#  Strategies on Enhancing 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 can the elderly groups fully integrate into digital life in the age? Promoting the network ageing-friendly transformation to enhance the digital well-being of elderly groups is a necessary path for the country to actively respond to population ageing. Through literature analysis, this paper summarizes the research status of digital well-being of the elderly, and finds that moderate Internet use helps to improve the digital well-being of the elderly. There are many factors affecting the well-being of the elderly, both internal and external. Analyzing the digital well-being dilemma of elderly groups based on specific situational practices, the main problems include external digital access barriers and digital divide, design flaws in digital products, insufficient social support systems, as well as internal digital exclusion and cognitive issues. Finally, in response to the digital dilemma faced by the elderly group, the study proposes to lower the threshold for their digital lives, strengthen the cultivation of their digital literacy through the application of the *Foot In The Door Effect*, strengthen supervision of their daily lives, adopt the *"Time Bank" Mutual Aid Service Model* to improve the digital social support system for the elderly, and continue to promote network ageing-friendly transformation*.* In summary, 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. This figure indicates that our country will enter a stage of severe aging (People’s Daily Online, 2022). 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 (China Internet Network Information Center, 2025). In focusing on the majority of people’s Internet experience, the society tend to ignore the elderly group. In order to promote social stability and enhance people's livelihood, 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 (Vanden & Nguyen, 2022). 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) (Huang & Yu, 2024). 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. We will also discuss the barriers to digital well-being of the elderly and how to improve the digital well-being of the elderly. We hope that through literature review and case studies, the elderly can transition from merely ‘growing old’ to truly ‘enjoying old age’.

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

Information Technology has developed rapidly, and the widespread use of Network Technology and New Media has profoundly reshaped all aspects of human life. Emerging technologies—including mobile payment, telemedicine, shared mobility, short videos, and live broadcasting—have 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. It’s even less possible 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. Evidence suggests that digital media use can yield both positive and negative effects on well-being (Stephanie et al., 2025). 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 are more likely to believe in false news compared to other age groups (Fan & Li, 2021). 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 et al. (2024) 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 integration among Chinese elderly population, Jin et al. (2024) 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. Digital technologies empower the elderly by enabling their participation in online spaces, thereby expanding their access to information and social connectivity. A thoughtful digitalization approach for the elderly can ensure they keep up with the times, bridge the “digital divide” between generations, extend their working lives, and enhance their subjective well-being (Jin, Zhang & Jing, 2023). 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 groups

Internet use has a significant positive impact on promoting the integration of elderly individuals’ social relationships. Meanwhile, their sense of social fairness is influenced by both the intensity of Internet use and their ability to acquire information (Xu et al., 2024). This perception of fairness, in turn, affects their overall well-being. 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 (Chen & Jiang, 2021). Both the health status (physical/mental) and perceived social support of older adults mediate their digital well-being. Specifically, individuals with better health and adequate support tend to demonstrate higher actively in adopting digital technologies. 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 (Wang & Zhao, 2023), 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 et al. (2024) 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 China, 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 (Li & Zhang, 2023). The study confirms the heterogeneous effect of digital well-being of elderly people with different levels of education in different geographical areas.

Guo et al. (2022) 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. The government hope it can further enhance the subjective well-being of the elderly. Li et al. (2023) 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 (Du & Han, 2021) that a more inclusive social environment should be constructed, implementing the idea of “human-oriented”. This enables older adults to develop technological adaptability, regain social belonging, and consequently achieve greater 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 (Jin et al., 2024), 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. Also, 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 (Tian, 2021). Taking the two dimensions of information acquisition capability and digital integration attitudes as the basis for clustering. Four types of elderly Internet users can be identified, which are Active Embrace Type (49.7%), Passive Away Type (22%), Passive Embrace Type (17.7%), and Active Away Type (10.6%) in descending order according to the proportion of elderly people, as shown in Table 1.

**Table 1. Four types of elderly netizens**

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| --- | --- | --- | --- |
| **Types of elderly users** | **Information acquisition capability** | **Attitude towards digital integration** | **Key Characteristic** |
| *Active Embrace* | strong | positive | These elderly people show an active attitude when contacting the Internet. They are more confident because of their strong ability to obtain information. They often have good digital integration results and an average high level of digital happiness. |
| *Passive Away* | strong | negative | Although they have strong abilities and are proficient in learning and using digital hardware and software, their subjective willingness to integrate into the digital society is not strong and they are relatively passive. |
| *Passive Embrace* | weak | negative | These elderly people believe that digital integration is not important and are not proficient in online operations, so they are far away from digital life and their sense of digital happiness decreases. |
| *Active Away* | weak | positive | They have limitations in their abilities and limited digital living. But they have a high perception of integrating into digital life, and subjectively they are very eager to integrate. |

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). There are also elderly bathing services and new models of home-based community elderly care at present. 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 (China Internet Network Information Center, 2025), which highlights that the elderly group is being marginalized in the process of digitization. The Digital Grey Divide (DGD) is a phenomenon that refers to the digital inequality existing among the elderly in using digital tools. DGD could generate social exclusion and hinder elderly well-being because today many aspects of life are online (Maria et al., 2025).

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. Through projects like these, 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 (Ministry of Industry and Information Technology, 2024). 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 (Tian, 2021). 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

Digital well-being has become a preoccupation, and Chen et al. (2025) proposed that there are three antecedents: digital design, awareness and utilization advancement, emphasizing that effective design is essential. 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 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. In other words, digital products should be designed with older adults’ behavioral patterns and habits in mind to ensure intuitive interaction, minimize cognitive overload, and ultimately enhance their user experience and satisfaction.

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). Trough observation, older adults often experience anxiety or even fear when encountering unfamiliar smartphone functions. Meanwhile, certain applications prioritize commercial interests excessively, frequently incorporating intrusive interface elements. Such applications usually adopt unsolicited download prompts, aggressive payment reminders and inappropriate financial product advertisements and so on. 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. We found that 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. 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 empathetic capacity when guiding their parents in the use of digital devices, often exhibiting impatience and failing to address their emotional needs (Xie & Hu, 2024). This kind of emotional neglect can easily cause the elderly to develop an inferiority complex, believing that themselves 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. It will absolutely deepen the psychological resistance of the elderly 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. In remote and rural areas, the causes of 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 integration and psychological fulfillment. Specific strategies can be proposed from the following five perspectives regarding the digital well-being dilemma faced by the elderly group in the four aspects mentioned above, as shown in Fig 1.



**Fig 1. Elderly's digital well-being**

## 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. They can 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, with corresponding policy support (Ministry of Industry and Information Technology, 2020). Many cities have been actively carried out this policy, such as Beijing. Beijing has 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. All sectors of society should do their best to 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, 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 elderly adapt to digital lifestyles.

## 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 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. Besides this, it is also integral to 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. In that way, 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 older 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. Local governments should actively engage with elderly populations, particularly vulnerable groups such as empty-nest, solitary, and disabled seniors, through regular visits and needs assessments. By establishing robust feedback mechanisms and providing on-site digital assistance, they can address usage barriers in real time. Concurrently, regulatory bodies must enforce compliance with aging-friendly design standards. This includes conducting periodic evaluations of app adaptations for older users and publicly reporting progress to ensure accountability, thereby guaranteeing tangible improvements in digital accessibility for the aging population.

## 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. With patience and meticulousness, elderly may stay away from low self-esteem or resistance due to learning difficulties. With regard to digital media, Simons et al. (2022) conclude that its value in old age should be sought in providing access to one's bonding social capital rather than adding to it by expanding the number of social relations. That is to say, Internet use can help the elderly to expand communication channels and establish emotional ties, but improving digital well-being still needs the support of families and social personnel.

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 (Xia & Yang, 2024). 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. This reciprocal system ensures long-term viability by incentivizing participation through time-based exchange.

## 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 (Ministry of Industry and Information Technology,2024). In terms of relevant policies, the Chinese government has issued the *Guidelines on Ageing-Adapted Transformation of Internet Applications* and the *Guidelines on Ageing-Adapted Transformation of Telecommunication Services to promote digital inclusion for older adults*. Enterprises and institutions should continue to learn relevant standards and specifications, and promote the popularization of general design concepts.

When 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.

Regarding the 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, alongside the imperative to develop bespoke applications tailored to older users (Danijela, 2024). 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 (Duan, 2024).

In terms of digital skills training, it is essential to mobilize key industry players. These players include basic telecom enterprises, Internet enterprises, terminal enterprises, etc. They should carry out digital technology application teaching activities. For example, there are the “silver-age digital classroom”, as well as the easy-to-understand teaching manuals and videos for the elderly. Through these, anti-fraud and anti-scamming knowledge can be popularized. And in this way, the elderly can know how to use ageing-adapted products and services with digital technology and feel at ease when using them. As for technology sharing, relevant enterprises and institutions should 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. They have the responsibility to 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 four 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.

**Disclaimer (Artificial intelligence)**

Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc.) and text-to-image generators have been used during the writing or editing of this manuscript.

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