

# The Problem Faced by Digital Elderly-Care Industry in China with Policies Suggesting

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**Abstract:** With the growth of China's aging population, traditional elderly-care services no longer meet the large and diversified needs of the elderly today. With the support of scientific and technological development, the digital elderly-care industry has developed in China. Many scholars have discussed the benefits of the digital elderly-care industry, this article will discuss the problems and suggestions specifically for China's digital elderly-care industry. By using quantitative analysis, we found that there are both industrial perspective and server-perspective problems in the industry. This paper will be useful for the market participants and scholars.

**Keywords:** Aging population, elderly-care industry, digital economy, digital products, policy suggestion

## 1. Introduction

Population aging is taking place in most countries of the world, especially in China (see Figure 1). At the end of 2022, the aging population had taken up 14.9% of the total population in China. The traditional industry for elderly can no longer meet the growing demand of aging population [1], which are mainly the demand of daily necessities and nursing. Thus, the digital transformation of the elderly-care industry has took place in China. The digital elderly-care industry mentioned above refers to the "smart home for the elderly", which creates a digital elderly-care environment for the elderly by providing telemedicine, assistance, security and other services based on the Internet to meet the needs of their physical and mental health [1], so it is considered to be an important way to improve the population aging in China.

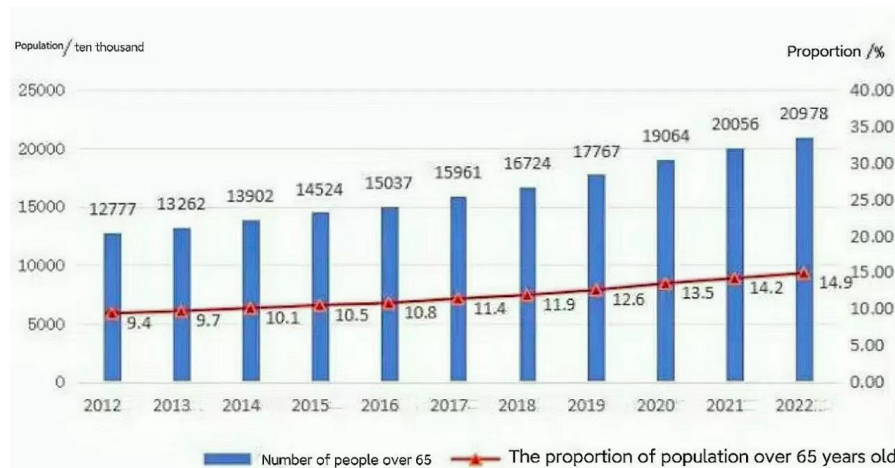


Figure 1: China's total population and elderly population from 2012 to 2022

However, although this scheme can strongly recommend the transformation of traditional old-age care, there will be many problems in that the process. With the wide application of new technologies, China's digital elderly-care has made great progress and achieved certain results, but there are still many problems that need to be solved urgently including mismatch between supply and demand, lack of talented and skilled labors, the low penetration rate of the Internet among the elderly and crisis of trust [2].

This article will discuss these issues in a qualitative way and propose solutions. It is found that there are problems in today's digital elderly-care industry in China on the industrial and server perspective. For the industrial side, there are misallocation of resources and the lack of skilled labors. At the server

perspective, the low penetration rate of digital products among the elderly and the crisis of trust also exists.

Then, this paper gives some suggestions solving those problems. For the industrial perspective, government need to make more policies to support the development of the digital elderly-care industry in China. For the problems in the server side, market participants need to hold some activities to teach elderly in China learning to use digital products and increase the exposure of those products among the elderly. Then, government need to encourage the development of the blockchain technology and establish laws to protect the privacy of the elderly to increase their trust on the digital elderly-care products.

## **2. Literature Review**

### ***2.1 Overview of the population aging in China***

Since the beginning of the 21st century, China's aging population has been risen continuously. As of 2020, about 13.5% of the total population was aged 65 and over. By 2025, this proportion will rise to 15%, with the peaking of the aging population. In the past, most families choose to let the children to support the elderly. However, there were still many empty nesters who do not have access to high-quality elderly-care services. At the same time, many demands of the elderly cannot be satisfied, like the remote socialization. With the increase in the diverse demands of the elderly and the development of technology, it has been found that digital elderly-care services can solve many problems faced by the aging population in China today, so it has been greatly developed in recent years.

#### ***2.1.1 Digital elderly-care industry and its development in China***

Digital elderly-care services refer to 'the smart home for the elderly' such as telemedicine and online socializing for the elderly. It embeds software and hardware technology products into elderly care services using modern information technologies such as the Internet, cloud computing, big data and artificial intelligence to meet the multi-level and personalized needs of the elderly [3], so that it can provide efficient, fast and intelligent elderly-care services.

By the end of 2021, the market size of the digital elderly-care industry has reached 4.8 trillion yuan, and the development structure has begun to form. At the same time, the scale of industry has gradually expanded. Before 2050, the scale of the digital elderly-care industry in China will reach 2.2 billion yuan and a more complete smart home system will form [2].

### ***2.2 Previous research of the digital elderly-care industry***

In the past, most scholars discussed the benefits of digital elderly-care industry. These advantages are mainly manifested in the following three aspects including the connection of demand and supply and the improvement in resource allocation [4].

#### ***2.2.1 The advantages of digital elderly-care industry***

First of all, the supply and demand of elderly-care services can be matched more accurately because of the 'smart home'. Empowered by the Internet, data platform for digital elderly-care services could form in China, so as to identify and process the complex and scattered demand for the elderly. This can improve the effective supply of elderly-care services such as meal services, daily care, accompanying medical treatment and spiritual comfort in order to solve the contradiction between supply and demand [5].

Secondary, the smart home for the elderly can continuously improve the accuracy of policy implementation as it includes data analysis. Market participants can find out their own investment direction and focus through digital analysis so that more social resources can be invested in the field of elderly-care. Hence, resources needed for the elderly-care services can be continuously optimized and the market (demand and supply) will gradually achieve a benign and balanced development [4].

#### ***2.2.2 The problem of the digital elderly-care industry***

There are also few papers discussed the problems faced by the industry simply. It has been found that the construction of data collection system in China is lagging behind and the digital data processing ability is weak, which makes it difficult to effectively realize demands in the digital

elderly-care industry. Besides, the low quality and imperfect functions of digital elderly-care products like telemedicine also made this industry very inefficient. However, most of the scholars did not discuss these problems deeply.

Through the above revision, we can know that there are many advantages of the digital elderly-care industry which is the smart home for the elderly. However, few scholars discussed the problems faced by digital elderly-care industry in the past, especially in China. But this pattern does face lots of problems. So, this paper will analyze the main issues facing by China's digital transformation of elderly-care industry and give policies recommendations using qualitative research methods. This paper can help the policy makers as well as the employers and entrepreneurs in digital elderly-care industry to determine their future improvement. Also, it can provide more valuable information for the future scholars to dig more about the development of the digital elderly-care industry.

### **3. Analysis**

#### ***3.1 The problems faced by the digital elderly-care industry in China***

We contribute problems into two perspectives. One is industrial perspective that include mismatch between demand and supply and the lack of skilled labors. The other is server perspective that include the low penetration rate of digital products among the elderly and the crisis of trust. We do so because the first two problems are the fundamental problems in the digital elderly-care industry and they are the problems that producers need to care about during the construction of the industry and firms. The other two problems are the problems that are closely connected with the elderly who are the users. So, these two problems need to be solved together.

#### ***3.2 Industrial perspective issues***

##### ***3.2.1 The mismatch between supply and demand***

China's digital elderly-care industry has fundamental industrial problems. First, the industry facing the problem of mismatch between supply and demand. This refers to the fact that the products offered by the market do not meet the real needs of the elderly, which are mainly the preference and the necessities that the elderly truly need. And this problem has already appeared in the traditional elderly-care industry which is the elderly-care industry without the help of the Internet. The market didn't be fully awarded of the physical and mental needs of the elderly at that time because it is hard to know the specific information in the long distance. But the misallocation can be solved today thanks for the Internet and big data.

Although the big data nowadays can provide lots of information for the market, it is still hard for Chinese participants to use this information effectively. This is mainly because of the low degree of data fusion in China, which refers to the ineffective collection of data. Thus, the things that the elderly truly need cannot be monitored accurately.

Secondary, due to the low penetration rate of digital products among the aging population, it is difficult for them to demonstrate their needs online. In detail, the majority of people nowadays would use the Internet in their daily life like takeaway ordering and online payment. There is only a small amount of the elderly using digital products like cell phone today (see Figure 2). Therefore, the needs of the elderly are hardly be seen through big data. As a result, other people can't know their real needs immediately in long distance and the effective smart home cannot form at the same time.

If the problem of mismatch between supply and demand is not solved, the digital elderly-care industry will misallocate the resources and make market failure. At the same time, the waste of resources will happen. So, it is a very significant issue that need to be solved in the future.

##### ***3.2.2 The lack of skilled labors***

The development of China's digital elderly-care industry is also facing another industrial perspective problem, which is the lack of talented and skilled labors. The skilled labors that the industry truly need are labors who master digital products and can use the big data smoothly. Also, these labors need to know many patterns and enough knowledge about the basic elderly-care industry. People with those ability can work together to construct a well-functioned smart home for the elderly in China.

However, the government did not pay much attention to the industry in the past, so there was little investment and accumulation in that industry. This has led to a lack of relevant technology and professional talents, which made the lack of stamina in the digital elderly-care industry [6].

With the increase in the aging population, government has gradually realized this problem, so it has opened a lot of new majors and courses related to elderly-care in universities and increased investment in the elderly-care industry. However, the shortage of talent has not been greatly improved because the labor force is not very familiar with this new industry, which is the smart home for the elderly. So, the majority of them would like to choose some well-developed and old industries like finance and entertainment industry.

If the problem of talent shortage cannot be solved, the development of the digital elderly-care industry will stagnate and the productivity of the market will continue to be sluggish because there is only a small amount of labor who can make innovation in the digital elderly-care industry, which will hinder the subsequent development of the industry.

### 3.3 Server perspective issues

#### 3.3.1 Low penetration rate of the Internet among the elderly

In addition to the basic industrial problems, there are also some important problems on the server perspective of the digital elderly-care industry in China. The low penetration rate of the Internet among the elderly is one of those main problems. This problem mainly refers to the fact that the elderly do not use digital products regularly and do not know how to use them. The digital products here refer to the products that are based on the Internet like cell phones and computers. However, many smart homes for the elderly like telemedicine need the good ability of using digital products because the elderly need to communicate with others or express their needs online to get accurate healthcare. But if there is only a few of the elderly who know to use digital products that use Internet to operate, it will be hard to operate those smart home because the functions of these smart home are based on the Internet.

The government has identified the problem and has made improvements to it in the past. It has encouraged many children to teach the elderly in their families to use digital products such as mobile phones and computers (see Figure 2). Although some of the elderly have learned to use products such as mobile phones, there are still many aging people who live alone and do not have access to digital products or refuse to use them. So, it is very significant and hard to increase the penetration of the digital elderly-care products among the elderly.

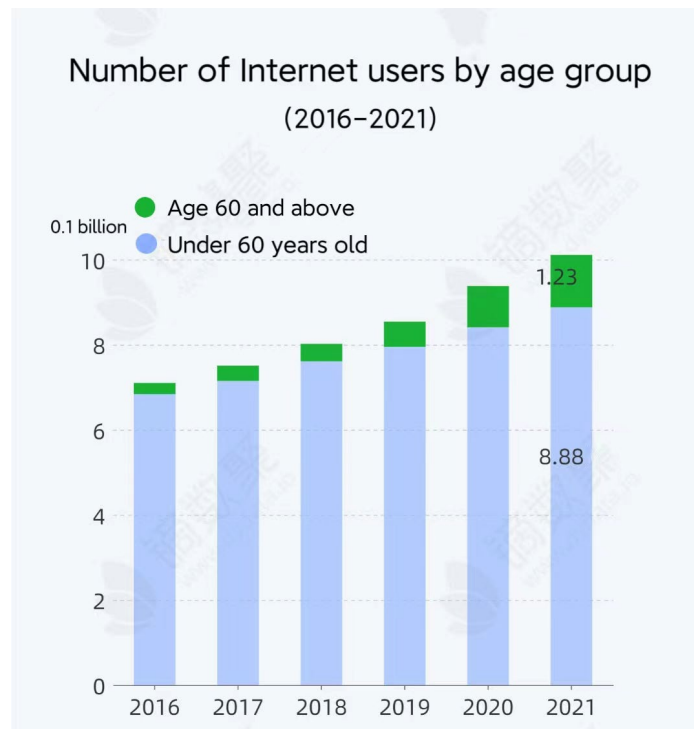


Figure 2: Number of Internet users by age group in China from 2016 to 2021

### **3.3.2 The crisis of trust**

China's digital elderly-care industry is facing a crisis of trust which is another server perspective issue. This problem refers to the distrust of smart home among the elderly. This problem is mainly caused by the lack of specific laws and regulations. Since there are no laws and regulations in China about data security and personal privacy protection in the digital elderly-care industry. Nowadays, the laws about privacy protection in China are mainly focused on the security offline like the banning of illegal wiretapping and insults. But for the digital industry, there are no specific regulations today in China to ban the illegal purloin and trading of the elderly in the digital elderly-care market [6]. Therefore, while the operating of the smart home for the elderly, some participants in the industry may steal privacy of the elderly and use them to trade in the black market. So many aging people are worrying that their personal information will be leaked while they are using the smart home like the remote socialization and that issue may affect their personal security.

However, the Chinese government has not made obvious policy recommendations and improvements on this issue at present and this issue has rarely been raised. If the trust of the elderly for smart home cannot be improved in the future, it will be difficult for digital elderly-care products to get into the elderly-care market or become profitable, which is also an obstacle to subsequent development.

## **4. Improvements and policy recommendations**

In this part we propose some policy recommendations for the participants in the digital elderly-care industry to help them to solve the above problems. And we also distribute this part to two perspectives which are the methods used to solve industrial perspective problems and the methods used to solve server perspective problems.

### **4.1 Methods solving industrial perspective issues**

#### **4.1.1 Increase policy support**

For the problem of the industrial side, improving policy support is an effective method. The basis of such problem is to increase the government's attention and investment in the digital elderly-care industry. For example, Japan has strengthened its investment and improved its policy in the elderly-care industry in the past 100 years, which provides development foundations for their digital elderly-care industry. In 1989, the Japanese government has formulated 'Golden plan' and urgently built a large number of infrastructures, which greatly helped the accumulation and operation of resources in their elderly-care industry. In 1994, the Japanese government formulated the 'New Golden Plan' to further enrich the content of elderly-care services at home. And this plan provides a good foundation to the future development of smart home for the elderly.

Specifically, government should pay more attention to the digital elderly-care industry, and even the entire elderly-care industry. The first step is to clarify the responsibilities of the government and formulate a development plan for the digital elderly-care industry. Secondly, the government need to improve laws and regulations for the industry. In detail, they can establish some regulations about the privacy protection and the improve the welfare in the digital elderly-care industry in China. In this way, more people will trust the industry and join it.

In addition, government can open up the elderly-care market to attract more foreign labors, so that more skilled people in this industry can enter China for guidance and training. For example, because the lack of labors in housekeeping industry in Hong Kong, the government of Hong Kong had opened that market and hired many homes cleaner and nanny from Philippine. Many of them are well-educated and have a good ability. That policy solved the lack of labors in housekeeping industry at that time and also saved many costs. By the same way, more labor will enter the digital elderly-care industry in China and the productivity and efficiency of the industry will increase.

For the misallocation of resources, government should encourage the integration of digital technology with the smart home for the elderly. After more skilled labors entered the digital elderly-care industry, market can start to develop data technology. Government can establish more project about big data improvement and technology improvement to speed up the construction of intelligent and information-based platform, which can grasp and predict the needs of the elderly and even provide them with personalized and customized elderly-care services. This can solve the problem of mismatch between supply and demand in digital elderly-care industry.

## 4.2 Methods solving server-side issues

### 4.2.1 Increase the penetration rate of the smart home among the elderly

The server-side problem needs to be solved after the industrial problems. After the digital elderly-care industry has gained enough talents, market need to concentrate on increasing the penetration rate of digital products among the elderly to increase the use of the smart home. First, digital product developers could be united with the digital elderly-care industry to provide more modes on digital products like the special mode for the elderly on cell phone. By this way, the elderly can learn to use smart home more quickly and more willingly.

Secondly, government need to improve the exposure of digital products among the elderly. They can organize existing universities and vocational colleges for the elderly to promote the "digital elderly-care partner" plan. This includes AI training centers in each community where the elderly can learn how to operate the smart home. After that, market participants can organize a series of activities to help the elderly in China learning about the Internet and digital products which can build a foundation for the using of smart home online.

### 4.2.2 Pay attention to the protection of the personal privacy of the elderly

When more aging people start to use digital elderly-care products, the personal privacy of the elderly can be easy to leak on the Internet. So, market participants need to concentrate on protecting the personal privacy of the elderly, which can increase the trust of the elderly in digital elderly-care products. At the same time, this can increase the follow-up demand of elderly-care products.

For this issue, it is very important to find a method that can help to transfer the information of the elderly without the third partner to avoid finding and stealing by other people. And this need can be satisfied by the blockchain technology. The concept of blockchain was first proposed by Satoshi Nakamoto in 2008, which essentially uses decentralized technology to carry out distributed data record. So that information is not tampered with cryptography technology and encryption algorithms. This technology can realize point-to-point data exchange and transmission without the participation of third-party intermediaries [7]. So, this technology can realize information storage, interaction and verification in a very secure way with the help of digital signatures [8].

Therefore, government should invest heavily in the improvement of the blockchain technology and its application in the digital elderly-care industry. Government can hold more courses about blockchain technology in universities and hold more project in firms. For example, in the U.S., there are any universities that holding courses relating to it like the course of blockchain in MIT(Massachusetts Institute of Technology). Besides, many organizations and websites about blockchain had formed in the U.S. like the CoinDesk and NewsBTC. By this way, the privacy of the elderly can be transferred in only one direction and the information will not be seen by other people.

While using blockchain technology, the government needs to establish privacy protection laws and regulations to strengthen the protection of the privacy of the elderly. Specifically, government can establish regulations to ban the trading and stealing of the privacy of the elderly and provide assistance for the elderly when they need to defend their rights and interests. Also, government can formulate punishment standards and compensation mechanisms for the stealing [9]. This can improve the environment of digital elderly-care industry, and can also make the elderly trust the digital elder-care industry more. Therefore, the elderly will be more willing to use the smart home in the future, as shown in Figure 3.

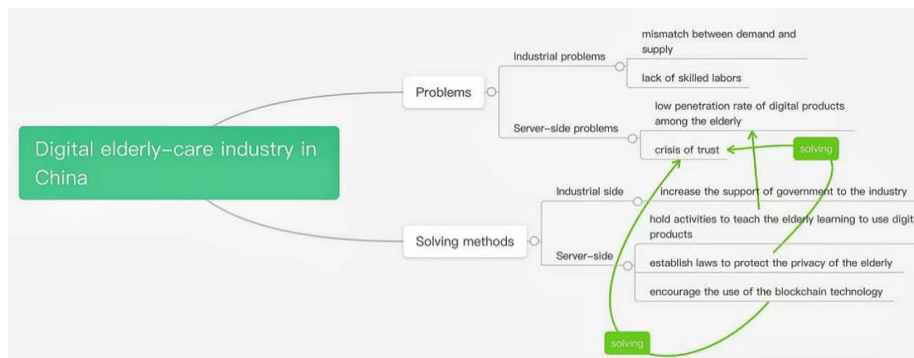


Figure 3: Problems and Solving Methods of Digital Elderly-Care Industry in China

## 5. Conclusion

This article discusses the current problems faced by China's digital elderly-care industry and gives analysis and suggestions for future development. For the development of China's current elderly-care industry, it is currently transforming to the digital direction mainly because of the development of the digital economy and the sharp increase in the aging population. Although China's digital elderly-care industry has a large scale, there are still many problems in its future development. First, there are some problems exist in the industrial side, which are the mismatch of the demand and supply and the lack of skilled labors. Second, there are some problems in the server side, which are the low penetration rate of the digital products among the elderly and the crisis of trust.

In response to the above problems, the article summarizes several suggestions for the future development of China's digital elderly-care industry. For the industrial side, government need to make some policies to support the development of the digital elderly-care industry. After that, government need to encourage more skilled labors to enter this industry for the future innovation. Then, the server side can be solved. Firstly, market participants can hold various activities to help the elderly learning digital products, which can increase the penetration rate of the smart home among the elderly. Secondly, government need to encourage the development of the blockchain technology in the digital elderly-care industry and establish laws to protect the privacy of the elderly in digital elderly-care, which can increase the security of the elderly online and increase their trust of the smart home.

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