Original Research Article

DICOM Standard and Its Application in PACS System

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ABSTRACT

PACS is an important link in the rapid development of information technology in contemporary hospitals. DICOM is the standard of PACS TCM medical image format and transmission medical image protocol. This paper describes the status of PACS system based on DICOM standard. In addition, the PACS system is described in detail according to its application classification and the characteristics and significance of DICOM standard are expounded. At the same time, it discusses the long-term prospect of DICOM in PACS.

KEYWORDS: Information technology; PACS; medical; imaging

1. Introduction

With the modernization of the hospital and the pace of medical equipment to update the pace. For instance, hospital information system (HIS), clinical information system (CIS) and transmission system (picture archiving and communication system PACS) are becoming more and more important, PACS has become a hospital medical imaging (such as radiology, ultrasound imaging, nuclear medicine Etc.) in the construction of the focus. Medical image information system referred to as PACS (Picture Archiving and Communication Systems), medical image information system in the narrow sense refers to the medical image storage and communication system based on the technical solution to the image processing technology management system. Clinical information system is to support hospital health care personnel Clinical information, the collection and processing of patients with clinical medical information management system. Radiological information system refers to the radiology of the registration, diagnosis, imaging diagnosis and radiology of the information query, statistics and other process-based management Information system. Hospital information system refers to all the business and business processes covering the whole process of information management system. Laboratory information system is used to deal with a laboratory process information system.

In the modern medical industry, medical imaging information system refers to the inclusion of RIS, DICOM3.0 international standard design, high-performance servers, networks and storage devices constitute a hardware support platform to large relational database as data and image storage management tools. The medical imaging of the collection, transmission, storage and diagnosis as the core is set image acquisition and transmission and storage management, image diagnosis query and report management, integrated information management, integrated application in one integrated application system. The main task is (Including nuclear, CT, DR, ultrasound, various X-ray machines and other equipment generated by the image) through the DICOM3.0 international standard interface (the Chinese market mostly analog, DICOM, network interface). In a digital way to save the mass load of work, the need for a certain time under the authorization can be quickly transferred back to use while adding some auxiliary diagnostic management functions.

Medical imaging storage diagnostic imaging equipment in a variety of advanced computer technology and digital image technology for the development of medical imaging information system laid the foundation. After more than 100 years of development, medical imaging technology from the initial X-ray imaging to the development of a variety of digital imaging technology.

2. Related knowledge

TCP / IP (Transmission Control Protocol / Internet Protocol) is an industry standard protocol set, which is designed for wide area network (WAN). It is developed by ARPANET network research institutions. IP is the English Internet Protocol (Internet interconnection between the agreement) abbreviation, the Chinese referred to as 'network association',

that is, for the computer network to communicate with each other to design the agreement. In the Internet, it is a set of rules that enable all computer networks connected to the internet to communicate with each other while specifying the rules that should be followed when the computer communicates over the internet. Any manufacturer of computer systems, as long as the compliance with the IP protocol can be interoperable with the Internet. IP addresses are unique, depending on the nature of the user, can be divided into five categories. In addition, IP also has access to protection, intellectual property, pointer register and so on. IP is how to achieve network interconnection, such as ethernet and packet switching network. They cannot communicate with each other and the main reason is because they send the basic unit of data (technically called 'frame') and their format is different. IP protocol is actually a set of software, program protocol software and it is a variety of different 'frame' unified into 'IP packet format' format. This conversion is one of the most important characteristics of the internet. All kinds of computers can be interoperable on the internet, that is, an 'open' features.

3. Introduction

DICOM is the abbreviation of Digital Imaging and Communications in Medicine, the medical digital image and communication standard. The Medical Digital Image Communication Standard (DICOM) is an international standard for medical imaging in the fi eld of medical informatics that enables manufacturers and users of medical image equipment to interconnect devices on standard networks and facilitate the use of various types of medical images Development and application, is the current international and domestic research and development of hot spots. DICOM standard is the industry standard of medical imaging, PACS system is the basis for the realization. Although the DICOM standard is primarily used in diagnostic medical imaging, especially in radiology, cardiac disciplines and other related disciplines, it can still be widely used in clinical and other medical statements of strictly declarative images and non-image-related information. In the DICOM standard in the defi nition of the image and its related information composition format and exchange method, with the use of this standard, people can set up an interface in the video equipment to complete the image data input and output work. The DICOM standard is based on the industrial standards of computer networks. It can help more eff ectively transfer digital images between medical imaging devices, including CT, MR, nuclear medicine and ultrasound, CR, fi lm digitization systems, video capture systems and HIS / RIS information management systems. At present, the world's major providers of medical imaging equipment have announced support for DICOM standards. The emergence of the DICOM standard makes medical care more advanced in terms of improving the level of medical diagnosis or in improving the economic benefi ts associated with medical imaging and its information.

4. Application of DICOM Standard in PACS Image

4.1. Working principle

The imaging device (the computer that acquires the image) obtains the image file, enters the database system through the description of the text information, carries on the image fi le archives and the control and fi nally the data image is displayed freely on the display workstation. The image display workstation is the window of the PACS system and the basis of medical imaging diagnosis. It provides users with a good user interface, the implementation of images (organization, measurement. Document processing) a variety of operations. The network is the path of PACS system information fl ow.

4.2. The basic structure of PACS

Including an imaging device (image acquisition computer), a PACS controller. Image display workstations and networks. According to the size of PACS can be divided into: radiology PACS, all hospital PACS and remote radiology system. Radiation internal PACS system, to achieve relatively easy, the use of Ethernet in the medical imaging disciplines to digitally realize the digital transmission, storage and copy display function. The hospital's PACS system covers a wide range of radiology or medical imaging disciplines, including all medical imaging equipment with independent image storage and management sub-systems and sufficient amount of soft copy display and hardcopy output devices as well as clinical image browsing, consultation System and remote radiology services. the whole hospital-wide PACS also involves the integration with the HIS system and must take into account the development of HIS, the interface of the two to achieve a certain degree of diffi culty, HIS and PACS common construction needs. High economic cost is currently limited to promotion in large hospitals. All hospital PACS and remote radiological systems, including all digital imaging devices (CT, MRI, DSA, etc.) other than conventional x-ray images, conventional x-ray images can be entered into PACS via a fi lm digitizer. With independent image storage and management sub-system and the necessary soft and hard copy output device.

4.3. PACS system interface technology:

There are several main aspects of the interface:

(768 × 576) and NTSC (640 × 480), black and white two kinds of standard (white and white), the standard is not the standard video and non-standard video (when connecting the video signal must pay attention to the ground) Corresponding to PAL and NTSC there are CCIR and RSl70. Non-standard video: corresponding to CT, MRI is mainly 512 x 512.

(2) Network access: through the network protocol (such as FTP) to access the file through the decoding. You can get the image.

(3) DICOM interface: DICOM (Digital Imaging and Communications), an international standard interface, through the DICOM interface can access the DICOM service. DICOM services are varied. The main use of a storage service, set word / return service, film printing services. The DICOM standard is the basis for device interconnection. Fully compatible with DICOM standard products is the inevitable trend of PACS development.

(4) Laser camera interface: In general, laser cameras have two interfaces. 3M952 protocol and DICOM protocol. 3M952 mainly through the serial port (command port) and parallel port (data port) to work together to achieve the image. DICOM printing is done by accessing the DICOM print service.

4.4. PACS image application

Medical image diagnosis in modern medical activities occupies a very important position. It is applied in the hospital imaging department system, the main task is to produce a variety of daily medical images through a variety of interfaces to digitally save the mass when the need for a certain time under the authorization can be quickly transferred back use while adding some auxiliary diagnostic management functions. Hospital use of PACS will be able to save a lot of time for patients, can facilitate the diagnosis, reduce misdiagnosis, reduce the use of film and management, reducing operating costs, able to image reprocessing in order to control and comparison,; improve the hospital's medical level, provide resources for the hospital, make full use of our resources and other hospital resources, help computer-aided teaching and to further improve the quality of teaching.

5. DICOM Features

DICOM defines the methods and specifications that include patient information, inspection information and related image parameters, as well as image formats, image point-to-point, grid and file.

The widely used standard is DICOM3.0, which has the following characteristics

A) It is available for a network environment. The previous versions are only available in point-to-point environments. Network operations, a network interface unit (NIU) is required. DICOM version 3.0 supports the use of standard network protocols in network environments such as OSI and TCP / IP.

B) It explain in details on how the device that claims to be compatible with the standard responds to the command and how the data is exchanged. The previous versions are limited in the transmission of data, but DICOM 3.0 specifies the semantics of commands and related data through the concept of service categories.

C) It explain the details the level of compatibility. The previous version specifies the minimum set of compatibility levels. DICOM3.0 clearly describes how an implementer must construct a declaration that is compatible with the selected special option.

D) It is organized according to the multi-part document structure. By simplifying the addition of new features, this structure makes it easier to evolve standards in a rapidly evolving environment. ISO directives - define how to construct multi-part documents - already added to the DICOM standard construct.

E) It presents a clear information object, not just for images and graphics but also reports.

F) It specifies a definite technique for uniquely identifying any information object. This facilitates a clear definition of the relationship between the information objects that operate on the network.

6. Development of DICOM and PACS

PACS generated an initial encounter one of the biggest obstacles, that is, manufacturers of equipment produced by the production of data formats are not compatible with each other andeach manufacturer has its own independent standards and formats so that data cannot be shared. DICOM production for the various manufacturers to provide a unifi ed international standards for the development of PACS paved the way. In 1982, the American College of Radiology

(ACR) and the National Electric Manufacturers Association (NEMA) jointly established a committee to develop digital imaging and communication standards (DICOM). Announced in the 1.0 version in 1985, published in 1988 version 2.0, launched in 1996, 3.0 version and later on the 3.0 version has been amended several times. The main provisions of the medical image information data format, the image transmission protocol and many subsequent amendments. The latest version is DICOM3.0 2008. Compared to the previous version, DICOM 3.0 2008 clearly delineates the standard range that the device should follow, clears the information entity more clearly, emphasizes the multi-document structure, the TCP / IP-based protocol and the network environment. Support for the JPEG-2000 compression standard and numerous new content including text, display and security. With this standard, people can create an interface on the imaging device to complete the input and output of image data and more effectively transfer and exchange digital images between medical imaging devices. These devices include not only CT, MR, nuclear medicine and ultrasound but also CR, film digitization system, video capture system and HIS / RIS information management system. At present, DICOM has become the standard communication protocol of medical imaging equipment.

6.1. Foreign development status

1970s Paul Capp proposed 'digital radiology'. Berlin Technical University Heinz U. Professor Lemke presents the concept of digital image communication and display. In 1983 the US military sponsored a remote radiology research program. In 1985, the US military also funded another DIN / PACS program. In 1985, the US National Cancer Center funded UCLA to begin the first PACS-related research program. In 1990, NATOASI (Advanced Study Institute) held an international conference on PACS in Evian, France. The US Army Medical Command has funded another program called MDIS, which aims to establish a large-scale military PACS system in the United States.

Applications:

A. Baltimore VA Medical Center The Baltimore VA Medical Center has about 200 beds, all of which are archived using the PACS system and have a two-way interface with the HIS / RIS system. So that the medical center and the network of three hospitals to improve the diagnostic efficiency and reduce the cost.

B. Hammersmith Hospital: 500 beds, serving 100,000 people, the hospital's radiology department since 1993 to run the PACS system, archives from 8 to 1 reduction, radiologists reduced by 3.3, film No longer save.

C. Many developers of UCSF PACS system participated in UCLA's PACS system development. System implementation began in October 1992, February 1995 put into clinical use. As the system is developed in the research institutions of the university, the technology is relatively advanced, with open architecture and interconnection, integration with HIS / RIS system, system modularization, using ATIW (asynchronous transfer mode) communication technology. Distribution of the image to the physician's desktop computer with a high degree of scalability.

6.2. Domestic developments

China's PACS research and development and application in the initial stage, but has been the Chinese government agencies, enterprises and hospitals who attach great importance. They hope that the three parties together in China to establish a local digital medical information system. Especially in the enterprise, the positive investment in human, material and fi nancial resources for PACS research. In view of the status quo of our hospital and the current Internet communication rate, the domestic developers are mostly in the study of a practical Intranet-based PACS system. In a TCP / IP-based Intranet to achieve high-defi nition medical images and video and audio transmission and management, through the selection of medical image standard interface DICOM (Digital [maging and Communications in Medicine) to achieve high-defi nition Medical image management and transmission. At present, many companies engaged in PACS software design but the product is uneven. Although many companies claim to have their own products, most do not have their own independent property rights. There are many cases where the use of free code on the Internet, controls, or direct OEM products abroad, poor performance. It cannot be based on the actual situation of the domestic hospital to improve their own system performance and it is impossible to develop related large-scale high-end products. In general, the industry is currently in its infancy. There is currently no domestic hospital-wide PACS system, there is no real sense of a digital hospital, main factor is that the center of the data generated as hospital radiology of ordinary radiation equipment is not a more economical and powerful for China National conditions of the digital program. Which can also proves that the development of PACS projects at all levels of the hospital is immeasurable.

6.3. Comparison of domestic and international situation

The SIPS-PACS products are better managed in terms of management such as high-quality preservation of images, convenient and powerful file queries, rich image post-processing function, HL7 communication interface, better support 'centralized' and 'online' management. However on the connection to the device, it is usually only to support DICOM. For non-DICOM devices, a software connection from a third party is used to convert the software to DICOM. The current domestic so-called PACS manufacturers are basically doing workstations especially some analog video

workstations. There are several workstations with DICOM interfaces or FTP interfaces. Network PACS do not take the DICOM standard road and there is no compatibility at all. There are some domestic system integrators through the agent of foreign PACS. No development and maintenance capabilities. PACS needs localization standardization.

Therefore, the domestic PACS and foreign there is a certain gap but foreign PACS in China encountered a lot of problems. The first is the price is too expensive and have to consider the market factors. General foreign brands of PACS, small systems that cost 20 to 400,000 US dollars, large-scale system is to reach more than one million US dollars. In addition, the full Western interface and meet the habits of foreign doctors design ideas difficult to accept the Chinese doctors. At the same time domestic PACS also has some characteristics such as connecting a unique video equipment, practical registration and diagnostic reports. In addition, China's information technology to follow up the international level of speed, although relatively fast, but the application is not enough and the lack of accumulation. In the software system itself, the interface aesthetics and full customization, ease of operation, functional stability and scalability,. Maintenance of the difficulty and so there is a considerable gap.

7. Classification of PACS System Based on DICOM Standard

PACS is widely used, the hospital used in the medical imaging system almost all to PACS to obtain image requests. PACS system can be divided into diff erent types according to the scope of application and application, the following were introduced.

7.1. PACS type

By default, PACS can be divided into Mini-PACS, PACS, and Enterprise-PACS according to its size. Due to the size of the area under the jurisdiction of the diff erent PACS role is not the same. Usually a single department or a single image of the model used, such as radiology

Mini-PACS is generally used in a single department or single image mode, such as the Mini-PACS of Radiology. Mini-PACS can carry out general patient information inquiry and acquisition, and carry out medical image browsing and simple processing

PACS is generally a general radiology PACS, can CT, MRI, CR / DR, X-ray and other medical images to collect, store, transmit, and to achieve the image color transformation, measurement (angle, area , Length, etc.) and analysis (regional average, the number of regional pixels, brightness, etc.) and other treatment. PACS can also carry out detailed patient information query, report editing, custom reports and other complex operations.

Enterprise-PACS is also known as the whole hospital PACS or enterprise-class PACS. Is generally able to support CT, MR, ultrasound, nuclear medicine and positron and all X-ray image post-processing, transmission and other operations. Enterprise-PACS covers a wide range of areas, making it an important foundation for regionalized healthcare and telemedicine.

7.2. According to the functional use PACS according to its functional use points, can be divided into image post-processing, diagnostic reports, system-shared data, image archiving

Image post-processing

Almost all domestic and foreign PACS system has a strong image post-processing function, because a good PACS system can not only carry out the basic medical image storage and transmission, but also should be able to meet the doctor quickly and accurately diagnose the patient. AGFA's PACS developed a series of local PACS with its powerful image post-processing and departmental requirements. For example, orthopedic imaging IMPAX-PACS with its surgical plan accurate, large artifi cial joint digital template library, automated computing operations and other functions, the precise positioning of the lesion and the patient for rapid adjuvant therapy. The PACS image post-processing of Wellcome Mita Corporation is based on its multi-sequence comparison, image format conversion, various masking boards, various fi ltering processes, 3D reconstruction, virtual endoscopy, multi-screen and vertical screen display modes Means of image processing.

Diagnostic report

The electronic diagnostic report is a document that combines the words and images in the PACS and is an important form for realizing the doctor's paperless fi lling of the doctor's information and the diagnosis of the disease. The study of structured diagnostic reports abroad has not stopped, such as Mariana Kessler Bortoluzzi et al. [3] presented a report editor that unifi ed the diagnostic report in accordance with the DICOM SR standard and achieved hospital information sharing and user-friendly interface. Domestic PHOENIST company's PACS with intelligent diagnostic report generation system, allowing doctors to quickly write illustrations, format standard diagnostic reports. Wellcome Mita Corporation's

PACS has a unique diagnostic report, can be preset editing template, WYSIWYG report writing mode, and a smart prompt window, you can always filter out the report did not write the patient. Existing reports are generally based on database technology as a means of storing data, and gradually achieve a unified structure of the reporting model for the sharing of regional medical data to provide possible.

7.3. Number of system sharing PACS

The number of system sharing PACS is an important part of medical image sharing and remote transmission. It is only connected with large medical information system such as HIS, and is combined with specialized terminal image processing (such as image fusion) and diagnosis system. In order to achieve the hospital process of information technology, to achieve regional medical and even national information technology. Michel Feron et al. studied the holistic workflow method combined with radiology and HIS [4] to form a commercial PACS, which provides a good reference for the design of the whole hospital information platform. Yu Yuan and others based on PACS and broadband network telemedicine, combined with DICOM, database technology and network interconnection design of a different HIS system heterogeneous data source sharing framework program [5], to achieve the medical image data remote sharing possibility. M Magliulo, who proposed a RIS |, HIS, PACS seamlessly connected to the 'RadGate' gateway technology [6] and to achieve the medical image data WEB sharing and transmission.

Image archiving

Medical image storage is an important function of the PACS system. In order to realize the rapid storage, acquisition and query of medical images, the database vendors and medical workers at home and abroad have carried on the thorough analysis and the research to the medical image storage. ORACLE 11g provides a high compression ratio for DICOM medical image processing, and can be easily carried out DICOM image retrieval and extraction, PACS system for medical image storage to provide long-term development space. Cheng Mengyun et al. [7] constructed a 3-layer medical image database system based on DICOM, which realized the function of mass storage, quick query and instant display of medical images.

8. Application of DICOM

DICOM applications are divided into three categories, including DICOM image format (DICOM and non-DICOM format conversion, DICOM image compression), DICOM communication and DICOM image acquisition.

8.1. DICOM Image Format

The conversion of the DICOM image format mainly focuses on the conversion of static or dynamic non-DICOM and DICOM medical images. In order to be easy to carry, browse, and compatible with other systems, sometimes DICOM fi les and non-DICOM fi le format conversion must be clear DICOM and non-DICOM fi le format and its related rules. This paper mainly studies the dynamic and static DICOM image transformation, analyzes the DICOM image and BMP image format, and introduces the non-DICOM image conversion for single frame DICOM. At the same time, it briefl y analyzes the multi-frame DICOM image for media stream synthesis. The Liu Xiaolei et al. [9] analyzed the BMP image and DICOM image format in detail and realized the conversion of ordinary BMP image to DICOM image by using VC ++ object-oriented technology which promoted the application of non-DICOM image in PACS. On the basis of analyzing the non-DICOM and DICOM formats in detail, the use of VC ++ to achieve the non-DICOM to the DICOM medical image of the DICOM medical system conversion and conversion of DICOM to non-DICOM images facilitates the unrestricted use of non-DICOM images and DICOM images within and outside the PACS system. Wail A. Mousa et al. [11] designed a general image program based on DICOM image size and DICOM image adjustment which can adjust the image clarity and provide reference for the development of medical image processing software. Boqiang Liu et al [12] with VC ++ to achieve the conversion from DICOM bitmap,and then converted from the bitmap into other general images. The conversion process can modify the brightness, contrast, image fi ltering, segmentation and other complex operations. DICOM image conversion generally rely on the existing image programming software to DICOM and non-DICOM image analysis and the corresponding format conversion processing or the use of gateway server way to automatic non-DICOM image to DICOM image conversion. Image conversion is generally achieved by object-oriented programming languages (such as C ++, PASCAL) and professional numerical calculation and image processing programming software (such as Mathematica, Matlab, etc.) that deal with image capabilities.

8.2. DICOM communication

DICOM communication is mainly based on the client / server mode and through the SCU and SCP service class interactive implementation of information transmission. The DICOM standard is the communication protocol that the PACS system complies with. DICOM medical image storage, management, retrieval and other

related applications should be established in the TCP / IP protocol on the DICOM upper layer protocol layer. DICOM communication is the use of object-oriented method of information transmission to facilitate the object-oriented language on the communication model development and design. On the basis of TCP / IP protocol, this paper analyzes the DICOM network protocol level and the structure of the message service unit and the service object in DICOM. We also use Visual C # .Net to develop one the set of components for all services of DICOM provides a good support platform for DICOM's complex communication and secondary development of DICOM communication programs in PACS. SUN Hao et al. [14] based on the DICOM communication model had proposed a new PDU service class and server side to accept multiple service requests simultaneously DICOM communication model and use Visual C + + to achieve the DICOM network communication client and server. For the network professionals on the DICOM communications, in-depth research and development provides a reference. On the basis of analyzing the DICOM network communication model in detail, the author discusses the DICOM communication mechanism and TCP / IP protocol and uses Visual C ++ to develop a DICOM which can realize the functions of image transmission, storage and query. Network communication library, for the PACS system DICOM network communication development provides a favorable professional information. Yu Donglan et al [16] with LEADTOOLS medical software development package, using object-oriented programming ideas to achieve based on DICOM communication model of medical image acquisition, query and other operations for the medical field of network professionals. DICOM network communication development provides a set Feasible options. Wei Ding Li et al. [17] used the DICOM communication model, ECP server / ECP client, TCP / IP, database technology, etc. to realize the intelligent external anti-pulsating (ECP) ischemic heart disease Central system, in order to achieve network diagnosis and treatment of heart disease provides a good technical conditions. DICOM communication is generally achieved by relying on C / S mode software or hardware and can be used to achieve the object-oriented way SCP and SCU interaction. The object-oriented design DICOM communication model is easy to implement and can be directly compatible with the PACS system and TCP / IP network protocol. It can also be used to facilitate the seamless connection between the various systems within the hospital.

8.3. DICOM image acquisition

DICOM image acquisition is mainly rely on PACS system for automated network acquisition. PACS performs fully automatic medical image acquisition. In most cases, the quality and completeness of the captured images are better, but some of the images are lost in the acquisition due to artificial setup and intervention. In order to reduce the misdiagnosis and shorten the diagnosis time of the patients, many scholars at home and abroad have made a detailed study on the recovery of lost images. (18) uses the image acquisition gateway service technology and compares the imaging device image sequence with the acquisition gateway database image by using the C-FIND class of the DICOM Query / Retrieve service to determine the missing image. Moreover, through the C-MOVE and C-STORE class image recovery in order to reduce the loss of the hospital and save the patient's life to provide a reliable guarantee. SL Lou et al. [19] explored two methods based on DICOM Query / Retrieve and no DICOM Query / Retrieve for missing image restoration, and compared the advantages and disadvantages of both methods. The core of both methods is determined Whether CT and MRI images are completed. At the same time SL Lou et al. Also conducted clinical trials, compared to DICOM Q / R more to achieve the standard of practice, in the hundreds of images when the sequence is not an image loss, in order to avoid and reduce the artificial change DICOM communication settings The resulting PACS image gets the data loss of the database, and the DICOM Q / R is a good functional unit. It can be seen that the DICOM Query / Retrieve service class can perform fast and accurate recovery of lost images, restore the loss of the hospital and save the patient's repeated inspection costs. Whether it is running on the gateway server or workstations, are using object-oriented programmable technology, which is to achieve the different needs of the hospital's different needs of the object.

9. Conclusions

With the development of information technology, DICOM standard in the application of PACS exposed some drawbacks: in the DICOM-based PACS system, the core is DICOM network while DlCOM network medical image data and related text information (PACS, HIS). The information is scattered while the standards and protocols of different systems are different and the distributed operation is not supported. The communication system is not the same. Hence the system cannot be fully shared. With the continuous upgrading of the system, complex, DICOM system fault tolerance, openness, interoperability and maintainability is becoming increasingly difficult. The emergence of CORBA (COmmon obiectrequest broker architecture) technology provides a convenient condition for the interaction of objects distributed across diff erent network nodes. CORBA supports the decentralization of resources in the logic of a certain coupling and constitute a whole can be easily carried out data sharing and regional interconnection. CORBA is based on distributed object technology, image and text information as a component object for processing and the use of popular object-oriented processing technology for PACS and HIS systems such as distributed integration. CORBA has the advantages of proxy service, client and server independence, compatibility, hierarchical design and distributed object design which provides a prerequisite for introducing CORBA technology into PACS.

For the realization of remote digital medical, regional PACS, national and even global PACS, CORBA technology and DICOM standard combination of ways to take full advantage of the advantages of both. Due to the drawbacks of DICOM, the DlCOM standard will be limited to medical imaging imaging equipment and display workstations, as well as other communication between workstations and workstations using DICOM. And the mainstream of the network design framework will be distributed object design CORBA technology, CORBA based on the three-tier PACS architecture technology gradually replace the DICOM standard PACS two-tier architecture, which makes communication more compatible and information sharing, but also real An important means of hospital telemedicine. DlCOM is the standard that must be observed in PACS TCM image format, which is the basis of communication such as medical image query, acquisition and acquisition. DlCOM mainly for PACS system image processing, telemedicine, hospital information, image archiving and communication functions. This paper mainly discusses the current situation of DICOM at home and abroad, and studies the current application of DICOM. Finally, the advantages of DICOM and CORBA are discussed. With the development of hospital information system and the construction of telemedicine, DICOM-based PACS system will focus on the distributed network structure, large-capacity medical image compression storage, rapid progressive transmission, medical image complex processing and diagnosis, and efficient Data access, integrated communication intelligent hospital information system direction.

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