Exploration of Internet Hospital Information System Based on Information Integration Platform

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Abstract—During the construction of the hospital information system, because the medical and health information itself is relatively complex, coupled with the large differences in the business needs of different departments of the hospital, the application of the information system will become more complicated. The increasing demand for information in hospitals and the increasing number of subsystems have had a certain impact on improving the level of information construction in hospitals. Therefore, China needs to strengthen the integrated management of hospital data and information. The use of information system integration platforms to build mobile Internet hospitals can promote the modern development of Chinese hospitals. In the application process of the hospital information system integration platform, relevant staff need to research and analyze the application of the information system integration platform. At the same time, relevant researchers need to explore the actual content of the Internet hospital construction process, improve the level of Internet hospital construction, and promote the long-term development of Chinese hospitals.

1. INTRODUCTION
The full application of information technology in the information age will help promote the development of hospital information. Building an Internet hospital based on an information integration platform can improve and optimize the daily operation and management of the hospital. This is conducive to accelerating the speed of hospital informatization construction, improving the level of hospital informatization construction, and actively helping to promote the future development of the hospital. In recent years, the development speed of modern information technology has been relatively fast. The application of technologies such as big data, Internet of Things and the Internet in the development of Internet hospitals can effectively improve the original hospital information management system. Based on the information integration platform, promoting the development of the Internet hospital can integrate and share the single business of the hospital information system, thereby improving the development level of the hospital.

2. OVERVIEW OF INTERNET HOSPITAL INFORMATION INTEGRATION PLATFORM
In general, the information integration platform of a hospital mainly includes a service bus data center and an integrated platform application based on the service bus and the data center. The function of the centralized service bus is mainly to define interface methods that comply with relevant standards. Meanwhile, it is necessary to standardize the different subsystems of the hospital to ensure that the interface scheme can interact effectively, and to track and monitor the information interaction process. This can solve various problems in information interaction and improve the compatibility and scalability of the hospital information integration platform. The data center generally includes structures
such as marking basic services, exchange databases, financial databases, business decision centers, and intelligent knowledge bases. When designing the hospital information system integration platform, we need to use data synchronization technology to synchronize it with the business layer to complete the historical information data tracking and processing work. We also need to use data extraction technology to standardize and analyze the data of the business layer, and finally we can integrate the data of the standard layer into the data center. When using the hospital information integration platform, we need to filter, transform, process, and integrate data information based on the data center and service bus. In addition, we can also integrate and effectively manage the data of different business systems in the hospital.

The hospital information integration platform itself is a part of the development process of the Internet hospital, and belongs to the content of the service software in the application process. It can not only carry out running operations between the operating system and the application layer, but also complete the connection and cooperation between multi-business systems and different systems. In the application process of the hospital information integration platform, it can be simplified into a communication process between different business systems, thereby establishing a standardized hospital information integration platform. In actual construction, the system must start from data generation, complete data interaction and data use and other links. In the meantime, we need to integrate and upgrade the hospital information integration platform. Only in this way can the information integration platform be used to effectively process the data of different systems in the hospital.

The effective application of hospital information integration platform in the development of Internet hospitals has important advantages that cannot be ignored. Making full use of the hospital information integration platform can complete the visual process adjustment and management. We can effectively define the business process of the hospital. If the corresponding rules in the development of the hospital are changed, the interface can be changed in time as the rules change. Moreover, the hospital information integration platform can connect other systems to the integration platform to improve the application effect of the system. This can further ensure the reliability of application management and monitoring [1].

3. Key Points for the Construction of Internet Hospital Information System Based on Information Integration Platform

3.1. Construction Principles

At this stage, there are still some problems and shortcomings in the construction of the Chinese hospital information integration platform that will affect the application level of the hospital information system integration platform. It is mainly manifested in the following aspects. Firstly, the level of technology used in the construction of the hospital information integration platform is not high. Because the hospital has many business processes and contents, once there are problems in some systems of the integrated platform, it will cause problems in the information management and construction of the entire integrated platform, which will affect the stability and security of the information system. Secondly, because there are certain differences between different business systems, it may cause problems in information sharing between systems and affect the management level of the integrated platform. Finally, when applying the information system integration platform, we need to complete information transmission. However, the current transmission of information is based on direct transmission. If information security is not effectively guaranteed, security problems are prone to occur.

The following principles need to be adhered to when building a hospital information system integration platform. Firstly, we must make full use of foreign advanced technology to improve the technical level of the information integration platform. In the process of hospital construction, it is necessary to actively explore the application advantages of foreign information systems. Simultaneously, it is necessary to build an integrated platform that meets the development needs of China's hospital information system based on the specific conditions of the Chinese hospital.
information management system. Although we need to learn from foreign information systems in this process, we still have to maintain our own characteristics to improve and optimize foreign advanced technology, and build a unique and targeted hospital information system integration platform that is more suitable for the development of Chinese hospitals. Secondly, we must strengthen the effective application of data technology. In particular, some data processing technologies and data encryption technologies must be constantly updated and optimized to improve information security. Finally, during the construction of the hospital information system integration platform, a unified and strict standardized management of medical measures and hygiene habits should be formulated in accordance with the specific standards and related requirements of the Chinese medical industry. We should carry out unified application in each system to improve the management level of the integrated platform [2].

3.2 Construction Content
In the process of Internet hospital construction, it is necessary to use the hospital information system support platform to complete data information management. The main information system construction content includes electronic medical record file management, medical video recording, and operation management of different departments of the hospital. In order to achieve information sharing, we must carry out effective information integration and transmission to supervise and manage the entire medical process. This requires medical staff to create an effective and reliable information system integration platform, and after completing information collection and processing, classify all the information and aggregate it into the integration platform. In this way, all data and information in the hospital can be centrally managed, thereby facilitating subsequent hospital information query and application.

4. INTERNET HOSPITAL INFORMATION SYSTEM DESIGN PLAN
When building an Internet hospital based on an information platform, it is necessary to strengthen the construction of the hospital information system. In particular, the current cloud computing and big data technologies are developing faster and faster, and building a cloud hospital information system will actively help promote the further development of Internet hospitals. There are certain differences in the design of the cloud hospital information system and the original hospital information system. Therefore, we need to effectively integrate the cloud hospital information system with the original information system, develop online business, and ensure hospital information security and scalability. The core function of the cloud hospital information system in the design is to provide patients with online hospital services. Patients can directly obtain corresponding medical record information online. We can build patient identity information integrated with the hospital information integration platform and the local hospital information system in the Internet cloud system, and enable patients to complete information indexing based on the identity. This will positively help improve the reliability and convenience of Internet hospitals. In the cloud hospital information system design, the feasibility of the design plan must be ensured.

The cloud hospital information system mainly includes the cloud doctor station and the system operation setting center. We need to ensure that the cloud hospital information system is connected to the review platform and the distribution pharmacy. The main function of the cloud doctor station is that the patient completes the registration request. It can use pictures or videos to conduct online consultations and carry out intelligent medical record writing tasks. The system can output medicines and inspection prescriptions, medicine prescriptions, etc. according to all the acquired information. These prescription information can be automatically entered into the review platform, and the prescription can be automatically reviewed based on the patient's information and the patient's past medical history. The verification result will show that the pharmacist has completed the second screening, and will be released after manual approval. The drug prescription after the verification can form the patient's mobile terminal order, and the patient can send the order to the pharmacy after completing the payment and choosing the delivery method. The pharmacy provides the patients with corresponding medicines according to the patient's order information. In the development of Internet hospitals, patients can pick up or prepare medicines for delivery according to their specific needs. The
main function of the system application setting center is to complete the management of doctor resources, and to manage doctor accounts and scheduling settings reasonably [3].

In the design process of the cloud hospital information system, it is necessary to ensure that the system and the external connection platform can complete the message information sharing. Using the external link platform to connect with physical hospitals can ensure that patients can establish timely, effective, credible and safe associations according to their own identity information index in different environments. Generally, the information content of the cloud hospital information system and the external connection platform mainly includes patient identification, patient's past medical history information, information on inspection items in the hospital, and history and real-time information of the whole hospital. The cloud hospital information system can generate all data information and order information related to the diagnosis and treatment process of the hospital, and directly use the external connection platform to effectively integrate the data of the hospital.

The hospital also needs to establish a prescription sharing platform when designing the cloud hospital information system. The electronic prescriptions of Internet hospitals must meet the regulatory requirements of relevant Chinese authorities, and patients can choose drugs independently. It is more convenient and accurate in the way of obtaining. As a result, building a prescription sharing platform not only needs to receive the generic names of drugs from the cloud hospital information system, but also manages and matches real-time inventory based on prescription data and drug suppliers, so that patients can choose drugs that meet the prescription requirements. At the same time, we must match the single-use transfer code for patients to complete the drug transfer work. Patients who take medicines in the pharmacy must provide the medicine withdrawal password. The pharmacy clerk can use the method of verifying the password to ensure the accuracy of the patient's medicine withdrawal and complete the order. Using the home delivery method, patients can directly scan the QR code of the order, enter the password for the delivery of the drug order, and complete the delivery process with the delivery person. When processing the electronic prescription after the medicine is handed over, the system must also mark the electronic prescription. This can show that the prescription has been used, and prevent the prescription from being used twice and causing medical disputes [4].

Figure 1. The Overall Design of the Internet Hospital

5. Specific Module Design

5.1. Business Application System Design
When designing the business application system of the Internet hospital, we need to proceed from the following aspects. First, design the data collection of electronic medical records. During the operation of Internet hospitals, return patients should be the main target group, and effective judgments should be made on patients' historical medical records. Under normal circumstances, doctors must ensure that they can accurately identify the patient's identity when reviewing the historical medical records. This
allows patients who meet the conditions for follow-up visits to enter Internet hospitals and provide corresponding services to patients. In addition, doctors also carry out medical history review operations in the follow-up service. In consequence, when a patient sends a service request, the system must accurately judge the patient's medical record information, and provide historical cases for the patient to select the starting point for follow-up visits, and provide the patient's selection information to the doctor. In the meantime, this can provide the doctor with the patient's historical medical record, which is convenient for the doctor to review and follow-up. With the continuous development of Internet diagnosis and treatment, doctors can perform structured and standardized medical record writing tasks in parallel with consultation behaviors in the specific diagnosis and treatment process, and effectively save the medical records. After consultation, the cloud hospital information platform can form corresponding medical records and other information records, and upload these information to the hospital's data integration platform using the external platform to complete data collection and storage. Secondly, the system must complete the design of the medical order function module. When designing the inspection and inspection medical order function module, we must ensure that the patient inspection and inspection application form makes an appointment or docking with the specific department of the physical hospital. After obtaining the application form information and completing the appointment, the patient can not only go directly to the physical hospital to complete the inspection and inspection work, but also can use the inspection sharing system to directly upload the inspection and inspection results obtained in the physical hospital to the hospital information integration platform. When designing inspection and inspection functions, we need to use Internet diagnosis and treatment to carry out hierarchical diagnosis and treatment operations, form the interconnection between inside and outside the hospital, complete online billing, medical consortium nearby blood collection, and logistics inspection. Meanwhile, the system can also report the examination results obtained by the patient in the information integration platform of the Internet hospital, so that the patient can choose the physical hospital according to their specific situation.

5.2. Integrated Management Platform
When we design the integrated management platform of the Internet hospital, we must build an integrated management platform based on the driven data platform. Carrying out quality management and application management in the process of Internet hospital operation and management is an important foundation for promoting the sustainable development of Internet hospitals. In order to improve the management quality of Internet hospitals, we must fully apply big data technology. Hence, we need to establish a driven data application system based on data integration, data warehouse, data association model calculation, data combination, and retrieval analysis, and build a unified Internet hospital information system integration platform. This can effectively manage all the information and data of the hospital. Simultaneously, we need to build a unified and complete hospital information management platform, payment platform, message platform, etc. This can not only promote the standardization and unification of Internet hospital data collection to data processing, but also effectively realize the functions of medical record retrieval and clinical path. In the design process of the Internet medical data center, we must integrate the source of the three parts of the hospital outpatient, inpatient, and online to improve the authenticity and effectiveness of data acquisition, and ensure the standard and normative of the data. Because the three data sources of outpatient service, hospitalization, and online are very different, we need to define the defined data separately to ensure the standardization and effectiveness of the data transmission format and conversion method, so that the format after the data conversion is unified. Otherwise, we also need to conduct unified management of patient identification to ensure that all medical records can be correctly diagnosed and correspond to patient identification information. In order to achieve decision-making assistance, the system not only needs to form a corresponding medical rule library and medical knowledge base, but also provides corresponding medical record writing and semantic analysis solutions. In the process of writing medical records, we need to associate it with the background logic of the decision-making system. We can start from topics, prompts, diagnosis suggestions, prescription suggestions, critical value warnings, etc., to
ensure the standardization of medical records. Interacting with doctors based on these content can not only improve the completeness and accuracy of data collection, but also provide a more reliable basis for decision-making. The semantic analysis should be adapted to the writing of the medical record, so that the main complaint and the current medical history can be analyzed. Medical semantic analysis of relevant medical record content information based on general natural semantic processing can provide the results of the analysis to the decision-making system to form a decision-making plan [5].

6. CONCLUSION
All in all, in the development process of the Internet hospital, based on the hospital information system integration platform can promote the sustainable development of the Internet hospital to a large extent. But it should be noted that in the process of designing and constructing the hospital information system integration platform, we must follow the corresponding construction principles. Furthermore, we will build a cloud hospital information system based on advanced technologies such as big data technology and cloud computing technology. This is conducive to improve the development level of the hospital Internet hospital.

Acknowledgements:
The project of Chongqing Shapingba about decision consultation and management innovation in 2020. (Research on the whole life-cycle in constructing of the health management system invade to promote the construction of health care of information system, Item number: jcd202003 )
The Key issues of Chongqing Education Evaluation Institute.(Research on the operation and quality management system of on-line and off-line mixed teaching in vocational higher education institution of Chongqing in AI era, Item number: PJY202001)

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