

# Analysis on the Effective Application of VPN Technology in Hospital Information Construction

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**Abstract:** With the rapid development of economic construction, constant improvement of economic level of china, all walks of life have technologically conducted in-depth study on related knowledge applied in their own areas. Among them, the application of relative technology as well as relative requirements in medical industry is also constantly improving. The application of emerging technology not only plays a significant role in the modernization development of hospital, but also is greatly significant on the improvement of medical quality. Therefore the key point of hospital development is how to use network technique to ensure the rapid, stable and safe operation of hospital's daily work. Starting from the information construction of hospital, this paper has made a discussion on the concept and advantages of VPN technology, and an analysis on the specific application of VPN technology in hospital. According to the discourse of the paper, it's possible to provide valuable references and suggestions for the application of VPN technology on the information construction of hospitals.

**Keywords:** VPN technology; Information construction; Application

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With the development of China's economic construction, the scale construction of hospital in china is increasing gradually, so some hospitals with large scale and relative advanced medical technique level have established their own branches. Under the overall political and economic environment accelerating the development of medical industry, in order to effectively maintain the daily work between general hospital and the branch, and ensure the medical quality of every hospital, advanced network technique must be applied as the manner of working, in that way information of different hospitals or medical departments can be shared in time, also through the internet, relative work between general hospital and the branch can be coordinated and commanding work on the branch can be completed. Sometime a branch hospital may be established in a location far away from the general hospital, leading to a scattering distribution of actual geographical locations of hospitals, which will impose restrictions on information

transmission among hospitals. Therefore, to ensure the fulfillment of hospital information sharing, the application of VPN technology to enhance information construction is an effective way to realize this purpose.

## 1. Effect and Significance of Hospital Information Construction

Currently, the requirements of people in china on medical treatment and public health is gradually increasing. As the social environment is constantly changing and fast-pace life style becomes increasingly common, while people are adapting to the social development, they also expect to obtain an effective treatment or rehabilitation methods once there are physical problems. At the time when people's demands on medical treatment are continuously improved, branches of community service centers and hospitals are set up one after another. Moreover, branches of community service centers and hospitals have gradu-

ally gained people's trust. Therefore, the main challenge for relevant medical workers is how to improve the actual medical effect and conduct information management and sharing in a scientific, effective and secure way during the daily operation of community service centers and branch hospitals. At present, the application and development of network technique is bringing a new moment for the hospital information construction and management, and providing effective way to solve numerous management issues and difficulties. But due to the many types and sorts of network system for option, during the usage of internet, there is a problem needed to be solved at the first place, that is how to select effective network system with certain stability and security to meet the hospital's actual needs<sup>[1]</sup>. There may be some network systems which work well in daily operation, but once put into use in the hospital information construction, the effect is not ideal. This kind of situations has imposed certain obstruction on the information management of community service centers and hospital branches, and have affected their development. So, it's necessary to perform further study on hospital information construction, and the application of VPN Technology is the only way for hospital information construction. At the meantime, enhancement of hospital information construction, which is of great important practical significance, is more beneficial for improving the health of Chinese people than accelerating the development of our country's medical treatment cause. Medical workers should carry out further in-depth study and analysis on it to better apply it into the actual medical treatment cause.

## 2. Concept and Advantages of VPN Technology

### 2.1 Concept of VPN Technology

VPN technology is the abbreviation for Virtual Private Network technique, which is not the actual network commonly used by people, it only has certain functions of the private network. Through the data processing of packaging and encryption, VPN technology can realize the complete of data transmission in public network, at the same time possessing the stability and security of private network system<sup>[2]</sup>. The practical application of VPN technology should have the following characteristics:

- 1) the characteristic of portability and economic application during the use of public network;
- 2) characteristics of privacy and security.

### 2.2 Advantages of VPN Technology

VPN technology has a prominent effect, which is extremely superior to other network systems during its actual application in hospital information management. As it turns

out, VPN technology has been widely used during the construction of numerous medical information systems. A brief analysis is made below on the specific advantages of VPN technology:

- 1) The use cost of VPN technology is low, which does not affect the networking expense of the overall network system and to a certain extent reduces the input cost of hospitals<sup>[3]</sup>. It's VPN technology that uses the internet system already built at present to achieve the functions of its own network system and control the cost and expense at the lowest. With the usage of VPN technology, there is no need to transfer the internet data information through private circuit, but to use other network system through other communication mode with lower operation cost to realize the operational effect of its own network system.

- 2) During the usage of VPN technology, the security and stability of the transmission of information data can be effectively guaranteed. During this process, various security technologies are used in safety verification work in different parts, including the verifications of users' identities, encryption of tunnel and channel protocol, etc., which make it possible to take advantages of VPN technology and render convenience to manage and control of daily operation of VPN technology. During the process of application of VPN technology, by using the transmission mode of VPN technology, general hospitals can send different information to their branches in different areas, ensuring that the performance of relate work by branches is in accordance with the code standard of hospitals, offering convenience for unified management and coordination of hospitals in different areas. It should be noted that the network address during the application of VPN technology is a kind of cryptographic URL, so all data information will be confidential, which makes the VPN network has certain privacy.

## 3. Specific Application of VPN Network Technique

### 3.1 Application of Emerging Technology in Hospital Information Construction

During the process of hospital information construction, many large-scale hospitals have gradually developed HIS System suitable for their operational process and development. Moreover, HIS System has made certain achievements. But there also have been obstructions, because of unbalanced development of network technique in different areas plus great distance in actual geographical location, all these aspects have imposed negative impact on the use and development of network technique, and besides having resulted in unbalanced application level of network technique. Among the application of network technique

in community service centers and branches of hospitals, data information sharing is not timely effectively conducted, and even there occurs network partitions in some areas, affecting the information management of hospital. At present some hospitals have started to connect their branches to themselves by leasing digital data network to ensure the effectiveness of the transmission of daily data information, and have gained an impressive result. Although by this way of leasing digital data network can improve the management efficiency and the work quality, the leasing cost is quite high. So from perspective of actual condition, it doesn't work to lower the cost but increases the cost of hospital information construction instead. As for using lower-cost dial-up line, it does save the cost but the capacity of this dial-up line is small, and it lacks stability and security during the process of transmission. How to guarantee the effect of network technique and at the meanwhile eliminate its negative impact during the network construction of hospital is the research contents of medical workers. In terms of in-depth study of VPN technique, it's the key point for implementation of medical industry's perfect and long-run development.

### 3.2 Method of Application of VPN Technology

Through the analysis on the practical application of VPN technology, it can be found that VPN technology has the advantages of fast transmission, high security and transmission stability as well as lower operating cost. But still there should be serious research on its application method. An effective connection mode should be selected to ensure the efficient operation of VPN Network System. The connection mode of VPN Technology applied in some hospitals' departments, as shown in Figure 1.

Under this connection system, by the action of Internet, medical institutions at different location can constitute an effective virtual private network, also it's possible for unified management through hospital network. The design

for VPN Network System is based on the actual condition of Internet at present, and at the same time combined with hospitals' own characteristics to make connections with relative network systems, to reach full effect of each network system. It's through the VPN Network System that realized the data sharing link among community service centers and hospital branches, and the process of relevant data by using network technique. This connection way of network system enables various service stations and branches of hospitals at different areas to perform correlative medical work under unified network environment, makes local area network of each department of hospitals gradually expend into a larger network, conforming to the law of hospital development, and provides better technical support to the information construction of hospitals, further promotes the development of hospitals and ensures the quality of medical treatment.

### 3.3 Major Means to Improve the Application Level of VPN Technology

VPN technology plays an important role in the information construction of hospitals. Therefore, promoting the application level can ensure the quality and efficiency of hospital information construction. The following is going to analyze from four different aspects:

- 1) Establish an information system of VPN technology in hospital. The application of VPN technology can promote the usability of hardware equipment in information system, integrate and optimize the technologies applied in the former information system, thus ensuring various virtualizers, like central management system, sever, local control system and information system, operate independently. Compared with the application of traditional servers, the VPN network service system has more functions as a server. Besides, the input cost it needs is much lower and it can further improve the operating efficiency of hospital information system.

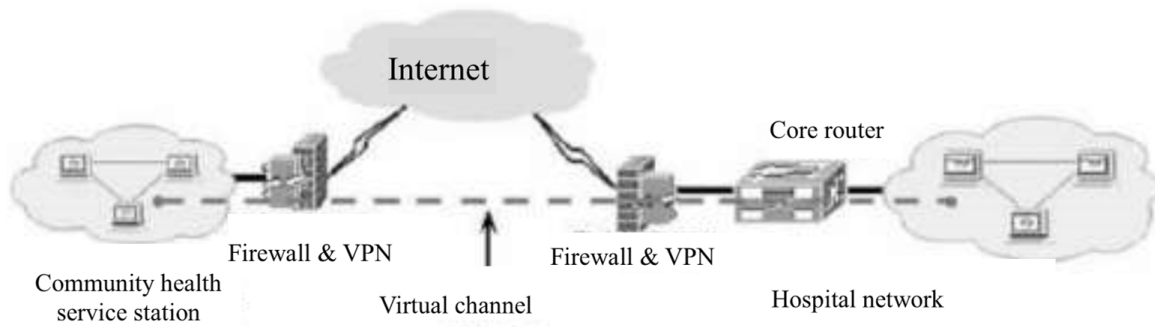


Figure 1. VPN network connection system

2) Enhance automated management of hospital information system. The information management system of hospitals mainly consists of software and hardware systems. but due to the large amount of relative software and hardware equipment, and scattering distribution of the equipment, the technicians concerned must be familiar with such situations so as to improve the management efficiency of information system.

3) Realize information data or resource sharing. To meet people's demands for cognition of medical treatment information or health information data, a related system of information resources sharing should be built during the information construction of hospitals in order to enhance people's understanding of medical health and gradually raise people's attention to their own health. Meanwhile, since there are numerous sections and branches of hospital, there will be exchange and reference of information and data among them. So the integrity of data resource in hospital information construction should be enhanced.

4) The information construction of hospital is not easy; what's more, the operation of hospital information construction needs to experience a long-term test, therefore, the information system should possess the continuity and high operating capability to some extent; an information system of different structures should be established according to the actual situation of hospitals so as to meet the requirements of different hospital environments. Sometimes, there may occur resource shortage during the operation of hospitals, at that time VPN technology can be used to perform effective judgment on the resource occupancy, then dynamic balancing technology can be used to complete the supervision and management on the operation process of sever, and to further improve the usability of information system and promote the information construction of hospitals.

## 4. Conclusion

With the popularization of computer technology and network technique, information system have been widely used in different fields. And there are many types of information systems available for hospitals, such as HIS System, PACS System and LIS System. But in consideration of the entire development demand of hospitals, traditional network structure is unable to completely satisfy the hospital development. According the discourse of the paper, applying VPN technology can help hospitals make a good achievement in the information management. Besides, the advantages of low-cost of VPN technology enables hospitals to obtain higher benefit with lesser investment. Applying VPN technology can further perfect the information construction of hospitals, promote the overall development of hospitals, and it is significant for the patients to some extent. Effective application of VPN technology promotes the overall development of hospitals as well as the entire medical industry.

## References

- [1] Jian Zhang. Application of VPN Technology in Hospital Information Construction[A]. National and Provincial Mechanical Engineering Society. Collected papers titled Lead by Innovation-driven, Accelerate "Made-in-China 2025" Strategy Implementation Seminar and the Sixth National & local MES Academic Annual Conference 2016[C]. National and Provincial Mechanical Engineering Society, 2016:3. (in Chinese)
- [2] Wenbo Wang, Yaping Wang, Lin Liu. Application and Research of VPN technology in Hospital Network[J]. China Medical Devices, 2014, 04:61-62. (in Chinese)
- [3] Shengzhe He. Application & Development Prospect of VPN Technology in Hospital Information Construction[J]. Information construction, 2015, 11:215+217. (in Chinese)