

Technology Empowerment and Smart Elderly Care: A Strategic Study on Wenzhou's Approach to Building a Benchmark Wellness City

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Abstract: Wenzhou is actively exploring strategies to address population aging, striving to build a benchmark city for smart elderly care. The current aging situation and its associated challenges have led to a series of initiatives, including the construction of an intelligent elderly care system, the improvement of elderly care service infrastructure, and the parallel development of the wellness industry and talent cultivation. Research findings indicate that digital technology trends will be Wenzhou's core competitive advantage, while resource integration and model innovation are essential paths forward. Wenzhou urgently needs to forge a smart elderly care approach with local characteristics, providing a reference and setting an example for the nation in addressing population aging.

Keywords: Aging; Benchmark City; Smart Elderly Care; Wenzhou.

1. Introduction

The tide of population aging is profoundly impacting the economic and social development of various regions. As one of Zhejiang Province's key cities, Wenzhou is facing increasingly severe aging challenges. The Wenzhou municipal government and various social sectors have keenly recognized that effectively addressing aging and leveraging smart health and elderly care models to enhance the quality of life for the elderly have become unavoidable critical issues.

This paper analyzes the internal and external factors influencing Wenzhou's efforts to build a model city for smart health and elderly care. It explores how the city, with its unique advantages, is innovating its elderly care model to position itself as a benchmark in the wellness sector, not only in Zhejiang but across China. These efforts may provide valuable insights and references for other regions.

2. The Current Situation of Population Aging in Wenzhou

Data from the Wenzhou Civil Affairs Bureau reveals profound changes in the city's demographic structure. By 2025, within the central urban area defined by the overall territorial spatial plan—including Yueqing, Rui'an, and Yongjia's concentrated urban development zones—Wenzhou's 76 subdistricts and towns will have a permanent elderly population (aged 60 and above) reaching as high as 890,000 [1]. Within the municipal districts, the elderly population is expected to be 498,000. The aging trend varies across Wenzhou's districts. Lucheng and Ouhai exhibit significantly higher aging levels, whereas Longgang has a relatively lower aging rate. Population aging has become an unavoidable reality for Wenzhou, with the aging rate expected to continue rising. By 2035, the elderly population in the central urban area may surge to 1.55 million, with an aging rate of 22.1%. In the four core districts—Lucheng, Longwan, Ouhai, and Dongtou—the elderly population is projected to reach 805,000. After 2030, Wenzhou is likely to face a rapid surge in its elderly population. This poses a serious challenge

to urban development, making it imperative for Wenzhou to proactively adapt, explore innovative elderly care models, and focus on building a resilient and dynamic smart elderly care service ecosystem.

3. The Development of Intelligent Wellness in Wenzhou

The Wenzhou Civil Affairs Bureau and the Wenzhou Municipal Natural Resources and Planning Bureau jointly formulated the "Wenzhou City Central District Nursing Service Facilities Layout Special Plan (2021-2035)" to promote the construction of recreational and nursing service system; the plan sets a clear target for the number of nursing beds configuration: 2025, 2035, and focuses on the construction of nursing service facilities adapted to the demographic structure and spatial characteristics of the population, and focuses on the 15-minute home nursing service circle. There are currently 278 elderly care facilities in the centre of Wenzhou and 225 in the district (as of August 2024). According to the plan, the number of beds in downtown Wenzhou will increase to about 26,700 by 2025 and 46,500 by 2035. The government plans to improve the allocation of medical resources: every 1,000 elderly people in the city will have 5.5 rehabilitation care beds in medical institutions, and the proportion of nursing care beds in nursing institutions in the total number of nursing care beds will be no less than 58% [2].

In addition, Wenzhou has established a number of recreation projects in recent years, such as the Hundred Cities Recreation Project, Yunjiang Yishan International Wellness Resort Centre, Lucheng District Pension Service Centre, Taikang House - Ou Park, Wenzhou Jinzhu Jiayuan AI+Intelligent Recreation Showroom[3] and so on, Lucheng District, Qidu Street, the International Recreation Centre, Oujiangkou International Nursing and Health Community, and other projects are under construction, and there are also a number of high-quality senior care facilities are successively put into operation, showing the trend of multi-point blossoming. At the same time, Wenzhou is also actively exploring the forest recreation industry, Wenzhou City rate

the first of the national municipalities to develop and introduce the "Wenzhou City Forest Recreation Base identified standards", clear from the static recreation, sports recreation, traditional Chinese medicine recreation and cultural recreation of the four major dimensions of the product connotation of the rich, to create municipal forest recreation bases, of which Yandang Mountain National Forest Park and other three forest recreation base is included in the national forest recreation base construction pilot unit. Pilot unit.

4. The Dilemma of Intelligent Wellness Development in Wenzhou

4.1. Unclear Planning and Objectives

Wenzhou Municipal Government has been involved in the smart health care industry, and has a relevant layout and development plan, but there are still challenges in the implementation. Financial resources are overly focused on hardware facilities, resulting in a lack of investment in service quality improvement, talent training and other soft strengths; some of the health care projects have improperly selected sites, poorly designed functions and services, resulting in a disconnect between project results and market demand; and unsatisfactory operational efficiency: all of these problems have exposed the current situation of insufficiently clear planning and ambiguous goal-setting in this area.

4.2. The Combination of Technology and Service is Not Close

Wenzhou intelligent recreation products have synergistic defects in technology application and service supply. Some of the smart wearable devices have already achieved the function of monitoring basic physical signs; the in-depth data analysis and health guidance module shows obvious shortcomings; the conventional artificial intelligence module has not yet been embedded, making it difficult for the health intervention programme to achieve the expected effect. Digital service platforms generally adopt standardised service templates, and the differences in individual physical signs and the particularities of living scenarios are not included in the assessment system, resulting in a mismatch between service content and the heterogeneous needs of the elderly. The product distribution system shows regionalised characteristics, the physical distribution network and online channels do not form effective complementary, and the problem of asymmetric information between supply and demand continues to intensify. It is necessary to build an intelligent service resource supply guidance model, combining cloud computing, the Internet, big data and other information technologies, taking the demand for recreation services as the guide, guiding the intelligent recreation service platform with the joint participation of diversified service subjects, realising the sharing of resources for supply and demand of recreation and intelligently matching them to provide diversified and multi-level on-demand services, and stimulating the transformation of potential demand of recreation personnel to effective demand [4-5].

4.3. Regional Development Imbalance

The recreation service network around the main city of Wenzhou has formed a basic framework, but the regional digital support facilities show significant differences. Remote mountainous areas and offshore islands generally have low

coverage of intelligent terminals, the Internet of Things application scenarios are missing and other prominent problems. In Taishun County, only 12% of administrative villages are equipped with smart health terminals, and 78% of the elderly rely on traditional village doctors. Weak network signals, limited promotional channels and other factors, resulting in health monitoring bracelets, remote diagnosis and treatment systems and other intelligent equipment is difficult to reach the silver-haired group. Part of the elderly population still relies on the traditional way of consultation, and is unable to obtain digital medical services such as electronic health record updates and cloud-based expert consultation in real time, and this technological gap directly affects the realisation of the universality of recreation services.

4.4. Data Security and Privacy Protection Issues

In the process of digitisation of the smart recreation industry, the data security protection mechanism and privacy protection norms are facing severe tests. There are multiple security risks in some of the intelligent recuperation systems in Wenzhou: there are technical loopholes in the underlying protection system of the Internet platform, neither the deployment of complete quantum encryption technology nor the lack of blockchain distributed storage architecture, and the vulnerability of the system is easy to be attacked by the infiltration of malicious code; the user authorization mechanism has yet to be formed into a standardized process, and the interface of the collection of biometric data has not been set up to provide a secondary verification link, which has formed a risk exposure to the information security of the elderly groups. The user authorisation mechanism has not yet formed a standardised process, and the biometric data collection interface has not been set up with a secondary verification link, creating a risk exposure that threatens the information security of the elderly. During the transmission of sensitive medical data such as neuroelectric signals, more than 63% of service providers have not opened data traceability ports to guardians, a technical cover-up that directly reduces informed consent clauses to formal promises.

4.5. Insufficient Resource Integration

Recreation industry as an emerging industry, social awareness of it is still insufficient, cross-border integration is not deep, and the development of homogenisation is serious. At present, the supply level of recreation services in China is low, the content is single, recreation resources are in short supply, and the problem of contradiction between supply and demand of recreation services is prominent [6]. Medical, nursing, community services and other resources are scattered, lack of a unified platform, has not yet formed a large-scale, clustered development. Most of the community health service centre in Wenzhou have not set up geriatric medicine department, it is difficult to meet the needs of some of the elderly with basic diseases in hospital, at the same time, the intelligent level of community home nursing service is low, lack of Internet diagnosis and treatment of basic functions and remote care services, most of the community aged care service centre are only able to provide basic services such as day care, meals, etc., and it is difficult to provide the elderly with the urgent needs of rehabilitation and nursing care, health care and mental needs. In addition, the number of licensed caregivers in Wenzhou City is relatively small, with only 24.86 licensed caregivers per 10,000 elderly people,

ranking second to last in the province. There are even fewer professionals engaged in community-based elderly care services, mainly retirees and volunteers, who are generally older, less educated and more mobile.

5. Creating a Smart Leisure Strategy to Help Cities Prosper

5.1. Strengthening Resource Integration and Platform Building

5.1.1. Optimisation of Intelligent Travel Facilities

Wenzhou as a second-tier city with rich transport facilities, there are aviation, railway, urban rail transit S line, etc., but the optimisation of the public intelligent transport system is not complete enough, should introduce intelligent traffic signals, driverless public transport such as buses, network car, etc., to improve the convenience of the city commute 15 minutes. At the same time, the number of seats for the elderly should be increased in public transport, green channels for the elderly, wheelchairs and handrails and other safety facilities, not only focusing on the convenience and safety of travelling, but also taking into account the situation of the increasing number of elderly people, to achieve dynamic adjustment.

5.1.2. Optimising the Service Support Structure

The functional structure of community street offices and schools is facing optimisation. Communities plan to renovate and upgrade their street offices or schools, and add embedded healthcare-integrated institutions or service points, where residents can enjoy day care, short-term nursing care, and long-term care; medical institutions are actively seeking collaboration with recreational and healthcare institutions, and are launching telemedicine and family doctor contracting. The First Affiliated Hospital of Wenzhou Medical University and Shanghai Ruijin Hospital have jointly established a 5G remote diagnosis and treatment platform, which handles over 2,000 complex medical cases annually. The opening of activity venues for the elderly and training courses in local schools is a highlight, and the ageing renovation of elderly care institutions and healthcare-integrated service facilities has been carried out in tandem, with a significant increase in safety and convenience. Regular surveys should be conducted to meet the demand for personalised recreational services for the elderly, such as health counselling, psychological comfort and rehabilitation physiotherapy. Volunteer activities have been widely carried out, allowing more volunteers to participate in recreational and nursing services, and the reach of services has been extended.

5.1.3. Balanced Regional Resource Development

Focusing on the distribution of public health resources in mountainous and island areas, Wencheng, Taishun and other ecological function areas and Dongtou and other coastal areas should be prioritised in the planning and construction of composite recreation service hubs. Integration of digital means to build a smart recreation platform, focusing on breaking through the spatial barrier problem of medical resources, the establishment of urban tertiary hospitals and grass-roots health organisations regular collaboration system. Remote diagnosis and treatment terminal equipment projects are simultaneously promoted to form an information infrastructure network with territory-wide coverage. Exploring the linkage mechanism of multilevel medical institutions, and realising the gradient sinking of high-quality

resources through the modes of technology export, talent rotation and equipment sharing.

5.2. Improvement of Intelligent Wellness Service System

Establish a standardized system for elderly-care services in Wenzhou City, including the development of age-friendly operational guidelines for smart elderly-care devices (drawing on the Japanese Industrial Standards [JIS]), standardized service procedures, and quality benchmarks. This framework aims to build a unified citywide service system that integrates medical, elderly-care, and community resources, to create a 'Wenzhou intelligent recreation cloud platform'; health management, remote medical care, pension services, and other functions into one. Residents' personalised recreational programmes are tailored by the platform's embedded artificial intelligence system, and barriers between medical, pension and community service centres are eliminated, with information interoperability. artificial intelligence assistants such as Deepseek, Wenxin Yiyin, and Kimi have been introduced to assist with condition monitoring and rehabilitation guidance, reflecting the scientific nature of the application. Intelligent portable devices such as watches, heart rate monitoring bands and eyeglasses allow users to wear them to analyse the living habits of the elderly with the help of big data, which in turn leads to the formation of exclusive wellness plans.

5.3. Promoting the Development of Intelligent Wellness Industry

5.3.1. Promoting the Development of Recreational and Cultural Industry Clusters

Focusing on the characteristics of Wenzhou's private economy, we should improve the four-dimensional linkage mechanism of "government-enterprise-community-family". Build a health and wellness industry cluster to form a scale effect. Establish health and wellness industrial parks or towns in the central urban area and key regions of Wenzhou, and concentrate the layout of health and wellness industrial projects to form an industrial agglomeration effect. Support local enterprises to develop health and wellness products, such as smart homes, rehabilitation equipment, etc. For example, the cross-border model of "health and wellness + photovoltaic" constructed by CHNT Group, which installs photovoltaic panels on the roofs of retirement communities, reducing electricity costs by 30%. This not only obtained certification from the National Development and Reform Commission as a "carbon peak and carbon neutrality innovation case" but also achieved dual benefits of "green energy + health monitoring". Introduce and cultivate a number of leading enterprises in the health and wellness industry, promote the extension and improvement of the health and wellness industry chain, and form a complete health and wellness industry ecology. For instance, a smart health and wellness industrial park can be built in Oujiangkou New Area to attract enterprises specializing in medical technology, health management, and elderly care services. Hold the "Wenzhou International Smart Health and Wellness Industry Exposition" to attract domestic and foreign enterprises to participate. Strengthen exchanges and cooperation with domestic and foreign health and wellness institutions, introduce advanced technology and management experience, and enhance the competitiveness of Wenzhou's health and wellness industry.

5.3.2. Development of Recreation and Cultural Tourism Construction

Deepen the synergistic development of the recreation industry with tourism, culture and other fields, integrate Wenzhou's regional characteristic cultural resources, incorporate Wenzhou drum lyrics, Ou embroidery, southern opera and other non-heritage projects into the recreation service system, and enhance the level of cultural experience of the aging group. Relying on geographical symbols such as Dongtou Archipelago, Nanxi River Basin, Yandang Mountain Scenic Spot and Taishun Ecological Zone, we have built a matrix of recreational and cultural tourism products covering diversified themes such as island retreats, hot springs and health care, and health management of traditional Chinese medicine. Establish a multi-dimensional marketing mechanism to achieve the organic integration of recreation tourism with rural leisure, cultural exploration and other forms of business, and form a differentiated, multi-level product supply system.

Explore the articulation path between recreation services and rural revitalisation strategies, cultivate new rural recreation businesses, and activate the endogenous growth momentum of the county economy. Strengthen the standardised construction of recreation tourism infrastructure, focus on improving the level of intelligence and humane design standards of service facilities, and cultivate internationally competitive recreation holiday destination brands. Promote the synergistic evolution of recreation tourism and related industries such as transport networks, accommodation clusters, special catering, etc., and build a recreation industry ecosystem covering the whole value chain. Improve the safety warning system and emergency response mechanism for recreation tourism, and establish a double protection network for personal safety and property risk management of tourists.

5.4. Training and Introduction of Recreation Talents

5.4.1. Cultivating Regional Talent

The practice of Zhejiang Oriental Institute of Vocational Technology's Wisdom Recreation College is of exemplary significance; the institute's geriatric service and management profession has formed a provincial and municipal-level characteristic discipline advantage, and its curriculum system deeply integrates cutting-edge technology modules such as the operation of intelligent medical equipment and health management informatisation. Wenzhou Medical University and Wenzhou University and other comprehensive colleges and universities urgently need to expand the layout of recreation and culture disciplines, especially in the construction of geriatric nursing training bases, chronic disease management simulation system development and other directions urgently need a breakthrough. It is recommended to build a government, school and enterprise collaborative cultivation mechanism, the implementation of the 'Youth Seedling Programme' special fund, through the credit system to achieve the articulation of vocational skills certificates and academic education; support the head of the recreational enterprises to establish a corporate university, and introduce international standards such as the Japanese intermediate care and well-being of the certification system into the staff grade promotion channel.

5.4.2. Introducing Excellent Talents

Attract domestic and foreign high-end talents in the

recreation and culture industry to settle in Wenzhou through the design of special supportive policies, with specific measures covering supporting systems such as residential security support and preferential fiscal and tax programmes. Construct a database of professional talents in the field of recreation, simultaneously improve the introduction and retention mechanism of expert talents, and set up a special commendation system for industry leaders, such as granting similar 'Wenzhou Recreation Leader' honorary title and matching special incentive funds. Promote the establishment of international recreation organisations strategic collaboration platform, the systematic introduction of cutting-edge recreation service system and technical standards, to promote the local recreation industry and international standards.

5.5. Optimise Support Policies and Financial Security

The formation of Wenzhou City, the leading group of intelligent recreation work, given its industrial planning and resource allocation functions, Propose measures such as "subsidies for new infrastructure construction in mountainous areas", The leading group needs to clarify the boundaries of departmental authority and responsibility, integrate cross-departmental collaboration effectiveness, and guarantee the penetration of policy implementation. Municipal finance to set up special support funds, focusing on infrastructure upgrading, service supply optimisation, industrial technology innovation in three major areas; explore the establishment of a government guidance fund, prying private capital to participate in the recreation industry layout, to build a diversified financing system. Create a mother fund for the intelligent recreation industry, focusing on cultivating exemplary projects; implement the PPP cooperation programme, and provide incentives such as tax relief and land guarantee. Construct an all-process supervision system, establish a quarterly supervision system, and implement a dynamic accountability mechanism. Introducing Huawei, Aliyun and other technology giants to build a technology-enabling platform; establishing a quarterly industry assessment model and implementing a star certification system for service quality; establishing a dynamic iteration mechanism for policies, and optimising the resource allocation scheme in real time based on big data analysis.

5.6. Strengthening International Communication and Cooperation

Wenzhou urgently needs to deepen the interaction and collaboration in the field of international recreation. Japan, Singapore and other countries are booming in the wisdom of the recreation industry, and the establishment of a solid partnership with them, the introduction of cutting-edge technology, advanced management systems and cutting-edge concepts of recreation, can significantly enhance the degree of internationalisation of the wisdom of the recreation services in Wenzhou. Organising local recreation enterprises to go overseas for in-depth research can open up their international thinking. Wenzhou's recreation service standards should be actively aligned with international benchmarks to enhance service quality and market competitiveness. At the same time can also be held similar to the 'Wenzhou International Wisdom Recreation Forum' and other international recreation industry expositions and forums, gathering experts and enterprises from all over the world, to

show the vitality of Wenzhou's recreation industry and the blueprint for the future. Wenzhou's unique geographical location and abundant resources can attract overseas tourists to experience; in-depth development of the international recreation tourism market, and can achieve a mutually beneficial win-win situation.

6. Conclusion

Science and technology innovation is reconstructing the paradigm of elderly service, intelligent solutions to significantly improve the effectiveness of services, effectively bridging the gap between the elderly and the digital society. Elderly people in the process of obtaining technological convenience, synchronisation also promotes the perfect construction of Wenzhou intelligent recreation system. This trend of Wenzhou recreation hardware facilities, software system put forward double upgrade demand. Wenzhou city development needs to adhere to the technology-driven strategy, continue to promote the iterative upgrading of the wisdom of the elderly system; so that scientific and technological innovation is transformed into the core kinetic energy of the development of recreation and leisure industry, and intelligent recreation and leisure services are shaped into the characteristics of the modern city logo.

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