

# The Digital Intelligence Revolution: A Study of Paradigm Shifts and Driving Forces in the Silver Economy Industry Wave

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**Abstract.** The ageing of China's population and the rapid development of the digital economy have converged historically, presenting significant opportunities to address the challenges of ageing and develop the silver economy. This study focuses on the mechanisms through which digital and intelligent technologies drive the transformation of the silver economy industry, employing a combination of literature analysis and case studies to systematically examine the integration pathways and development models between the two. By clarifying the essence of the digital economy and the silver economy, and analysing their respective development statuses and integration status, this study found that digital technology primarily empowers the silver economy through three pathways: the first is technology innovation driving product and service upgrades, such as smart health monitoring devices. The second is digitalised operations improving service efficiency, achieving cost reduction and efficiency improvement, both reducing the cost of elderly care services and expanding the scope of service coverage. The third is precisely meeting the needs of the elderly to stimulate consumption potential, such as personalised health management services. These mechanisms have given rise to new industrial models such as smart elderly care and digital health management. At the same time, the study revealed four major bottlenecks in current development: the digital divide among the elderly, unclear industrial profit models, data security risks, and policy lag issues. It proposed targeted solutions such as ageing-friendly renovations, improving digital literacy, cultivating industrial ecosystems, and building data governance systems.

**Keywords:** Digital economy, silver economy, digital intelligence revolution, industrial integration, smart elderly care.

## 1. Introduction

Currently, China is facing increasingly severe challenges posed by population ageing. According to the 2024 population census data from the National Bureau of Statistics, China's population aged 65 and above has reached 219.69 million, accounting for 15.6% of the total population, an increase of 3 percentage points compared to 2019 [1]. This trend places higher demands on the traditional elderly care system and exerts significant pressure on the social security system. However, it also gives rise to a vast silver economy market, presenting new opportunities and challenges for China's economic development.

Nevertheless, traditional elderly care service models are no longer sufficient to meet the diverse needs of the elderly population in the new era. On one hand, the elderly face the "digital divide" issue in the digitalisation wave. Many digital products and services are primarily designed for younger groups, with limited functionality and inconvenient operation, neglecting the special needs of the elderly in terms of vision, hearing, and operational habits. On the other hand, the development of the digital economy is uneven across urban and rural areas and regions, with rural areas lagging in terms of equipment and network infrastructure, leading to significant differences in the elderly care issues faced by the elderly in different regions [2]. These differences are not only reflected in the supply of technology but also in service provision and consumption capacity across multiple dimensions.

Notably, the deepening of the digital revolution offers new possibilities for addressing these challenges. The rapid development of technologies such as artificial intelligence and big data is reshaping the foundation of the silver economy industry. For example, smart health monitoring devices can enable real-time tracking of the health status of the elderly, while the widespread adoption of 5G technology holds promise for narrowing the gap in elderly care services between urban and

rural areas. These technological innovations not only enhance service efficiency but also drive profound transformations in industrial models. To advance the "Three-Pronged Strategy" for the consumer goods industry, efforts have been made to increase the promotion of elderly-friendly consumption information and leverage platform roles to precisely target the elderly population [3]. As a benchmark city for the digital revolution, Shanghai has implemented the "Elderly Digital Partner Programme," which has increased the usage rate of mobile payments after elderly-friendly modifications by 62% [4]. The application of smart health monitoring devices has improved the response efficiency of home-based elderly care services by 40% [5]. These innovative practices demonstrate that digital and intelligent technologies can not only improve service quality but also create entirely new models of elderly care services.

Based on the above background, this study aims to explore how the digital and intelligent revolution drives the transformation and upgrading of the silver economy and analyse its underlying driving mechanisms. The study will analyse key dimensions such as model innovation and policy coordination to provide theoretical foundations and practical references for promoting the effective integration of the digital economy and the silver economy. This study holds significant practical implications for addressing the challenges of population ageing and unlocking the potential of elderly consumption, not only contributing to the improvement of governance systems in an ageing society but also offering new insights for the transformation and upgrading of related industries.

## **2. Research Background and Methodology**

### **2.1. Research Background**

As the pace of population ageing accelerates, China's elderly population continues to expand, with the number of people aged 60 and above expected to exceed 400 million by around 2035. The growing demands of this large elderly population in areas such as healthcare, elderly care, and entertainment have made the silver economy a key tool for addressing the challenges of population ageing. Additionally, as a promising new economic growth point, the deep integration of digital and intelligent technologies with the silver economy not only significantly enhances industrial productivity but also stimulates the consumption potential of the elderly through innovative products and service models, opening up vast market opportunities and injecting new momentum into economic development. Against this backdrop, the central government has also introduced a series of supportive policies. In 2024, the State Council's General Office issued the "Opinions on Developing the Silver Economy and Enhancing the Well-being of the Elderly," and the 2025 Government Work Report explicitly stated the need to "vigorously develop the silver economy" and "accelerating the development of smart elderly care." Studying the paradigm shift and driving mechanisms of the digital revolution on the silver economy industrial wave is an inevitable requirement to adapt to demographic changes, activate economic growth potential, and implement policy orientations to promote the scaled and standardised development of the silver economy.

### **2.2. Research Methods**

This paper employs a literature review method, systematically reviewing domestic and international literature on the digital economy, silver economy, industrial integration, and technological innovation. This includes academic monographs, journal articles, and policy documents (such as population census data from the National Bureau of Statistics, industry reports released by the Ministry of Industry and Information Technology, and the National Committee on Aging.). The paper clarifies the boundaries of core concepts, summarises existing research findings and shortcomings, and provides theoretical support for constructing an analytical framework for the digital revolution's empowerment of the silver economy. The study also employs case analysis, selecting typical cases of digital intelligence technology integration with the silver economy for in-depth analysis, including smart elderly care service models (such as home/community smart elderly care projects), elderly digital consumption scenarios (such as elderly-friendly e-commerce platforms),

and digital health management practices (such as the application of smart health monitoring devices). By combining specific cases like Shanghai's "Elderly Digital Partner Programme," the study identifies empowerment pathways and operational characteristics across different scenarios, validating the practical application effectiveness of theoretical mechanisms.

### **3. Analysis and Findings**

#### **3.1. Paradigm Shift: The Transformation and Upgrading Path of the Silver Economy**

Driven by digital and intelligent technologies, the silver economy is transitioning from traditional models to digital integration models, manifested in three key aspects.

The first aspect is the shift in service logic. Previously, elderly care services were mostly "services or items provided by institutions, which the elderly used," and standardised services struggled to meet the diverse needs of individuals. Smart elderly care is driving the upgrading of the elderly care service system. Its platform integrates online and offline resources, breaking through the limitations of traditional elderly care services that rely on offline institutions and families and have limited content. It integrates various functions such as online health consultations and telemedicine, providing elderly individuals with convenient and efficient one-stop services. Additionally, it uses big data analysis to accurately understand needs, optimise supply, and enhance service efficiency and experience. Additionally, smart elderly care requires leveraging digital technology to empower the system by incorporating multiple stakeholders such as governments, businesses, and social organisations. This builds a collaborative mechanism involving diverse participants, breaking away from the traditional situation where each stakeholder operates independently without collaboration. This enhances service supply efficiency and regulatory standards, alleviates the imbalance between supply and demand in elderly care, and drives the transformation of the system. Furthermore, digital technology has given rise to new models such as virtual nursing homes and smart elderly care communities, which use digital tools to provide comprehensive care for the elderly, replacing some manual labour and alleviating the shortage of elderly care talent, thereby transforming the elderly care service system towards greater intelligence and efficiency.

The second aspect is about updating the supply model. In the past, elderly care services were relatively scattered, with resources from homes, communities, and nursing homes not interconnected, and significant gaps between urban and rural areas. Now, digital and intelligent technologies are used to build smart elderly care platforms, integrating resources such as hospitals, care personnel, and domestic services into a network of "online connections and offline services." For example, elderly people can measure their blood pressure at home using a smartwatch, and the data is directly transmitted to the community service centre and hospital. If there are any abnormalities, the community can immediately arrange for home care, and the hospital can also provide remote guidance, breaking down the previous issue of scattered resources [6].

The third aspect is the expansion of industrial forms. In the past, the silver economy mainly sold elderly care products and provided basic care, with relatively limited avenues for profit. Now, digital and intelligent technologies have made industry boundaries more flexible, forming a new model of "products + services + data." For example, a smart health wristband is not just hardware that measures heart rate, it can also collect data to establish health records and subsequently provide remote consultations, chronic disease management, and other services. Data has become the key link between products and services, enabling the industry to obtain more value-added benefits [7].

#### **3.2. Analysis of Internal Driving Mechanisms**

Digital and intelligent technologies drive the silver economy through a cyclical process of "technology laying the foundation—efficiency boosting momentum—demand pulling the market," with three aspects working together to form a sustainable driving force.

First, technological innovation serves as the foundation. Technologies such as artificial intelligence, big data, and 5G form the foundation for the upgrading of the silver economy. On one

hand, new technologies have created smart devices tailored for the elderly, such as user-friendly smart bracelets, chat-enabled robots, and online platforms for medical consultations and elderly education courses, directly expanding the range of services and products available. On the other hand, technology can optimise service processes, such as using algorithms to schedule bed assignments and caregiver shifts in nursing homes, standardising services, and laying the technological foundation for industry upgrading [8].

Secondly, efficiency improvement serves as the driving force. Digital operations can help the silver economy reduce costs and expand service coverage. In terms of costs, smart monitoring devices can reduce labour costs in nursing homes, and online platforms can simplify service processes. In terms of scope, with the internet and 5G, high-quality services from urban areas can be extended to rural areas, enabling more elderly people to access them conveniently. Taking Shanghai's "Senior Digital Companion Programme" as an example, the upgraded mobile payment and online services have made it more convenient for the elderly to access services, enabling them to reach a wider audience, demonstrating that improved efficiency can drive industry growth [9].

Finally, activating demand serves as a driving force. Digital and intelligent technologies encourage the elderly to spend money and release their consumption potential [10]. On one hand, ageing-friendly renovations address the issues of the elderly "not knowing how to use" or "being afraid to use" technology, such as simplifying mobile phone interfaces and using voice-controlled devices to reduce usage difficulty. On the other hand, technology creates new consumption scenarios, such as online senior universities, virtual tourism, and online socialising, meeting the elderly's new needs in learning, entertainment, and making friends. Data shows that as the elderly become more proficient in using digital products, their spending on health management and online entertainment has significantly increased, forming a virtuous cycle of "demand growth—market expansion—technology upgrading" [11].

## 4. Discussion

This study analyses the core issues of how the digital revolution is driving changes in the silver economy. The conclusions not only address the practical needs of integrating ageing and the digital economy but also provide new perspectives on the logic of industrial transformation.

Theoretically, the study combines industrial integration and technological innovation theories to reveal that the impact of digital intelligence technology on the silver economy is not merely the application of tools, but rather the breaking down of industry boundaries in sectors such as elderly care and health, and the restructuring of the "product-service-data" value chain, driving the transformation from traditional service industries to digitally integrated industries. This finding enriches the application of industrial paradigm shift theory in the context of ageing, particularly clarifying the closed-loop dynamic mechanism of "technological innovation-efficiency improvement-demand activation"—technology lays the foundation for transformation, efficiency lowers industry barriers, and demand drives the market in reverse, with all three accelerating the reshaping of industrial forms.

In practice, the research findings align closely with reality. The success of smart ageing and digital health management models (such as Shanghai's ageing-friendly renovations to improve payment usage rates) demonstrates the advantages of digital intelligence technology in precise service delivery and expanded coverage. However, issues such as the digital divide and unclear profit models expose structural contradictions in supply-demand mismatches. This indicates that digital intelligence empowerment cannot rely solely on technological iteration but requires a systemic reform combining "technology adaptation, policy coordination and social participation," such as narrowing the generational gap through digital training and guiding enterprises to find profit points through policy guidance to avoid a disconnect between technology and demand.

At the policy level, the research further highlights the importance of institutional support. Current issues, such as the absence of industry standards and insufficient interdepartmental coordination,

reflect that policies lag behind technological and market practices. For example, gaps in data security regulation may hinder the digitalisation of health management, while inconsistent ageing-friendly standards leave enterprises unclear about their R&D direction. Future policies need to shift from "reactive response" to "proactive guidance," both nurturing the market through fiscal and tax support and accelerating the formulation of standards such as smart device safety norms, establishing interdepartmental mechanisms, and providing a clear institutional framework.

Overall, the digital intelligence revolution presents an opportunity for the upgrading of the silver economy, but it must overcome bottlenecks such as superficial technological applications, fragmented ecosystems, and insufficient policy support. Only by building an ecosystem where technology, market, and institutional frameworks mutually support each other can the silver economy transition from "scale expansion" to "quality and efficiency improvement," providing a sustainable solution for addressing aging and activating new economic momentum.

## 5. Conclusion

This study systematically examines the integrated development of the digital economy and the silver economy, drawing insights from real-world applications of digital intelligence technologies. The digital intelligence revolution is driving paradigm shifts in the silver economy across multiple dimensions, specifically manifested in the following three aspects. Elderly care services are shifting from traditional "supply-driven" homogenization to "demand-centric" personalized precision services. The supply model of elderly care services has evolved from fragmented, decentralized structures to networked, collaborative smart-care ecosystems, and the industrial structure now extends beyond single-product sales to encompass integrated "product, service and data" value chains.

Central to this transformation is digital technology's role in dissolving traditional industry boundaries, enabling resource reorganization and efficiency gains. At the same time, the driving mechanisms of digital and intelligent technology empowering the silver economy exhibit multi-layered characteristics. Technological innovation serves as the foundational driving force, continuously optimising product and service forms through the development of intelligent devices and the digitalisation of service processes. Efficiency improvement acts as the core traction force, reducing operational costs and expanding service coverage through digital means, and demand activation functions as the market driving force, unlocking the consumption potential of the elderly population through precise alignment with their needs. However, the current integration of the two still faces structural challenges, such as insufficient service coverage due to the digital divide, incomplete industrial ecosystems limiting innovation vitality, and lagging policy and standard updates failing to keep pace with industrial transformation. Therefore, to deepen the integration of the two, the key lies in establishing a coordinated mechanism of "technology adaptation, policy guidance, and market cultivation"—eliminating the digital divide through ageing-friendly renovations and digital skills training, clarifying profit models through industrial ecosystem construction, and strengthening data security through standard setting and regulation. This solution addresses the current weaknesses in industrial development and also points the way for further application of technology in the future.

It is worth noting that this research also has certain limitations. For instance, most of the case studies are based on domestic practices, with insufficient comparison of international experiences. Future research could incorporate comparisons with models such as Japan's community-based elderly care and Nordic digital inclusion to derive more generalisable pathways. Additionally, the long-term impact of digital and intelligent technologies on the silver economy (such as their substitution effect on workers) has not been thoroughly explored, leaving room for further research. It is recommended that future studies incorporate more international experiences and explore the long-term impacts of digital and intelligent technologies. In the future, it is hoped that a more comprehensive ecosystem can be established to provide stronger momentum for the development of the silver economy.

## References

- [1] National Bureau of Statistics. 2024 population census main data bulletin. 2024. <https://data.stats.gov.cn>. 2024.3.26.
- [2] Beijing Ageing. Digital intelligence technology drives new business models in the silver economy. 2025.
- [3] Ministry of Industry and Information Technology Microblog. Fully utilising digital technology to empower the silver economy, promoting the "Three-Pronged Strategy" for the consumer goods industry, and enriching the supply of elderly products and services. 2024.
- [4] Shanghai Municipal Commission on the Aged. 2023 Shanghai report on the development of the aged. 2023.
- [5] China Association of the Aged. Smart ageing development report 2023. 2023.
- [6] Chen Yanyu, Chen Xi. Mechanisms, gaps, and strategies for the integration of the digital economy and the silver economy. *Development Research*, 2025 (01).
- [7] Ren Baoping, Zhang Chenxuan. The effects, mechanisms, and pathways of the digital industrial chain in promoting the modernisation of China's industrial chain. *Financial Science*, 2023, (2): 54-64.
- [8] Lin Jiayu. Bridging the digital divide to promote the development of the silver economy: Trends and recommendations. *Western Finance and Accounting*, 2023, (2): 77-79.
- [9] Zhu Yue. A study on the "Interactive-Empowering" model of urban community elderly care service supply in Shanghai. Shanghai Normal University, 2025.
- [10] Xu Ying, Liu Huanxiao. The current status, issues, and prospects of China's "Silver Economy". *Journal of Beijing University of Aeronautics and Astronautics (Social Sciences Edition)*, 2023, 36 (1): 140-147.
- [11] Qiu Wenwen. Digital economy empowering consumption growth among the elderly population: An analysis of the moderating effects of the silver economy. *Research on Commercial Economics*, 2024, (6): 76-79.