DIAGNOSTIC PATHOLOGY

ORAL PRESENTATION

Information Technology (IT) in Histopathology (HIS)

Jürgen Görtler[1], Klaus Kayser[2], and Gian Kayser[3]

Background

Based on the developments in radiology in the last twenty years image digitalization moved into all different medical disciplines and is subject for integration into a Hospital Information System open and shared among Internet as a backbone. This discussion will introduce the wider context of the foundation of recent developments given the global standardization and will give examples on what can be implemented already. IHE is an initiative by healthcare professionals and industry to improve the way computer systems in healthcare share information. IHE promotes the coordinated use of established standards such as DICOM and HL7 to address specific clinical need in support of optimal patient care. Systems developed in accordance with IHE communicate with one another better, are easier to implement, and enable care providers to use information more effectively.

Standards

Health Level Seven (HL7), is an all-volunteer, not-for-profit organization involved in development of international healthcare standards. "HL7" is also used to refer to some of the specific standards created by the organization. HL7 and its members provide a framework (and related standards) for the exchange, integration, sharing and retrieval of electronic health information. v2.x of the standards, which support clinical practice and the management, delivery, and evaluation of health services, are the most commonly used in the world.

In medical imaging, *picture archiving and communication systems* (PACS) are computers, commonly servers, dedicated to the storage, retrieval, distribution and presentation of images. The most common format for image storage is DICOM (Digital Imaging and Communications in Medicine). Electronic images and reports are transmitted digitally via PACS; this eliminates the need to manually file, retrieve or transport film jackets. A PACS consists of four major components: the imaging modalities such as CT and MRI, a secured network for the transmission of patient information, workstations for interpreting and reviewing images, and long and short term archives for the storage and retrieval of images and reports. Combined with available and emerging Web technology, PACS has the ability to deliver timely and efficient access to images, interpretations and related data.

Digital **I**maging and **Co**mmunications in **M**edicine (*DICOM*) is a standard for handling, storing, printing, and transmitting information in medical imaging. It includes a file format definition and a network communications protocol. The communication protocol is an application protocol that uses TCP/IP to communicate between systems. DICOM enables the integration of scanners, servers, workstations, printers, and network hardware from multiple manufacturers into a picture archiving and communication system (PACS). DICOM has been widely adopted by hospitals and is making inroads in smaller applications like dentists' and doctors' offices.

One example of an applicable IT architecture is the IBM GMAS (Grid Medical Archive Solution), which can help you securely store and efficiently transmit diagnostic images and documents within your organisation or across multi-site facilities. By combining the power of grid computing with intelligent information lifecycle management the result is an ability to deliver patient images wherever they're needed - at the moment they're needed - which can lead to improved diagnosis and treatment.

Conclusions

Today's standards and architectures and the variety of building blocks ready to be used for building solutions

will enable physicians to speed up their work and improve the quality of work. Many users across the globe use it for their daily work, for communication with their peers and for education of the new generation of pathologists. Those IT solutions link together records or storage resources among multiple campuses or remote facilities, treat distributed images and remote files as if they were local, automatically create multiple replicas of images at distributed sites on the grid - and enable automated fail over to those copies in case of a disaster or unplanned downtime. Further foreseeable work in providing Internet tools and databases and visionary thinking will provide major progress soon in an advanced use of digital technologies in the pathology practice.

Author details
[1]IBM Germany, Stuttgart, Germany
[2]UICC-TPCC, Institute of Pathology, Charite, Berlin, Germany
[3]Institute of Pathology University Freiburg, Freiburg, Germany

Email: Goertler@de.ibm.com