

Research on the Development Status of the Smart Elderly Care Industry and the Empowerment Paths of Smart Elderly Care Systems for Enterprises

Linglian Cheng, Yihan Yan, Chenjing Xiang

Ningbo University of Finance & Economics, Ningbo 315175, Zhejiang, China

**Author to whom correspondence should be addressed.*

Copyright: © 2026 Author(s). This is an open-access article distributed under the terms of the Creative Commons Attribution License (CC BY 4.0), permitting distribution and reproduction in any medium, provided the original work is cited.

Abstract: Right now, China has entered a stage of moderate population aging. Many different types of smart elderly care systems can provide workable ways to fix the mismatch between supply and demand that is common in today's elderly care market. In this study, we did on-the-ground research about the local smart elderly care industry in different parts of Zhejiang Province. We found that there are clear development gaps between companies that run on different operational scales. Large enterprises take the initiative to deploy relevant business segments and build a full-process ecosystem for smart elderly care; medium-sized enterprises steadily expand their businesses and focus on segmented tracks and local regional markets; small enterprises have strong demand for digital transformation yet have long been constrained by insufficient resources and weak technical capabilities. This paper sorts out four practical implementation paths for enterprises to realize industrial empowerment through smart elderly care systems. Technical empowerment centers on optimizing overall top-level planning and constructing an integrated comprehensive service platform for smart elderly care. Service empowerment facilitates the establishment of a home care service system that connects online channels with offline services. Ecological empowerment drives coordinated development among participants within the industrial chain and promotes in-depth cross-industry collaboration. Data empowerment integrates scattered elderly care information resources distributed across regions to realize the sharing of all types of elderly care data.

Keywords: Smart elderly care industry; Stratified development of enterprises; Empowerment paths

Online publication: April 30, 2026

1. Introduction

Population aging is not a unique issue for a single country, and numerous nations around the globe are confronted with this challenge, including China. It has become a fundamental national condition that

China must cope with at present and for a long time in the future. The latest statistics indicate that by the end of 2024, China's population aged 60 and above had reached 310 million, accounting for 22.0% of the total population, among which the population aged 65 and above stood at 220 million, taking up 15.6% ^[1]. Following the current growth trend, the national elderly population is projected to exceed 400 million by 2035, accounting for over 30% of the total population. This means China will experience a rapid transition from a moderately aging society to a severely aging society.

Against such a backdrop, traditional elderly care service models are increasingly unable to cope with practical demands. The combined impacts of shrinking family sizes, a growing number of empty-nest elderly residents and shortages of professional caregivers make traditional family-based and institutional elderly care barely capable of meeting the increasingly diversified and personalized demands of senior citizens. Meanwhile, the emerging generation of the elderly attains higher educational attainment and gains familiarity with smart devices and the Internet, leading to rising acceptance and demand for smarter, more convenient elderly care services. As an economically developed province, Zhejiang serves as a representative research sample for addressing population aging. In 2024, residents aged over 60 made up 24.5% of Zhejiang's total population, a figure higher than the national average and reflecting a relatively severe aging level. Nevertheless, Zhejiang took the lead nationwide in developing smart elderly care services. The province launched the Zheli Yang Smart Elderly Care Service Platform at an early stage, integrating various elderly care service resources through digital technologies to improve service efficiency and quality ^[2]. This platform integrates multiple functions, including elderly resident information management, service demand matching, and service quality supervision, delivering convenient and efficient elderly care services to seniors across the whole province.

This study selects three representative cities, namely Jinhua, Taizhou and Ningbo, to conduct in-depth investigations into multiple smart elderly care enterprises. Questionnaires and in-depth interviews are combined to collect substantial first-hand data. The research mainly focuses on the current development landscape of the smart elderly care industry, categories and characteristics of participating enterprises, as well as the practical application of smart elderly care systems. It aims to analyze specific implementation paths, prominent obstacles and future development trends for different types of enterprises advancing smart elderly care services.

The three cities are chosen as research subjects for the following reasons. Jinhua boasts rich experience in smart elderly care pilot programs and has established a relatively complete policy support system. Taizhou features a vibrant private economy, and its local smart elderly care enterprises have strong motivation for innovation. As a separately planned city, Ningbo maintains high standardization of elderly care services and delivers remarkable demonstration effects. Distinct differences exist among the three cities in terms of economic development, industrial structure and aging degree, so the combined sample can generally reflect the overall development status of the smart elderly care industry in Zhejiang Province and even the whole country.

This research intends to offer references for government authorities to formulate relevant industrial policies, provide practical guidance for smart elderly care enterprises to optimize their development strategies, and contribute to the construction of a more comprehensive smart elderly care service system.

2. Development status of the smart elderly care industry

The smart elderly care industry covers multiple segments including hardware manufacturing, software development, platform operation and service provision, forming a comprehensive cross-sector industry. Driven by the rapid popularization of new-generation technologies such as artificial intelligence, the Internet of Things, big data and 5G, this industry has maintained a rapid growth momentum. In-depth investigations of enterprises in Zhejiang Province reveal that market participants in smart elderly care cover a wide range of types with huge gaps in operational scale, showing obvious stratified characteristics. Based on enterprise scale and market influence, these operators can be divided into four categories: large, medium, small and micro enterprises.

2.1. Large enterprises: Active layout and construction of full-chain smart elderly care ecosystem

Large enterprises account for less than 5% of all participants in the smart elderly care sector, yet they serve as the core driving force of industrial development by virtue of abundant capital reserves, profound technical accumulation and prominent brand influence. Such enterprises can be roughly categorized into three types.

The first category refers to leading tech giants represented by Alibaba, Tencent and Huawei. Relying on core technical strengths in cloud computing, artificial intelligence and the Internet of Things, these enterprises devote themselves to building open smart elderly care platforms. For instance, Alibaba provides data storage and analysis services for elderly care institutions via Alibaba Cloud; Tencent develops social and health management applications for seniors based on its social platforms; Huawei delivers infrastructure support for smart elderly care with 5G technologies and intelligent hardware products^[3].

The second type consists of large insurance and real estate enterprises including Taikang Insurance and Vanke Group. They regard smart elderly care as a core service feature of high-end senior living communities, and integrate medical, nursing and rehabilitation resources to deliver one-stop elderly care services for the aged. Taikang Community acts as a typical example, which adopts intelligent management systems to deliver all-round care for resident seniors.

The third group covers communication operators such as China Mobile, China Telecom and China Unicom. Taking full advantage of their 5G networks, household broadband and IoT user access resources, these operators launch exclusive smart elderly care service packages targeting elderly users. Typical practices include the senior version of Magic Box TV service from China Mobile, as well as intelligent monitoring and telemedicine solutions released by China Telecom.

Large enterprises generally adopt a full-chain coverage strategy for smart elderly care businesses, forming a complete industrial loop covering hardware equipment, software platforms, data storage and management, and service operation. Taking Alibaba Health as an example, it not only realizes secure storage and management of health data, but also generates personalized health recommendations through big data analysis to provide thoughtful health management services for the elderly^[4].

In terms of compliance management and risk control, large enterprises usually make sufficient investment. They have established relatively standardized systems for privacy protection and data security, and organize regular staff training to raise employees' awareness of data security and standardized operations. Meanwhile, they play a remarkable leading role in industrial chain coordination, linking upstream and downstream resources to drive the whole industry toward standardization and regularization.

Nevertheless, the smart elderly care businesses operated by large enterprises still have inherent drawbacks. On one hand, their products and services tend to target high-end markets with relatively high prices, which are unaffordable for ordinary elderly groups and inevitably restrict the popularization of relevant services. On the other hand, the platform ecosystems built by large enterprises remain relatively closed with high access thresholds for small and medium-sized service providers, making it difficult to form an open and win-win industrial environment. Therefore, large enterprises need to pay more attention to the universality and accessibility of their products in the future, reduce costs through technological and model innovation, and enable more seniors to access the convenience and comfort brought by smart elderly care.

2.2. Medium-sized enterprises: Gradual expansion and focus on segmented fields and regional markets

Medium-sized enterprises account for approximately 25% of all players within the smart elderly care industry. Most of them are locally influential regional operators or specialized firms with profound expertise in a single vertical segment. Having passed the initial startup phase, these enterprises possess stable customer bases and professional service teams, yet they still lag far behind large corporations in capital reserves, technical capabilities and brand influence.

The core businesses of medium-sized enterprises cluster around several segmented tracks. In terms of hardware equipment, they develop wearable and home monitoring devices such as smart bracelets, fall detection radars and smart mattresses. In software services, their primary offerings include community SaaS elderly care platforms, health management applications and emergency call systems. When it comes to service delivery, they mainly provide professional services covering age-friendly renovation, home-based care and rehabilitation training.

Such enterprises stand out for flexible operations and high industry concentration, enabling them to quickly adjust services according to the specific demands of local seniors and deliver practical, targeted solutions. For example, some medium-sized enterprises develop voice recognition systems compatible with local dialects, allowing elderly users to interact with smart devices in their familiar languages. Others cooperate with local medical institutions to design personalized health management plans tailored for senior groups.

Even so, medium-sized enterprises face multiple bottlenecks restricting their growth. Limited investment in research and development slows product iteration, making it hard for them to keep pace with rapid technological upgrades. Their market expansion heavily relies on government connections and policy support, while independent market-oriented operational capacity remains insufficient, which creates major obstacles for cross-regional replication and scaled development. Besides, insufficient investment in data security and privacy protection brings potential compliance risks, requiring further improvements to internal management systems and safety defense mechanisms.

To tackle these challenges, medium-sized enterprises may take multiple countermeasures: strengthen cooperation with research institutes to boost technical competence through industry-university-research integration; strive for government policy support while cultivating independent market operation capabilities; establish sound data security management systems to elevate overall compliance standards; and introduce and train professional talents to build more competent service teams.

2.3. Small enterprises: Urgent demand for digital transformation restricted by resource limitations and technical deficiencies

Small enterprises constitute the largest group in the smart elderly care industry, making up nearly 60% of all market participants. They maintain active business operations yet suffer from the weakest capacity to withstand market risks. Most small enterprises are run by individual entrepreneurs or tiny teams with limited business coverage, usually confined to one or several communities and sub-districts. Their service offerings are mostly basic elderly care services, including agency sales of smart devices, simple equipment maintenance, and training sessions that teach seniors how to operate smartphones.

The biggest advantage of small enterprises lies in their sensitive market response. They can promptly identify the real demands of local elderly residents and adjust relevant services in a timely manner. Low operating costs allow them to set affordable service prices that ordinary seniors can readily accept. In addition, they maintain close ties with local communities and can smoothly integrate into community-based elderly care service networks.

Nevertheless, small enterprises are confronted with prominent operational difficulties. They lack robust technical research capacities and professional technical teams, leading to inconsistent quality of products and services, which prevents them from building recognizable brand influence. Most operators lack a thorough understanding of relevant policies and regulations and have weak awareness of legal risks, while their employees generally possess poor proficiency in digital tools. Internal management systems are usually incomplete; fundamental rules such as standardized labor contracts and customer information protection mechanisms are often absent. Such shortcomings leave small enterprises in a passive position when handling contract disputes or user complaints.

Most small enterprises recognize the significance of digital transformation. However, constrained by insufficient capital and resources, they prioritize short-term profits and hesitate to make long-term technical investments. Inconsistent service quality frequently triggers user complaints, which further intensifies their operational pressures. Therefore, supplying low-cost, user-friendly digital tools for small enterprises to improve their service quality and operational efficiency has become an urgent task for the development of the whole industry ^[5].

2.4. Micro enterprises: Weak foundation and urgent demand for inclusive support

Micro enterprises account for roughly 10% of participants in the smart elderly care industry. They are mostly individual businesses or small studios with only two to three staff members, featuring ultra-small scales and the weakest risk resistance. Such enterprises have the poorest legal awareness and technical foundation. The vast majority do not employ full-time technical staff, rarely cooperate with large platform operators, and possess limited knowledge of relevant industrial policies and industry standards.

Micro enterprises mainly provide rudimentary services such as neighborhood mutual aid and housekeeping referrals, with extremely low adoption of intelligent systems. In daily operations, they are frequently involved in disputes arising from non-standard contracts and substandard service quality. Without access to legal aid, they face great difficulties in safeguarding legitimate rights and interests. These enterprises are in urgent need of free or low-cost digital tools, including simple scheduling software, health record templates, and public welfare call transfer services. Restricted by their tiny scale and uneven distribution of industrial resources, micro enterprises have very limited access to smart elderly care systems,

forming an obvious shortfall in the digital transformation of the whole industry ^[6].

In view of the unique dilemmas faced by micro enterprises, governments and social organizations should provide more attention and targeted support. Regional shared service platforms can be built to supply basic digital tools for micro operators; free public training sessions can be held to raise their awareness of compliant operation and improve their digital service capabilities; policy incentives and financial subsidies can also be deployed to help micro enterprises realize standardized and sustainable development with continuous capacity improvement.

Overall, the smart elderly care industry presents an obvious pyramid-shaped structure. Enterprises of different scales undertake distinct roles and encounter unique challenges within the industrial ecosystem. In the future, joint efforts covering policy guidance, technological innovation and business model innovation are required to drive industrial progress, construct a more comprehensive smart elderly care service system, and enable more elderly people to enjoy convenient elderly care and improved quality of life brought by technological advances.

3. Empowerment paths for enterprises driven by smart elderly care systems

All types of enterprises explore suitable empowerment implementation modes based on their own resource endowments. The relevant paths can be divided into four core dimensions, namely technical empowerment, service empowerment, ecological empowerment and data empowerment. The four dimensions do not operate independently, but need to form a coordinated and interactive linkage system.

3.1. Technical empowerment: Strengthen top-level design and build integrated smart elderly care platforms

Unified platforms shall be constructed to realize resource sharing. Qualified hospitals or elderly care institutions can be selected to undertake emergency treatment tasks according to distance and matching degree, so as to cut the overall cost of smart elderly care services and optimize the integrated elderly care system combining home-based, community and medical care ^[7].

Technical empowerment serves as the core carrier for the implementation and operation of smart elderly care systems. Large-scale enterprises are capable of conducting comprehensive independent research and development to build an integrated cloud-network-terminal platform. The cloud layer realizes big data computing and artificial intelligence analysis; the network layer connects all kinds of intelligent devices via 5G and Internet of Things technologies; the terminal layer deploys hardware products including smart bracelets, fall detection radars and voice assistants. Medium-sized enterprises adopt an operation mode integrating independent R&D and external cooperation. They purchase mature technical modules and carry out secondary development in light of the practical demands of local elderly care markets. Small and micro enterprises adopt third-party SaaS platforms, lowering their technical access threshold through annual or pay-per-use billing schemes ^[8].

The smart elderly care industry requires comprehensive top-level development planning, increased financial support, and continuous improvement of supporting policies and industrial standard systems ^[9]. The access threshold for social capital should be relaxed, and government subsidies can be provided to attract more market operators and capital into the elderly care industry. Meanwhile, a supervision and evaluation system matching the development pace of the elderly care industry ought to be established to ensure the long-

term stable operation of the whole sector.

3.2. Service empowerment: Online-offline integrated home care service network

Independent operation of online technical service platforms can hardly resolve various practical terminal difficulties in delivering elderly care services to the elderly. Elderly care services feature strong offline implementation attributes. Digital online portals can only fulfill basic functions such as demand registration and information push, while hands-on care and accompanying services actually needed by seniors cannot be realized merely through the Internet. Therefore, the overall operation of platforms must be coordinated and advanced synchronously with offline physical service resources. The integrated linkage of online and offline resources constitutes an indispensable component of improving the home-based elderly care service system.

Large enterprises in the market possess abundant capital and human resources. They generally adopt two approaches to strengthen offline service capacity: first, recruit and train full-time offline staff to build exclusive service teams; second, acquire mature local housekeeping and elderly care institutions to integrate existing service personnel. These two methods construct a complete service chain, forming a stable operation mode where users submit elderly care demands through online portals and professional offline staff deliver door-to-door care services according to reservations. This whole process boasts higher standardization and wider service coverage.

Lacking sufficient capital reserves comparable to large enterprises, medium-sized enterprises can hardly build full-coverage offline service teams on their own. Accordingly, most of them focus on local elderly care markets within their jurisdictions and establish long-term stable partnerships with neighborhood committees, residential property management companies, and local housekeeping service providers. They integrate multiple offline service resources to build a closed-loop service network covering unified order distribution by platforms, service reception by multiple cooperating entities, and evaluation feedback submitted by the elderly after service completion, reducing offline operating costs via local cooperative resources.

Restricted by limited capital and manpower, small and micro operators are unable to construct complete service systems. They act as fundamental terminal service providers in the entire elderly care industrial chain, undertaking scattered service orders distributed by large comprehensive platforms. They deliver basic on-site practical services for the elderly, including bathing assistance, medical accompaniment, and household cleaning. Meanwhile, they gain steady customer sources through online platforms and realize unified settlement of service fees after order completion. Enterprises of different scales form differentiated labor division based on their respective resources, undertaking service links matching their capacities in the industrial chain. Such a division mode can fully exert the respective operational advantages of all market entities and make the overall supply of elderly care services more complete and balanced.

3.3. Ecological empowerment: Industrial chain coordination and cross-industry cooperation

Smart elderly care is a composite service industry covering multiple independent industrial tracks including medical treatment, communication networks, financial security and real estate housing. Each sector has exclusive operation logic, qualification requirements and service resources. No single enterprise can gather all supporting resources to cover all business segments of the whole elderly care industrial chain, which makes cross-industry collaborative development an inevitable trend of the industry. The core value of

ecological empowerment lies in breaking resource barriers between different sectors and promoting long-term, in-depth cooperation among market players from all industries.

Cross-border integration of diverse entities can generate various elderly care service scenarios. Equipped with digital technologies such as the Internet of Things and big data, tech enterprises can realize real-time transmission of seniors' heart rate, blood pressure and other health monitoring data to hospital HIS systems after cooperating with medical institutions. Physicians can check seniors' health records online to carry out remote consultation and online follow-up visits smoothly. Cooperation between elderly care service providers and insurance institutions enables the customization of exclusive pension and nursing insurance products tailored to the elderly's characteristics of high incidence of chronic diseases and frequent daily care demands. Real estate developers can cooperate with smart elderly care service providers in the planning phase of new residential communities to uniformly deploy smart bracelets, emergency call devices, and a full set of smart elderly care terminals within communities, improving support for elderly care facilities from the residential perspective in advance.

The Zheli Yang Smart Elderly Care Platform operated in Zhejiang Province serves as a typical practical case of cross-industry ecological cooperation. This platform connects resource channels across the province and links thousands of public and private elderly care institutions, medical organizations and grassroots community service groups. The elderly and their families can complete all elderly care-related business, including consultation, service reservation, and subsidy application, via a single online platform without traveling through multiple channels, which greatly simplifies administrative procedures^[10].

Most medium-sized enterprises lack the capacity for full industrial chain operation and choose to deepen development in a single segmented ecological track. Taking the R&D of age-friendly intelligent hardware as an example, such enterprises take the initiative to reach deep binding cooperation with large comprehensive elderly care platforms and expand product sales relying on platform traffic. Vulnerable small and micro operators with weak risk resistance do not need to develop markets and technologies independently. They can continuously obtain stable customer resources and enjoy the technical and operational support provided by platforms by relying on a mature and complete industrial ecosystem.

3.4. Data empowerment: Realize the sharing of data resources

Data serves as the core and most critical resource supporting the operation of smart elderly care systems. At present, a prevalent practical bottleneck hindering the development of the smart elderly care industry is the insufficient interconnection and sharing of various types of elderly care data. The industry is in urgent need of a unified information sharing service platform to integrate elderly-related data preserved by various functional departments. Scattered senior information stored in sub-districts and communities shall be aggregated step by step into municipal and provincial databases, so as to realize the overall integration and cross-regional circulation of elderly care information.

District-level platforms continuously collect multi-dimensional information covering seniors' physical conditions, daily behaviors and service evaluations to establish detailed personal files, and push customized elderly care services matching individual demands simultaneously. Combined with historical blood pressure fluctuations and long-term medication records, the platform system can automatically send follow-up visit reminders and offer targeted dietary adjustment suggestions. It also tracks seniors' daily activity trajectories and counts the frequency of emergency calls to identify changes in self-care ability and send early warnings

of potential disability risks to family members.

Big companies have a huge amount of stored data, and they can build health analysis models that make more accurate predictions. Medium-sized businesses focus on specific groups of older people, like people with diabetes and older women who live alone, to collect detailed information that fits each group. When small and very small service providers get access to the unified platform for elderly care, they can just use the built-in data analysis tools that already exist there. They don't need to set up their own separate teams to research and develop algorithms, so this lets them improve their service offering with help from data. When all different kinds of elderly care information are put together, the entire system of elderly care services can match what older people actually need much better ^[11].

Disclosure statement

The authors declare no conflict of interest.

References

- [1] National Bureau of Statistics of China, 2025, 2024 National Economic and Social Development Statistical Bulletin. National Bureau of Statistics of China.
- [2] Zhejiang Provincial Department of Civil Affairs, 2025, Zhejiang Smart Elderly Care Development Report (2024). Zhejiang Provincial Department of Civil Affairs.
- [3] Ali Health Research Institute, 2024, 2024 Smart Elderly Care White Paper. Ali Health.
- [4] Sun CZ, Zhao YR, Wu CA, 2023, Research on Influencing Factors of Users' Willingness to Participate in Smart Elderly Care Services Based on Grounded Theory. *Journal of Beihua University (Social Science Edition)*, (5): 1–8.
- [5] Li F, 2024, Formation Logic and Development Paths of the Dilemma in Home-Based Eldercare Beds in Rural China: From the Perspective of Embeddedness. *Research on Aging Science*, 12(04): 42–54.
- [6] Shen FW, 2020, Rural Technological Empowerment: Strategic Choices for Effective Rural Governance. *Journal of Nanjing Agricultural University (Social Sciences Edition)*, 20(02): 1–12.
- [7] Hu Y, 2024, Current Situation and Prospect of China's Smart Elderly Care Industry. *New West*, (4): 107–110.
- [8] Wu X, 2021, Development Trends, Practical Dilemmas and Optimization Paths of the Smart Elderly Care Industry. *East China Economic Management*, 35(7): 1–9.
- [9] Man XO, Yang Y, Zhang L, 2025, The Research on the Coupling Mechanism and Implementation Path of Blockchain-Empowered Community Smart Home-Based Elderly Care Services. *Journal of Ocean University of China (Social Sciences)*, (3): 90–100.
- [10] Liu YL, Zhang H, 2018, Research on the Construction of a Public Service Platform for Intelligent Home-Based Elderly Care Based on Information Technology. *Information & Computer*, (15): 113–114.
- [11] Wang XH, Xiang YH, 2019, Development Practice and Reflection of Smart Elderly Care. *Social Sciences in Guangxi*, (7): 81–88.

Publisher's note

Bio-Byword Scientific Publishing remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.