

Software development of Medical Image Archiving System

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SZOTE-PACS has been developed since 1995. The goal of the system is to provide a modular, flexible PACS (Picture Archiving and Communication System) which is able to collect digital images of patient studies from different modalities and archive them in a central database. The end users can retrieve the requested images from the image database.

SZOTE-PACS is based on the DICOM standard which is a common file format and communication protocol in medical imaging. There are lots of different imaging modalities producing different image formats (TIFF, Interfile, ACR-NEMA, DICOM). Each modality is connected to the University Network. The old modalities which produce non-DICOM output are connected to converter stations. These stations and the newer modalities are directly connected to the main image server via NFS, FTP and DICOM protocol. The non-DICOM studies can be converted automatically into DICOM format. The image server can receive images both from the admitting stations and from the outside world via the Internet. The incoming images are stored in a temporary directory from where the server builds the studies into the Oracle database. This database stores the image data in a Patient, Study, Series, Image hierarchy. The images are stored in this database as a reference to the physical image file. The disk capacity of the server (26 GB) is enough to keep the studies for at least 15 days. After this period the images are removed from the server. The header data will remain in the database forever. In these two weeks the images can be archived to CD-ROM. End users can reach the image database from the viewing stations using the Oracle SQL server. On the viewing stations physicians are able to create educational material and to create local scientific databases for their work.

On the admitting stations and on the server the processes can be executed in an automatic way. It means that the automatic process takes into account the result of the previous process and the free disk spaces. Errors are logged into an information file. The executed commands are stored in a diary which helps to reconstruct the system events.

SZOTE-PACS is able to include study parameters from the Radiology Information System (RIS). The form of the RIS database is a DBase database. The admitting stations are connected to the RIS database via RIS gateway which receives SQL queries and forwards them to the RIS. The answer from the RIS goes through the RIS gateway to the admitting stations as well.