



Research on the Design of Smart Elderly Service System Based on Design Perspective

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Abstract. Based on the actual background of the national aging population and the rapid development of intelligent technology, this study aims to explore how designers can use intelligent technology design to improve the efficiency and quality of elderly care services when designing elderly care services and adapt to the needs of the aging society; to carry out in-depth design optimization for the current development needs of China's elderly care service industry, as well as the shortcomings and challenges of the intelligent elderly care service model and innovative reconstruction. The research focuses on the behavioral habits, needs and technical realizability of different elderly groups, aiming to build innovative elderly service products that meet the needs of the older people in terms of spirituality, respect and self-realization.

Keywords: Ageing, service system design, smart aging, differences in demand.

1 Introductory

Nowadays, China's social elderly care system is gradually maturing and perfecting, forming a diversified service pattern that integrates family care, community support, professional institutions, and the combination of medical care and elderly care. With the rise of the concept of "smart elderly care", technology-enabled elderly care services are leading the industry's new trend, and a series of intelligent products for the elderly are gradually gaining popularity and penetrating into the daily lives of families with elderly care needs. By providing a convenient, rapid, efficient, and economical service model, intelligent elderly care has demonstrated its unique advantages in different elderly care scenarios, effectively alleviating the deficiencies and challenges of traditional elderly care.

With the wave of digitization sweeping across the world today, cutting-edge technologies such as big data and artificial intelligence have been deeply embedded in our daily lives, and innovative products such as intelligent furniture and intelligent service systems have emerged in an endless stream, which has greatly accelerated the intelligent process of society and enhanced the efficiency of life. However, in the context of aging, the acceptance of new things and the learning speed of the elderly lag behind,

and the rapid development of technology has instead built an invisible high wall between the elderly and the times. Therefore, exploring a more humane aging intelligent elderly service system from a design perspective is of far-reaching significance for both theoretical research and practical application of related industries in the future, so that every older person can enjoy the well-being of science and technology, and achieve the happiness and dignity of their later life.

2 Background of China's Aging Society and the Current Status of the Development of Intelligent Aging Technology

2.1 Context of an Aging Society

According to the National Bureau of Statistics, as of 2023, China's elderly population aged 60 and above has exceeded 250 million, accounting for about 20 percent of the total population. It is expected that by 2035, the proportion will exceed 30 percent, meaning that one in every three persons will be an older person. As the phenomenon of social ageing intensifies, the demands of the elderly population for elderly care services have also increased, with the need not only to meet the basic needs of the older person, but also to pay attention to their spiritual, cultural, social and interactive needs.

2.2 Current Status of Innovative Aging Technology Development

The current focus of intelligent aging in China is on meeting basic needs, including home safety, health, medical care and disease services. Nevertheless, with regard to the spiritual life and social needs of the older people, the provision of cultural entertainment and social services remains inadequate. For the considerable number of young and middle-aged elderly individuals who remain capable of gainful employment, the current provision of elderly care services is insufficient in meeting their desire for respect and self-actualization. Consequently, the design and development of products that more effectively address the emotional, respectful and self-fulfilling needs of the elderly represents a crucial avenue for advancement within China's intelligent elderly care industry.

3 Current Status of the Application of the Smart Elderly Service System

3.1 Existing Models of Elderly Care Services

At present, China's pension system is basically shaped, mainly divided into four modes: family pension, community pension, institutional pension, and medical and nursing care, which do not exist in isolation, but can complement each other to form a smart

pension service system that comprehensively covers the needs of the elderly. The family old-age care can be combined with the community old-age care to achieve the sharing of family and community resources; the institutional old-age care can be introduced into the medical and nursing combination mode to improve the level of medical care.

Among them, family care for the elderly, as a traditional mode of care deeply influenced by history and culture, accounts for 90 per cent of the market, and has become the mainstream mode of care for the elderly in both urban and rural areas in China. Community care for the elderly accounts for 7 per cent of the market, with community care for the elderly relying mainly on the Government, family members, society and other forces to provide care for the elderly. Once again, there is institutional care, because most of the elderly prefer to age in their own familiar home or community environment, so institutional care accounts for only 3% of the overall old age care. And its combination of Chinese medicine and nursing is not an independent model of elderly care, but a service model or concept that can be applied to home care, community care and institutional care. It mainly focuses on professional healthcare facilities to provide medical services such as day care, sports rehabilitation, healthcare treatment and chronic disease management. [1]

The above describes in some detail the four modes of ageing and the addition of smart technology. Among them, community-based home care is widely welcomed for its flexibility and convenience. However, the model is still deficient in terms of resource integration, service efficiency and meeting individualized needs. Institutional elderly care, on the other hand, is difficult to popularize due to high costs and bed constraints. Although telemedicine can solve some medical problems, it lacks emotional communication and humanistic care.

3.2 Existing Problems and Challenges

Differences in age, health and family structure lead to different needs among different groups of older persons. Those who remain healthy and relatively young are more in search of quality, social interaction and dignity, and refuse to be dependent; those who are old and frail focus on safety, comfort and medical care, and, because of declining physical function, are prone to fear and need the company of family members, while emphasizing dignity and privacy. [2]

Due to the high technological threshold of smart ageing products, it is difficult for older people to master them, resulting in low usage rates. At the same time, the lack of compatibility and interconnectivity between different brands and models of smart ageing products has led to the need for older people to learn a number of different operating systems when using a variety of products, increasing the difficulty and complexity of use.

The failure to fully respect the independence and autonomy of the elderly in the design of elderly services has led to the elderly becoming passive recipients of services, feeling that their dignity and quality of life have been compromised, which has reduced the humanization and effectiveness of service design.

As smart elderly products involve a large amount of personal privacy data, leading to such as how to protect privacy and data security has become an important issue.

Elderly people lack the experience and basic knowledge related to online privacy protection, and are unable to control and manage it effectively, resulting in personal information being accessed and used without consent, thus causing unnecessary harassment and trouble.

4 Design of Smart Elderly Service System Based on Design Perspective

4.1 Design Principles

The impact of design activities in today's era has been gradually extended to the entire human society, which therefore requires designers to have a high sense of social and ethical responsibility, and to constantly explore needs and identify problems, which can be transformed into design points embodied in products and benefited to service users. As a result, how to reflect the humanistic concern of design, how to take advantage of technological change and reduce the negative impact of technology are problems that can be solved through design, which is also the main purpose of the study. [3]

Focusing on the comprehensive needs of the elderly and providing personalized services according to their individual differences. At the initial stage of service design, the research should comprehensively and meticulously cover the physical and mental health status, pursuit of spiritual and cultural life, social interaction needs and other dimensions, while taking into account the different age groups and health conditions of the elderly, to ensure that the service content is covered in-depth and detailed, and to provide a wider range of choices to fully satisfy their personalized self-needs. [4]

Focused attention is given to taking care of the decline in physical functioning and cognitive abilities of older persons. As they age, their visual and auditory senses gradually deteriorate, and many problems arise in their motor and memory abilities. Through interface design that enhances colour contrast and increases font size, and concise and clear language in text descriptions, it is important to ensure that products and services are easy to understand and operate for older people. Specifically, in the development of mobile applications, adjustable font sizes can be incorporated to flexibly adapt to the visual reading preferences of different older people, thus enhancing the experience of older people.

Lower the technical threshold and ensure the technical feasibility of products. Product designers need to pay more attention to the user-friendliness of older people, simplify the operation process, design more intuitive user interfaces and equip them with voice guidance functions, so as to lower the technological threshold. In addition, the involvement of family members and community service workers is also crucial, as they can act as a bridge for older people to use smart ageing products, providing the necessary help and guidance to help older people overcome their fear and resistance to new technologies and master the skills of product use. For example, Amazon Echo, a product with built-in Alexa intelligent voice assistant, allows seniors to control smart devices at home with simple voice commands to meet immediate needs, reducing reliance on complex operations and reflecting care for seniors' convenience and social needs.

Focus on the personal emotional and psychological needs of older persons. In addition to basic physical health care, meeting the deeper needs of older persons in terms of self-worth, emotional support and social interaction is an important direction that needs to be explored further in the area of service design. For example, to meet the needs of the elderly in pursuing their self-worth, we can launch the "Silver Age Career" and "Wisdom Restart" programmes, and set up an online one-stop platform, which integrates functions such as job selection, one-click CV delivery, and incubation of elderly entrepreneurship, and aims to create a convenient and efficient career development platform for the elderly. The platform integrates functions such as selecting jobs, one-click resume submission and incubation of elderly entrepreneurship, aiming to create a convenient and efficient career development channel for the elderly. In response to the pursuit of marriage and emotional value, we can develop specialized marriage and dating platform services to provide a safe and warm communication space for single or widowed elderly people. At the same time, combining with the community to encourage the organization of all kinds of emotional exchange activities, to enhance the emotional connection between the elderly, so that they can feel the warmth of love and being loved.

Strengthening security is the cornerstone of protecting the privacy of older persons. It is necessary to build a comprehensive protection system, including two major areas of physical and data security.

In terms of physical security, anti-slip, anti-collision, colourful and obvious safety materials should be used in the design of elderly service venues and products, and emergency call systems and barrier-free access should be set up in the venues to ensure that the elderly can have timely and effective safety protection in the process of using the services; in terms of data security, data encryption and privacy protection should be strengthened, and a perfect authority management system should be set up to ensure that only authorised technicians or relevant personnel can access the relevant data, to further protect the privacy of the elderly. In terms of data security, data encryption and privacy protection should be strengthened, and a perfect data extraction, access and matching authority management system should be established to ensure that only authorized technicians or relevant personnel can access the relevant data, so as to further safeguard the data security and privacy of the elderly.

Encouraging social participation and making full use of the resources of the community, families, institutions and other parties to achieve optimal allocation and sharing of resources. Through the innovative design of the elderly care mechanism, the community is taken as an important carrier of elderly care services, and it is advocated that elderly care institutions should open up and cooperate with the community and families, so as to form an "institution-community-family" three-in-one model of elderly care services, so as to achieve the complementarity and sharing of resources, and to improve the quality and efficiency of services.

5 Concluding Remarks

With the aggravation of the population aging problem, the design and optimization of the smart elderly service system is particularly important. From a design perspective, this study focuses on the multidimensional needs of the elderly and advocates the concept of user-centred design, which seeks to break down the technological barriers and enable the elderly to integrate into the smart life more easily. Through in-depth analyses of existing elderly service models and challenges, we propose strategies to enhance service efficiency, strengthen emotional care, and ensure data security, aiming to build a more humane, efficient, and secure smart elderly ecosystem. The successful implementation of this system can not only effectively improve the quality of life of the elderly, but also promote the transformation and upgrading of the elderly service industry and inject new vitality into the aging society. [5]

It is expected that the smart elderly service system will continue to innovate to meet the changing needs of the elderly, so that every elderly person can enjoy the convenience and happiness brought by technology.

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