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Research on taking the elderly on the digital express train in the smart age

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Abstract: *Under the background of our aging society, the digital gap between generations is expanding constantly. As an objective social phenomenon, the digital gap between generations has not been paid attention to. To help the elderly get on the digital express train is an important issue that needs to be addressed urgently. We need to remove the label of "marginalized people" for the elderly, so that they can have more sense of participation, belonging and gain. Therefore, we analyzed the physiological factors, psychological factors and social factors of the elderly, read a large number of relevant literature and carried out a partial investigation, analyzed the causes of the digital divide and feasible solutions and law enforcement, based on the reality, to provide feasible programs and ideas for the study of the elderly on the digital express train.*

Keywords: *Digital divide, Smart age, Old people, Smart products, Digital feeding back*

1. Introduction

According to the results of the seventh national census, there are 264 million people aged 60 or above, accounting for 18.7 percent of the total population, of whom 190 million, or 13.5 percent, are aged 65 or above. China has now become the world's largest elderly population. It is estimated that the number of people aged 60 and above will exceed 300 million in 2025, 400 million in 2033 and 487 million in 2053. With the deepening of ageing, the digital divide is becoming increasingly prominent. Digital does not have temperature, but our society should have temperature. While enjoying digital dividends, we should also extend a helping hand to help the elderly to keep up with the pace of digital and to get rid of the suffering of digital divide.

2. Survey data analysis

Considering that age, physical condition, occupation and family living conditions may have certain influence on the use of smart products by the elderly, we added these factors into the design of the questionnaire. At the same time, in order to better understand other influencing factors, we also designed some open questions. We designed 13 multiple choice questions and 4 open questions, and collected 150 questionnaires.

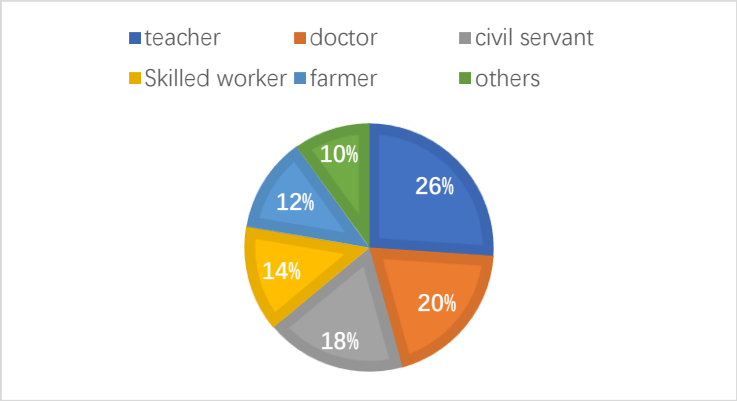

Figure 1: The occupations of older people familiar with using smart products were observed

According to the survey data (*Figure 1*), occupation has a certain influence on the use of smart

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products by the elderly. Teachers, doctors and civil servants have higher proficiency than farmers and skilled laborers. So the more educated a person is, the smaller the data gap.

Table 1:Correlation analysis between the elderly's proficiency in using smart products and their living conditions

x\y	tall	not tall	subtotal
Live with children	16(23.19%)	53(76.81%)	69
Live with one's wife	15(30%)	35(70%)	50
Live alone	7(26.92%)	19(73.08%)	26
Other ways of living	2(40%)	3(60%)	5

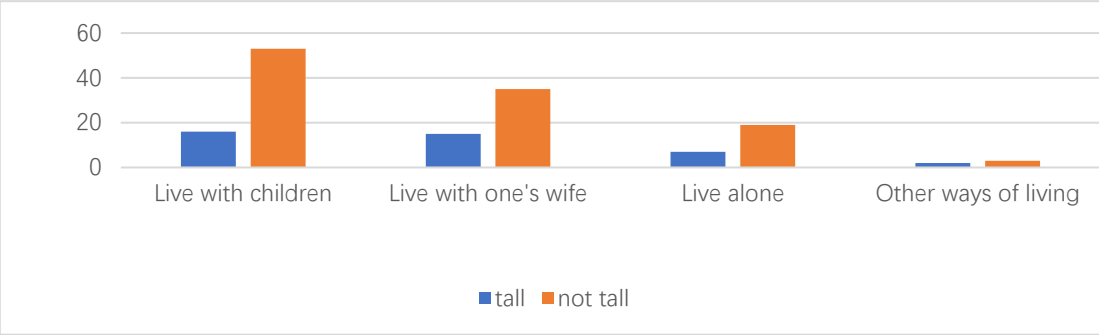

Figure 2: Cross analysis of the relationship between the proficiency of the elderly in using smart products and their family living conditions

The above cross analysis (Table 1, *Figure 2*) shows that the proficiency of the elderly in using smart products has little relationship with their family living conditions.

Table 2: Correlation analysis between the elderly's proficiency in using smart products and age

x\y	tall	not tall	subtotal
Aged between 60 and 74, they are young and elderly	32(29.91%)	75(70.09%)	107
The age range is 74 to 90 years old	7(20.59%)	27(79.41%)	34
Those aged between 60 and 74 and those aged over 90 are considered to be longevous	1(11.11%)	8(88.89%)	9

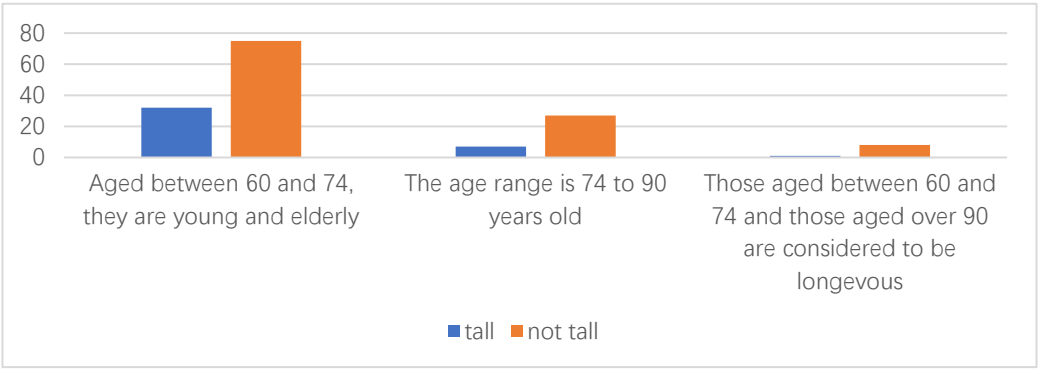

Figure 3: Cross analysis

According to the cross analysis(Table 2, *Figure 3*), there is a small difference in the proportion of proficiency among different age groups, but the normal distribution and heterogeneity of the population exist in each group, and the aged group cannot be used as a one-size-fits-all. As a 65-year-old man, some people learn quickly and then play with Tiktok, giving gifts to anchors and making their children jealous, while some people even make six trips to the station without seeing their daughter's ticket, Yunai kneels down and cries.

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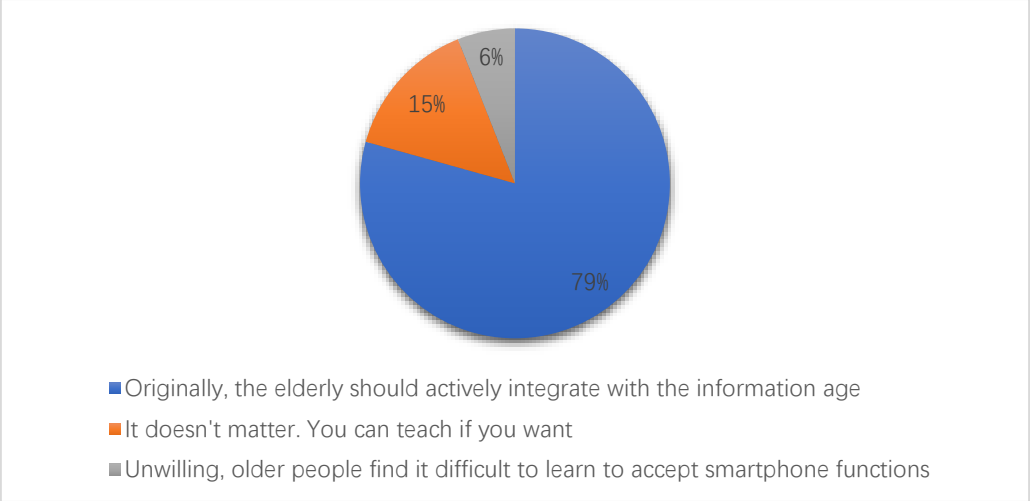

Figure 4: Teach the elderly about their willingness to use the Smart age

According to the survey (*Figure 4*), most people, especially college students, are willing to teach the elderly to use smart products. Only 6% of the respondents think it is difficult to teach the elderly to use smart products and are unwilling to teach the elderly to use smart products. Therefore, it is not fanciful to assume that society can help the elderly to use smart products. During the investigation, we also found that there are some groups that occasionally help the elderly to use smart products.

3. Problems with older people getting on the digital express train

3.1 Inconvenience + distrust + unwillingness

Table 3: The use of smart products by the elderly in the household

option	option	proportion
Yes	120	80%
No	30	20%

Table 4: The proficiency of the elderly in using smart products

option	option	proportion
Yes	40	26.67%
No	110	73.33%

Table 5:Older people want to learn but can't use smart products

options	**subtotal**	**proportion**
right	123	82%
wrong	27	18%

According to the survey results (Table 3, Table 4, Table 5), 80% of the elderly own smart products, and 73% are not proficient in using smart products. This means that most of the elderly have or will use smart products, but they cannot understand and use smart products well. The design of smart products mostly follows the behavioral preferences of young people, and the operation ability of the elderly group is relatively weak [1].The convenient design of various gestures or slides is not convenient for them, but easy to touch by mistake or increase the difficulty of operation. Older elderly people tend to have a declining memory and learning ability for things, and even if they have learned them once, they still cannot use them. However, most of the current intelligent products have no detailed guidance or only text. Some elderly people do not know the words and cannot check them, but even those who can read may not be able to easily master them. There are also problems that have guidelines but only once are difficult for older people to grasp easily.

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Table 6: Resistance to intelligent products

options	subtotal	proportion
Yes, they think cell phones hurt people or do some other harm	24	16%
For one thing, they feel that they have nothing to do with their phones all day	39	26%
It doesn't matter. They don't feel much	49	32.67%
No, they are happy to experiment with smart products	38	25.33%

The questionnaire survey (Table 6) shows that the elderly have a strong resistance to learning smart products. They believe that the use of smart products is harmful to their health or that the use of smart products will lead to economic losses, such as fraud or wrong ordering. Some elderly people blindly believe in opinions, news and products on the Internet, while some false propaganda or unscientific remarks on the Internet are easy to make elderly people feel a sense of gap. Their suspicion of information extends to their resistance to smart products. For example, an elderly person saw the watermelon advertisement recommended by a shopping platform, but found that watermelon seeds came back after shopping. And some shopping platforms will pop up a lot of Windows make people inadvertently open the non-secret payment or automatic deduction fee after use, closed several times will still automatically open, due to the elderly are not familiar with smart phones, so they often in- advertently receive shopping products. Knowing that we do not know when we have placed an order to buy some useless things, even as college students, we will inadvertently inexplicable point mistakes and cause some unnecessary losses. In addition, some smart products must save a sum of money before they can be used, which is acceptable to people who use them frequently, but not acceptable to people who only need them occasionally. While the elderly are mostly thrifty and unwilling to consume ahead of time, which is also one of the reasons why they believe smart products are unreliable and distrust and resist them. For the old people who are used to seeing and touching paper money, it is not safe to put money in the mobile phone. The popularization of digitalization is accelerating, but the elderly with different educational backgrounds and professional experiences have different discriminating abilities. Online fraud letters are frequent, and the elderly generally have a low acceptance of digital finance. Because some elderly people do not understand smart phones, their sons and daughters to save money in the phone or tied card in the phone is easily cheated by two-dimensional code, which reduces their trust in smart products[2].The Internet is a mixed bag, often telephone fraud, network fraud, resulting in the elderly on the network there is a certain psychological prevention, many old people would rather use the traditional old mobile phone, rather than dare to use smart phones[3] .Especially some of the links involving funds and finance, the old people will choose cash or bank cards. The false publicity of some smart products and the mandatory advance consumption to start are also important aspects that the elderly are concerned about. Poor learning, difficult learning process, inconvenient use and other reasons, coupled with distrust of smart products, have led to the resistance of the elderly to smart products.

3.2 The needs of the elderly are not reflected in smart products.

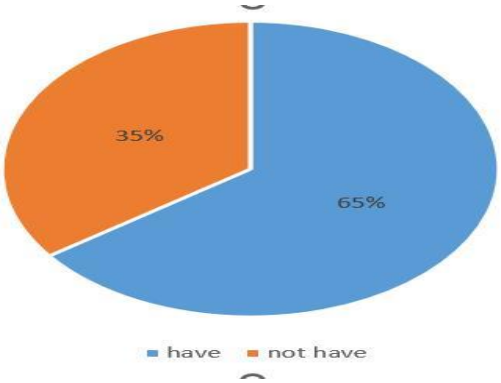

Figure 5: Old people out of touch with The Times

According to the Research Report on Consumption and Demand Willingness of the Elderly from the Demand-Side Perspective released by the China Association on Aging in Beijing, the development of China's aging industry is still in its infancy, and the types of elderly products and services provided by China are too few, and there is a serious shortage of supply[4] . Firstly, from the perspective of the supply

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of elderly products, according to incomplete statistics, there are more than 60,000 kinds of elderly products in the world at present, which is completely inconsistent with the reality of 160 million elderly population in China. Secondly, from the point of view of the aging of the products, many smart products are designed mainly for the young group, but for the elderly, the product operation is complex, lack of design for the elderly group. According to the survey (*Figure 5*), 65.33% of the elderly are out of touch with the information age. This increases the error rate and frustration of the elderly when using. Although the rapid development of modern social science and technology, but did not meet the real needs of science and technology to help the elderly, but made the elderly and modern science and technology to establish a huge "gap".

3.3 There is a lack of care for the elderly in intelligent services

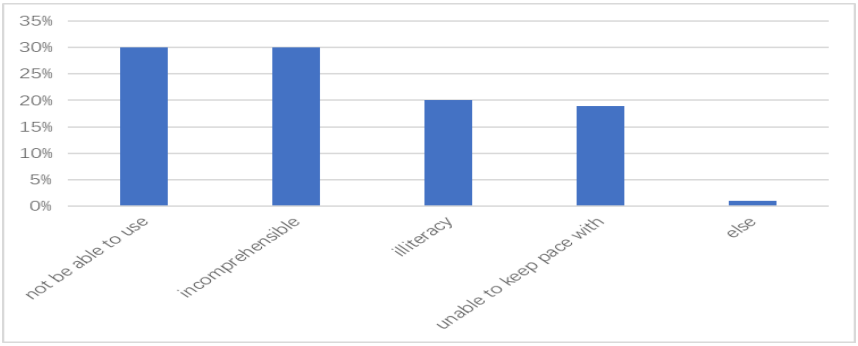

Figure 6: The analysis chart of the main difficulties in the elderly using smart products

According to the survey (*Figure 6*), the proportion of elderly people who can't use and can't understand smart products accounts for 60%. Intelligent design concept is to facilitate people's life. But in actual life, intelligence seems to run counter to the elderly, the main reason is that these services do not pay attention to the care of the elderly, ignore the real needs of the elderly. Intelligent products pay too much attention to the pursuit of speed and intelligence, large-scale use of intelligent services, artificial management channels continue to decrease or even disappear, which makes the situation of the elderly group more awkward. For example, there is no "health code" during the epidemic, travel will be hindered; Problems such as we chat payment being more than cash have plagued the elderly, and it has been quite common for the elderly to suffer inconvenience due to their inability to use smart products.

3.4 Society ignores the learning needs of the elderly

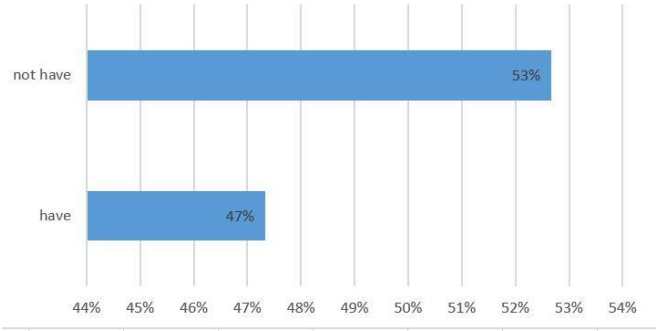

Figure 7: The situation of social organization to help elderly use smart products

As the above data shows (*Figure 7*), there is a serious lack of social help for the elderly to learn smart products. In today's existing social conditions, it is impossible for the elderly to continue to follow the old pattern and pace of life, and corresponding changes must be pointed out. In fact, many elderly people are eager to integrate into the intelligent society, hoping to master the skills of the Internet and intelligent devices through learning, but due to the lack of necessary cultural quality and knowledge ability, the elderly need to rely more on outside help to learn network technology. However, the lack of support from the society makes it more difficult for the elderly to learn to use smart products.

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3.5 Government, society and business need to work together to solve this problem

With the rapid development of network technology, the era of intelligence has gradually become the mainstream. In such an intelligent era, people's life has been transformed, and the facilitation of life has been improved to a large extent. However, some elderly people who cannot use smart products have become "marginal people" in a sense, and they do not use apps, smart household appliances, online communication, etc. According to the collected questionnaire survey data (*Figure 8*), the number of elderly people who do not know we chat Pay accounts for 64.67%. The number of senior citizens who know we chat Pay accounts for 35.33%.

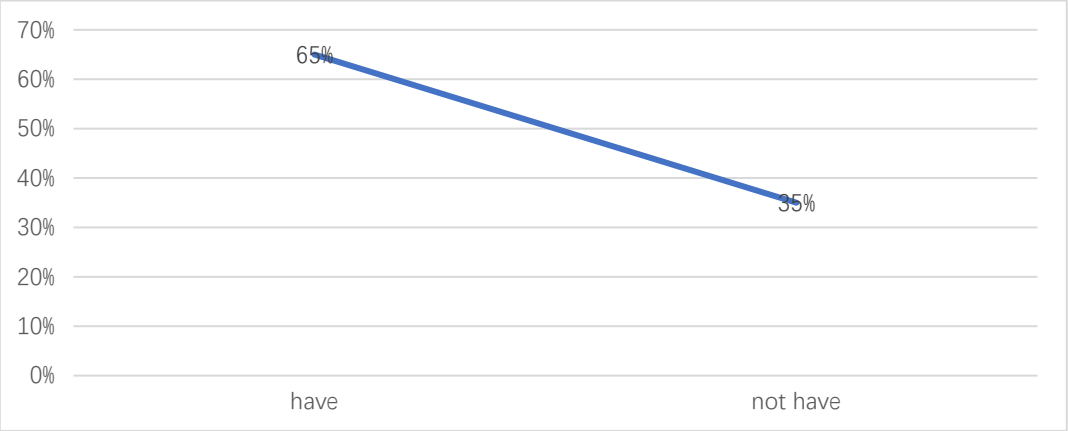

Figure 8: The elderly WeChat situation

Due to the rapid changes in society, some elderly people have a low understanding and acceptance of new things. The interference and implication of cultural distance and lack of access to smart phones, a tool of modern society, means that elderly people cannot communicate with the outside world effectively and easily as before, but it will be out of touch with the present. The convenient life does not cover most elderly people, but becomes their confusion.

To help the elderly cross the digital divide, governments, communities, enterprises and other entities need to work together to come up with corresponding solutions and implement them. According to the data of National Bureau of Statistics and China Internet Network Information Center in December 2017, Chinese mobile Internet users accounted for 54% of the total population, elderly Internet users accounted for 20% of the elderly population, and elderly Internet users accounted for 11% of mobile Internet users. It seems that the elderly are gradually stepping into the era of intelligence. According to the analysis of the questionnaire survey data (*Figure 9*), 119 people are willing to guide the elderly to use smart products and drive the elderly to actively connect with the information age. People are unwilling to instruct the elderly to use smart products because of the difficulty in learning to accept the functions of smart phones; if the elderly want to learn, 22 people are willing to guide them.

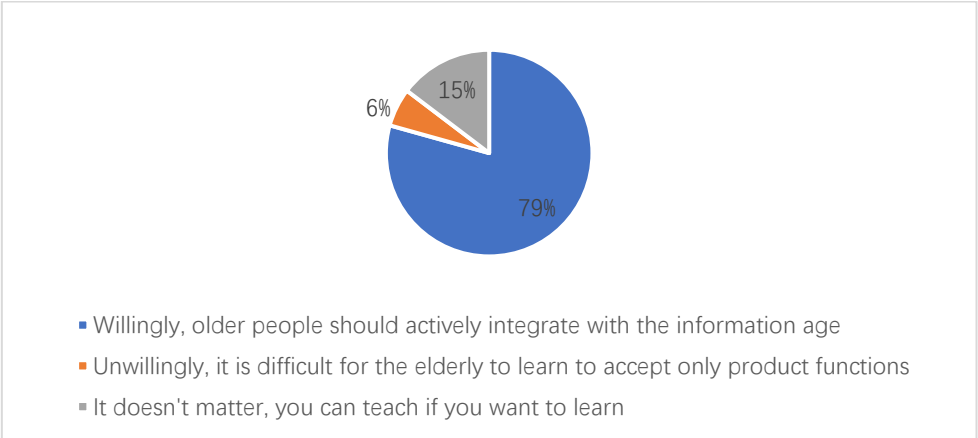

Figure 9: Willingness to help older people use smart products

However, there are many problems hidden behind the data, and a large number of elderly people do not fully operate the smart products, or even do not know how to use them, although some children will

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guide the elderly how to use, but the effect is very small, and cannot solve the fundamental problem, which needs the joint assistance of the government and major entities in the community to solve.

According to the research (Table 7), 52.67% people have never heard of relevant social organizations providing help to the elderly in using smart products. As for the social problem that the elderly are difficult to use smart products, the social attention and solving efficiency need to be improved. Some elderly people's children are not around, which makes it difficult for them to find professionals to help them solve the confusion when using smart products. The elderly gradually become lonely "marginal people", the government and the community need to take responsibility, serve the people, solve problems for the elderly, reduce the elderly should be separated from the social track of anxiety and unease.

Table 7: Social organizations (volunteers, neighborhood committees, etc.) provide help for the elderly to use smart products

Options	Subtotal	Proportion
Yes	71	47.33%
No	79	52.67%

The emergence of intelligent products undoubtedly improves the convenience of life. However, some products are not easy to operate and even lack consideration of whether the elderly are easy to operate. They ignore aging and do not consider the needs of the elderly. From the perspective of consumers, they need humanized products and services that can meet their needs. Therefore, social enterprises should consider the personalized requirements of groups, regions and ages in the design, combine intelligence with aging, truly serve the elderly, improve their life quality, and follow the pace of the smart age.

4. Measures for the elderly to board the digital express train

4.1 To solve the problem of inconvenience, distrust and unwillingness

If we want to help the elderly to cross the digital divide and keep up with the pace of digital technology, we need to make the right remedy. First of all, it is inconvenient. In my opinion, the design of intelligent products can take the elderly as a major market segment and focus on the needs of the elderly to design products to cater to the elderly market[5]. We can spread some relevant operation methods through the combination of online and offline means such as organizing volunteer groups or online teaching, so as to provide easy learning channels for the elderly and help them improve their ability to use smart products.

On the other hand, try to spread as much knowledge as possible about the safe use of smart products and how to protect their own property, and under what circumstances it will cause property damage. The state should also strengthen the crackdown on online fraud, provide a good social atmosphere for the use of intelligence, and improve the sense of security of the elderly using smart products[6].

We must give full play to the important influence of family members, mobilize family members to encourage the elderly, encourage and accompany the elderly to use smart products, and improve their enthusiasm for using smart products. For example, family members encourage and teach the elderly to use the WeChat video function, the elderly can take the initiative to learn and use the product many times when they miss their families or are lonely, and the efficiency of active learning will be better than passive learning, so that the elderly will learn more skills step by step and better keep up with the pace of the intelligent era. The designers of smart products should also think about the needs and requirements in front of the elderly, so that the elderly can truly experience the convenience and fun brought by intelligence. Yongkang Adult Day Care Center in New York, USA, uses smart technology, from ordering meals for the elderly to traveling to participate in activities, whether in nursing homes or living at home, the elderly can experience the convenience brought by smart technology. When the elderly eat, the system screen will clearly display the remaining empty seats and the corresponding table number, as well as the names of the elderly who have chosen to eat at this table, and will reasonably formulate healthy dishes according to the physical condition of the elderly. For the elderly with diabetes, the computer program has limited the dishes that the elderly can choose to be sugar-free, light, and less oily that diabetics can eat, saving time in line and seat selection while ensuring nutrition and taste.

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4.2 Promote the age-appropriate transformation of intelligent products and services to ensure that the elderly can "use"

4.2.1 Optimize the system design of smart products so that the elderly can overcome their physical and mental disabilities

A good intelligent product system design is conducive to the automatic "touching of the net" for the elderly. There is a certain gap between the elderly's cognition, acceptance and use of smart products compared with young people. Therefore, certain improvements must be made in the design and application of smart products, and the actual needs of the elderly should be fully considered. Since it is a product for the elderly, it should be based on respect for the elderly in the design, and design suitable smart products according to their different needs, and provide a certain care model for the elderly.

4.2.2 Integrate traditional and intelligent service methods

Adhering to the parallel humanized services of traditional and intelligent "two legs" is the key to helping bridge the digital divide of the elderly. In this regard, the "Implementation Plan on Effectively Solving the Difficulties of the Elderly in Using Intelligent Technology" issued by the General Office of the State Council proposes that relevant departments should adhere to the combination of traditional services and intelligent innovation to provide more direct and comprehensive convenience services for the elderly.

After all, technology cannot replace people, and completely abandoning traditional service methods will inevitably seriously affect the daily life of the elderly group. Therefore, in the daily life of the elderly, we should open a "green channel" exclusive to the elderly, pay attention to the needs of the elderly themselves when providing services, transform traditional service methods, and provide more aging management and services.

4.2.3 Carry out intelligent application training for the elderly

In the process of digitalization, in order to improve the information literacy of the elderly, it is necessary to cross the digital divide with the help of social forces. Conducting training sessions in the community specifically for the elderly to learn smart products plays an important role in helping the elderly integrate into the Internet. Volunteers should actively and patiently teach the necessary network skills to the elderly, and provide online communication and learning platforms for the elderly in a timely manner. This is not only conducive to helping the "digital divide" of the elderly, but also helps the elderly to share the era of intelligence, promote social development and build a harmonious society[7].

4.3 Based on the perspective of government, community and enterprise

As the main body of macro-control, the government can start through two major aspects: policy and economy. In the economic front. The government can purchase smart products in the elderly is to carry out certain subsidies, stimulate the consumption demand of the elderly, and be willing to try to use smart products to improve the popularity of smart products in the elderly group; In terms of policies, establish and improve the social security system, work with the community to solve it, so that there is a law to solve the problem of the elderly crossing smart products, and narrow the generation gap between the elderly and the intelligent era[8]. As a comprehensive department to solve problems for residents, the community should actively solve the problems encountered by the elderly, and can organize classes in their free time, provide relevant services and guidance, and also provide a good communication platform for the elderly, so that the elderly can have a sense of progress with the times and harmony. Enterprises need to implement the policy, operate and sell normally in accordance with the policy, and actively cooperate with the community to feedback the community's suggestions on the use of smart products to the manufacturer, and then the manufacturer will refer to the design to meet the real needs of the elderly.[9]

To alleviate the anxiety and anxiety of the elderly and solve the problem of the elderly crossing the digital divide, it is necessary for the government and community enterprises to work together to create a warm and good intelligent era environment for the elderly.

5. Conclusion

While our society is developing, we must also care for the elderly who cannot keep up with the pace of the times, and retain some primitive methods for them, which is also a part of the embodiment of social development. In fact, solving the problem of the "digital divide" is not complicated, in a nutshell,

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it is necessary to adhere to people-oriented and scientific and technological innovation, and explore the real psychological needs of the elderly from the perspective of adapting to the physical functions and action characteristics of the elderly. At the same time, from the three communication dimensions of individuals, groups and society, the bridge path of the "digital divide" of the elderly is discussed. We will also get old, although there are more and more modern smart products, but the elderly should not be left behind by the times, we should make the society full of human touch, maximize the help of the elderly in the digital era to enjoy the convenience of intelligent life, keep up with the pace of the times[10].

Acknowledgements

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