

Research on the Innovation of Rural Elderly Medical Service System Based on ERG Demand Theory

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Abstract:

Objective: The aging in rural areas is severe at present. In order to solve the problem of imperfect service for the aged, especially in the elderly care, ERG theory is applied to the rural elderly medical service system, to explore and realize the diversified needs of the elderly and improve the quality of life of the elderly. **Methods:** According to the ERG demand level theory, the paper analyzes the demand of rural elderly at all levels, integrates the elderly demand with rural and social resources, and analyzes the supply subject, service mode and service environment in the service system, and explores the cooperative relationship among the multiple providers in the service system, to formulate innovative design strategy of rural pension service system. **Conclusion:** Based on ERG theory, the rural pension service system is designed, and the basic life service, medical health service, social entertainment service and self-development service are built. Meanwhile, the multiple supply entities are linked and interdependent. The whole service system realizes the dynamic balance of supply and demand and the circular sharing of service closed-loop.

Keywords:

The Needs of the Elderly, Service System Design, Providing for the Aged in Rural Areas, Medical Service

1. The Challenges and Opportunities of Rural Old-Age Service

1.1. The Reality of Rural Old-Age Services

The Proposal of the CENTRAL Committee of the Communist Party of China on the Formulation of the 14th Five-Year Plan for National Economic and Social Development and the Vision for 2035 addresses the issue of aging, one of which is to actively promote the coordinated development of the old-age undertakings and the old-age industry and improve the basic old-age service system. At present, due to the lack of economic supply and lack of care, the quality of life of the elderly in rural empty nests is generally poor. The old-age service system has not yet been formed. [1]

Social level: old-age service belongs to the high-cost and low-profit business, with less government subsidies, which may reduce their participation in the enthusiasm; the government's financial investment in the rural old-age service industry is low, and the relevant old-age policy is not perfect, which leads to the slow development of the old-age service; at the same time, there is no professional nursing guidance personnel, making it difficult to train professionals, showing a lack of professionals and low level of care situation.

Personal level: home-based care services, the concept of raising sons for retirement safeguard deeply ingrained, less consideration of the purchase of old-age services; Today, due to various practical dilemmas and conceptual shocks, the aging of the rural elderly relying solely on their children often appear very vulnerable [2].

To sum up, the traditional home-based care services model has been unable to adapt to the current social development and the objective needs of the elderly in rural areas. It is imperative to integrate the effective resources of society and build an innovative old-age service model.

1.2. A comparative Study of Old-Age Services at Home and Abroad

With the rapid development of China's economy and society, the improvement of people's living standards, both the young and the old groups concentrate more on spiritual needs. In addition, the number of elderly people living alone in rural empty nests is increasing, but the level of supporting infrastructure is not high [3]. For the elderly services, countries belong to introduce the corresponding service measures and help policy. Such as: Europe and the United States are independent type, Australia and New Zealand government relief type. The biggest feature is that the family, society and other aspects are actively mobilized to achieve the socialization of old-age services, which means to effectively integrate decentralized old-age related services, promote cooperation and common development. For example, despite increasing spending on pensions, the Australian government spends only 9.5 per cent of total pension spending a year, with the rest spending 63.5 per cent on social groups and 17 per cent on private spending. And the government advocates home-based old-age care, not only conducive to the longevity of the elderly, but also reduce the cost of government expenditure. It can be seen that foreign old-age services in the community coverage is extensive, allocation are coordinated and unified of social resources is reasonable mobilization of all aspects of social resources.

Through the relevant information query, domestic and foreign pension services comparison, such as Table 1.

Always have something to rely on, to enjoy and to do is the expectation of the majority of the old, from the table above can be seen, in terms of survival needs, domestic and foreign towns to provide services are much the same, can meet the expectations of old people, domestic (towns) focus on health care, security guidance, etc., foreign focus on psychological guidance; In terms of relationship and development needs, domestic (towns) pay attention to the organization of cultural activities, gerontology schools, games and other services, while care, development services are more fragmented, in the stage of old fun; Foreign attention to social, old-age employment and other services, so more is to provide care, development of the core of high-level services, and constantly realize the old needs of the elderly;

Table 1. Comparison of domestic and foreign pension services.

Comparison of pension services at home and abroad					
ERG demand layer	Maslow demand	service	Domestic (rural)	Domestic (urban)	abroad
Survival needs	Physiological needs	Breathing, water, food	Housekeeping (personal and house cleaning)	Door to door service, delivery and catering, housekeeping, purchase and other services	Provide meals, housekeeping, transportation, installation of facilities, tax reduction and exemption
	Security requirements	Health and safety, family and external environment guarantee	Elderly assistance, medical insurance, minor illness treatment	Medical security, safety guidance, aging transformation and other services, multi head management	Psychological support, (medical treatment, nursing, teaching the way to maintain life), providing elderly care services with high welfare, and double parallel management and supervision mechanisms
Caring needs	Love and belonging	Identification needs of college and social relations	Chess and cards, door-to-door chat, daily mutual assistance	Family services (accompanying and listening), construction of cultural activity stations	Fraternity, government funded elderly vacation, overall care, social and recreational services
Development needs	Respect needs	Self esteem, prestige, social status, etc	Elderly activity facilities (fitness equipment)	Create an environment of respecting and loving the elderly (performances such as grandparents and us, Beijing opera, interactive answers to lectures on respecting the elderly, etc.)	Independent living space (focusing on independent type)
	self-realization	Potential exertion and self value realization	Festival Performance (yangko dance, gongs and drums)	Set up a school for the elderly, set up an organization of elderly volunteers, interesting educational games for the elderly, etc	Senior talent center (employment), self-help elderly care community (DIY)

The measures taken both at home and abroad to make the old always have something to rely on, to enjoy and to do, the way that foreign countries adopt to mobilize all aspects of resources, intergrate scattered old-age and socialize old age services related services, are worthy of our reference. Based on the needs of human

nature, actively encourage the participation of government and social forces, and promote the formation of a new pattern of integrated development of government, market and community governance [4], establish a diversified new development model, forming a virtuous circle of old-age service closure.

2. Explore the Rural Elderly Service Demand Based on ERG Demand Layer

2.1. Target User Research and Demand Analysis

2.1.1. The Target User is Determined

Article 2 in *China's Law on the Protection of the Rights and Interests of the Elderly* stipulates that the starting age standard for the elderly is 60. The World Health Organization classifies older persons into three categories: young older persons aged 60-74, older persons aged 75-89 years and older persons aged 90 years and over [5]. Based on the above division, the study targeted young people aged 60-70 with self-care skills. As core service object of the old-age service, at the same time they will pay more attention to their quality of life in their later years, they can have a clear sense of life experience and the shortcomings in the old-age life can be fully expounded, which make collecting convenient access to research information easier.

2.1.2. Get Target User Information

ERG demand hierarchy theory is a kind of humanistic demand theory formed by the addition and revision of Maslow demand theory on the basis of a large number of empirical studies by Clayton Alderfer, professor of organizational behavior at Yale University in the United States [6]. In this study, by issuing questionnaires, interviews and observation, we selected some elderly people in some rural areas of Inner Mongolia to conduct sampling surveys, according to the situation of questionnaire data collection, and some take the form of face-to-face interviews to the elderly, through the distribution and recovery of 78 valid questionnaires (the questionnaire distribution area: Fengzhen, Ulanhab, Inner Mongolia Autonomous Region: 45 copies, Bayangar City, Inner Mongolia Autonomous Region: 13, Ordos City, Inner Mongolia Autonomous Region: 10, Wuhai City, Inner Mongolia: 10, total valid questionnaire: 78), Interview 10 people in person. The questionnaire content structure framework is set according to the ERG demand hierarchy, and the contents of the questionnaire are designed for the three aspects of survival needs, relationship needs and development needs.

2.1.3. Tap Into Target User Needs

(1) Survival needs:

The proportion of 60-70 year olds is 60.87%, mostly farmers, living with husband or wife, 67.86 percent of the elderly choose to travel by farm car, half of the elderly annual expenditure less than 30%, Daily necessities accounted for 51.21% of the expenditure, cleaning services accounted for less than 20% of all aspects, their demand is to strengthen multi-cleaning services, convenient travel, broaden consumption channels; 60.71% of the elderly income source is the living allowance, the elderly welfare of the elderly subsidies and health insurance accounted for 85.71%, it can be seen that the supply of security-type funds is insufficient, how to broaden the supply of funds is the key to solve the needs of the elderly financial security; Only

50% of people choose to seek medical treatment in a timely manner, which shows that there are still elderly people with low awareness of medical treatment, 71.4% of the elderly simply choose village hospitals when seeking medical treatment, and 55% of the elderly say that medical equipment in the village is not perfect, The proportion of medical care services for the elderly is 10.71%, which indicate the need to strengthen the promotion of the correct concept of medical treatment, improve the construction of medical configuration and professional medical care.

(2) Relationship requirements:

59.26% of the elderly can get children accompanied for 1-3 days each time, Only 14.29% the village provide accompanying chat services, and contact with relatives and friends more, contact 77.7% of older people choose to watch TV and chat with each other in a social way, which shows that their social needs focus on providing a wealth of social vehicles (activities and facilities), more access to spiritual comfort for their children, and providing a companion service platform.

(3) Development needs:

59.25% of the elderly are more concerned about whether there are professional (medical) services, 50% of the elderly put forward that the village activities is held once a year, for the event facilities placement situation 82.14% of the elderly choose fitness equipment, for the elderly to organize tourism accounted for 17.86 percent, the elderly think that institutions to provide professional (medical) services, strengthen activities, arrange elderly tourism, expansion of activities and other activities and other old people's environment atmosphere construction is the basic respect for the elderly; Fifty per cent of the elderly took sports as their interest, with 67.86 per cent of the elderly who thought that the main focus of the activity arrangement was on national fitness and 46.64 per cent of the elderly who did not participate in the activities, Its demand-rich activities to mobilize participation enthusiasm, stimulate potential interest to find the same good people to regain their own circle of belonging, to meet the old and do something, to achieve the value of the elderly themselves.

2.1.4. Demand Feature Conversion

The functions required by users in terms of survival are mainly daily cleaning, accompanying travel, convenient shopping, on-site medical treatment, etc. The functions required in the relationship are mainly to provide rich social activities and spiritual comfort dialogue for the elderly, while the functions required for development are mainly to improve the experience of the elderly environment and develop the interests of the elderly. It can be seen that different groups of older people have different emphasis on functional needs. Although there are highs and lows in the three levels of survival demand, relationship demand and development demand in the ERG demand model, this hierarchical division is not rigidly structured, and the three demand levels coexist [7].

2.2. The Design Direction and Strategy of the rural Old-Age Service System

Building a diversified rural old-age service system is an important way to meet the diversified needs of the elderly, and also the key to build an innovative old-age service model. Therefore, actively mobilizing social resources to participate in the construction of rural old-age service system, can provide users with more service content and old-age resources. At the same time, the traditional old-age service model

of multi-head management will be upgraded to form a unified operation of the whole old-age service.

The rural old-age service system design direction based on ERG demand theory: allocate market resources effectively, improve the rural infrastructure, to build a platform for the elderly to express their own ideas to meet, while providing a safe social and living environment, so that the elderly find their own love and belonging to the group and other higher-level services.

Specific strategies adopted by the rural old-age service system based on ERG demand theory:

(1) Mutually beneficial cooperation: the key to mutually beneficial cooperation is equality and justice, cooperation and complementarity, mutual benefit and symbiosis. Reciprocity is mainly reflected in the multi-directional cooperation between relevant departments in urban and rural areas; The hometown village gives urban elements support and the city gives rural resources back feeding; Provide a platform for villages to express themselves, promote the enthusiasm of rural-urban cooperation and the accurate correspondence between supply and demand, and realize mutually beneficial cooperation; Equal consultation between relevant urban and rural departments is conducive to reaching a consensus and resolving the problems in the development of rural elderly care services, so as to form an atmosphere of symbiotic development of relevant urban and rural departments.

(2) Improve infrastructure construction: with the support of the government, promote the construction of rural infrastructure, public services and other rural people's livelihood, and establish mutually beneficial links with relevant departments; In terms of infrastructure, we can rebuild and expand the existing institutions in rural areas, or jointly build medical and elderly care institutions. In terms of professionals, we can select high-quality medical and elderly care talents from the existing medical professionals in rural areas [8], so as to build a perfect medical service system; Give preferential policy subsidies to the rural elderly for medical treatment, continuously enhance the basic guarantee function of social assistance, and explore the establishment of rural long-term care insurance system [9], so as to effectively avoid poverty caused by illness and return to poverty due to illness.

(3) Interest attribution: pay attention to the deep-seated needs of the elderly, take the interests of the elderly as a clue, establish diversified activities, let the elderly spontaneously find suitable activity groups, so as to integrate them faster, take participation in activities as a bridge, establish mutual trust, obtain the recognition and affirmation of peers, and enhance self-confidence; promote communication between different groups, so as to expand the activity content and social breadth; Provide a platform for the elderly in the community to give full play to their skills, promote their self realization and increase their sense of well-being [10].

3. The Design of Rural Old-Age Service System Based on ERG Demand Theory

3.1. Rural Old-Age Service System Platform

The design is based on the analysis basic needs of the target users and the inner emotional needs design and construct, the rural old-age service system platform. Rural old-age service involves user data, old-age model, user demand, digital network

information system, service supply main body and other content, and these contents need to be, upgraded and cycled in time with the change of demand. As the largest collection circle, the rural old-age service system platform integrates the resources of various types of old-age-related industries and makes efficient service supply according to the diversified demand of users. In the multi-party collaborative development model to form interconnection, co-perch linkage mode, to fill the service short board loophole, can weave a more complete and effective old-age service network in the three aspects of economic support, life care and spiritual comfort [11]. The subsystems that survive in the service system complement each other to meet the needs of users and improve the quality of the rural old-age service. While meeting the basic needs, we construct activities or services that can meet the emotional needs, let the target users participate in the construction of the old-age service system, and play the dual role of enjoyer and contributor. On the one hand, it will increase the supply of effective old-age services, on the other hand, it will provide the elderly with a platform to realize their self-worth [12], in the contribution of practice to obtain their own inner emotional needs to meet, regain confidence and self-worth. The organizational structure of the old-age service system platform, as shown in Figure 1.

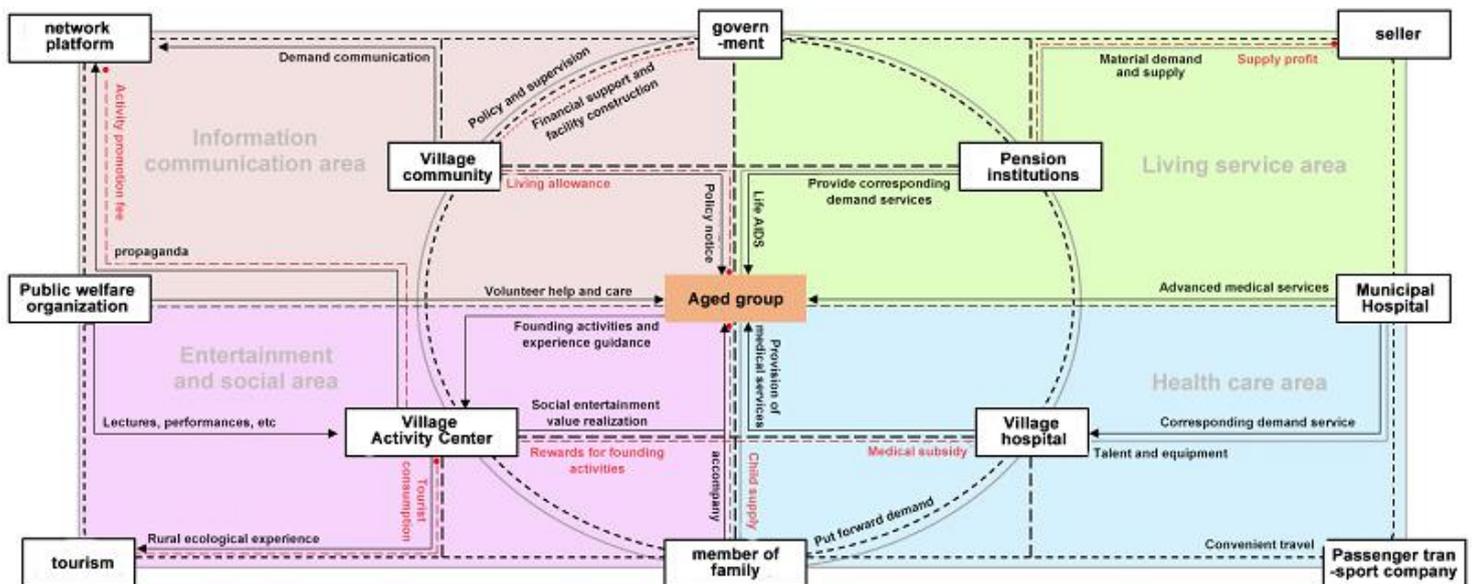


Figure 1. Organizational structure of system platform.

3.2. Rural Old-Age Service System Process

Smooth operation of the service flow is the key to meet the needs of users in high quality, the rural old-age service system involves a number of service types, service supply units and service contacts. The entire old-age service system could achieve the optimal allocation of various types of resources through the service supply units and the target user service contacts between efficient docking. Rural old-age service system flowchart, as shown in Figure 2 service system process. Service system platform personnel through the online platform to obtain user demand information, the basic survival needs of users in real time contact with the government, old-age institutions, medical centers and other coordination to provide appropriate specialized services; in terms of user relationship needs and development needs, online and offline services and self-worth platforms can be provided through activity centers, pension organizations, non-profit organizations and third-party service collaborations,

and the government, society and the elderly are widely linked through the “Internet Plus” approach, and different channels for old-age care are also linked to each other [13]; The participating entities in the service system operate independently, forming invisible symbiotic links with each other, and developing systematic and holistic solutions to optimize the service to meet the reasonable and predictable needs of users [14]. Continuously improve the comprehensiveness and professionalism of services, build a dynamic balance between supply and demand service network, forming a closed cycle service experience.

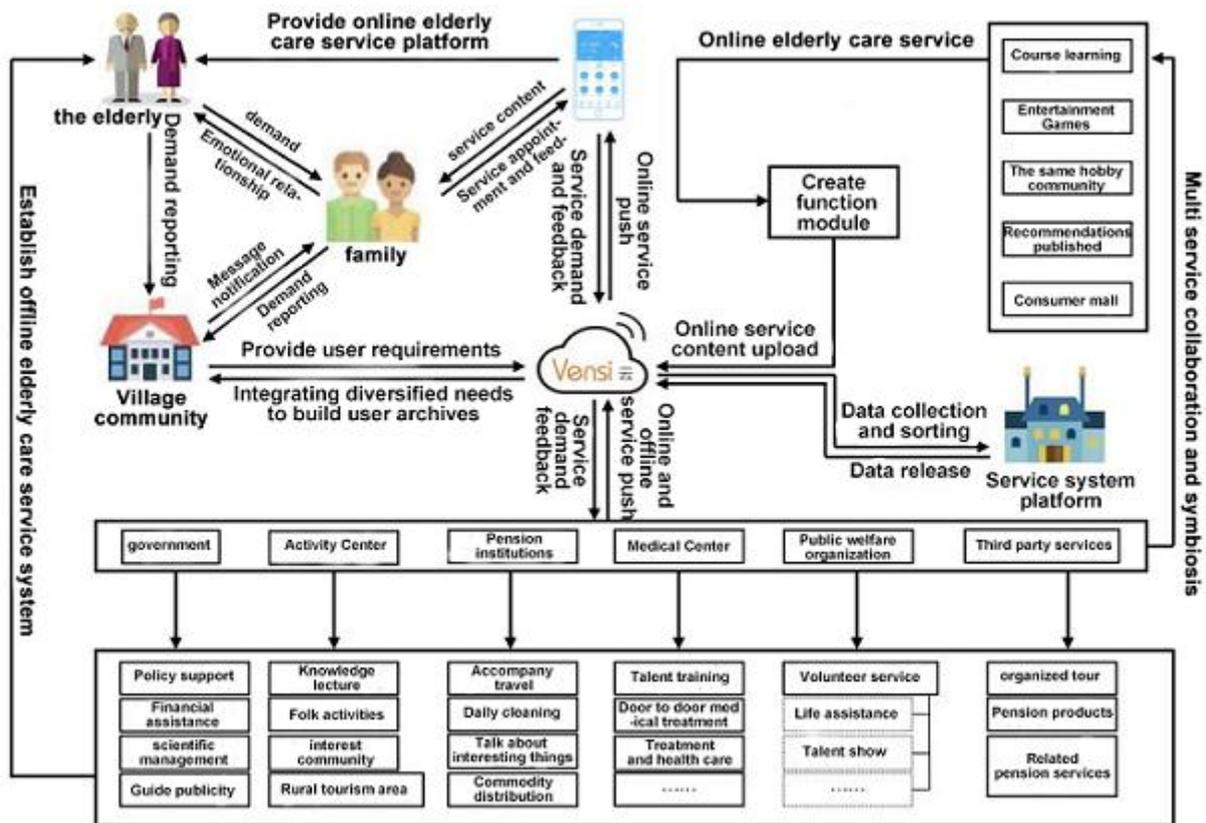


Figure 2. Flow chart of service system.

4. The Terminal Design of the Old-Age Medical Service System

On the basis of the rural old-age service system, seeking for higher-level medical treatment in urban area is essential, where to go to seek medical treatment, how to seek medical treatment, medical procedures are problems faced by the elderly when seeking urban medical treatment, so the rural old-age medical section to carry out further research, so as to carry out end-product design, for the rural elderly to provide a more convenient way to seek medical treatment.

4.1. Product Design Requirements

Information technology products have certain application potential and practical value to the elderly, and intelligent and healthy old-age care is a new model to deal with the aging of the population and help the elderly improve the quality of life and life [15]. Based on the current situation of rural medical care and old-age care, combined with the needs and characteristics of the elderly in rural areas, design a smart wearable device for the elderly to better access medical resources.

After analyzing the current wearable devices, it is found that different forms of wearables have their own shortcomings, such as: the form of clothing is not easy to clean and information feedback is not timely; Smart bracelet has better concealment and fusion, avoid the interactive space, information feedback and technical implementation of the problem effectively, so choose smart bracelet to provide more convenient medical services for the elderly. In conjunction with the requirements learned from the previous research, the design requirements for smart bracelets and APPs are as follows: Smart bracelets, which are primarily used for health monitoring and medical guidance, should ensure the convenience of older people when wearing and the comfort and durability of their wearing. At the same time, considering the elderly's declining physical function, adopt voice interaction to lower the difficulty of operation.

Considering that relying solely on smart bracelets can not provide the elderly with perfect medical needs, for this purpose design an APP for the elderly children or family members to use, as an auxiliary tool for smart bracelets, to achieve two-way information exchange between the bracelet and the APP, if necessary, through the APP to help the elderly to complete their needs.

4.2. Product Design and Description

The following will analyze the design from color, function and appearance, which is carried out according to the above product design requirements, the elderly use of intelligent bracelet design.

Choice of Bracelet color: the appearance of color makes nature more colorful. Considering that the elderly are more exposed to black, gray and white in life, in order to make the color world of the elderly no longer so monotonous, the color schemes dominated by red, yellow and blue respectively reflect a sense of liveliness and steadiness, as shown in Figure 3 red effect map, Figure 4 different color effect map. In the later user experience, expand color according to its needs.



Figure 3. Red rendering.



Figure 4. Effect pictures of different colors.

Function: mainly includes health monitoring, telephone, emergency call for help, reminder notification, intelligent voice guidance and real-time positioning navigation

and other functions, specifically as follows: (1). He is also a bracelet and headphones in one of the intelligent wearable device - the elderly medical guidance bracelet. (2). The bracelet host has a health monitoring chip behind it, which can monitor the wearer's blood pressure, blood oxygen, heart rate, etc. in real time, as shown in Figure 5 monitoring function structure. (3). Considering the small interface, the chance of misoperation, the elderly limb sensitivity is reduced, the front of the host using non-interface operation design, to complete its needs by voice, to display the light way to present various types of states, through visual color transmission of information. (4). The host has a removable design, the core area can be unloaded from the bracelet as a headset to wear, to achieve the communication of information from the auditory aspect, through the sound hole on the headset can be human-computer voice interaction. (5). The earbuds come with a small clothing clip, which can be attached to the earbuds by a soft cord, so as to avoid the loss of the headset. (6). When monitoring the elderly health abnormal or fall, automatically turn on the emergency call for help notice, do not need the elderly to operate to achieve the call for help.

In the appearance of the image: first of all, as the elderly's mode is more traditional, the more novel appearance will increase its acceptance time. Therefore some conventional styles are chosen to avoid causing their learning burden, secondly, in order to better achieve human-computer interaction in the process of use, the main body of the device is removeable, such as in the medical guidance process as a headset wearing, through hearing better information to the elderly, Figure 6 use scene display.



Figure 5. Inspection function structure display.



Figure 6. Use scenario Display.

4.3. APP Design and Instructions

The main users of the app are the children of the elderly or family members, they use APP remotely to help the elderly to achieve demand. APP mainly includes monitoring, registration, car navigation, footprints, consultation, shopping, mailing and other functions, such as The Home, Monitoring, Car Footprint, shopping, mailing, car information. The specific functions are described as follows: (1). You can remotely view the health monitoring data of the elderly in real time, and analyze or suggest the data to cause children to care for the health of the elderly. (2). Check the progress of the car voyage to ensure that the elderly travel more safely. (3). The medical guidance route is presented, and the status of all medical treatment links for the elderly is known. (4). Online registration, to help the elderly online appointment registration, so that the elderly in the shortest possible time to get medical services. (5). One-click payment, for the elderly in the hospital of the various consumption expenses, APP can automatically receive various consumption items, to achieve

online summary payment, to avoid the red tape of online payment. (6). Online shopping, mailing, to help the elderly will check list, consultation list, corresponding drugs, etc. sent to the door, to avoid the omission of old characters.

4.4. The Process of Medical Services for the Elderly

Building a perfect rural medical and old-age service process for the elderly in rural areas is the key to improve the level of rural medical services, so the process of old-age medical services is designed, as shown in Figure 7. The elderly through the bracelet could get to know health status timely, while the bracelet can also upload the health situation of the elderly through the cloud platform uploaded to the APP, so that children can remotely pay attention to the health of parents; To complete the examinations at designated places, and to simplify the process of medical treatment for the elderly, children use APP to help the elderly register, pay for, and take medicine, shorten the time itinerary for the elderly to seek medical treatment. The elderly do not have to worry about whether they can get perfect medical services in their old age with the help of the co-operation of bracelets and APPs in the continuous improvement of the medical service system, the formation of high-quality medical services experience.

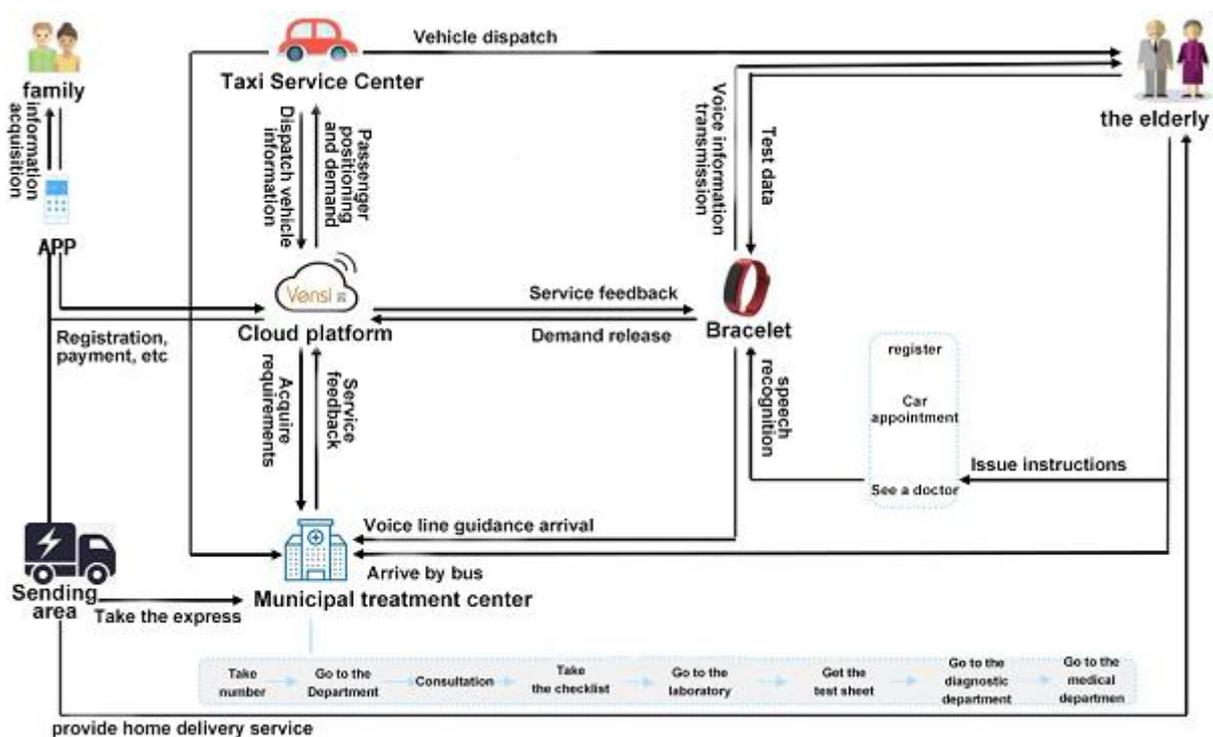


Figure 7. Flow chart of elderly care service.

5. Conclusions

Building a comprehensive rural elderly care service system is not only an effective way to alleviate rural elderly care pressure and promote urban and rural development, but also the key to improve the quality of life of the elderly in their later years. This paper is based on the demand for rural elderly care services in Inner Mongolia, based on ERG theory to carry out service design and realize the service strategy and mode of mutual assistance and cooperation among multiple supply subjects. Integrate big data, cloud platform and other technologies into the operation of the elderly care

service system, form resource information co-construction and sharing, effectively improve the dynamic balance of supply and demand in the elderly care service system, and promote the realization of higher-level elderly care service needs. Considering the diversified needs of the elderly group, there may still be some deficiencies in the service system. Therefore, following service prototype test to meet the deeper needs of users according to the test results is still needed. Although this proposal is not the comprehensive solution to elderly care services problems, it can effectively improve the elderly care services, enhance the elderly care experience, and provide a reference theoretical basis and reference for the design of rural elderly care services and promoting the development of elderly care service industry.

Conflicts of Interest

The author declares that there is no conflict of interest regarding the publication of this article.

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