A Study on the Necessity of Developing an Information-Based Elderly Care Service Platform in the Context of Digitalization

Meijian Ren[1]，Chengliang Zhu[2*]

[1]*Zibo Polytechnic University，Zibo，255314，China*
[2]*Zibo Central Hospital，Zibo，255314，China*
[*]*Corresponding Author：18560292706@163.com*

Abstract: *With the development of the social economy, traditional elderly care models can no longer meet the growing diversified and personalized needs of the elderly. Expectations regarding quality of life, health management, and spiritual and cultural life continue to rise, placing higher demands on the precision and intelligence of elderly care services. Therefore, how to utilize modern technological means—especially big data technology—to optimize elderly care service models has become an urgent issue to address. In the field of elderly care services, big data technology enables a better understanding of the needs and conditions of the elderly, thereby facilitating personalized and precise service delivery.*

Keywords: *digitalization; elderly care services; information-based platform*

Introduction

Currently, with the intensification of population aging, traditional elderly care models are becoming unsustainable. The demand for elderly care is shifting toward diversification and high quality, bringing about various socio-economic impacts. Information technology plays a significant role in elderly care management, data sharing, and intelligent services. The construction of an information-based elderly care platform is of great importance for optimizing resource allocation. The following sections will explore these issues in depth.

1. Background and Needs of an Aging Society

1.1 Population Aging Trends

Aging is not only characterized by an increase in the elderly population but also by a growing complexity within the internal structure of that population. With the continuous expansion of groups such as the oldest-old, empty-nest elderly, and disabled seniors, traditional family-based elderly care models have become increasingly unsustainable; the demand for professional and socialized elderly care services is becoming more pronounced. Aging imposes tremendous pressure on the elderly care service system and profoundly affects the functioning and sustainable development of the socio-economic system[1]. On one hand, the rapid growth of the elderly population leads to a rising dependency ratio, thereby increasing the caregiving burden on the younger generation and society as a whole. On the other hand, aging may also result in labor shortages and shrinking consumption, posing obstacles to economic growth. It is clear that proactively addressing population aging and establishing a corresponding social policy system is essential for national stability and public well-being. This is a necessary condition for achieving high-quality economic development and harmonious social progress[2].

1.2 Changes in Elderly Care Service Demands

With the development of the economy and society, along with the transformation of personal values, the expectations of the elderly regarding care services have been steadily rising. They not only require basic daily assistance but also long for emotional support, spiritual care, and self-fulfillment. This

necessitates a shift in elderly care services from merely "meeting survival needs" to "pursuing quality of life," calling for continuous innovation in both service content and delivery methods to create a positive and dignified later life for the elderly.

As the proportion of the elderly population continues to increase, the demand for elderly care services presents new characteristics and trends. On the one hand, the needs of the elderly are becoming increasingly diversified. Beyond traditional basic needs such as daily care and medical services, there is growing demand for emotional support, cultural and recreational activities, and social engagement. The elderly now expect more personalized and diversified services to meet their holistic development needs[3]. On the other hand, expectations regarding the quality of elderly care services are also rising. With improved living standards and heightened health awareness, higher demands are being placed on facility infrastructure, service quality, and the professionalism of care personnel. At the same time, home-based and community-based elderly care models are gaining popularity, posing new challenges for the improvement of community service systems.

These changes in demand place new requirements on the construction of the elderly care service system. First, it is necessary to accelerate the development of a multi-level and diversified elderly care system to meet the differentiated needs of various elderly groups. This requires not only improving services in care institutions but also vigorously promoting home-based and community-based care options to provide more flexible and convenient choices for the elderly[4]. Second, the level of professionalization in elderly care services must be continuously improved. This entails strengthening the workforce of elderly care professionals, refining service standards, and establishing comprehensive quality evaluation systems to promote the development of elderly care in a more professional and standardized direction. Lastly, modern information technology must be actively employed to advance smart elderly care. Through the use of technologies such as the Internet of Things, cloud computing, and big data, intelligent care service platforms can be built to deliver personalized and smart services, thereby enhancing the efficiency and quality of elderly care provision[5].

1.3 Socio-Economic Impact

At the macro level, population aging primarily affects the labor supply of a country or region. As the proportion of the elderly population increases, the share of the working-age population correspondingly decreases, leading to potential reductions in both the quantity and quality of the labor force. Labor shortages may not only constrain economic growth but also result in industrial structural imbalances, thereby affecting the sustainability of economic development. Meanwhile, the growing elderly population significantly increases the burden on the social security system. Expenditures on pensions, medical insurance, and other forms of social protection will rise sharply, potentially crowding out public investment in other sectors and compromising the sustainability of government finances.

At the micro level, population aging also exerts a significant influence on family structures and intergenerational relationships. Under the traditional family model, children are expected to shoulder the responsibility of caring for elderly parents. However, with shrinking family sizes and rising work pressures among younger generations, this model is increasingly under strain. Many elderly individuals are left to live alone, and both their material and emotional needs require greater attention and support from all sectors of society. Furthermore, intergenerational tensions may be exacerbated by aging-related issues. In the redistribution of social resources, conflicting interests may arise among different age groups. Balancing these interests and achieving intergenerational equity has become a critical challenge for policymakers[6].

2. The Role of Information Technology in Elderly Care Services

2.1 Information-Based Management

The core of information-based management lies in the collection, integration, analysis, and application of data. By establishing unified data standards and interface specifications, it becomes possible to aggregate and link elderly care service data dispersed across various departments and institutions, thereby forming a comprehensive, accurate, and real-time updated database. On this basis, advanced technologies such as big data analytics and artificial intelligence can be employed to uncover underlying patterns and values within the data, providing scientific support for decision-making in elderly care services.

Information-based management also facilitates the optimal allocation of elderly care resources. Through big data analysis, the demand for elderly care services across different regions and demographic groups can be precisely identified, enabling the rational planning of facility layout and infrastructure development. Additionally, information platforms support the integration and sharing of elderly care resources, breaking down interdepartmental and regional barriers and enhancing resource utilization efficiency.

Moreover, information-based management offers broad possibilities for the innovation of elderly care service models. With the support of next-generation information technologies such as the Internet, the Internet of Things, and cloud computing, new service forms—such as smart elderly care, remote monitoring, and home-based care—can be developed to meet the diverse and personalized needs of the elderly[7].

2.2 Data Sharing and Integration

With the deepening of population aging and the continuous growth of the elderly population, the demand for elderly care services has become increasingly diversified and personalized. At the same time, the uneven geographical distribution of elderly care resources and the varying degrees of informatization have resulted in significant information asymmetry between service providers and recipients, leading to inefficient resource allocation. To address this issue, it is urgent for relevant authorities to promote data sharing and integration, break down data barriers among departments, regions, and institutions, and achieve cross-level, cross-system, and cross-department information connectivity and business coordination[8].

Elderly care services involve multiple departments, including civil affairs, health care, human resources and social security, medical insurance, and finance, and cover various service types such as home-based care, community care, and institutional care. The persistent problem of “information silos” severely limits the overall efficiency of elderly care service provision. By utilizing data sharing and integration, it is possible to aggregate, compare, and clean information scattered across various departments and systems—such as demographic data on the elderly, information on elderly care institutions, personnel data, and service project data—and establish a unified, standardized database that is comprehensive, accurate, and dynamically updated. Based on this shared and integrated data, big data analysis technologies can be applied to identify patterns in elderly service demands, assess the spatial alignment of regional care resources, and predict future trends in elderly care development, thus providing accurate data support for government decision-making, industry supervision, and institutional management.

Data sharing and integration play a critical role in optimizing the allocation of elderly care resources. Through data sharing, government departments can access real-time information on the spatial distribution of care facilities, bed occupancy rates, and service capacities within their jurisdictions, identify resource gaps and service blind spots, and formulate targeted policies to strengthen weak areas. Elderly care institutions can use data comparison to evaluate their service capacity against regional averages, pinpoint areas for improvement, and refine their operational strategies. Elderly individuals and their families can also query data to quickly obtain information about the location, pricing, and service offerings of care institutions, enabling informed decisions and helping to alleviate the problem of information asymmetry.

2.3 Intelligent Services

In the area of health management, intelligent services can monitor elderly individuals’ vital signs and activity status in real time through wearable devices and smart home systems, enabling the early detection of abnormalities and timely intervention. Additionally, based on health records and medical history data, intelligent systems can offer personalized health guidance and chronic disease management plans to support scientific health maintenance and improve quality of life.

In terms of daily care, intelligent services can provide personalized suggestions for meal planning and daily routines according to the living habits and preferences of elderly individuals, thereby meeting their diverse needs. The application of technologies such as intelligent voice interaction and emotional companionship can also alleviate feelings of loneliness and enhance emotional well-being. For disabled or semi-disabled elderly individuals, intelligent rehabilitation aids and training systems can deliver tailored rehabilitation plans to improve self-care capabilities.

In emergency assistance, intelligent services can implement a “one-click emergency call” function. When an elderly individual encounters a sudden situation, simply pressing a device button or issuing a voice command enables the system to automatically identify the event and notify relevant parties, ensuring timely help. Furthermore, based on location data and behavioral trajectory analysis, intelligent systems can assess whether the individual is in a potentially dangerous state and determine whether proactive care and intervention are required.

3. The Significance of Elderly Care Information Platform Construction for Resource Optimization

3.1 Enhancing Resource Allocation Efficiency

By integrating diverse service resources across elderly care institutions, communities, and home-based settings, the elderly care information platform breaks through traditional information barriers and provides elderly individuals with menu-style, personalized service options. This not only broadens service channels and enriches service content, but more importantly, enables precise matching and efficient utilization of elderly care resources.

A unified elderly care information platform facilitates the scientific allocation and balanced distribution of care resources. Through the platform’s big data analytics capabilities, decision-makers can accurately access key information such as the distribution of elderly populations and their service demands across regions, allowing for the development of more practical and targeted elderly care service plans. This helps prevent resource waste and redundant construction while promoting the equal development of elderly care services across regions, ensuring that every elderly individual has access to high-quality and convenient care.

The elderly care service information platform also creates favorable conditions for market entities to participate in service provision. With its credit evaluation system and dynamic supervision mechanism, the platform allows high-quality institutions and care professionals to stand out and gain public recognition and market reputation. This not only stimulates market vitality and encourages healthy competition within the industry but also enhances the overall quality and professionalism of elderly care services. At the same time, the platform offers convenience for small and medium-sized care institutions to establish an online presence, helping them expand their service reach and improve market competitiveness, ultimately fostering a diversified, market-oriented, and professional ecosystem for elderly care services.

Moreover, the platform provides elderly individuals and their families with a channel to participate in care-related decision-making. By browsing information on service offerings and institutional evaluations, the elderly can independently choose care services and providers that suit their needs and preferences. This approach respects the autonomy and choice of elderly individuals while enhancing their sense of gain and happiness. Meanwhile, family members can use the platform to stay informed about service conditions and participate in service evaluation and supervision, thereby fostering a virtuous cycle of familial and human-centered interaction in elderly care services.

3.2 Improving Service Quality

An information platform can assist elderly care institutions in achieving the standardization and regulation of service procedures. Through the platform, service providers can establish comprehensive service standards and operating procedures, clarifying service content, timing, and requirements to ensure that the service process remains orderly and compliant. At the same time, the platform can record and manage service-related data—such as recipient information, service content, and service duration—providing objective evidence for service quality supervision and evaluation. This data-driven quality management model helps institutions promptly identify and resolve issues during service delivery, continuously optimize service processes, and enhance overall service standards.

The information platform offers a convenient and efficient communication channel for elderly care institutions. In traditional service models, communication between caregivers and elderly individuals or their families often relies on face-to-face interaction or telephone contact, making it difficult to ensure timely and accurate information exchange. Through the platform, service personnel can interact with care recipients in real time, quickly understand their needs and feedback, and adjust service plans accordingly. Meanwhile, the platform can also provide elderly individuals and their families with

online consultation, complaint, and feedback functions, thereby streamlining communication and improving the interactivity and transparency of services. This efficient and convenient mode of communication fosters better understanding and trust between service personnel and elderly individuals, enhancing service experiences and satisfaction.

Additionally, the elderly care information platform facilitates the optimal allocation of service resources. By using the platform, elderly care institutions can gain a comprehensive understanding of each individual's health status, living habits, and personal interests, thereby delivering personalized and precise care services.

3.3 Cost Control

The elderly care information platform can integrate various service resources, match supply with demand, and improve resource utilization. Through the platform, elderly individuals and their families can conveniently access information on service content, pricing, and evaluations, enabling them to select appropriate service items and institutions based on their needs. This not only satisfies the diversified and personalized service demands of the elderly but also helps service providers accurately target their clientele, avoiding resource idleness and waste. Meanwhile, the platform can utilize big data analytics to dynamically monitor service supply and demand, promptly adjust resource allocation, and thereby optimize resource distribution to control service costs.

The elderly care information platform also contributes to regulating the service market and reducing transaction costs. Traditional elderly care markets often suffer from information asymmetry and insufficient supervision, resulting in inconsistent service quality, inflated prices, and inadequate protection of elderly individuals' rights. Through the platform, a unified service standard and quality evaluation system can be established, enhancing oversight and accountability of service providers, improving service quality, standardizing pricing, and safeguarding the legitimate rights of the elderly. At the same time, the platform can streamline service transactions, reduce intermediaries, lower transaction costs, and maximize the effectiveness of limited service funding.

Furthermore, the elderly care information platform promotes the sharing and integration of service resources, achieving economies of scale and lowering per-unit service costs. At present, elderly care resources in China are scattered, small in scale, and unevenly distributed, making it difficult to achieve synergy and resulting in high service costs. With the aid of the information platform, geographical and departmental barriers can be overcome, facilitating the sharing and mobility of resources and enabling cross-regional, cross-entity collaborative services. This not only expands the reach of quality resources and enhances service efficiency, but also reduces unit costs through large-scale operations, improving the effectiveness of fund utilization.

Conclusion

Against the backdrop of intensified population aging and the unsustainability of traditional elderly care models, the demand for elderly care services is shifting toward diversification and higher quality. Information technology plays a significant role in elderly care management, data sharing, and intelligent service delivery. The construction of an elderly care information platform can enhance resource allocation efficiency, improve service quality, and control costs, thus holding great significance for the optimization of elderly care resources and providing strong support for the realization of personalized and precise care services.

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