# Medical Applications of Distributed Multimedia Database System on the Internet

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Background. PACS (Picture Archiving and Communication Systems) have been applied in medical image management and transfer/browsing for several years. Unfortunately, most of such systems are still based on proprietary platforms and are cost-prohibitive to justify a large-scale deployment. Recently, Internet and Intranet are becoming more popular in the many real-world application. By combining an array of technologies including Internet/Intranet, ATM network, parallel processing, distributed multimedia database systems, we developed an Internet / Intranet-Based Picture Archiving and Communication Systems(IPACS). It will enable physicians to view, handle and analyze the medical image of the patient directly in a web browser.
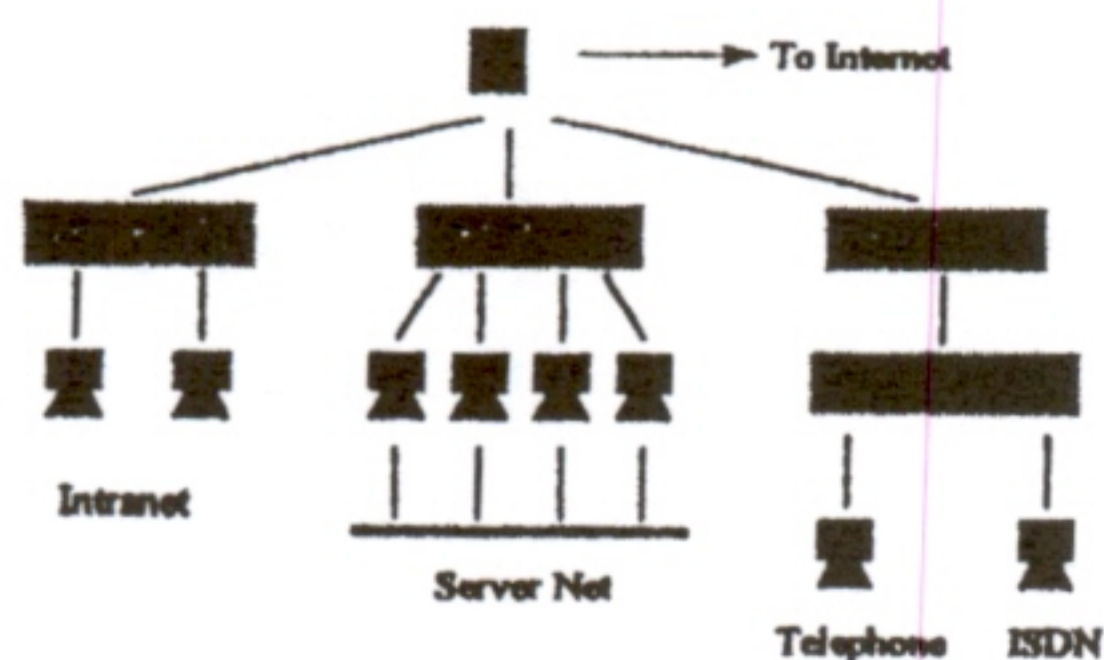
The purpose of IPACS is to provide an infrastructure of various kinds of medical image retrieval. It can be used through the hospital LAN, telephone, ISDN and Internet. This multimedia-assisted and client-server medical database system brings several benefits to the users in the hospital. First, it helps physicians get medical images more efficiently and thus shorten the time of diagnosis. Second, the physicians can use any client PC connected to the IPACS, either locally or remotely, to review patient related information and images. Third, authorized users in other hospitals can use leased-line, ISDN or dial-up services to link to the IPACS and review the multimedia patient information stored. This opens new possibilities of medical collaboration with field experts in other hospitals domestically or internationally.

System. This system contains five major software modules: a distributed database management module, a server network management, a admission control module, a request forwarding module and a full text search module. To be a high performance multimedia database server, we use the SIGMA (System Integrated Growable Multicomputer Architecture) developed at National Taiwan University as server clusters. Using the SIGMA to implement our multimedia medical server can ease the manage of the huge amount of multimedia information .

The user interface was built using Javascript and IDC (Internet Data Connection) from Microsoft. Any World Wide Web browser that supports Javascript (e.g. Netscape or Internet Explorer) can be used to retrieve multimedia information stored in the IPACS.

Current Status. We have successfully transferred all the endoscopic images and sonograms to the IPACS. In our hospital, there are about 52,000 endoscopic images captured per year. This alone translate into a saving of $100,000 dollars per year compared to the print out of these images from thermal dye-transfer printers on coated paper.

Conculusion. The IPACS represents a new-generation PACS that utilizes a host of new technologies. If deployed appropriately, the IPACS can be a powerful, yet cost-effective, scalable, easy-to-use and Internetable system for medical image management and review.