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INTEGRATING DEEPSEEK INTO RURAL ELDERLY SERVICES: OPPORTUNITIES, CHALLENGES, AND ADAPTATION STRATEGIES IN JILIN PROVINCE, CHINA

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ABSTRACT

Given China's aging population and rural revitalization, artificial intelligence has provided a new approach to addressing the shortage of rural old-age resources. This study focuses on a village in Jilin Province, from the perspective of village cadres and township civil affairs cadres. By employing qualitative methods, including interviews with key informants (2 individuals) and focus groups (2 groups with a total of 10 participants), it investigates the process of implementing policies related to the DeepSeek system in old-age services. The study finds that grassroots managers believe DeepSeek enhances the understandability of policies through voice interaction to provide "plain language interpretation" of old-age subsidies and other policies; it precisely analyzes the needs of the elderly to improve service targeting; and it links county and township medical resources to conduct remote consultations, thereby strengthening resource integration. The challenges are mainly reflected in four contradictions: the elderly's insufficient digital literacy and limitations in dialect recognition; unstable village-level networks and the absence of a mechanism for sharing technical maintenance costs; the elderly's emotional aversion to "robot butlers" and privacy concerns; and the lack of effective standards to measure the improvement of service quality. In response to these challenges, it is suggested to develop dialect voice libraries to enhance technological inclusiveness; strengthen policy training for grassroots managers; establish resource integration mechanisms to deepen technological integration; customize technological functions based on rural needs; and build a scientific service quality evaluation system. The study shows that by advancing both technological adaptation and institutional innovation, DeepSeek can be effectively integrated into the rural old-age system, injecting new momentum into the old-age cause in Jilin Province.

Keywords: Separated Application of DeepSeek technology, Rural old-age services, Policy implementation process

INTRODUCTION

Improving rural elderly care services is an inherent requirement of China's rural revitalization strategy. In 2024, the aging rate in Jilin Province (the proportion of people aged 60 and above) was approximately 28.2% (J. P. B. o. Statistics, 2025), significantly higher than the national average of 22% (N. B. o. Statistics, 2025). Meanwhile, according to Jilin J. P. B. o. Statistics (2025), the proportion of empty-nest elderly in rural areas of Jilin Province has exceeded 60%. This presents a "double pressure" of deep aging and a weak foundation for elderly care security.

The "Internet +" technology builds a network platform for old-age services, which can strengthen institutional construction and provide more comprehensive protection for the elderly population in rural areas (Wu, 2017). With the development of Internet + old-age services, the construction research of smart old-age services has also gradually developed (Pang et al., 2017). DeepSeek's generative artificial intelligence embedded in old-age services has brought new opportunities to contemporary rural old-age issues. At the same time, the risks existing in terms of technology and ethics cannot be ignored.

The DeepSeek series of conversational artificial intelligence, especially the DeepSeek-R1 model, possesses large-scale language understanding capabilities and multi-task processing capabilities, and has demonstrated application potential in several industries in China. The application of DeepSeek-R1 in rural old-age scenarios mainly focuses on policy interpretation, health consultation, emotional companionship, and emergency response.

However, in an aging society, it is inherently challenging for the elderly to bridge the digital divide (Wang & Zhang, 2021). Especially in Jilin Province, the educational attainment of the rural population is relatively low and the infrastructure is weak. Therefore, effectively integrating the DeepSeek system into the rural old-age service system faces considerable challenges. This study aims to enrich theoretical research on smart old-age in China's rural areas, expand the application boundaries of conversational AI in low-resource regions, and provide valuable experience for rural areas like Jilin Province to draw on.

METHOD

This study adopts a qualitative research approach, aiming to gain an in-depth understanding of the application path, adaptation obstacles, and localization strategies of DeepSeek conversational artificial intelligence in the rural old-age system of Jilin Province. The in-depth interview subjects of this study are two village committee cadres, who play a key role in decision-making and promotion in the old-age service planning and governance of their respective villages. The interview content mainly focuses on the current situation and bottlenecks of elderly care services in the village; their cognition and attitude towards the DeepSeek system; the feasibility of introducing artificial intelligence technology, institutional obstacles, and resource issues; and their ideas and suggestions for localization promotion.

Simultaneously collect policy documents and industry reports on rural old-age, smart village construction, and the application of artificial intelligence technology at both the provincial and national

levels in Jilin Province. Since 2020, the State Council of China has formulated policy documents every year specifically aimed at ensuring the development of smart old-age services. Policies such as the "Opinions on Promoting Economic Development to Enhance the Well-being of the Elderly (Guo Ban Fa [2024] No. 1)" and the "Opinions on Promoting the Construction of the Basic Elderly Care Service System" all point out that the development of smart elderly care should be cultivated. Policy documents are used to assist interview materials in context analysis and application evaluation.

RESULTS AND DISCUSSION

The interviews with two village committee officials provided a crucial perspective from the front line. One interviewee pointed out that AI-based elderly care is a novelty for rural seniors. But it would be a great thing if one could remind the elderly not to forget to take their medicine and talk to relieve their boredom. Modern family structures are smaller and have fewer children. Rural elderly people have a less entertaining life. Smart elderly care can help the needs of the elderly receive more attention and solutions (Zhang & Zhang, 2023). Another interviewee emphasized that a portion of the elderly population is not adept at using smartphones. Although the convenience of integrating the DeepSeek system into the old-age model is foreseeable, the reality is that a significant amount of manpower is required to teach the elderly how to use it. This includes village committee officials themselves, who also need time to learn and enhance their digital and intelligent literacy.

Through interviews and analysis with two village committee cadres, this study found that the DeepSeek system has the potential to alleviate the insufficiency of grassroots service capabilities and increase service coverage. However, in its actual promotion, it is still limited by realistic conditions such as human resource allocation, cognitive acceptance and financial mechanisms; The attitude and ability of village committee cadres directly affect the implementation effect of the system. They are the key hub force for achieving "human-machine collaboration".

The future integration of DeepSeek into the rural old-age system is highly forward-looking. The key lies in how to leverage the power of artificial intelligence to boost the development of rural old-age services (LIANG, 2025). This includes optimizing dialect recognition, simplifying interaction processes; customizing functions based on local living habits and emotional communication styles; and improving financial support, digital literacy, and training mechanisms (Zhu, 2024). Additionally, establishing an "AI + human service" hybrid mechanism (such as having village doctors assist with system startup and explaining system responses) will be a crucial approach to enhancing the acceptance of artificial intelligence among rural elderly people during the transitional period.

The limitation of this study lies in the small sample size and the fact that the data mainly come from villages in Jilin Province. Subsequent research should combine multi-group interviews and long-term tracking to further verify the application effectiveness and behavioral change path of the AI elderly care system.

CONCLUSION

This study explores the opportunities, challenges and localization paths of DeepSeek conversational artificial intelligence in rural old-age services through qualitative methods. The conclusion drawn is that conversational artificial intelligence has the potential to alleviate the "service gap" problem in rural old age, but it needs to address three major practical issues: technological accessibility, cognitive impairment, and fiscal sustainability. Village-level cadres play a core driving role in the promotion of the system, and "human-machine collaboration" is the most feasible application approach at present. Technology promotion must be accompanied by infrastructure construction, service personnel training and cultural localization strategies to achieve efficient integration.

It is suggested that in the future, the conversational DeepSeek be included in the policy support list for "Smart Villages", with priority given to deeply aging regions such as Northeast China. At the same time, the position of "AI service provider" should be added, or the scope of business services for rural new media cadres should be expanded. Promote the integration of artificial intelligence services with the basic public service information system to achieve data sharing and coordinated management. And encourage the collaboration among industry, academia and research to carry out customized product design of artificial intelligence for elderly care, to enhance the supply capacity of old-age services in rural China.

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