


Research Article

Research on the Construction of Modern Medical Information Service Model under the Background of Artificial Intelligence

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In the era of the Internet, artificial intelligence (AI) and other emerging technologies leading the industrial revolution, on the basis of comprehensive analysis of modern medical information services and analysis of the content of some hospital websites, from the perspective of the public, the expert scoring method is applied to establish medical information on hospital websites. Service comprehensive evaluation index system, at the same time quantification and assignment of indicators, combined with the theoretical research platform of information service quality. The comprehensive evaluation model of the medical information service function and quality of the hospital website was constructed by the comprehensive scoring method, and an empirical study was carried out. After comparing the data results of the model simulation with the actual data, it can be seen that the deviation between the actual data and the simulated data is not significant, that is, between 0.12% and 15.93%, which is within a reasonable range. Therefore, we have reason to believe that the model is an effective and reasonable use of the system dynamics method. On the basis of previous theoretical research and historical yearbook data, plus innovative theoretical assumptions, the Internet+healthcare embedded in the Internet+healthcare is constructed. The model of the traditional medical information service system can help clarify the role of Internet+health and medical information service in the overall medical information service system.

1. Introduction

Medical artificial intelligence is one of the most deeply applied fields, which will really improve people's healthy living conditions [1]. At present, under the impetus of cutting-edge technologies such as mobile Internet, big data, and brain science, medical artificial intelligence solves the medical production mode [2]. Under the condition of market economy, under the environmental background of health reform in hospitals, how to correctly use modern technological means to improve their competitiveness and social influence has become a major topic widely studied by major hospitals [3]. Especially with the continuous development of modern information technology, computers are widely used in various fields. Whether the modern information

construction of hospitals can be realized by computers has become an important index to measure the quality of hospital medical services. Therefore, it is of great significance to study how to strengthen the modern information construction of hospitals and improve the quality of medical services [4]. The Internet has changed people's study, life, and work style in its unique way, and people are more and more accustomed to knowing medical and health information through the Internet [5]. Internet technology has changed the behavior and communication mode between hospitals, between doctors and patients, and between medical information transmitters and receivers through high-speed information transmission and exchange rate. Through the Internet, the public can easily obtain all aspects of health information and communicate face-to-face with medical

experts without leaving home. Its wide range of benefits, great influence, and profound significance will be the dream of medical workers [6].

The medical market, medical service products, and medical demand have very important particularity, and the hospital culture that adapts to it also has many characteristics. These characteristics are reflected in the differentiated service culture [7]. This differentiated service culture is the core competitiveness of hospitals. As the name implies, modern medical information service can be understood as medical information service under the network environment [8]. An activity that can provide patients or the public with required treatment or healthcare information by launching a medical and health website or posting medical and health information for online consultation, appointment registration, remote consultation, online consultation room, and information inquiry. The content of network medical information service includes medical treatment, prevention, healthcare, rehabilitation, health education, and other information. Its service object is information users with objective needs for medical information service [9]. The goal of network medical information service is to start from the social reality, give full play to the social role of medical information, communicate users' information contact, and effectively organize users' information activities [10]. The purpose of this study is to investigate the development of hospital website medical information service in China from the perspective of the public and to understand the popularity and quality of hospital website medical information service. Therefore, we will sort out and summarize the current medical information service items of hospital websites in China, form a relatively complete information service function diagram, and use the comprehensive scoring method to build a comprehensive evaluation model of medical information service of hospital websites based on public demand. Based on the empirical research on the sample hospital website, the traditional weighted rank sum ratio method and weighted TOPSIS method are used to statistically analyze the index data of the sample website again, so as to verify the scientificity and rationality of the model. The main contributions of this paper are as follows: (1) targeted research on the evaluation of hospital website medical information service can further enrich the theoretical research on the evaluation of internet medical information service based on user needs in Chinese hospitals. (2) Using quantitative methods such as expert consultation survey and statistical analysis to study the influencing factors of hospital website medical information service can further enrich the empirical research results in this evaluation field. (3) Discussion on the composition dimension of medical information service on hospital website can make hospital management.

The main research contents of this paper are as follows:

- (1) Section 2: literature review of modern medical information service and health medical service information in internet plus

By reviewing the historical documents, this paper analyzes the focus areas and the latest frontier directions of

modern medical information service-related research, summarizes the shortcomings of its research, and clarifies the content direction of the follow-up research.

- (2) Section 3: expounds the definition and construction approach of modern medical informatization and constructs the comprehensive evaluation model of modern medical information service
- (3) Section 4: empirical evaluation and analysis of the comprehensive scoring evaluation model. The simulation results of the healthcare information service system in internet plus are analyzed
- (4) Section 5: conclusion and prospect

2. Related Work

Wenke et al. pointed out that traditional biomedical models only focus on the biochemical factors that lead to disease, while ignoring the social and psychological dimensions, is a simplified and approximate view [11]. They further suggested that in order to understand the determinants of disease and to arrive at a rational model of treatment and healthcare, the model of medicine must take into account the patient, the environment in which the patient lives, and the complementary systems designed by society to deal with the destructive effects of disease, namely, the role of the physician and the healthcare system. Chiochio et al. proposed that the efficiency of medical services mainly includes two aspects: (a) the allocation efficiency of medical service resources, that is, whether the limited medical resources are allocated to the most needed areas and (b) the operation efficiency of medical service institutions, that is, on the premise of ensuring the quality of medical care, the maximum output can be achieved with the least input [12]. Elrod and Fortenberry proposed that improving service attitude and optimizing service process is one of the important measures to improve the quality of medical service and build a harmonious doctor-patient relationship [13]. Gullick and West pointed out the prominent problems in the traditional outpatient process such as long waiting time for patients and proposed measures such as optimizing the diagnosis and treatment process, but there is no data to support which parts of the patient queue time in the process of seeing a doctor are long, and which parts can be optimized of [14]. Kerasidou et al. applied ordinary Petri nets to the research on resource optimization of hospitals. On the one hand, due to the large number of public resources involved, the ordinary Petri net model is extremely complex, which is not conducive to understanding the specific meaning of the model. The process optimization is only proposed in terms of how to allocate resources reasonably, and the defects of the original process are not covered [15].

In recent years, "Internet+" has become a general trend of multi-industry development in the society. To explore its core significance, there are not a few literatures doing value research on it. Bréchat et al. summarized the characteristics of Internet medical care and discussed the future development trend of Internet medical care on the basis of

comparing and analyzing the development status of Internet medical care at home and abroad [16]. Wright et al. discussed the background trend of the transformation of healthcare under the Internet model and analyzed and expounded the challenges faced by the modernization of medical and health information construction and gave corresponding countermeasures [17]. Gille et al. sorted out the development process of Internet+healthcare and pointed out that the current stage has entered the stage of accumulating development and pointed out that the realization of "Internet+healthcare" should be promoted from the capital, government, and medical parties [18]. Sacks and Rhodes, on the basis of pointing out the drawbacks of the traditional medical model, demonstrated the task, value, and significance of the Internet+healthcare model [19]. Margaret proposed to incorporate the use of the Internet into medical resources, focusing on the use of the Internet by rural doctors [20]. Feng provides an overview of eHealth research activity in the UK, summarizes available information on the legal barriers and issues faced by these projects, outlines ongoing work to investigate these barriers, and considers some recommendations for overcoming them [21]. From the perspective of improving the doctor-patient relationship, Donnelly et al. pay attention to the changes brought by the Internet+healthcare to the doctor-patient relationship. In the context of the Internet, due to the overflow of online medical knowledge, the authority of doctors is relatively reduced, while the medical ability of patients has been improved, gradually forming a new medical model of "patient-centered," thereby promoting the relaxation of the doctor-patient relationship [22]. Andersson et al. believe that Internet+healthcare can play an important role in promoting demand due to the superior nature of the Internet itself, so it can alleviate the problem of medical resource allocation by promoting multipoint practice of general practitioners, thereby promoting hierarchical diagnosis and treatment [23].

3. Construction of Comprehensive Evaluation Model of Modern Medical Information Service

3.1. Definition and Construction Approach of Modern Medical Information. Medical informatization can be divided into narrow medical informatization and broad medical informatization [24]. Narrow medical informatization refers to the hospital medical informatization; the hospital information system it relies on. By using computers and communication equipment, the hospital departments can collect, store, process, extract, and exchange patient diagnosis and treatment information and administrative information and meet the functional requirements of all authorized users. Generalized medical informatization includes all information products and technologies related to medical care, and it is an application field of information technology with wide depth and high complexity. The medical informatization we generally refer to is mainly hospital medical informatization in a narrow sense, with the empha-

sis on establishing and making full use of data systems and management information systems related to medical services and management. At present, most people's understanding of medical informatization still stays at the narrow level of computerization of hospital management process, because the most contact is the application of computer technology in hospital management process. For example, in the medical expense settlement system of various hospitals, in the past, hospitals simply used the computerization of hospital management as the goal of hospital informatization. However, with the rapid development of society and economy and the continuous progress of network technology, the computerization of simple hospital management process can no longer meet the needs of medical workers and medical people. What people need is more convenient and reliable medical services. Therefore, the new goal of modern medical informatization is to establish a system centered on patient information collection and sharing and establish internal hospitals, hospitals, urban communities, and government departments. The information resource sharing between medical insurance departments is an information system that tries its best to serve patients, facilitate the treatment of medical staff, and help different managers analyze and make decisions faster and more accurately. The evaluation of website medical information service is based on PZB's service quality gap theory. The gap theoretical model can be summarized as that the gap between perceived service and expected service is service quality. Therefore, the gap between the service level actually felt by the investigators on the Internet and the expected value is the interactive medical information service, information quality, and service quality of the information construction part of the hospital website. Second, for the dimensions of medical information disclosure service, online medical information service, information management, and information technology, the actual measured value of investigators online is their service level. By analyzing and studying the service level of the front and rear parts, we can obtain the quality of comprehensive medical information service on the hospital website. The theoretical research platform of medical information service quality of hospital website is shown in Figure 1.

In the modern informatization construction of the hospital, the attention of the leaders is the first key factor for the success of the modern informatization construction. Only the leaders of the hospital fully realize the important role played by the modern informatization construction, and the problems of human and financial resources can also be solved and can be successfully resolved. Therefore, the hospital should establish a modern informatization leading agency and an implementing agency, which is mainly responsible for the guidance, supervision and coordination of informatization work, so as to ensure that the modern informatization construction of the hospital continues to develop along a benign track. In order to realize modern information construction, the focus of the hospital lies in the construction process. However, in this long construction process, a large number of software and hardware facilities need to be invested in the early stage of any stage. In

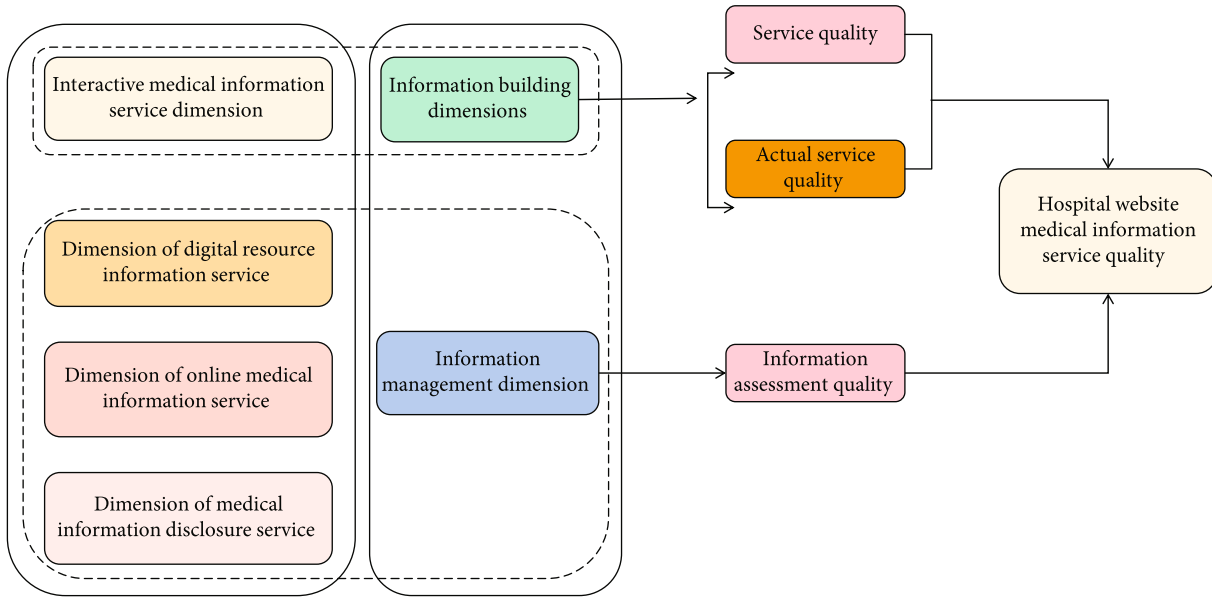


FIGURE 1: Theoretical research platform of medical information service quality of hospital website.

addition, with the continuous updating of information technology, the corresponding software facilities and hardware facilities also need to be upgraded, which must be guaranteed by a large amount of funds. Therefore, to strengthen the modern information construction of hospitals, we should increase the investment of various funds. Only sufficient capital investment can promote the better development of modern hospital information construction. Hospitals should establish diversified investment channels. For example, by means of government management, enterprise construction and purchase of services, we can fully attract social funds to be used in modern information construction. The stakeholders involved in the regional collaborative medical care integrated medical information platform are shown in Figure 2.

To strengthen the modern informatization construction of the hospital, a team of informatization talents with solid technology is indispensable. To increase the training of informatization professionals, we can start from the following aspects: First, widely recruit students majoring in health informatics, because these students not only have basic medical knowledge and health management theory but also have an in-depth understanding of computer professional theoretical knowledge, which is essential for the construction of modern hospital informatization. Regardless of whether they are engaged in medicine or computer science before, they should be required to establish a learning attitude of one specialty and multiple abilities, so as to promote the comprehensive crossover of multiple disciplines and comprehensively improve the information technology knowledge and medical and health knowledge of the incumbents. Cultivate a group of new compound talents. In addition, on the basis of cultivating information talents, we should also create a hospital information culture atmosphere, so as to continuously strengthen the modern information awareness and concept of all staff in the hospital. Strengthen the propa-

ganda of modern informatization knowledge and create favorable conditions for the development of modern informatization construction. The operation and management of the hospital are closely related to the patients, and the development of the hospital is finally reflected by the patients' satisfaction with the service quality. Therefore, in strengthening the information construction of the hospital, we should follow the principle of "patient-centered, medical service and treatment as the core" business philosophy. In strengthening the construction of information forgetting, we should use a large number of visual information technologies such as electronic medical record, led, and PACS, so as to build a good service platform for patients. In addition, we should build an infinite LAN of the hospital in areas requiring mobile work of medical staff, such as wards, emergency rooms, and operating rooms, so as to facilitate medical staff to carry out various medical treatment work in time and further increase the information technology of mobile terminals, so as to truly realize the bedside medical service and improve the level of hospital medical service. The flow chart of third-party pharmaceutical distribution service is shown in Figure 3.

With the help of modern medical information technology and professional logistics and other services provided by the Qiao operation and maintenance party, the medical platform makes the high-quality medical resources of the higher-level hospitals really sink to the community, and improves the attractiveness of the grass-roots hospitals.

3.2. Construction of Evaluation Index System. Establishing a scientific evaluation index system is an important preparation for carrying out evaluation work, and the index system is the basis and basis of evaluation activities. As a special kind of website, hospital website not only has the nature of general website but also has its industry characteristics. Therefore, we must also consider these industry factors in

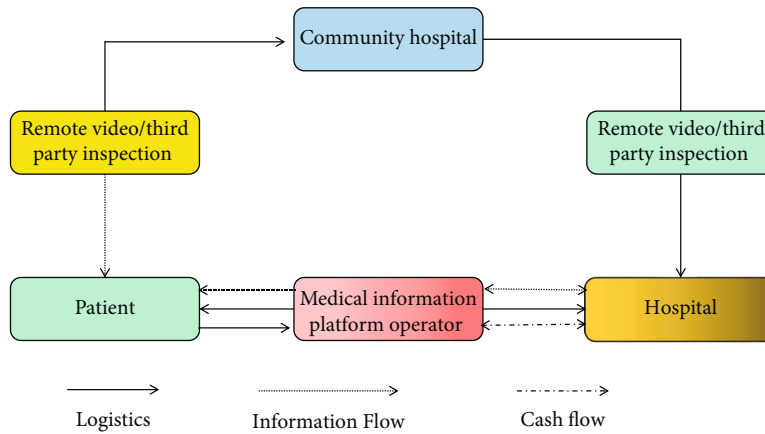


FIGURE 2: Association diagram of medical information platform.

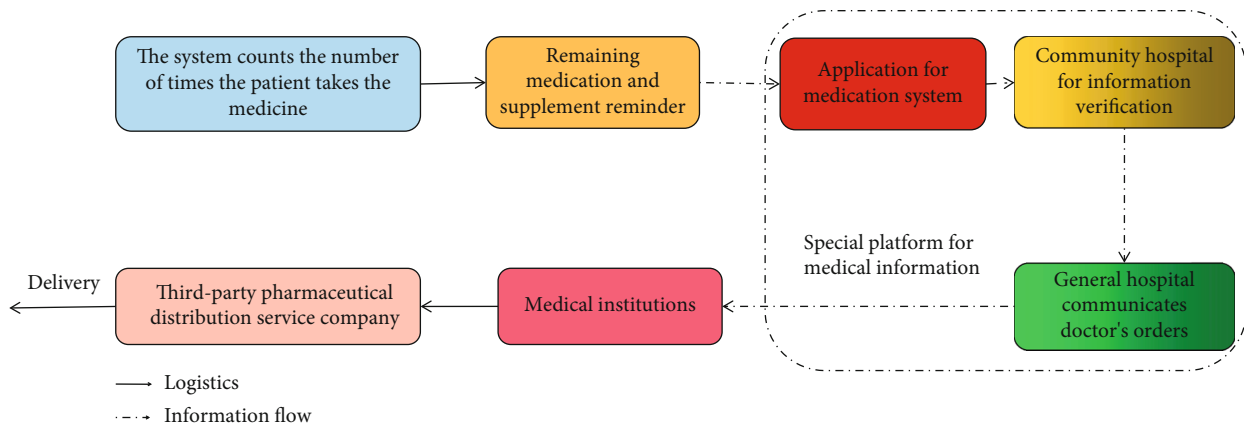


FIGURE 3: Process of third-party medical distribution service.

establishing the evaluation index system. Whether the evaluation index system is reasonable or not and whether it actually reflects the detailed characteristics of the hospital website and then effectively carry out the evaluation work and obtain a comprehensive, scientific, and accurate understanding of the hospital Internet medical information service are the key to judging whether the evaluation results are effective or not. The principles to be followed when designing the evaluation index system are as follows.

3.2.1. *The Principle of Purpose.* The index system should be an objective description of the essential characteristics, structure, and elements of the evaluation object and should serve the purpose of the evaluation activities. The purpose principle is the basic starting point of the design of the index system. An important standard to measure whether the index system is reasonable and effective is to see whether it meets the evaluation purpose.

3.2.2. *Scientific Principle.* The scientificity of the index system is the basis to ensure the accuracy and rationality of the evaluation results. The establishment of the evaluation system should take into account the sudden constraints and mutual interference of internal and external factors in the evaluation process on the basis of adopting reasonable

evaluation methods, real data, and scientific analysis methods and consider the coordination in the designation of indicators.

3.2.3. *Independence Principle.* There should be no strong correlation between the indicators in the index system, and there should be no excessive information inclusion and coverage to make the connotation of indicators overlap. However, it is difficult to achieve complete independence between indicators. In the actual evaluation activities, in order to emphasize the importance and evaluation of a certain aspect, it is sometimes necessary to set some indicators from different angles to verify and make up for each other. At this time, the correlation between indicators can be handled by appropriately reducing the weight of each indicator.

3.2.4. *Principle of Practicality and Operability.* Hospital website evaluation is a highly practical work. The design of index system should take into account the realistic possibility. The index system should be suitable for the evaluation method, the limitation of time and cost of evaluation activities, the understanding and judgment of index users, and easy to use.

3.2.5. *The Principle of Objectivity.* The evaluation index should be able to objectively evaluate and measure the

evaluation object. Generally speaking, the evaluation with concrete figures is objective, while the indicators evaluated by people are easily mixed with human factors, but these indicators and practices are essential in the evaluation activities.

3.2.6. The Forward-Looking Principle. Internet medical information service evaluation should be a developmental evaluation based on the present and looking forward to the future. Therefore, the setting of evaluation indicators should consider the application of new technologies and methods of the Internet. At the same time, it should also be understood that with the deepening of network life, the public's demand for network medical care is constantly changing, and the setting of indicators should reflect this change and development.

There are various methods for the primary selection of the evaluation index system, such as analytical method, comprehensive method, and cross method. The most commonly used method is the analysis method. The analysis method refers to dividing the measurement objects and measurement objectives of the evaluation index system into several different components or different aspects and gradually subdivides them until each part and aspect can be used with specific statistics indicators to describe and achieve.

In order to better improve the dimensional index structure of hospital website information service evaluation, this study selected relevant experts to conduct two rounds of questionnaire consultation on the revised dimensional index structure of hospital website information service evaluation, in order to determine the evaluation index system. In order to ensure the accuracy of the expert consultation results, this study conducted a survey of the experts' personal situation among the consultants. The survey items included professional titles, majors and working years. At the same time, the experts' positive coefficient, the degree of authority of the experts, the degree of coordination of the experts' opinions, the degree of coordination of the experts' opinions, and the degree of variance in expert opinion were calculated. The formula for calculating the positive coefficient of experts is the ratio of the experts participating in the evaluation to the total number of experts:

$$K = \frac{m_i}{m}. \quad (1)$$

Among them, K is the positive coefficient of experts, m is the number of experts participating in the evaluation of i index of satisfaction evaluation, and m is the total number of experts participating in consultation score.

The degree of expert authority is the arithmetic mean of the judgment coefficient and the familiarity coefficient, and the value ranges from 0 to 0.95. The calculation formula is

$$C_R = \frac{(C_a + C_s)}{2}, \quad (2)$$

where C_R is the authority of experts, C_a is the basis for experts to judge the evaluation, and C_s is the familiarity of experts with the evaluation object.

The coordination degree of expert opinions can be calculated through the formula, and the coordination coefficient ranges from 0 to 1. The larger the value, the higher the consistency of opinions among experts. The calculation formula is

$$W = \frac{12}{m^2(n^3 - n) - m \sum_{i=1}^m T_i} \sum_{j=1}^n d_j^2, \quad (3)$$

where m is the total number of experts, n is the total number of indicators, d_j is the difference between the sum of all experts' evaluation grades of j indicators and the arithmetic average of all experts' evaluation grades of all indicators, T_i is the correction coefficient of the same grade, and its calculation formula is

$$T_i = \sum_{i=1}^L (t_1^3 - t_i), \quad (4)$$

where L is the number of the same evaluation index in the i expert evaluation, t_1 is the number of the same grade in a group, and the rest are defined as above.

The difference degree of expert opinion can be expressed by the coefficient of variation V_i , which represents an important index for evaluating the magnitude of fluctuations, indicating the degree of difference in the experts' understanding of the relative importance of the evaluation index. The smaller the coefficient of variation, the better the degree of coordination. The calculation formula is

$$V_i = \frac{S_i}{C_i}, \quad (5)$$

where V_i represents the coefficient of variation of i index, S_1 represents the standard deviation of i index score, and C_i represents the weighted arithmetic mean of i index.

After two rounds of expert consultation, the distribution scheme of indicators at all levels is determined, and the combination weight of each three-level indicator is obtained by the product method:

$$W_{cj} = W_{1j} \times W_{2j} \times W_{3j}. \quad (6)$$

Among them, W_{cj} is the weight of the third-level index, W_{1j} is the weight of the first-level index corresponding to j index, W_{2j} is the weight of the second-level index corresponding to j index, and W_{3j} is the weight of j index in the third-level index.

Similarity test of evaluation results is as follows.

Spearman rank correlation coefficient r_s is calculated as follows:

$$r_s = 1 - \frac{6 \sum d^2}{n(n^2 - 1)}. \quad (7)$$

Calculate the r_s value according to formula (7) and then check the r_s boundary value table to determine the P value, and $P < 0.05$ is statistically significant.

The rank sum ratio method is to obtain the dimensionless statistic RSR through rank transformation; on this basis, the concept and method of parametric statistical analysis are used to study the distribution of RSR and use the RSR value to directly rank or rank the evaluation objects. When the weight of each evaluation index is different, the weighted rank sum ratio WRSR is calculated, and its calculation formula is

$$\text{WRSR}_i = \frac{1}{n} \sum_{j=1}^m W_j R_{ij}, \quad (8)$$

where $i = 1, 2, \dots, n$, $j = 1, 2, \dots, m$, R_{ij} is the rank of element in row i and column j and W_j is the weight of j evaluation index, $\sum W_j = 1$.

A model is a simplified and general description of people's cognitive objects for a specific purpose. It can be expressed in many ways, such as charts and formulas. According to the significance of weights and attribute values, the comprehensive evaluation model of medical information service on hospital websites in China is established by comprehensive scoring method, with the weighted total score as comprehensive score.

$$S = 100 \times \sum_{i=1}^k \sum_{j=1}^{n_i} W_{ij} S_{ij}. \quad (9)$$

In the formula, S is the total score, in the $[0, 100]$ interval, S_{ij} is the score value of the j th index in the i th dimension, W_{ij} is the combined weight of the j th index in the i th dimension, $i = 1, 2, 3 \dots k$, $j = 1, 2, 3 \dots n_i$, and n_i is the number of indicators included in the i th dimension, k is the degree, and $k = 8$ in this study. After processing the data in the data collection table of each hospital website, assign values according to the scoring levels of the indicators at all levels, and then according to formula (9), the comprehensive score of each hospital can be obtained.

4. Result Analysis and Discussion

In order to make an empirical evaluation on the evaluation model of comprehensive scoring method, this paper selects the websites of 6 public hospitals as the survey object for comprehensive scoring.

The sampling method adopts stratified cluster random sampling according to the principle of combining scientificity and operability. The stratified indicators are the East, Middle, and West regions. According to the empirical method, three hospitals were randomly selected from each floor according to the eastern region: two hospitals were randomly selected from the central region and one hospital was randomly selected from the western region.

The investigation and statistics of medical information service evaluation data of hospital websites are the basis of

website information service evaluation. The traditional method of medical service evaluation and investigation is no longer suitable for this study. Therefore, the evaluation system of medical information service of modern Internet websites has been established. Based on this, this study established an investigation system of medical information service evaluation data based on Internet websites. The hospital's network medical information service system is realized by the form of its website, that is, it integrates various medical information systems, interactive service systems, and data resources into the website platform to provide medical information and services for the public. In recent years, due to the vigorous development of the network and the improvement of data collection technology and data management technology, many network-based information collection methods have been widely used.

The survey method of this research is to use the website information service evaluation form for online real-time observation and record of the hospital website sample by two investigators. The content of the information service to the quality of the information service, the support of the service technology, the construction of the information, and other survey items are scored against the evaluation table one by one. These evaluation items have both objective evaluation and subjective evaluation. At the same time, for the evaluation of service items with unique network characteristics, the interactive information service of the hospital website, this research adopts the virtual user survey method. Time and feedback content to evaluate the service quality of the hospital website.

For the survey items involving the application of virtual user survey method in the data collection table, the investigator shall record the reply time and reply content after submitting the consultation or sending the consultation post and telecommunications and summarize and sort out the data. When obtaining the website evaluation score, if the result of the website evaluation score of the investigator is inconsistent, add the scores of the two investigators, and take the arithmetic mean value as the index score.

Through the above research process, the comprehensive evaluation scores of medical information services on the websites of six hospitals are obtained, as shown in Table 1.

It can be seen from Table 1 that the comprehensive quality level of the medical information service on the website of the 6 hospitals is ranked as E, D, F, A, C, B from high to low. Among them, the hospital websites with relatively high level are E and D hospitals, and the relatively low level is B hospital.

The six hospital websites are ranked in descending order of comprehensive score, as shown in Table 2.

Enter the websites of the above six hospitals into Alexa website query system, and the traffic rankings of each website can be obtained. Please see Table 3.

Figure 4 is the scatter diagram between the website comprehensive score ranking and Alexa traffic ranking of the six institutes in this study.

It can be seen from Figure 4 that there is a linear trend between the two variables.

TABLE 1: Scores and total scores of six hospital websites in each dimension.

Hospital number	A1	A2	A3	B1	B2	B3	Total score	Ranking
A	0.060	0.041	0.034	0.032	0.028	0.028	0.223	4
B	0.048	0.036	0.041	0.031	0.015	0.015	0.186	6
C	0.057	0.043	0.049	0.037	0.018	0.018	0.222	5
D	0.094	0.081	0.054	0.040	0.035	0.035	0.339	2
E	0.103	0.088	0.059	0.044	0.038	0.038	0.37	1
F	0.074	0.063	0.042	0.032	0.027	0.027	0.265	3

Note: for the sake of confidentiality, the names of each hospital in this table are marked with letters.

TABLE 2: Basic attributes of the websites of the top six hospitals in the comprehensive evaluation.

Hospital number	Comprehensive score ranking	Comprehensive evaluation score
A	4	0.223
B	6	0.186
C	5	0.222
D	2	0.339
E	1	0.37
F	3	0.265

TABLE 3: Alexa website traffic ranking.

Hospital number	Ranking	Alexa website traffic ranking
A	2	910290
B	5	3522534
C	4	2629219
D	1	690019
E	3	1348794
F	6	4238048

The average score of medical information service quality of hospital websites in eastern coastal areas is generally higher than that in central and western regions, and the score in western regions is the lowest. The scores of the two first-class indicators of the hospital websites in the eastern region are higher than those of the corresponding hospital websites in the central and western regions. The shape of the eight dimensional score map of the hospital websites in the eastern, central, and western regions is basically similar. The scores of the eight dimensions of hospital websites in the eastern region were higher than those in the central and western regions. The standard scores of eight dimensions of hospital websites in different regions are shown in Figure 5.

Interactive medical information service is currently a popular Internet service item used by hospitals in developed countries. However, in my country, the network environment is poor and the degree of modern informatization in hospitals is low. Therefore, the service in this area started late. In this study, the interactive medical information service is included in the evaluation project of the website, and it is also intended to find out our shortcomings, so as

to take more targeted measures to improve our own service level and narrow the gap with developed countries.

In the context of modern information technology, the number of Internet medical services business represents the user scale of Internet medical services and further reflects the development of the industry. Because the Internet +healthcare service uses the Internet as the main carrier, it has the advantages of being close to users and having a wide range of users. Therefore, it can well undertake the task of preliminary consultation before diagnosis and help promote the realization of reasonable hierarchical diagnosis and treatment. It is precisely because the development of Internet services has brought a new medical window to residents. The use of Internet means has improved the quality and convenience of medical services. At the same time, it has virtually reused medical resources in multiple dimensions and rationalized hierarchical diagnosis and treatment, so as to improve the utilization efficiency of medical resources, improve the level of medical services available in China in terms of quality and quantity, and help residents to be faster and more efficient in case of illness. It is convenient, easy, and free from worries to find services to meet their needs, so as to achieve the purpose of reducing PMD.

Figure 6 shows the change of “the ratio of the number of medical visits,” a variable reflecting the level of graded diagnosis and treatment, with time before and after joining the Internet medical service system.

As can be seen from Figure 6, compared with the situation without the development of internet medical treatment, the “proportion of medical treatment” is higher after joining internet medical treatment. This gap is not significant first, more obvious in the medium term, and gradually narrowed after 2022. However, generally speaking, the promotion effect of the development of internet medical treatment on hierarchical diagnosis and treatment is not as significant as expected.

Figure 7 shows the change of the variable “not seeking medical treatment rate” with time before and after joining the Internet system.

As can be seen from Figure 7, compared with the situation of no development of internet medical treatment, the “rate of no medical treatment” decreased faster and more sharply after joining internet medical treatment.

Medical insurance can help patients reduce the economic burden of medical treatment. It is a widely popularized medical policy in China. However, because Internet

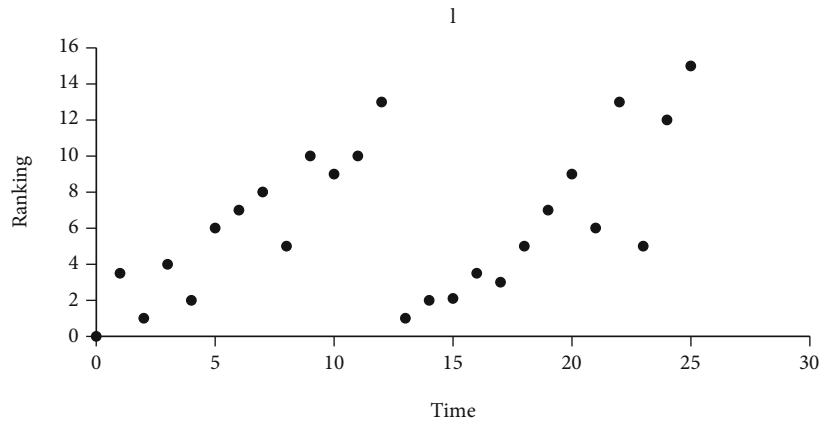


FIGURE 4: Scatter chart of comprehensive evaluation ranking and Alexa ranking.

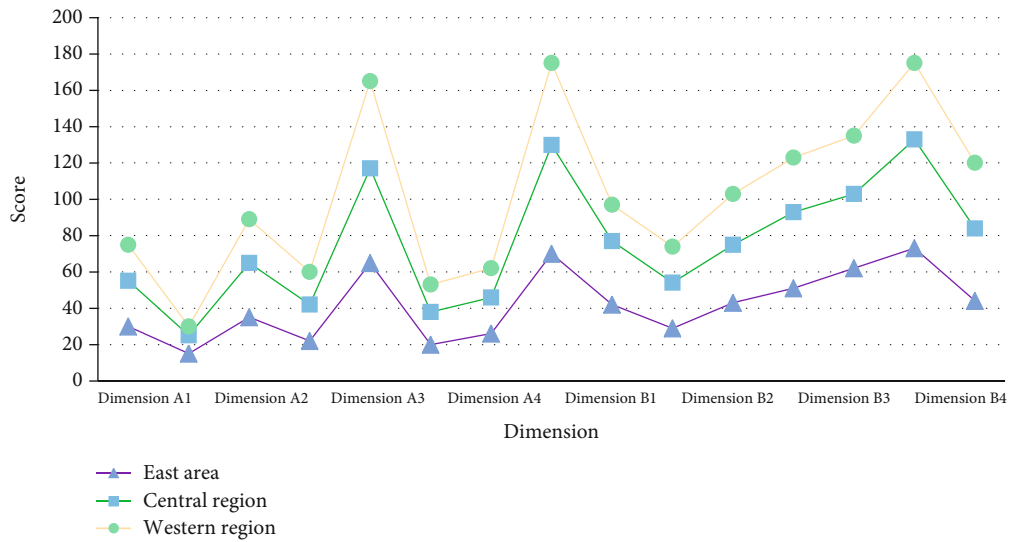


FIGURE 5: Standard score chart of 8 dimensions of hospital websites in different regions.

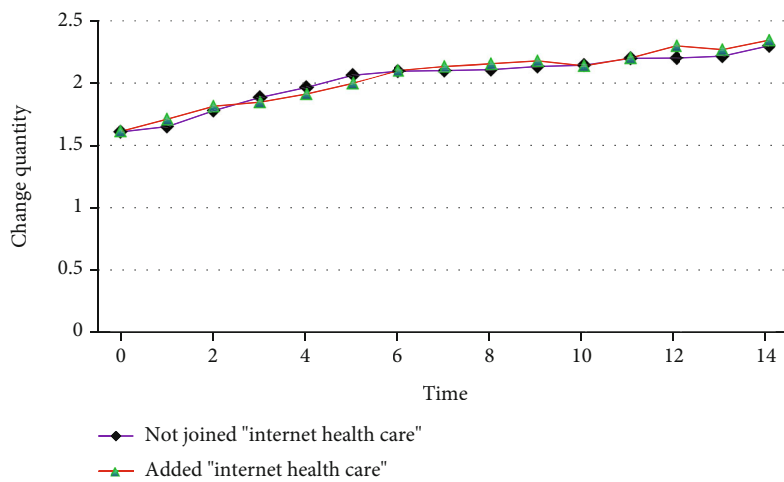


FIGURE 6: The ratio of the number of medical visits.

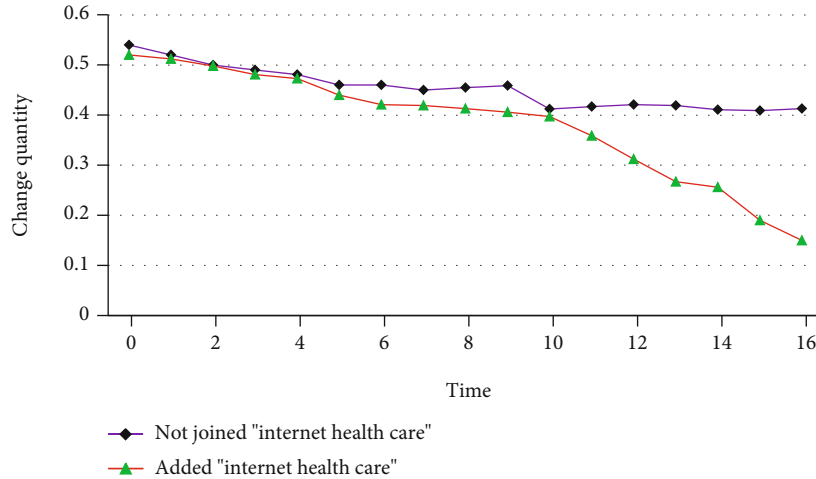


FIGURE 7: The rate of nonmedical treatment.

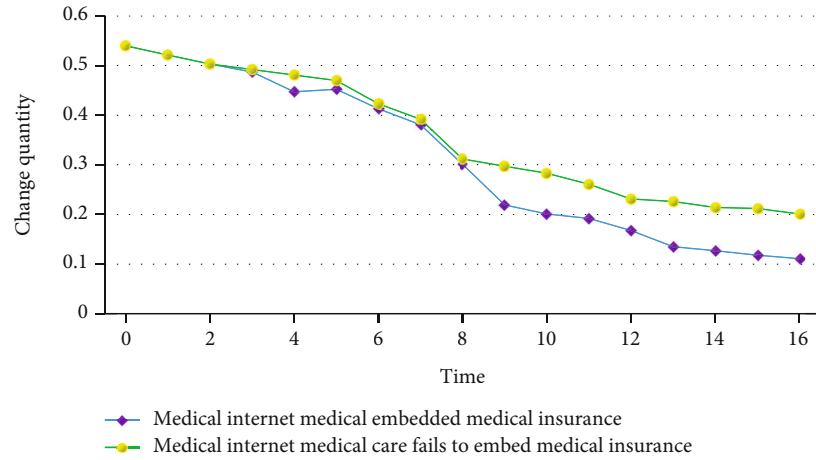


FIGURE 8: The influence of whether medical insurance can be used in the Internet medical system on the rate of not seeking medical treatment.

Medical is a new thing, it is difficult to connect its electronic system with the management system of traditional medical insurance. Although in this model, we set that medical insurance can be used to the same extent in internet medical treatment, not all internet medical systems can make smooth use of medical insurance resources in real life. Now, we set that medical insurance reimbursement cannot be used when using the internet medical platform for consultation. Figure 8 shows the change of “no medical treatment rate” when using medical insurance or not.

It can be seen from Figure 8 that, compared with the situation that medical insurance is not embedded in Internet medical care, after the medical insurance process in Internet medical care is opened, the rate of “not seeking medical care” drops faster and more sharply, and the gap between them is very obvious.

This simulation intuitively shows the importance of opening up the medical insurance process in the Internet medical system, which is an important foundation for Internet medical care to play a greater role in the market in the future.

5. Conclusions

Firstly, this paper introduces the background, research significance, and research purpose of the project. Secondly, according to the characteristics of modern medical information service system, the demand analysis is carried out, mainly from two aspects of the system function and performance, and the corresponding functional modules are divided. At the same time, the evaluation model of modern medical information service is constructed. Comparing the data results of model simulation with the actual data, we can see that the deviation between the actual data and the simulated data is not significant, that is, between 0.12% and 15.93%, which is within a reasonable range. Therefore, we have reason to think that the model is effective and reasonable. On the basis of determining the weight by the expert scoring method, the evaluation indexes are assigned, and a comprehensive evaluation model with the weighted total score as the comprehensive index and the comprehensive scoring method as the evaluation method is constructed.

This paper makes an empirical study on the medical information service quality of six hospital websites by using the constructed comprehensive evaluation model and makes statistical analysis on the index data of sample websites by using the traditional weighted rank sum ratio method. It is found that the evaluation results of the above three comprehensive evaluation methods are similar, which shows that the evaluation model constructed in this study is scientific and feasible and has the value of popularization and application. This paper introduces that Internet medical service can play a positive role in promoting graded diagnosis and treatment, but it has a remarkable effect in helping to reduce PMD, thus ensuring people's livelihood medical service and improving the overall health level of the people.

Artificial intelligence technology plays an important role in the development and construction of medical and health undertakings in the new period. Vigorously carrying out the modern information construction of internal and regional medical care in medical institutions and gradually establishing the national personal electronic health records will become an important means to improve the medical and health service level and promote the health of the whole people. Among them, the research on a series of related basic problems of medical informatics and the solution of key technical problems will provide strong support for this. At the same time, with the development of research, the modern informatization of medical and healthcare is bound to face more challenges, which requires the close cooperation of medical workers and information technology personnel.

Data Availability

The data used to support the findings of this study are included within the article.

Conflicts of Interest

The authors declare that no competing interests exist concerning this study.

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