# Research on Strategies to Enhance the Digital Well-being of Chinese Elderly Groups in the Age of Digital Economy

**ABSTRACT:** The application of new technologies serves as a driving engine for rapid economic and social development, reshaping human lifestyles. However, not everyone can benefit equally from the digital dividends brought by technological advancements. How are older groups going to be integrated into digital life in the comprehensive digital era? Applying web-based ageing-friendly transformation to enhance the digital well-being of the elderly population is a necessary path for the country to actively respond to population ageing. By analyzing the literature, this paper summarizes the current research status of digital well-being among the elderly population, and examines the dilemmas they face in this regard through specific case studies. The main issues include external digital access barriers, design of digital product, social support systems, as well as internal barriers stemming from exclusion and cognitive issues. Addressing the digital challenges faced by the elderly group, we can leverage the *Foot In The Door Effect* and adopting the *"Time Bank" Mutual Aid Service Model.* By integrating efforts from society, enterprises, families, the elderly themselves, and governments, the internet will facilitate the elderly-friendly transformation, enabling the elderly to share in the benefits of digitization and enhancing their digital well-being.

***KEYWORDS:*** *Elderly Groups; digital well-being; ageing-friendly transformation*

## 1 INTRODUCTION

With the rapid development of science and technology, the era of digital economy has dawned, profoundly changing our lifestyles and habits. In the process of digitization, both China and the rest of the world are facing a pressing social reality—the accelerating trend of population ageing. According to authoritative industry data in 2024, the number of resident population aged 60 and above in China is 310 million. Prior to this, the National Health Commission of China forecast that by approximately 2035, the population of individuals aged 60 and above would surpass 400 million, accounting for more than 30% of the total, signaling that China will enter a phase of profound ageing [1]. According to the CNNIC report, by December 2024, the population of non-internet users in China stood at 301 million. Regionally, this group is predominantly based in rural areas. In terms of age, beyond children under six, the elderly aged over 60 constitute the primary segment of non-internet users, with the Internet has penetrated into the middle-aged and elderly groups [2]. In focusing on the majority of people’s Internet experience, the society tend to ignore the elderly group, the elderly digital integration and physical and mental health care issues can no longer be ignored. How to make the Internet’s “Digital Refugees” across the “Digital Divide” needs the deep attention of the whole society. The problem of crossing the “gap” is not only the physical use of the Internet by the elderly, but also the satisfaction of their psychological well-being by enjoying the dividends of the digital economy.

Digital well-being refers to a state of well-being that strikes a balance between being connected and disconnected in the digital realm [3]. Researchers believe that digital well-being is an important theoretical tool in the study of media literacy, which can be understood as a certain extent as a digital extension of the traditional sense of well-being (a collection of subjective well-being, psychological well-being, and social well-being) [4]. It is mainly manifested in the modern information-based society through technology to obtain happiness, and is a positive emotional experience dominated by positive emotions. The digital well-being of the elderly is expressed as satisfaction with digital life, and the digital well-being of the elderly is influenced by multiple aspects and levels of factors, such as physiological experience, psychological feelings and social environment. Through literature method and case analysis, the study will explore the current situation of digital well-being of the elderly in the digital economy, the barriers to digital well-being of the elderly, and how to improve the digital well-being of the elderly, so that the elderly can change from “getting old age” to “enjoying old age” through the literature method and case studies.

## 2 Current status of research on digital well-being in elderly groups

The rapid development of Information Technology and the wide application of Network Technology and New Media have profoundly reshaped all aspects of human life. The popularity of emerging technologies, such as mobile payment, telemedicine, shared mobility, short videos and live broadcasting, has enabled us to enjoy the convenience of digital technology. However, these forms of technology, characterized by virtualization and digitization, have not benefited all social groups, especially the elderly. Due to the natural decline of physiological functions, the elderly are facing significant changes in their perceptual abilities, cognitive functions, emotional states and psychological adaptations. At the same time, the accelerated digital transformation of society has further exacerbated the gap between the elderly and the high-development society, making it impossible for the elderly to adapt to the new digital society, and even more difficult for them to derive a sense of well-being from it. The insufficient popularity of technological applications and the lack of age-friendly design have limited the range of activities of older people in their daily lives, which in turn triggers a sense of social alienation and inferiority complex in their inner selves due to reduced self-efficacy.

## 2.1 Relationship between Internet use and well-being of the elderly

The Internet is a double-edged sword that brings both convenience and crisis. Especially for the elderly, the role of the Internet can not be generalized. Smartphone is the main tool for the elderly to access the Internet, the elderly use the Internet to contact new things, leisure and entertainment, life payment, understand various information, etc. However, the complexity and change of the network there is uncertainty, resulting in the elderly group compared to other age groups are more likely to believe in false news [5]. Some studies believe that Internet use can increase the health knowledge of the elderly, improve their mental health level, and then affect their sense of well-being.

An empirical study by Ren Hongjie et al. [6] based on CHARLS data confirmed that Internet use significantly and positively promotes the level of well-being of the elderly. Based on survey data regarding the digital divide and digital inclusion among Chinese elderly population, Jin Yongai et al. [7] found that moderate internet use has a positive impact on healthy ageing and subjective well-being among middle-aged and older Internet users. This is because the Internet in fact has certain security risks, which can cause losses if used inappropriately or by mistake. In contrast, the elderly population lacks awareness of internet security, making them more likely to face financial and security risks. In the era of digital economy, the Internet has penetrated into the elderly group with an unstoppable momentum, digitally empowering the elderly group and opening up a new space for them to surf. In summary, more studies have concluded that Internet use has a significant effect on the well-being of the elderly, but we must pay attention to moderate use, not improper use or excessive use.

## 2.2 Factors affecting the well-being of the elderly group

Internet use has a significant positive impact on promoting the integration of elderly groups’ social relationships, while the sense of social fairness is affected by the intensity of Internet use and ability of information acquisition [8], which in turn acts on the level of well-being of older adults. Some studies have shown that older people who use the Internet have significantly higher subjective well-being. However, the frequency of Internet use and the subjective well-being of older people is not a simple linear relationship [9]. The level of physical and mental health of the elderly and the social support they receive will act as mediating factors to affect the digital well-being of elderly , which shows that the more physically and mentally healthy the elderly are and the more the receiving society will help the elderly to use digital technology more actively. Studies based on Affordance Theory and Self-Determination Theory have shown that the realization of personal values plays a role in the subjective well-being of older people [10], and the more older people can feel the realization of their own values, the happier they feel.

Based on geographical differences and characteristics of the elderly population, Fang Zhen et al. [11] found that the digital divide negatively affects the well-being of rural elderly, which is particularly in specific elderly groups such as lower-aged elderly and more educated individuals. Lower-aged elderly have more positive attitudes toward digital life compared to higher-aged elderly, and a larger digital divide can cause them to feel a sense of loss, while elderly with higher levels of education are prone to feel a sense of deprivation in the digital divide. In specific regions of our country, such as the eastern and non-plain rural areas, the performance is more prominent. The implementation of digital infrastructure in rural areas in the eastern region is relatively sound and complete, so the digital needs of these elderly people are more clear. On the contrary, rural elderly in non-plain areas feel lonely due to the lack of digital life. It has also been pointed out that in the context of individual heterogeneity of residents, the effect of Internet use on the enhancement of the well-being of rural residents and elderly residents is more significant [12]. The study confirms the heterogeneous effect of digital well-being of elderly people with different levels of education in different geographical areas.

Guo Wenshan et al. [13] took the elderly users of the elderly-friendly version of the “Gan Fu Tong” (a government service mobile software jointly launched by Jiangxi Provincial People’s Government and Alibaba Group) as the survey object, and the study verified the positive impact of the fulfillment of competence needs on the emotional level through the questionnaire and model building method, which can further enhance the subjective well-being of the elderly. Li Siyue et al. [14] found that the social support provided by peer relatives, friends and the community, as well as the support of relatives in the later generation, had a significant positive impact on the subjective well-being of the elderly through a questionnaire survey of older smartphone users. In summary, it can be found that the factors affecting the digital well-being of older adults can be divided into self-efficacy from internal sources, value realization, individual heterogeneity and social support from external sources, environmental conditions such as the digital divide, Internet use and so on.

## 2.3 Research on countermeasures related to digital well-being of the elderly

As for the challenges faced by the digital well-being of the elderly, academics have put forward a variety of solutions. Some scholars suggest [15] that a more inclusive social environment should be constructed, implementing the idea of “human-oriented”, so that elderly can improve the technological adaptability of the elderly group, regain a sense of social belonging, and then enhance their sense of well-being. Some scholars also emphasize that the digital well-being of the elderly requires the joint participation of the government, enterprises, communities, families, and elderly themselves [7], to form a multi-party collaborative digital support system. Today’s society should pay attention to the anxiety and distress of the elderly in the process of digitization, and different social circles can provide social support and create a space for diversification and free choice, so as to enhance the sense of social participation and digital well-being of the elderly group.

At present, the ageing problem of population in China is becoming increasingly serious, showing the characteristics of “large scale and rapid speed”. Although the academic community has conducted a relatively comprehensive study on the well-being of the elderly and its influencing factors, it is still urgent to improve the digital well-being of the elderly. In the era of digital economy, there is a relative lack of research on the digital dilemma of the elderly and the problems they face in digital transformation, and a systematic theoretical framework has not yet been formed for the study of strategies to enhance the digital well-being of the elderly. This study will combine cases to expand the research perspectives on the digital well-being of the elderly, and provide practical paths to enhance the digital well-being of the elderly in the era of digital economy.

## 3 Analysis of barriers to digital well-being in older age groups

According to the 2021 Chinese Elderly Digital Life Research Report, the elderly population living in a digital society exhibits significant digital stratification [16]. Taking the two dimensions of information accessibility and digital inclusion attitudes as the basis for clustering, four types of elderly Internet users can be identified, which are Active Embrace Type, Passive Away Type, Passive Embrace Type, and Active Away Type in descending order according to the proportion of elderly people. Relatively speaking, many elderly people hold a positive and optimistic attitude towards digital life, and have a high sense of the necessity of digital integration. They will actively learn network operation skills and enhance their information abilities; However, there is still a considerable proportion of elderly people with low information literacy, limited mastery of network operations, and limited scope of digital life. Such digital stratification is caused by a variety of subjective and objective factors, such as the ages of the elderly, their education levels, their pre-retirement occupations, their family roles, their social roles, and their subjective willingness to integrate into the digital life, and so on. The government has paid attention to the well-being of the elderly, and a series of ageing-friendly renovation projects have been carried out in offline real life, such as barrier-free environment renovation, installation of elevators in buildings with the conditions, installation of additional safety handrails on residential staircases and so on, and now there are also elderly bathing services and new models of home-based community elderly care. The public’s attention has gradually transitioned to the digital well-being of older groups, focusing on the plight of online digital life.

## 3.1 Digital access barriers and the digital divide

The development and application of digital technology are changing various aspects at an incredible speed, but it is difficult to achieve among the elderly. CNNIC report shows that by December 2024, non-internet users in China aged 60 and above will reach 140 million [2], which highlights that the elderly group is being marginalized in the process of digitization. The phenomenon of elderly people facing difficulties in accessing the internet and having high barriers to entry has become a core factor affecting their digital well-being. The first is the hardware barrier, and the lack of penetration of hardware facilities is one of the main obstacles to the use of digital technology by the elderly. The penetration rate of smartphones and computers is still low among the elderly, especially in rural areas, where the coverage rate of hardware devices is low. With the relative scarcity of mobile device sales outlets in rural areas and the limited service coverage of mobile communication operators, the lack of access to channels for the elderly naturally leads to a low rate of device ownership, which makes them unfamiliar with digital technology. Secondly, there are obstacles in terms of software networks, especially in remote areas, where problems such as unstable network signals and insufficient broadband still exist. And the issue of high mobile network costs can become a financial burden that older Internet users are generally worried about. The high fees of some operators discourage many older people who want to try it out, which will undoubtedly further weaken their motivation to participate in digital life. However, Chinese government has been actively promoting universal services, through the “Telecommunications Universal Service” and “Broadband Promotion In Border Areas” and other related actions, so that more people in rural and remote areas can use the network, has been realized in villages and villages through the broadband. Currently, China has realized broadband access in every village and the size of rural Internet users has exceeded 300 million [17]. For the elderly, the external objective environmental barriers, digital access and digital divide is gradually bridging.

## 3.2 Digital exclusion and cognitive difficulties

The digital integration of the elderly group requires more internal motivation than external assistance, and some of the elderly are either actively staying away from or passively embracing online life. Older people who are Active Away Type have low information processing abilities, low awareness of the necessity of digital integration. They do less online operation independently and do not value whether they can utilize digital resources, tend to choose not to integrate into the informational life. The Passive Embrace Type elderly have strong information capabilities, but they have limited awareness of the necessity of integrating into the Internet society and improving digital capabilities. They can make good use of Internet resources, but their subjective willingness to learn network applications is not strong, reflecting the characteristics of passive information involvement [16]. These two types of elderly groups account for a relatively large number of older people, presenting digital exclusion and cognitive dilemmas.

Elderly people’s physiological functions are declining, their vision, hearing and memory are declining, their dexterity in fingers and joints is reduced, and their learning efficiency is generally lower than that of younger groups. These make it difficult for them to efficiently integrate into the increasingly intelligent digital life. Especially for older people without formal education, learning to use digital technology is not a way for them to break away from social isolation, but may become an additional burden.

In addition, elderly people often have rigid thinking patterns and cognitive structures, which exacerbates social stereotypes of the elderly population and leads to difficulties in adapting to digital life. In long-term social interactions, the elderly are often stereotyped as having “diminishing mental capacities” and “old-fashioned views”, and these labels have made them fearful of emerging technologies, causing them to be extremely insecure about ageing and devaluing their own abilities. These age-stereotyped social concepts have created an insurmountable gap between the elderly and digital technology, and the resulting psychological barriers are like high walls that prevent the elderly from interacting effectively with the digital society, making it difficult to form a sense of digital well-being. It can be seen that the digital exclusion and cognitive dilemma of the elderly group is caused by external factors, but fundamentally, the digital economy and society have not allowed the elderly to generate confidence and self-efficacy in the use of digital smart technology.

## 3.3 Digital product design defects

The State Ministry of Industry and Information Technology of China has been promoting the age-appropriate transformation of Internet applications since the end of 2020, and has made initial progress. However, some products and APPS only stay at the superficial level of adjustment, failing to realize substantive improvements. Adjustments such as larger font sizes, optimized color displays, and voice-reader services are implemented to accommodate the functional needs of ageing users, specifically addressing the declining vision and hearing capabilities of the elderly population. However, most of the elderly people do not even have a basic understanding of such functions as “age-friendly mode” “caring version” and “accessibility” when they use smartphones. Moreover, the ageing friendly entrance design of most applications has obvious defects, such as non-intuitive naming and difficulty in finding the mode portal, which is the first barrier to older people’s access to digital technology, making it difficult for the results of the ageing-friendly approach to reach all the elderly groups.

Some of the network ageing-friendly modifications only make simple adjust ents at the visual level, such as enlarging fonts and purifying concise displays, while neglecting the deeper needs of elderly users in terms of cognitive understanding, operating habits and emotional experience. The design of intelligent products should fully consider the changes both in cognitive ability and body functions of the elderly. That is to say, we should consider the behavioral characteristics and habits of the elderly in using to ensure effortless interaction, so that the elderly can use it without feeling overwhelmed, and enhance the experience and pleasure of the product.

Although many elderly people have a certain ability to use the Internet, they have limited information management ability and weak information screening ability. In terms of complex life needs, many elderly Internet users are not yet able to comfortably use network resources to accomplish them, such as cell phone navigation, ordering takeout, online registration, booking tickets, and ordering online cars. Through observation, it is found that the elderly will be anxious or even fearful of unknown cell phone functions, while some APPS attach excessive importance to commercial interests, frequently appearing in the interface of inducing downloads, payment prompts and even promotion of financial products. For the elderly, it not only increases the difficulty of use, but also reduces the trust of the elderly group in digital technology.

## 3.4 Inadequate social support systems

With the development of digital technology, mastering digital skills has become a key skill for full participation in society, and social support systems play a crucial role in enhancing the digital well-being of the elderly. Digital users need a certain level of digital literacy, and family is an important source for older people to acquire digital skills learning. However, young people are busy with their daily work and have limited time and energy coupled with difficulties in empathizing with the psychology of the elderly. When teaching digital technology knowledge, it is often difficult to find effective communication methods, and without paying attention to methods, it is difficult to provide continuous digital support for the daily lives of the elderly group. Some adult children demonstrate limited empathic capacity when guiding their parents in the use of digital devices, often exhibiting impatience and failing to address their emotional needs. This kind of emotional neglect can easily cause the elderly to develop an inferiority complex, believing that they are useless and become a burden to the family. The unpleasant digital technology learning experience is easy to lead to the elderly self-confidence is frustrated, the rejection of new technologies will be more intense, and then deepen the elderly resistance to digital technology.

In terms of education for the elderly, China currently has relatively few digital skills training for the elderly in Internet technology popularization. Although a number of community and senior citizen universities have already launched digital teaching services, it is difficult to conduct systematic and large-scale digital skills training due to a lack of funds and professional staff. Most of the existing services are basic operational training, and there is a lack of personalized services tailored to the needs of the elderly, so their deep-seated needs are not being met. For example, some older persons have a high demand for digital skills in the areas of medical security and health knowledge, but community training often fails to cover these. It is also difficult for community services and universities for the elderly to cover all groups of older persons, especially in remote and rural areas, where geographical constraints and the dispersed nature of the population make it difficult to bring older persons together for unified and systematic instruction.

## 4 A Study of Strategies for Enhancing digital well-being in the Elderly Population

As digital transformation accelerates, proactive measures are needed to prevent the exclusion of older populations—a demographic that has long fueled societal growth. And sharing the digital dividends helping the elderly group to enhance their digital well-being is a direct manifestation of the progress of social civilization. A multi-stakeholder approach is needed across all societal domains to support older populations in adapting to digitally mediated lifestyles, thereby promoting their digital inclusion and psychological fulfillment.

## 4.1 Lowering the threshold of digital life for older people

In response to the current situation in which the elderly have difficulties in acquiring equipment, the relevant government departments should introduce policies to provide subsidies or discounts for the purchase of digital equipment such as smartphones and computers by the elderly, in order to reduce their financial burden. Relevant enterprises should respond positively to the call of the policy, develop ageing-friendly products and cooperate with the government to implement the subsidy policy. In addition, all sectors of society should actively participate in the implementation of various public welfare activities like “digital elderly assistance” to provide more support and assistance to the elderly. The "Guiding Opinions on Promoting Information Accessibility" issued by Ministry of Industry and Information Technology (MIIT) of China clearly states that enterprises are encouraged to develop information terminal products suitable for use by the elderly, the disabled and other groups, and are given policy support [18]. Many cities have been actively carried out this policy, such as Beijing, which launched the “digital support for the elderly” action, providing subsidies for the purchase of smartphones for the elderly over 60 years of age, with a maximum subsidy of 1,000 yuan per mobile phone. This has effectively lowered the threshold for older people to use digital devices.

With regard to the problem of network coverage and tariffs, which many older people are worrying about, the government should increase its investment in human, material and financial resources. We should continuously improve the network infrastructure in rural and remote areas, increase network coverage and signal quality to narrow the gap in digital life between urban and rural seniors and let every elderly person 'keep up with the big army of the data age. On the enterprise side, communications operators should actively launch preferential packages for the elderly, reduce costs, simplify the business process, reduce similar bundled services and other “tricks”, and provide guidance on the use of traffic services. In addition, they can also provide free Wi-Fi in the community, libraries and other public places where the elderly often gather, to help the digital life of the elderly.

## 4.2 Enhancing digital literacy among older persons

Most older people have difficulty processing complex information as their physical and cognitive abilities decline, and over time they become psychologically resistant to a new life in the context of new technologies. So it is urgent to strengthen digital skills training. Communities and relevant elderly care institutions can carry out a combination of online and offline teaching models to to facilitate elderly people with physical disabilities, such as mobility impairments in their hands or legs, enabling them to learn without leaving their homes.

Beyond that, personalized teaching content should be designed to match the interests, hobbies, and actual needs of different elderly individuals. Some elderly people have already mastered the use of basic functions and would like to learn about short videos and game software favoured by young people, so the demand should be fully met. For the cultivation of digital literacy among the elderly, applying the “foot in the door effect” is a more appropriate and pragmatic approach. For the elderly population who have difficulty learning digital skills, it is not advisable to demand too high of them. Instead, a small requirement that only requires progress compared to the past should be proposed first. When the elderly meet this requirement, they can be encouraged to gradually raise higher requirements. The elderly population is often more willing to accept and strive to achieve it. To cultivate digital literacy in this rational and intelligent manner, it is essential to analyze the existing proficiency levels of different elderly groups and set specific, tiered goals based on their foundational knowledge and performance across various literacy competencies. This will enable the elderly population to achieve and meet the basic requirements of digital use through hard work—so that every elderly can experience the joy of successful use. At the same time, in order to encourage older groups to adapt to the new medium, learning incentive mechanism can be established by setting up a system of awarding certificates and posting cases of peers who have successfully used digital equipment. This will not only increase the confidence of older people in their willingness to learn digital skills, but also enhance their sense of achievement in mastering digital skills.

Along with innovative teaching ideas, efforts should be made to create an inclusive and friendly social atmosphere to help older people make the psychological transition from rejection to integration into the digital society. We should foster an “age-friendly” atmosphere by promoting universal respect and understanding for the elderly. It’s critical to advocate for everyone to respect and understand them. Although seniors may learn digital skills at a slower pace, this should never lead to prejudice or discrimination. Instead, they deserve to feel genuine care and support throughout their learning journey. For family teaching, we should strongly encourage “digital back-feeding”, so that young people can take the initiative to help the elderly around them to learn digital skills. Through concerted efforts at multiple levels, we can enhance the confidence and motivation of the elderly in learning digital technology, so that they can gradually move towards the digital society. Companies in information communication industry of China have held more than 200,000 “silver-age digital classrooms” to provide elderly with training in the use of smart devices, online payments, fraud prevention and other related training activities, so that more and more older people can share the digital dividend.

## 4.3 Strengthening supervision by engaging deeply with the elderly lives

The core of ageing-friendly transformation lies in truly understanding the needs and usage habits of elderly users. Enterprises, as product providers, should conduct in-depth research and develop products that truly meet the needs of the elderly, rather than just staying on the “surface” (means it’s just superficial efforts). For example, it can simplify the operation process, provide voice assistants, one-key dialing 120 and other functions, to effectively reduce the difficulty of use for the elderly. Enterprises should focus not only on product development, but also on security and privacy protection. Elderly people are susceptible to the interference of induced information and operational errors. Therefore, enterprises in all industries should improve their sense of social responsibility and try to become the conscientious enterprises. They should protect the personal and property safety of the elderly, and create digital products that the elderly can trust. It is essential to strengthen top-level design, ensuring the thorough implementation of policies from the top down. At the industry level, efforts should accelerate to establish public service platforms for APP testing and certification, standardizing service practices across sectors.

Government departments should actively participate in the promotion of ageing-friendly transformation. On the one hand, the grassroots government should go deep into the elderly groups, often visit special groups of elderly people, such as empty-nest seniors, solitary elders, and older adults with disabilities. They must attentively listen to their needs and concerns, establish robust complaint and feedback mechanisms, and provide on-site support to resolve issues encountered during digital product usage. On the other hand, the supervisory department should, in accordance with the enacted norms and regulations, regularly evaluate and notify the APP ageing transformation, playing the role of supervising enterprises to ensure that the ageing-friendly transformation is put into practice and benefits more elderly people.

## 4.4 Improving digital social systems for the elderly

Older groups have the longest contact with their families in their daily lives, and the family is an important source of digital skills learning for older people. Children should take the initiative to strengthen communication with their parents and understand their digital and emotional needs. They should also guide them in the use of digital products with patience and meticulousness, give encouragement and affirmation, and help them build up confidence in learning digital skills, so as to stay away from low self-esteem or resistance due to learning difficulties.

Apart from family support, the community is also an important platform for the elderly to obtain digital support. The community should actively recruit professionals and introduce professional equipment to provide systematic and personalized training services for the elderly. Many seniors crave profound emotional connections, requiring caregivers to demonstrate meticulous attentiveness and genuine heartfelt engagement to truly resonate with them. While many communities have established basic digital services for seniors, there remains a critical need to expand service offerings—such as healthcare access and utility payments—to align with their daily necessities. Only by addressing these practical needs can digital technology become truly integrated into elderly lifestyles. “Time Bank” elderly care volunteer service initiative in Liu Zhou City represents an innovative exploration of mutual-aid community eldercare models in urban areas. This has formed a service model with social organizations as the main body, “help + companionship” as the core, party member volunteers as the backbone, and “dual paths” combining online and offline in-kind services to complement each other[19]. To a certain extent, this makes up for the lack of community elderly service resources and forms a social support system. “Time Bank” mutual aid service model refers to the record of volunteers to serve others to exchange for their own services, belonging to the mutual aid community economic model. The “Time Bank” model is suitable for the elderly digital social support system, which can give the elderly group companionship and care as well as digital life guidance, and this model is sustainable.

## 4.5 Promoting sustained improvements of ageing-friendly transformation in Internet

To address the challenges faced by older adults in using smart technologies, it is essential to implement digital age-friendly initiatives across six key dimensions: policy, research, services, skills, technology, and ageing-friendly measures [20]. In terms of relevant policies, the Chinese government already issued guidelines on the ageing-friendly transformation of Internet applications and barrier free transformation, and ageing-friendly transformation of telecommunications services. Enterprises and institutions should continue to learn relevant standards and specifications, and promote the popularization of general design concepts. In conducting research, it is imperative to comprehensively understand both the needs and expectations of older adults in using digital technologies, as well as the challenges and difficulties faced by enterprises in implementing age-friendly digital adaptations. This involves gauging public sentiment, identifying the most critical and urgent issues, and developing practical solutions to translate problem inventories into actionable plans and tangible outcomes. In terms of service upgrading, the government should go deep into various fields of digital applications for the elderly, organize relevant enterprises and institutions, and carry out ageing-friendly transformation of Internet websites and mobile applications. Basic telecommunication enterprises should continue to improve “face-to-face” services in their business halls and carry out special services to help the elderly to effectively improve the experience of ageing-friendly services for the elderly. In terms of digital skills training, it is essential to mobilize key industry players—including basic telecom enterprises, Internet enterprises, terminal enterprises, etc. to carry out digital technology application teaching activities such as the “silver-age digital classroom”, the easy-to-understand teaching manuals and videos for the elderly to popularize anti-fraud and anti-scamming knowledge, and make the elderly know how to use and feel at ease in using ageing-adapted products and services with digital technology. In terms of technology sharing, relevant enterprises and institutions will be organized to conduct research and exchanges on ageing-friendly technologies around the development and application of new generation information technology in the field of ageing friendly technology, and promote the co-construction and sharing of ageing friendly technologies.

The government shall give full play to the power of enterprises, universities and research institutes to actively carry out research and development of ageing-friendly technology innovation and bring together a wider range of forces, and then create an open and win-win environment for technological innovation. Lastly, in the area of benefiting the elderly, closely following the characteristics of the needs of the elderly, basic telecommunication enterprises, Internet enterprises, terminal enterprises and so on have to organize special activities to benefit the elderly, and display and promote the excellent results of digital technology for the elderly. This will enable the elderly to experience ageing-friendly products and services in an immersive manner, enjoy exclusive offers and rights and benefits, and enhance their sense of well-being through the use of digital technology.

## 5 Conclusion

At the current stage, the problem of ageing is aggravating all over the world, and all countries are actively making plans for the problem of ageing. With the rapid development of the digital society, integrating modern technology into the lives of the elderly is an important measure to actively address their issues. Building on this foundation, enhancing digital well-being among the elderly has emerged as a critical issue requiring collective societal attention. The study has analyzed the main challenges facing the digital well-being of the elderly in China, mainly from the aspects of digital access barriers, cognitive difficulties, product design defects, and inadequate social support system, and proposed strategies to enhance the digital well-being of the elderly population. In the future, with the advancement of technology and the attention of the whole society to the digital well-being of the elderly, the ageing-friendly transformation of digital smart products will be further improved. Elderly will increasingly benefit from digital convenience and enhanced life satisfaction, embracing technology with greater enthusiasm. China will truly realize the beautiful vision of "ensuring that the elderly can enjoy their lives and contribute to society" in the future.

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