Institutionen för klinisk vetenskap, intervention och teknik (CLINTEC), Enheten för medicinsk bild, funktion och teknologi

Designing and Using an Information Infrastructure in Radiology
– Prepare – Share – Compare IT

AKADEMISK AVHANDLING
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Abstract

Radiology informatics is changing the way that work practice and planning of work are conducted in the radiology department and between radiology departments. Today, the need for sharing of information between organizations is increasing in parallel with the growth in both patient mobility and healthcare specialization. This sets demands on the information infrastructure in use regarding interoperability issues as well as distribution problems with the focus on metadata quality in the information shared. The new shared approach marks the beginning of a change from a local to an enterprise workflow. The challenges are to develop useful and secure services for different groups related to the radiological information infrastructure. It involves continuous negotiation with people concerning how they should collaborate within the enterprise. Therefore qualitative action research methods and quantitative methods were used in this thesis. The objective of this research was to understand how to use distributed information in a change process where radiology departments needed to invest in and use new technology that had not been used before in their local workflow, using simulation as a tool for changes in work practice. A further objective was to understand what types of metadata were needed for a radiology enterprise workflow across organizational boundaries. The quality of metadata used in the information infrastructure is critical to the use and benefits this enterprise workflow will gain throughout the patient healthcare process. It is concluded that only a few items of shared metadata are needed to support an effective enterprise workflow. This means that the technical fully working cross-organizational solution is hindered to function as an information infrastructure for collaboration between all departments and hospitals in the region if the quality of metadata elements is poor. It would thus be warranted that as many elements of metadata that has a national semantic definition taken by agencies become mandatory across the society. All semantic standardization initiatives, e.g. Snomed CT are enablers for cross-organizational workflow. It is of importance for interoperability that the agreed semantic models are implemented both in vendor systems and in local workflow so they can support new cross-organizational services around the patient's health as shown in VGR.

In conclusion, this thesis shows that the transformation of digital data in local systems into virtual information in an information infrastructure creates greater potential for using the digital information to improve planning and logistics within the information infrastructure in use, regardless of the local systems involved. Quality control and management of the data make it possible to derive information from it. Quality work should be done based on an information model grounded in useable standards and legal sources for metadata elements. The key success factor seems to be creating and holding an information infrastructure with quality of the metadata elements. Implementing an information infrastructure takes time and therefore needs special attention from a strategic viewpoint.