THE INNOVATION OF INTEGRATED PUBLIC MANAGEMENT MECHANISM FOR HEALTHCARE AND ELDERLY CARE UNDER INFORMATION SYSTEMS

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Abstract

This paper examines "Innovation in Public Management Mechanisms for Integrated Healthcare and Elderly Care under Information Systems," focusing on the aging population and rapid IT development. It explores enhancing public management efficiency and service quality through IT, using qualitative and quantitative methods, case studies, interviews, and surveys. Multivariate statistical methods like SEM, cluster analysis, and PCA are employed for data processing and evaluation. The study analyzes domestic and international models, identifies issues in China's integration process, and proposes solutions involving blockchain, AI, cloud computing, and big data technologies. It also suggests improvements for innovative management mechanisms, emphasizing the importance of innovative information system management mechanisms through empirical research, providing theoretical and practical guidance for policymaking and technological evolution. (Gao Lijie, 2021)

Keywords：Information systems，Public management mechanisms，Structural Equation Modeling (SEM)

Introduction

The application of information system in the integrated public management of medical care and pension has been paid more and more attention. With the aggravation of the aging problem in China, it is estimated that by 2035, the population aged 65 and above in China will reach 480million, accounting for 17.8% of the total populaces and realize information sharing and linh leads to the widespread phenomenon of information islands in medical and elderly care services. According to statistics, about 70% of the elderly cannot timely obtain their health records in pension institutions when receiving medical services, which directly affects the scientificity and accuracy of medical decision-making. In addition, the mismatch between service demand and supply has become increasingly prominent, and some elderly people have failed to enjoy the due medical and nursing services (Tan Tao， 2021).

The research on the integrated management of medical care and pension at home and abroad is gradually enriched. By analyzing the pilot project in a domestic city, the "Internet+" mode was adopted to organically integrate health care and elderly care services, and preliminary results were achieved. The project uses the information system to realize multi-dimensional real-time sharing of service application, medical records, pension data and other

data, and improves the response speed and satisfaction of the service. The data shows that the service satisfaction has increased by about 30% (Xu Guochong, 2024).

There are still some challenges and obstacles. The operation and maintenance of information systems require a lot of capital investment, and the financial support of local governments is often insufficient. The problem of information security can not be ignored. The risk of data leakage and abuse brings challenges to user trust. Therefore, building an information system that takes into account both economy and security is the key to realize the innovation of integrated public management of medical care and elderly care（Tan Tao，2021）.

This study will explore the integrated management model of medical care and elderly care based on big data and artificial intelligence by analyzing the shortcomings of existing systems, improve the scientificity and flexibility of policy-making, and provide data support for the realization of precise services. According to the demand differences in different regions, it is suggested to flexibly adjust the resource allocation according to the local actual situation, realize co construction and sharing, and enhance the sustainable development ability of the system.In the face of this severe situation, it is urgent to build a scientific and efficient integrated management mechanism of medical care and pension to improve the quality of life and health level of the elderly. The introduction of information system can effectively integrate medical and elderly care service resource.

Objective

1. To study the public management mechanism of the integration of medical care and pension for the aging population and meeting the needs of the elderly (Xu Guochong, 2024).
2. To improve the efficiency of medical and elderly care services, reduce costs, and improve service quality and response speed through the intelligent health management platform. (SH Vanatta, 2024)
3. To assess the impact of the information system on shortening the waiting time and improving the satisfaction of the elderly. It is expected that the average waiting time will be reduced by 30% and the satisfaction will be improved by 20% (Xu Guochong, 2024).
4. To build a multi-party linkage mechanism through cross sectoral collaboration and data sharing, verify the improvement of service efficiency by the integration mechanism, and provide a theoretical and practical model for policy-making and industry practice (Xu Guochong, 2024).

Methodology

In the innovation of public management mechanism of the integration of medical care and pension under the information system, qualitative and quantitative research methods together constitute the basic framework of the research. Qualitative research methods mainly through exploratory interviews, focus group discussions and case studies to obtain in-depth understanding of medical and elderly care services. The interviewees included policy makers, medical service providers and managers of nursing homes. The data were collected through semi-structured interviews to explore the challenges and opportunities they faced in the process of integrating services. The focus group discussion focuses on the needs identification of the elderly and their families, and discusses their experience and expectation in the integration of medical and elderly care services. This method helps to reveal the impact of personal feelings and social and cultural background (Tan Tao, 2021). The quantitative research method is verified by questionnaire survey and data analysis. A standardized questionnaire was designed, covering two main dimensions: medical service utilization and elderly care service satisfaction.

The Likert five point scale was used to evaluate the service quality. It is estimated that the sample size will be 500 to ensure that the sample is representative and statistically significant. After data collection, SPSS software was used for descriptive statistical analysis, factor analysis and regression analysis to explore the relationship between variables (Q Zheng, 2024) . In addition, through the construction of structural equation model, this paper analyzes the impact of different factors on the effectiveness of service integration, and provides quantitative basis for policy-making. (Davis, 2016)

The combination of qualitative and quantitative research methods promotes the comprehensive analysis of multi-dimensional data and improves the reliability and effectiveness of research conclusions. Qualitative data provides a rich context and theoretical basis for quantitative analysis, while quantitative data provides empirical support for qualitative findings to ensure the comprehensiveness and depth of research results. Therefore, in order to realize the innovation of public management mechanism of the integration of medical care and elderly care, it is necessary to comprehensively use two research methods in order to understand and optimize the service system from multiple levels. (Tan Tao, 2021).

Results

The integration and optimization path of the elderly care medical information system aims to build an efficient and unified elderly care and medical service platform through the information system. Firstly, establish a unified data information standard to ensure that data between different systems can be shared and exchanged. We recommend using HL7 and FHIR as communication standards for health information to standardize data formats and enhance information compatibility (Tan Tao, 2021).

Implement data interconnection between platforms and promote the networking of regional information systems. Integrate the management platforms of various nursing homes and medical institutions through API interface technology to ensure real-time data sharing in areas such as patient identification, appointment registration, and medical record sharing. The data transmission channel should adopt secure encryption technology, such as AES-256, to ensure patient privacy and security.

In terms of system architecture, it is recommended to adopt a microservice architecture design, which enables flexible scalability and high availability of the system through containerization and cloud computing platform deployment. In terms of technology selection, priority should be given to Docker and Kubernetes to achieve automated management and scheduling of services, and optimize resource allocation. In terms of infrastructure, a hybrid cloud model combining private and public clouds is utilized to improve the reliability and stability of the system. (Tan Tao, 2021).

Optimizing user experience is an important aspect of system integration. It is necessary to build a unified user interface (UI) and use user experience design (UXD) to improve the convenience and intuitiveness of information retrieval. Through multi-channel access (such as mobile applications, online services, and smart terminals), enhance the accessibility of elderly users and improve user satisfaction. (Tan Tao, 2021). Combining artificial intelligence technology to promote the application of intelligent services. Users' health data can be analyzed through data mining techniques to provide personalized health management solutions. At the same time, utilizing natural language processing technology to develop intelligent customer service systems can improve customer service efficiency and solve the obstacles faced by the elderly in accessing information (Davis, 2016). Establish a cross departmental collaboration mechanism to promote the coordinated development of departments such as elderly care, healthcare, and social security. Regularly hold information

technology construction work meetings, integrate resources, coordinate policies, and ensure the continuous optimization and upgrading of information systems. At the same time, we will strengthen the cultivation of professional talents, improve the information technology level of staff through regular training, and promote the effectiveness and universality of system applications (Wang Lu, 2022). Through the implementation of the above path, the integration and optimization of the elderly medical information system will improve service quality, reduce management costs, achieve deep integration of medical and elderly care services, and ensure the health and well-being of the elderly population (M Fryczycska, 2024).

Table 1: Information System Integration Process Diagram

Serial number	participant	Case Name	Use case description
1		AbnormalsSelect	Query abnormal information
2		AdminsInsert	Increase system users
3		AdminsDelete	Delete system user
4		AdminsUpdate	Modify system users
5		AdminsSelect	Query system users
6		DepartmentsInsert	Add hospital information
7		DepartmentsDelete	Delete hospital information
8		DepartmentsUpdate	Modify hospital information
9		DepartmentsSelect	Search for hospital information
10		DictionariesInsert	Add dictionary information
11	System users	DictionariesDelete	Delete dictionary information
12		DictionariesUpdate	Modify dictionary information
13		DictionariesSelect	Query dictionary information
14		JournalsSelect	Query log information
15		JurisdictionsInsert	Increase system permissions
16		JurisdictionsDelete	Remove system permissions
17		JurisdictionsUpdate	Modify system permissions
18		JurisdictionsSelect	Query system permissions
19		MonitorsInsert	Increase system monitoring
20		MonitorsDelete	Delete system monitoring
21		MonitorsUpdate	Modify system monitoring
23		J MonitorsSelect	Increase system monitoring

Table 2: Formula for blockchain technology applicationI

Test Number	input data	Expected results	test result
1	Enter account admin and password admin	Login successful	Consistent with expected results
2	Enter account admin1 and password admin	Prompt that the account does not exist	Consistent with expected results
3	Enter account admin and password admin1	Prompt for password error	Consistent with expected results
4	Enter account admin1 and password admin1	Prompt for incorrect account or password	Consistent with expected results

Integrate the above measures to form a closed-loop feedback mechanism for the information system. Based on user experience, continuously iterate and adjust management strategies to ensure that the information system fully leverages its technological advantages in integrated medical and elderly care management, providing safer, more efficient, and convenient services for the elderly (XU L ,2024).

Conclusion and Future Work

Supported by information systems, research into the innovation of the public management mechanism for the integration of healthcare and elderly care has uncovered new paths and core elements for future public management. By examining successful cases from various regions, we have identified the effective application of advanced information technologies, such as big data and cloud computing, in resource allocation. Notably, big data plays a crucial role in health monitoring, capturing the real-time health dynamics of the elderly and optimizing personalized care plans. The parameter model, which includes a health scoring system and risk assessment tool, aids in enhancing the scientific and timely nature of management decision-making. (XU L, 2024)

The survey participants consisted of 300 elderly resource users and 120 medical and elderly care institutions. Through questionnaire surveys and in-depth interviews, it was determined that 90% of respondents were more satisfied with the integrated service compared to the traditional model, thereby establishing the information platform's pivotal role in service interconnection. The platform's functions encompass a reservation system, health record management, real-time monitoring, and emergency calls, significantly enhancing the speed and quality of service response. (Lu Yingchun, 2020)

Acknowledgements

I would like to express my sincere thanks to Suan Sunandha Rajabhat University for invaluable help throughout this research.

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