use through the interface of the user access layer. The middle part of the user’s request by a variety of services to provide support and service management to manage a variety of services, provided by the middle of the hierarchy contains the business management and service management, cloud computing services provided for all levels of management functions, is the core of the cloud computing platform to support function, it is also an important factor evaluate cloud computing solution effect. Available access devices: including personal computers, smartphones, tablets, and other smart terminals.

The first part of the figure includes three levels: basic resource level, platform level, and software application level, which provide different levels of services, respectively. The basic resource support layer (IaaS) provides computing resource service, network service, and storage service. The platform layer (PaaS) encapsulates the services of the infrastructure layer so that the software application layer can use more advanced services to build its own applications. Application layer (SaaS) provides application software services for users and is the interface for users to use cloud services.

The software application layer includes community service, medical service, cultural and leisure service, positioning service, education service, etc. Below, we will introduce the main cloud services provided in the home care service platform based on cloud computing.

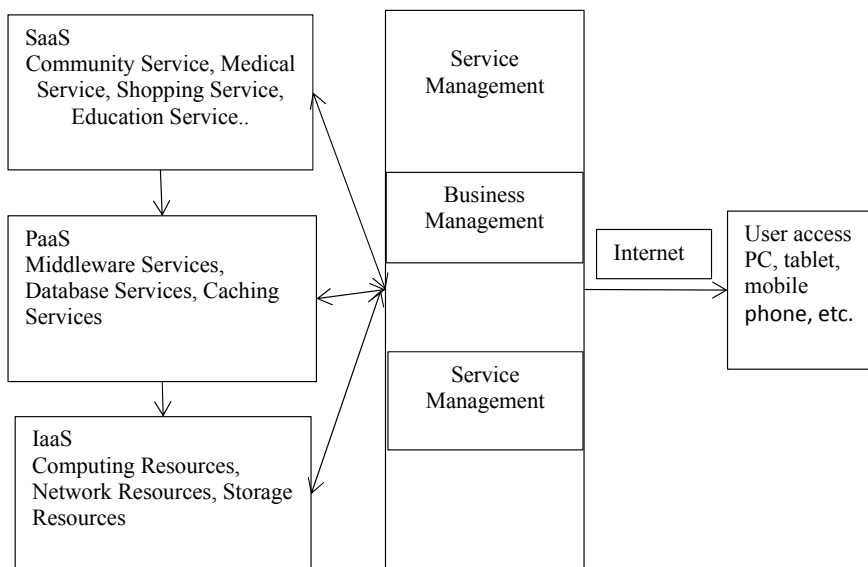


Fig. 1 Home care service platform based on cloud computing

4.1 Community Cloud Services

The community cloud service platform supports pension certification, food delivery, sanitation, basic medical care, escort chat, and other practical and personal services. The community carries on the statistics, the integration to the district old person information, carries on the online registration for them, realizes the network access, and the self-service service through the Internet. In this way, only a few professionals are needed to monitor the cloud computing platform, which greatly makes up for the shortage of professionals. In addition, this mode provides support for endowment insurance authentication function. Through setting login account, password, fingerprint identification, and other technologies for the elderly, cloud computing, and cloud security are applied to community management to provide online authentication for the elderly to ensure accurate and strict pension management.

4.2 Medical Cloud Service

Home care service based on cloud computing introduces regional medical information solutions to provide a low cost, easy to manage and flexible expansion of information sharing platform as needed. The middle link is omitted so that the elderly and the hospital can directly establish a network system of mutual support, namely the medical cloud. Through intelligent home health testing equipment, such as smart blood pressure monitor and smart blood glucose meter, relevant health data of the elderly are collected regularly and uploaded to the cloud service platform in real time. According to the different physical conditions of the elderly, different health testing equipment can be configured in the family to achieve targeted measurement [8]. The cloud platform integrates the information of the elderly and delivers it uniformly to the cloud terminal of the hospital, so as to meet the sudden medical needs of the elderly at home more effectively.

4.3 Shopping Cloud Services

The shopping cloud module comprehensively integrates the information of the elderly with the information of various shopping malls and supermarkets by means of cloud computing, and pushes it to the cloud terminal of the merchants and the elderly, respectively, forming a complete resource pooling pool of information, providing automatic management and fast delivery for the elderly's shopping needs, so as to timely meet the needs of the elderly. The elderly can use devices such as tablets and mobile phones to contact the store for delivery. Businesses can introduce cloud computing and set up their own shopping cloud network to better meet the special needs of the elderly.

4.4 Locate Cloud Service Platform

The location monitoring data comes from the health smart watch worn by the elderly or the mobile phone carried by the elderly, which can make accurate positioning through GPS outdoors and fuzzy positioning through the base station signal of mobile operators inside the building. The information of the elderly can be effectively integrated together and connected with the children of the elderly, Internet-connected hospitals and communities, so as to facilitate their children to remotely monitor the elderly at all times and to accurately understand the geographical location of their parents and the security situation of their environment [9]. When the old man's activities are beyond the scope of platform of setting safety activity that is electronic fence, platform will trigger the alarm in time, alarm message will be sent to the old man's real-time children or set of guardian, at the same time, the old man and can quickly set up calls, to understand the details and subsequent response measures according to actual situation, such as remote guidance old man return to safe areas or sent rescue workers arrived at the old location to implement direct aid.

4.5 Entertainment Communication Cloud Service

The platform introduces the function of entertainment and communication into the daily life of the elderly and provides the elderly with an environment suitable for their communication and entertainment. Connect the elderly together through the Internet and provide them with entertainment and communication methods that are beneficial to their physical and mental health, such as flower raising, painting, calligraphy, fishing, dancing, and tourism [10]. The entertainment communication cloud can also be used to cover people who cannot attend the event on-site, so that they can feel the happiness of the event through the musical note icon of the smart device, as if they were in the scene. At the same time, the extensiveness of cloud computing is utilized to integrate the elderly with their related personnel, so that the elderly can contact with others at any time and expand their entertainment communication scope.

4.6 Spiritual Comfort Cloud Service

Spiritual consolation cloud service includes psychological counseling service, accompanying chat service, generation memoir service, and other services provided by the corresponding localized service providers. The cloud service platform will conduct unified management of each service provider and the service items provided, and provide personalized offline services for the elderly. The elderly can also comfort and care for each other spiritually with their children and others through spiritual comfort. Through spiritual comfort cloud will be home to the elderly together, by a

few professionals to provide network counseling and psychological comfort, timely to teach the elderly positive and optimistic spirit. In addition, community or other organizations can use this spirit to comfort the cloud, the information of the old people and other family information integration and network coverage of all, make the old man could see the needs of others, have the ability of the old man they can directly to families with demand, paid or unpaid help requests, so that the old man in providing services for others to please his own body and mind again, at the same time, achieve the goal of the young and the old mutual aid.

4.7 Education Cloud Service

Education cloud service can provide education and learning functions for the elderly, so that the elderly can better meet the needs of the times. Service platform using cloud computing resources integration function to the old man, summarized the needs of all kinds of information, information released by the platform, the old man can check to see and read the according to their own needs at any time, the platform will be according to the attention of the old man for all kinds of information for statistical analysis, and according to the different characteristics of the elderly (such as gender, age, income, and physical condition) dynamic adjustment to every old man available personalized pension-related services.

5 Conclusion

This paper analyzes the current situation and problems of old-age care services through the study of the current old-age care model in China. Combining the advantages of cloud computing, this paper proposes a cloud-based old-age care service platform suitable for China's aging situation. With the increasingly informatization, networking and intelligence of the society, advanced technologies such as cloud computing and big data will play a great role in promoting regional medical and health informatization and promote the faster development of medical technology.

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