Innovation and Entrepreneurship from the Perspective of the Metaverse — Taking Elderly Care as an Example

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DOI: 10.32629/memf.v4i5.1492

Abstract: In this day and age, the relevant products of the metaverse have been utilized in many social scenarios. There are problems of elderly care such as decline or even complete loss of certain physical functions and difficulties in accessing medical care in the elderly population. Spiritually, the elderly need companionship, and their cultural life needs to be further promoted. The innovation and entrepreneurship in the direction of metaverse on elderly care will bring huge economic and social benefits. The government should pay attention to taking metaverse elderly care as one of the key directions in the long term through policy inclination, and guiding multiple social forces to invest in the research and development of metaverse applications in the field of elderly care in the long term. Universities and society also need to pay attention to the strengthening of guiding the theoretical innovation and practical creation in the direction of metaverse elderly care.

***Keywords*:** metaverse, innovation and entrepreneurship, digital economy, elderly care, Chat GPT

1. Introduction

The metaverse will push innovation and entrepreneurship into a new era, such as innovation and entrepreneurship in elderly care. Everyone will eventually face the issue of elderly care. Elderly care is an important livelihood issue, and the development of elderly care is a reflection of the degree of social civilization. The metaverse-related products have been gradually put into use. In the future, using metaverse technology to develop the elderly care industry and doing well in the metaverse vision of smart elderly care will certainly bring huge economic and social benefits.

2. Overview of metaverse-related products

Both the metaverse and the current Internet are digital applications in nature. Generally, they both need the support of hardware, software and content products. High-performance chips can be described as the center of the metaverse, while low-latency communication devices such as 5G are the channels of the metaverse, and XR devices and brain-computer interfaces are the entrances to the metaverse.

As for the development of the metaverse center, at present, the application of chips is everywhere. Government departments of various countries, major Internet and Internet of Things manufacturers attach great importance to the research and development of chips. High - performance chips are gradually coming out, and the computing power of the virtual world is undergoing great changes. The construction of the metaverse is inseparable from the support of computing power, and the current computing power has been able to carry the operation of many virtual scenes. However, the current computing power is still far enough to build a metaverse world with multiple people participating, multiple scenes, high maturity and high realism. The energy support behind the huge computing power is also an urgent problem to be solved. The development of controlled nuclear fusion technology may offer a glimpse of its future.

As for the development of the metaverse channels, the application of 5G Communication technology has been relatively mature, and the substantial improvement of information transmission rate has provided many possibilities for the operation of the metaverse world. Efficient and low-cost video interaction has been widely perceived and applied by the public today. The technology of 6G Communication has also entered the research and development stage, providing communication support for the further development of the metaverse in the future.

As for the development of the metaverse entrance, XR(Extended Reality) devices have been put into large-scale production and application. XR (Extended Reality) devices are a general term that includes VR (Virtual Reality), AR (Augmented Reality) and MR (Mixed Reality). At present, XR devices from domestic and foreign brands such as PICO, Meta Quest and Adventure have been applied by a large number of ordinary people. According to the Virtual Reality and Industry Application Integration Development Action Plan, the sales volume of virtual reality terminals in China will exceed 25 million units by 2026. In terms of brain-computer interfaces, Elon Musk's brain- computer interface company neuralink

has already enabled monkeys to type with their minds in 2022. In the future, it has also been called a new research direction for people to enter the metaverse through brain-computer interfaces.

It can be seen that the hardware equipment related to the metaverse is always on the way forward. The development and popularization of hardware devices will stimulate the production of software and content. In the future, the software ecology of the metaverse will be gradually built and improved, and the content production of the metaverse will be as popular as the content production of short videos, bringing countless new opportunities for innovation and entrepreneurship, and becoming a new industry trend of the digital economy.

In addition, the components of the metaverse can be divided into three forms: Digital Twin, Digital Original, Virtuality mixed Reality. The products of digital twining come from the mapping and simulation of the real world. The products of digital primitiveness originate from the creation of the digital world. The product of virtual reality comes from the mixture of digital world and real world. Some broadcast videos of the famous business consultant Liu Run, using digital twin technology to form a virtual digital person, just like the twin of Liu Run, has achieved the effect that it is difficult to identify the person is just the digital twin of Liu Run. Many enterprises and organizations in the society have also launched the use of Digital Original technology to create digital people. For example, in October 2022, China Daily launched its first digital employee, the national style girl "Yuan Xi".

The metaverse-related products have played a corresponding role in many social scenarios. If the metaverse-related technology is to be transferred to the elderly care scenario, it is necessary to clarify the specific problems of the current elderly care.

3. Overview of elderly care problems

As early as 2000, China's aging rate officially exceeded 7%, entering an aging society. In 2020, the number of people aged 65 and above in China had reached 190.64 million, accounting for 13.50 percent of the total population, close to the standard of an aging society of 14 percent[1]. The huge elderly population means a huge demand for elderly care. In fact, the aging phenomenon is often accompanied by the phenomenon of disability and empty-nest, and there are still a large number of basic elderly care needs that have not been met. With the improvement of China's social security system, most urban residents have the foundation to receive pensions, and the elderly care system for the elderly in rural areas is also gradually improving. However, the pension fund problem is only the basic problem faced by the elderly care, and many other elderly care problems deserve further attention and solutions from the society.

3.1 Physical elderly care

Many elderly people are faced with a variety of physical problems, including daily chronic diseases and sudden diseases. Some cases are handled carelessly, which often endanger the lives of the elderly. If physical problems occur, whether the elderly can be accompanied for medical treatment? If there is no accompany, whether it is convenient for the elderly to seek medical treatment? During our daily life, there often exists the facts that the elderly cannot seek medical treatment or cannot seek medical treatment in time because they have difficulty in going out or do not understand the medical treatment process.

In addition, even if the timely medical treatment of the elderly is guaranteed, the aging decline of some physical functions, or even the complete loss, is also a problem that physical elderly care often has to face. The inflexibility of legs and feet, the decline of hearing, the loss of language function, as well as the aging of other body organs and the decline of intelligence, are all physical problems that maybe faced in old age. Even if the elderly can get special care in the institutions for the elderly, the degree of care is difficult to get long-term guarantee. Even some elderly people may be unable to clearly express their own needs, and after-work care by children is often not timely enough to meet the basic physical needs of the elderly. Many problems in physical elderly care cannot be properly solved, which means that the basic quality of life of the elderly has seriously declined, and the further needs to improve the quality of life of the elderly are elusive.

3.2 Mental elderly care

Compared with physical elderly care, mental elderly care is more likely to be ignored. It is relatively easy for the children of the elderly to see the medical needs of the elderly, and they do not pay enough attention to the spiritual needs of the elderly. Although the social organizations and institutions such as the university for the aged, the Palace for the aged and the Silver Age school meet the spiritual life needs of some elderly people, their strength is obviously not enough in the face of the huge group of elderly people. Moreover, the spiritual life of the elderly in rural areas is comparatively more deficient.

Spiritually, on the one hand, the elderly need the emotional companionship of basic relatives,while their children often have little time to accompany the elderly due to work and other reasons. On the other hand, the elderly also need a spiritual and cultural life, a need to consume cultural products and a need for self-realisation in creating them. In addition, older persons have a spiritual need to socialise. The cultural and social needs of the elderly are often difficult to satisfy in a timely

manner because of the insufficient supply of corresponding cultural products or because they are hindered by geography and time. Spiritual loneliness and emptiness have become the norm for many older persons.

4. The combination of metaverse and elderly care

From the development overview of the metaverse, the metaverse belongs to a high-level form of the Internet, which is a revolutionary upgrade of the Internet. Although the metaverse has not yet reached the mature stage, many metaverse-related technologies and products have been put into large-scale application. At present, the metaverse-related applications are still mainly concentrated in games, movies, broadcasting and other virtual activities involving a small number of people. However, the metaverse has a strong momentum of development and has attracted attention from all parties. It is an inevitable trend that the application scope of the metaverse will be further expanded in the future. The concept of metaverse can be introduced into the elderly care industry.

4.1 Metaverse application of physical elderly care

From the perspective of body elderly care, current AR glasses and other devices have been able to superimpose virtual navigation and weather information on real scenes. In the future, it is entirely possible to develop applications by adding a medical guidance module to AR glasses and other devices, which can overlay information such as medical treatment methods in real scenarios and guide the elderly to seek medical treatment step by step. In addition, the further development of virtual digital people to accompany the medical treatment, enhance the interaction with the elderly, and increase the password to call a taxi, call a companion and other functions, is also fully expected to be realized through integrated AR glasses and other devices. What's more, the current Internet hospitals and commercial consultation platforms such as Ping An Health and Jingdong Health have been relatively mature and widely used. With the metaverse enabling Internet medical treatment, more elderly people will also have more convenient access to digital virtual medical treatment, greatly reducing the trouble of going back and forward offline medical treatment. The metaverse will provide all kinds of revolutionary solutions for the difficulties encountered by the elderly in medical treatment.

For the decline or even loss of some physical functions of the elderly, metaverse technology can provide partial alternative solutions. At present, it is already possible to use non-invasive external patch brain-computer interfaces to allow the elderly to control the robotic arm with their minds to achieve actions such as lifting cups and drinking water. Spelling letters with minds has also been preliminarily implemented in experiments. In the future, the recognition and digital transformation of brainwaves will be more mature, and the virtual-real fusion technology will be further developed, which will provide more alternative solutions for making up for the lack of physical functions in the elderly.

4.2 Metaverse application of spiritual elderly care

From the perspective of spiritual elderly care, the metaverse can build a highly realistic virtual social space and time, in which relatives can accompany the elderly to interact, and the elderly can also break the limitations of real time and space to communicate with more elderly people and carry out other activities. The elderly can enter a colorful virtual world through metaverse devices while lying in bed, and create and enjoy spiritual and cultural products. The metaverse can also simulate some common scenes such as illegal healthcare product sales and illegal financial elderly care product fraud for the elderly through the flexible construction of virtual scenes, so as to prevent the elderly from being cheated and suffering a serious mental attack.

Moreover, virtual reality technology can be well combined with the two links of psychotherapy and palliative treatment in the elderly care industry to improve the negative emotions of the elderly. Experiments show that the elderly can experience specially customized VR scenes through the fast transmission of big three-dimensional data, which can satisfy the elderly's desire to return to their memories or travel to a place in reality[2].

Compared with the modern Internet, the high interactivity of future metaverse devices also greatly reduces the difficulty for the elderly to use. At the same time, virtual digital people can also assist the elderly in further using metaverse devices. Moreover, when the Internet natives such as the post-90s and post-00s enter the old age, the demand for spiritual elderly care based on the metaverse is bound to be further stimulated and released, and the huge economic benefits will also promote the further development of the related elderly care industry, forming a positive cycle.

In addition, when the elderly's partner or friend passes away, they can also make an immortal twin digital partner or friend through digital twin technology, combining the voice and image of their partner or friend in life, which can accompany the elderly all the time and communicate with the elderly naturally with the help of Chat GPT and other technologies. Even when the elderly pass away, the metaverse funeral can be used to build the virtual image of the elderly, so that the elderly can live forever in the spiritual world of their children. In the distant future, brain-computer interface and other technologies will be highly mature, and people's consciousness will get rid of the human body, and realize the real eternal life of consciousness

in other carriers through the metaverse technology, which may also move from science fiction to reality.

5. Suggestions and prospects for related development

In short, there is a certain development foundation and a strong momentum of development for the metaverse, and there is a huge population base and physical and spiritual needs to be further solved for the elderly care industry. For the combination of the metaverse and the elderly care industry, there are also lots of corresponding points of convergence. Empowering the elderly with the metaverse is a promising blue ocean.

However, the current target groups of XR devices and other metaverse-related products are still mostly teenagers who pursue modern technology. Metaverse-related companies should try to shift part of their focus to the elderly group and develop metaverse-related products tailored to their physical and mental needs. Capable enterprises need to try the layout from the moment, and the current metaverse technology can be fully used to solve part of the elderly care problem. In addition, enterprises need to pay attention to and think about whether they can make the iteration and upgrading of metaverse elderly care products in time with the further development of metaverse technology. In fact, the purchasing power of many elderly people and the time they can spend on metaverse consumption are not inferior in any respect.

At the same time, even if the high level of interactivity in the metaverse era can make it easier for the elderly to use digital technologies, the digital divide phenomenon will inevitably exist. The Party and the state have incorporated digital elderly care into the national strategy to create an inclusive and mutual social environment and technical support for the digitization process of the elderly group.[3] Universities and social related voluntary organizations should organize more young college students and other active group forces to carry out public welfare teaching activities to send the current Internet digital products and the future higher order metaverse digital products to the elderly group.

In addition, it should be noted that innovation, entrepreneurship and creation projects need to go through a spiraling process from scratch to mature, accompanied by bottlenecks or setbacks[4].The government should focus on supporting the development of metaverse-related innovation, entrepreneurship and creation projects throughout the whole process, and make metaverse elderly care one of the key directions through policy preference, so as to guide various social forces to invest in metaverse application research and development in elderly care and other areas of people's livelihood for a long time. When universities and society carry out innovation and entrepreneurship education, they also need to pay attention to strengthen the theoretical innovation and practical creation of guiding the direction of metaverse elderly care. At present, these are still in the gestation stage of relatively lack.

In elderly care, deployment of modern assistive technologies is one of the major trends.[5] In the future, breakthroughs in virtual reality technology could enhance sensory experiences in the metaverse.[6] The input of the government, enterprises, universities and social forces will certainly make the innovation and entrepreneurship of the metaverse elderly care and the economic and social benefits it brings into the outbreak stage.

Acknowledgments

The paper is funded by the "2023 Shanghai College Students' Innovative Entrepreneurial Training Plan Program Demonstration School".

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