

# **Web-Service Based Information Retrieval in Conventional DICOM Repositories to Support Teaching and Research in Radiology**

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# supporting medical teaching & research

- **major achievement**

- ↪ **information dissemination**

- ↪ **towards advanced information management**

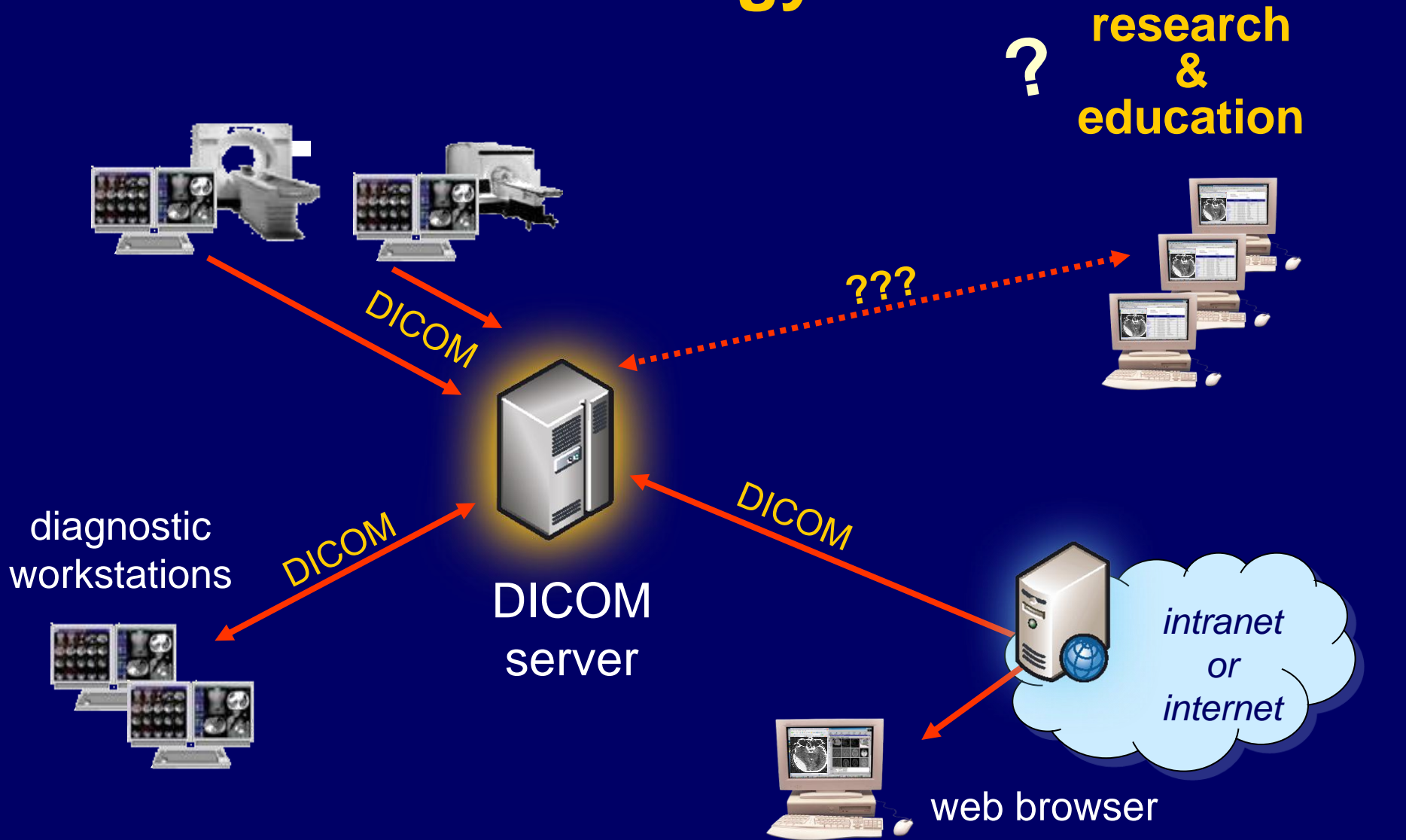
- **current challenge**

- ↪ **bridge healthcare enterprise with  
academic and research environment**

**i.e.**

**integrate clinical data with  
teaching and research software tools**

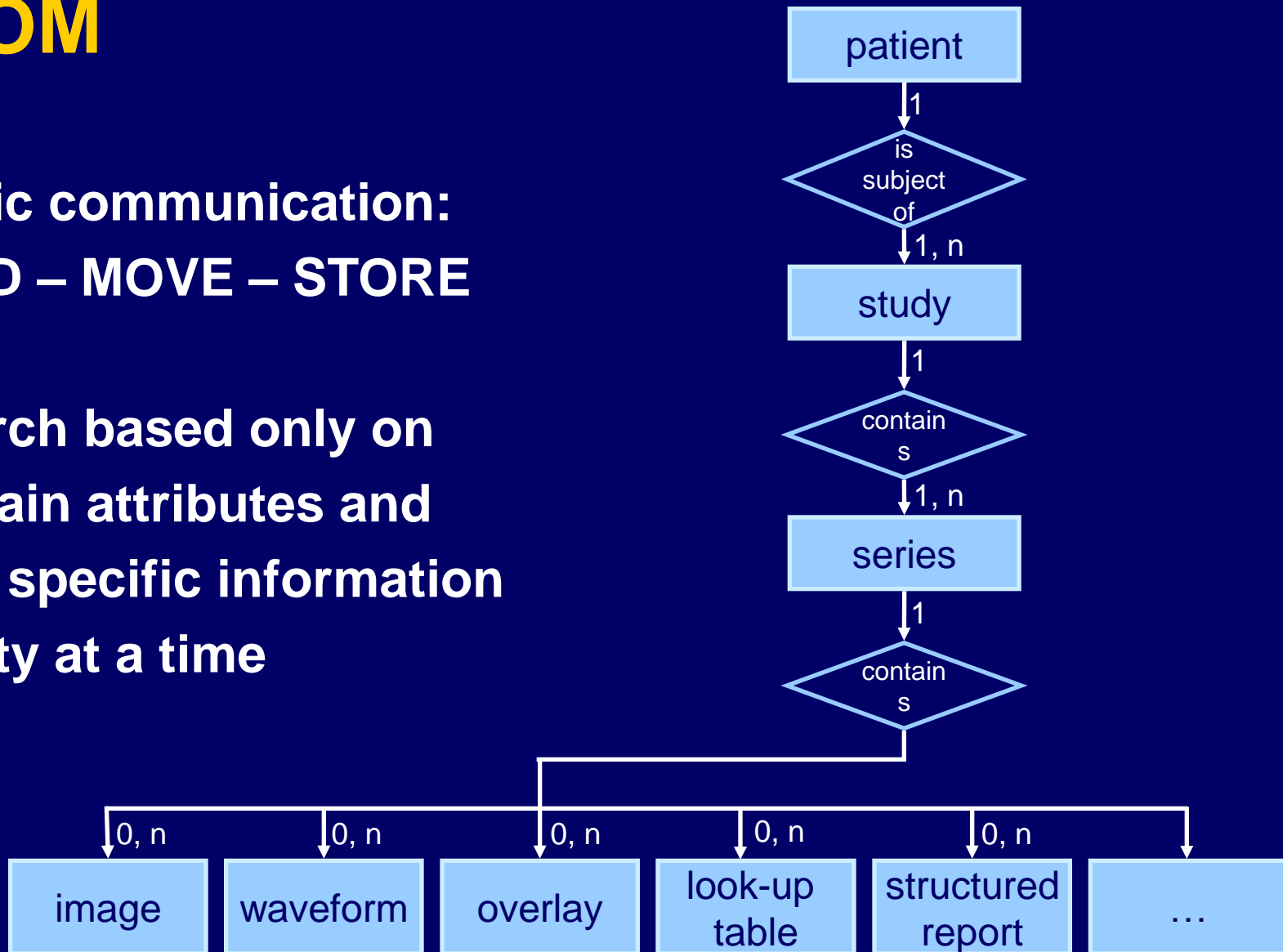
# the case of Radiology



# DICOM

**basic communication:  
FIND – MOVE – STORE**

**search based only on  
certain attributes and  
of a specific information  
entity at a time**



# requirements

- **flexibility**

- ↳ change and adapt easily, and expand to cover emerging needs

- **easiness to implement**

- ↳ does NOT require expensive infrastructure & long development times

- **security**

- ↳ data anonymization & integrity

- **adherence to open standards**

- ↳ accommodate synergy with disparate systems & the open standards academic and research infrastructure

# our approach

teaching & research  
end-user  
applications

added-value  
web services

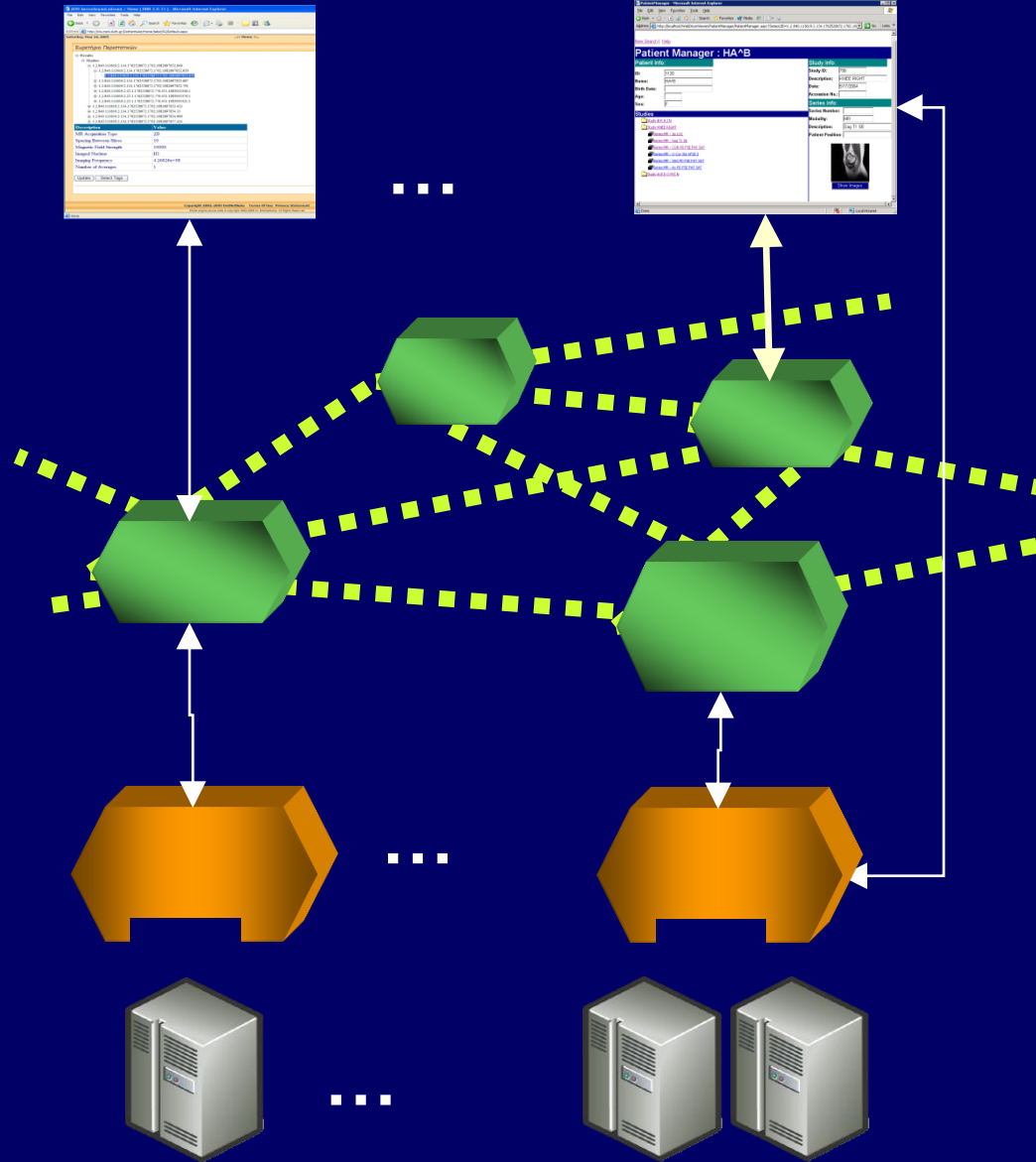
web services  
acting as wrappers

conventional  
clinical information  
systems



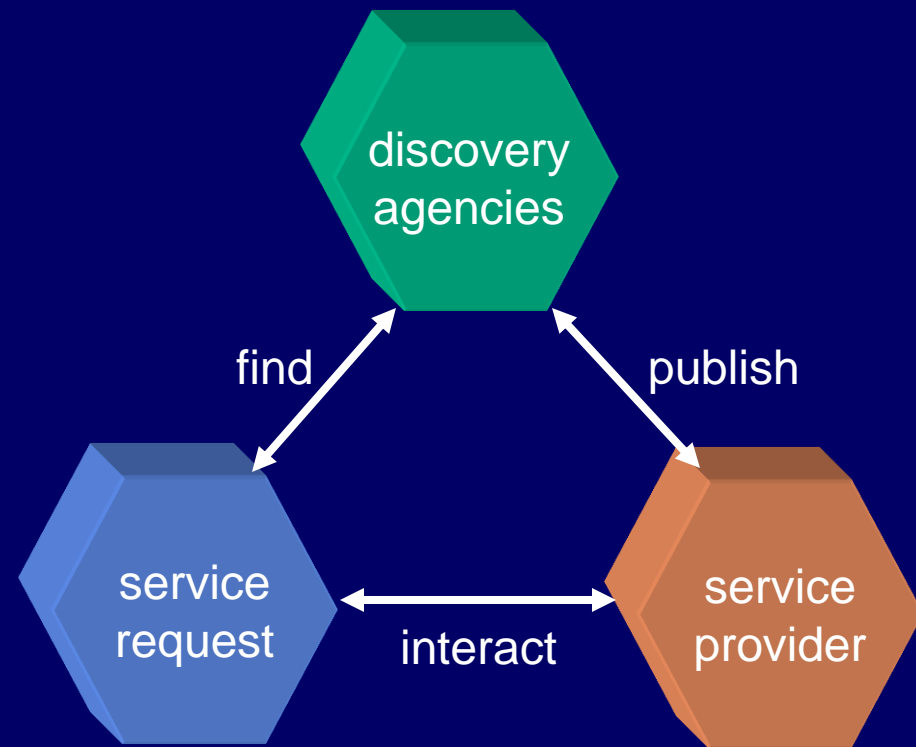
non-DICOM

DICOM



# web service paradigm

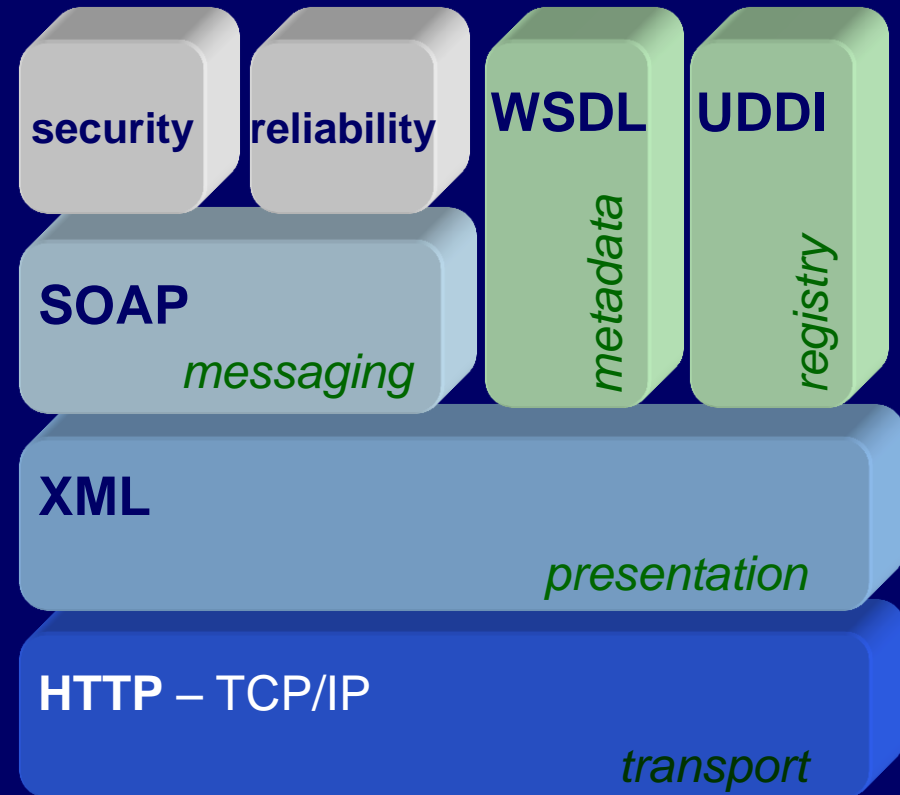
- middleware technology for program-to-program interactions
- URI-addressable software with certain functionality
- can act as wrappers for legacy applications



**Service Oriented Architecture**

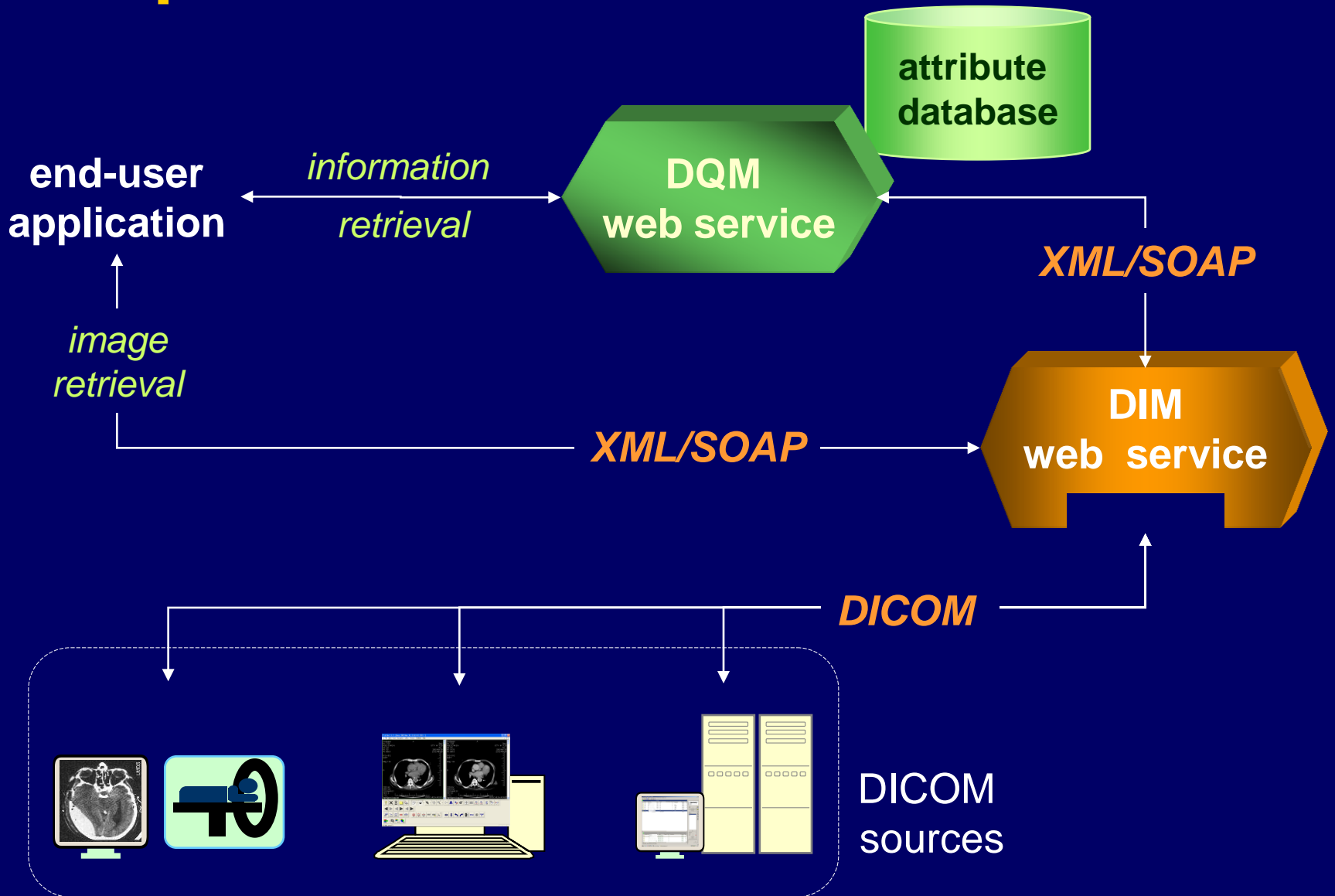
# web service paradigm

- enable disparate systems to work together
- based on open internet standards
- broad industry support

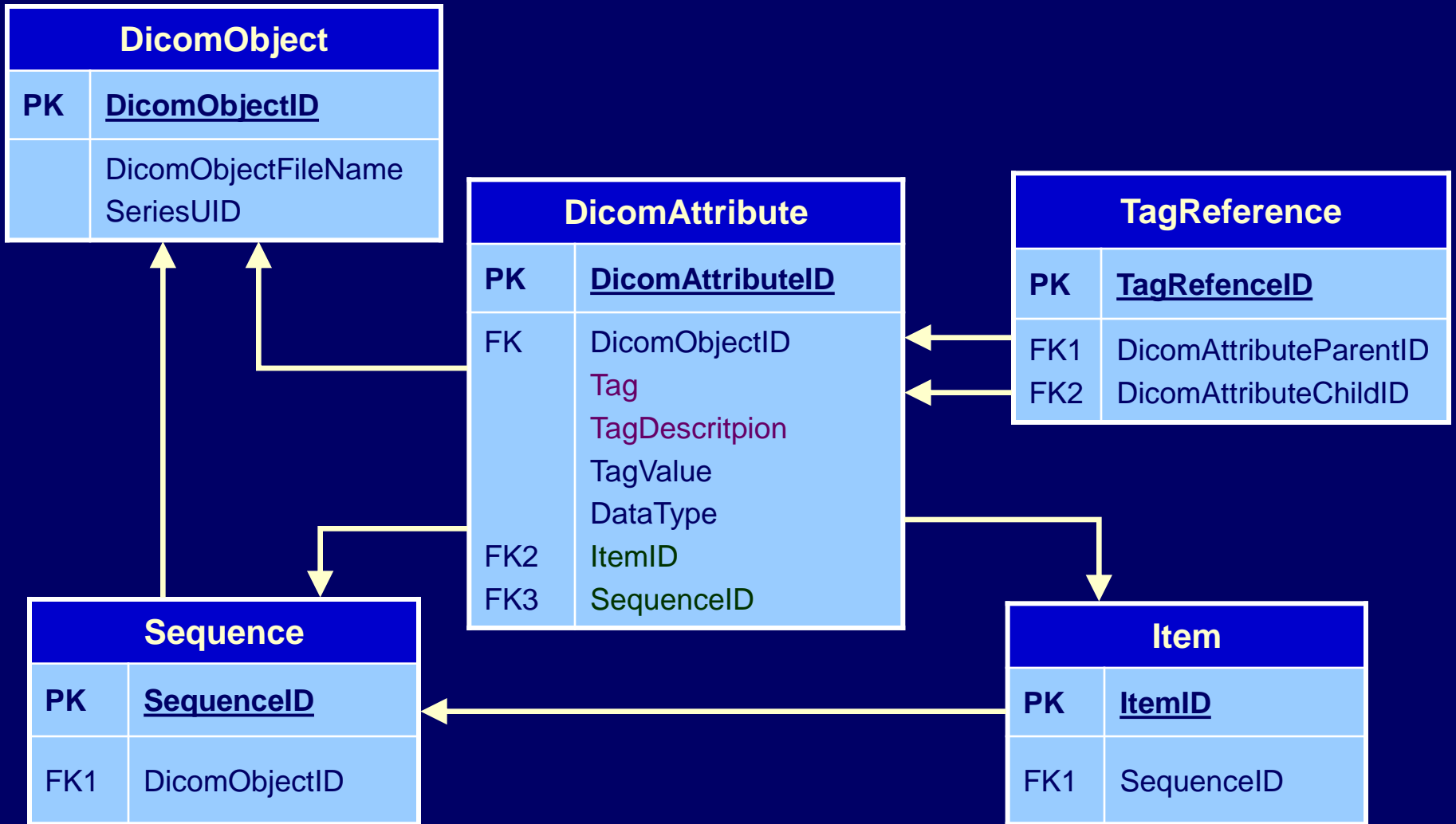




# complex DICOM search



# database model



# implementation issues

- **technologies**

- ↪ **C# (MS .Net Framework 1.1)**

- ↪ **DicomObjects 4.1 (Medical Connections)**

- **system requirements**

- ↪ **MS Internet Information Server >5.x**

- ↪ **MS .Net Framework 1.1**

- ↪ **MS SQL Server 2000 Desktop Engine (MSDE)**

- **security**

- ↪ **SSL, user authentication, role-based data anonymization**

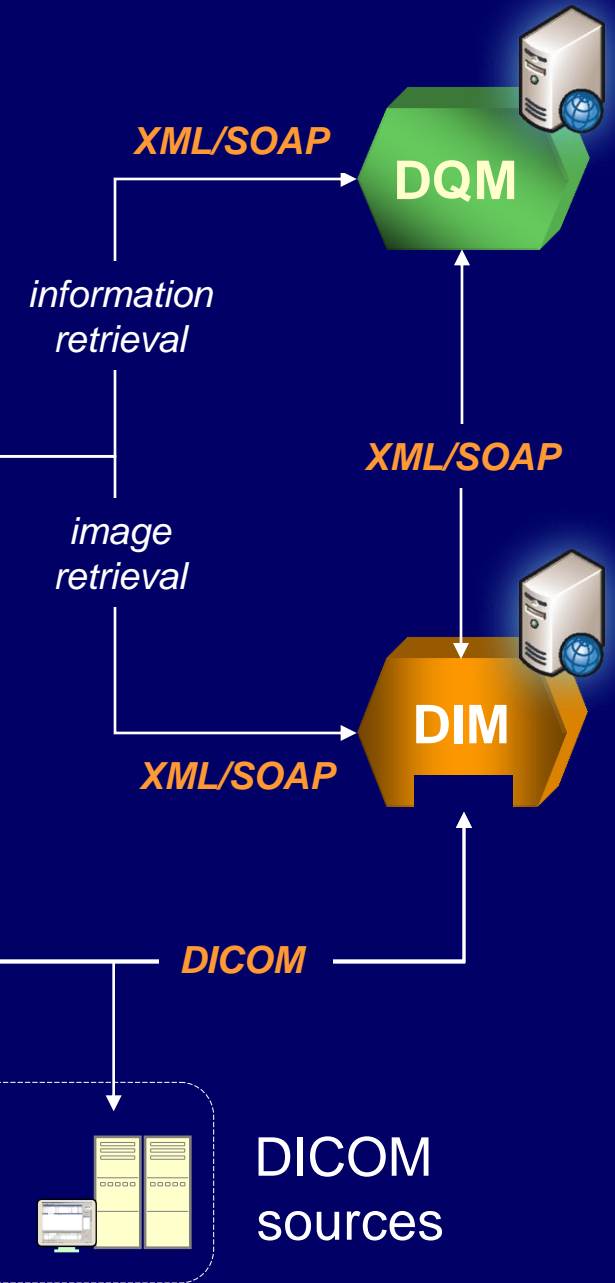
***<http://iris.med.duth.gr/>***

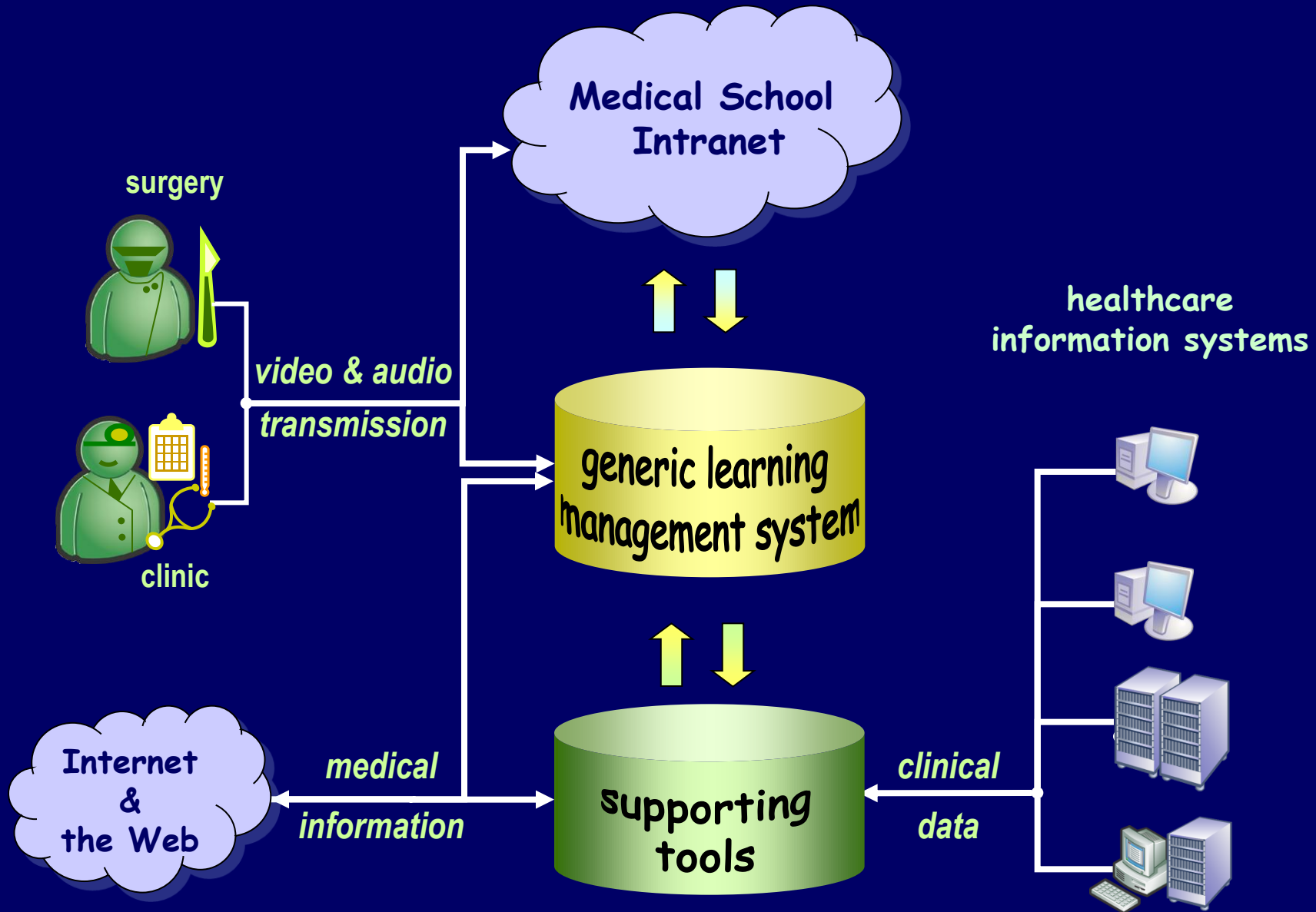
# DICOM search engine

The screenshot shows a web browser window with the URL <http://iris.med.duth.gr/DoNetHuke/Home/Tabid/52/Default.aspx>. The page displays search results for a study with ID 1.2.840.113619.2.134.1762528672.1702.1082697852.631. Below the results, there is a table with the following data:

Description	Value
MR Acquisition Type	2D
Spacing Between Slices	10
Magnetic Field Strength	10000
Imaged Nucleus	H1
Imaging Frequency	4.26826e+08
Number of Averages	1

An arrow labeled "HTTP" points from the browser to a server icon, indicating the data retrieval process.





# acknowledgements

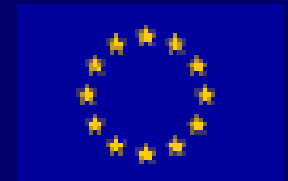
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