From Connectivity to Interoperability: more than 10 years DICOM experience at Philips MRI

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In 1995 we built our first DICOM export server. This was the start for switching from a private protocol to the standard DICOM protocol for communication with other systems. The first step was only focused on Connectivity (exchange of data). Interoperability (correct use of exchanged data) was at that time less visible. During the following years more and more systems supported the DICOM standard to communicate with other systems. This enabled hospitals to switch to an almost complete digital workflow. This also implies that the focus must shift from just storage of data (Connectivity) to the real usage of the data in a workstation (Interoperability). In practice this means that the MR system has to operate in a complex multi-vendor environment, with different levels of DICOM maturity.

**History DICOM at Philips MRI**

- 1992: Access PACS to HIS (DICOM gateway)
- 1994: DICOM from Server Target (NEMA)
- 1995: Support of Enhanced MR Image Storage SOP Class
- 1996: DICOM DVD
- 1999: Support of Philips MRI Image, MR Spectroscopy & Raw Data Storage

While we were able to make some "stand-alone" Connections to other systems and to exchange some data on PACS and workstations, this did not give us a complete and comprehensive connectivity to other workstations.

**Enhanced MR Storage SOP Classes**

For the MR system it is important to exchange more data with other systems. For this purpose we used the DICOM standard to support data exchange between other systems. This enabled us to send more data to other systems.

**Introduction of Enhanced MR Storage SOP Classes**

It takes some time before the Healthcare Industry understands and accepts new SOP Classes. The strategy is to support only Filtered and Efficient SOP Classes.

**Possibilities to Check Implementations**

The DICOM standard provided us with a smooth transition from local to remote storage thanks to the fact that standard data can easily be extended with private products and protocols.

**Challenges**

- To live in a fast world where new applications emerge. The data of those new applications is at that moment not part of the DICOM standard.
- How to keep up with the modifications of the DICOM standard by proposing changes and contributing to new supplements. A good DICOM implementation strategy should take into account all aspects and Interoperability with other vendors, the IHE Connectathons are a good place to test.

**Connectivity**

- E.H. Philippe: "Be our sure requirings and a flexible web-mailing"
- Information: "We use the DICOM and inform the user that it's the same"

The DICOM standard provided us with a smooth transition from local to remote storage thanks to the fact that standard data can easily be extended with private products and protocols.

**Interoperability**

- How to keep up with the modifications of the DICOM standard?
- We do not have that many new applications emerging. The data of those new applications is at that moment not part of the DICOM standard.
- Interoperability with other vendors, the IHE Connectathons are a good place to test.

**References**