

changing the way healthcare **co**nects



Success Story

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## Johannes Gutenberg University

Mainz, Germany

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### BENEFITS OF THE PROJECT

An online learning system at Johannes Gutenberg Universität Mainz is used by over 1,000 medical students to master a knowledge of radiology and residents to sharpen diagnostic abilities. Built on the picture archiving and communication systems (PACS) infrastructure of the university hospital using the IHE TCE-based Teaching File Solution, the system is linked with a university-wide open source e-learning platform.

The ease-of-use, the regular updating of cases and the presentation of a full medical context for each case has won wide adoption and contributions from all medical disciplines, including pathologists and surgeons.

Expanded applications for this capability include support of clinical trials, research studies or reference data bases for rare cases and differential diagnoses.

### THE APPROACH

The first step for creating the radiology teaching system was the integration of clinical workspace with teaching file database to facilitate creation of e-learning content. The next stage of work was integration of teaching files with e-learning platform to merge functionalities, followed by a period of assessment and evaluation of the integrated web application.

At the critical junction between the diverse PACS systems in the clinical workspace and the shared resource platform, the vendor independent IHE TCE integration profile allowed selected images to be pushed from any PACS while a graphic user interface of the TCE Selector facilitated the entry of keywords and information about the selected case. Patient information was masked at this stage with a pseudonym, DICOM instances and content were processed, and additional teaching file information could be generated. Project managers found the IHE TCE Selector to be "robust, simple, easy to use, set up and configure."

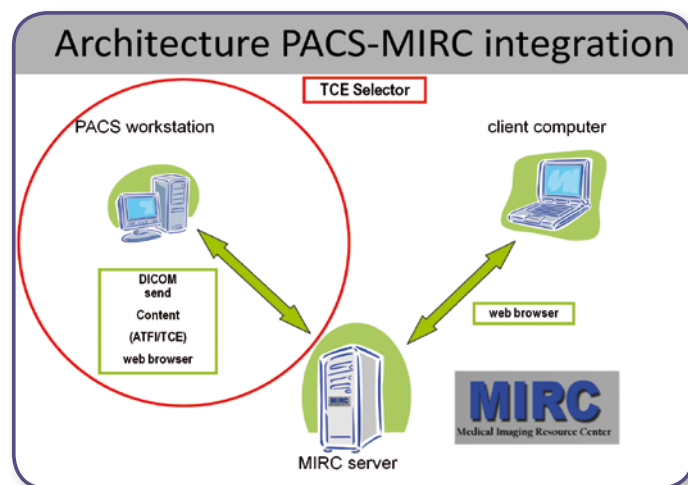
The final teaching case resides on the Medical Image Resource Center (MIRC), an open-source solution developed by the Radiological Society of North America (RSNA), where the teaching file collections could be shared on a cooperative platform. The RSNA lexicon for uniform indexing and retrieval of radiology information resources called RadLex was also utilized for the project and has been widely accepted.

Students and residents access the collections on MIRC through the university-wide e-learning platform, called ILIAS where image content may be contained within lectures or exams. Teaching files can also be directly accessed for self-study on MIRC, which features improved display and viewing functions compared to ILIAS. MIRC has also proven to be easy and convenient for authors to create or update content.

### THE CHALLENGES

Despite the increasing digitalization of medical images, sophisticated picture archiving and communication systems (PACS) do not support the export and creation of teaching files for distribution outside of a specific system.

Key requirements for an e-learning platform included an ability to select interesting cases while masking patient identities; standardization of categories and key words to enable efficient queries and searches; and, a presentation mode in which only the images with some necessary clinical information are displayed while findings are hidden to simulate diagnosis exercises.



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*A clinician utilizing the system*

#### **ABOUT JOHANNES GUTENBERG UNIVERSITY**

Founded in 1477, Johannes Gutenberg Universität Mainz is one of Germany's oldest and largest universities with degree programs in more than ninety subjects. A research center of the federal state of Rhineland-Palatinate, the university is home to 35,000 students from more than 130 nations with 500 professors and 2,300 academic research staff. The University Medical Center is a 1,500-bed research and teaching hospital with 50 specialist clinics, institutes and departments treating 62,000 in-patients every year and 210,000 out-patients.

## IHE Integration Profiles, Actors and Transactions Implemented

Integration Profile	System/vendor	IHE Actor	IHE Transaction	New or Upgrade
Teaching File and Clinical Trial Export (TCE)	Cerner ProVisionPACS	Image Manager		
	ConVis PACS	ImageDisplay	Store Instances Store Export Selection	Upgrade
	TeraRecon Aquaris.net	ImageDisplay	Store Instances Store Export Selection	Upgrade
	MIRC	TCE Manager	Store Instances Store Export Selection Store Additional Teaching File Information Export Instances	Upgrade
	GeSIT	TCE Selector	Store Additional Teaching File Information	New
	MIRC	TCE Receiver	Export Instances	Upgrade



*Medical students at the university working on a radiology teaching case accessed through the online e-learning platform*

#### **IHE-EUROPE MEMBERS:**

**IHE-Europe National Initiatives:** IHE-Austria / IHE-France / IHE-Germany / IHE-Italy / IHE-Netherlands / IHE-Spain / IHE-United Kingdom

**IHE-Europe User Members:** EAHP / ESR / SFR

**IHE-Europe Vendor Members:** Agfa Healthcare / COCIR / ETIAM / GE Healthcare / Siemens AG Healthcare Sector

**IHE-Europe Scientific Organisation:** INRIA