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Infobroker – an ICT Healthcare Solution

The global demand for interoperability within healthcare is increasing in order to provide the services needed in healthcare today. This situation is also reflected in the Västra Götaland region (VGR) on the western coast of Sweden. Studies illustrate that relatively few healthcare organisations have developed sustainable interoperable solutions with an enterprise scope (Ebbert et al. 2007; Mendelson et al. 2008; Weinstein et al. 2008). Healthcare institutions are intrinsically slow to adopt innovations, especially when they lead to changes in workflow caused by the involvement of new actors in the process of care (McLean 2008 and Borland 2009).

To share information within an enterprise faces a number of challenges. Several central challenges are addressed towards management and their ability to identify how to harmonise information as well as how to focus on organisational issues and human factors in relation to the implementation of the new Infobroker solution. This is done by working with the ownership of information and by providing shared visions, strategies, goals and new technologies to healthcare professionals. Another challenge for management is to make room for negotiations at work that stimulate the development of a new enterprise workflow. Experience from the management in addressing these challenges can contribute to the development of enterprise solutions that offers interoperability between many different and heterogeneous healthcare organisations.

Background

Interoperability within the enterprise environment is maintained according to the IHE mission, i.e. the project is applying standards such as Digital Imaging and Communication in Medicine (DICOM) and Health Level 7 (HL7) (PS DICOM 2008, IHE 2009, HL7 2009) to address specific clinical communication needs and support optimal patient care. All information is stored as DICOM objects. In practice, this means that images are stored as their original SOP class e.g. DICOM MR, DICOM CT. Textual information is stored as DICOM Structured Report. Thus images and texts are combined into a holistic entity

Results

1. Importance of Technology

In the Västra Götaland region (VGR), Sweden, data is shared from 29 x-ray departments, 170 dental clinics, two clinical physiology departments and four cardiology departments through the Infobroker solution. Text from EPR systems are stored as DICOM-Structured Reports objects, together with the images. Interoperability is based on the IHE mission, e.g. XDS-I registry and repository.

2. Benefits

The reasons for using Infobroker are to:

- Reach improved treatments, diagnostic and clinical quality;
- Reach improved and more equal information quality
- Better plan for load balancing of clinical and diagnostic resources, resources allocation;
- Enable working in teams across traditional departmental boundaries, e.g. first and second opinion, and
- Improve the follow up ability and predict the outcome of changes (reports and simulations), and knowledge management.

3. Originality

Infobroker is the first enterprise data storage in Sweden and globally, to the best of our knowledge, centralising patient information regardless of different sites' local EPR, PACS and RIS systems. Information from different local systems are centrally stored and shared as if they had been produced from one system. Physicians access the information via the web.

4. Difficulties

Syntax from the producing systems, harmonisation of the syntax and support for enterprise sharing in healthcare standards is difficult. Today standards are built for interoperability between systems and not for interaction on information from different systems. Other more practical difficulties have been:

- The enterprise environment includes many different vendors. The objective of these vendors has been to enable system-to-system communication - retrieve and send. Infobroker and sharing of the information is completely different from the idea system-to-system communication.
- The perspective from vendors has been that they own the data within their systems databases. The argumentation is that they otherwise cannot handle the information in their workflow. Contrarily, the care givers' perspective is that they own the information that is stored in a vendor system and produced from a patient perspective. This gets more complex when the region is of the opinion that they own and

manage the information. Who owns the information and how do we get vendors to cooperate instead of competing within the enterprise environment?

- Standards are not complete out of an enterprise view as it opened up for different ways of interpretation and using the standards on.

5. Success

Infobroker is implemented and used daily in VGR since 2006. During 2010 Infobroker also fed the national "historical patient overview" service deployed in Sweden, being a role model for other healthcare regions to follow.

Conclusion

Development of the Infobroker solution, with an unlimited number of healthcare organisations and individuals, within the VGR enterprise involved continuous negotiations regarding (among others): the harmonisation and ownership of information, and knowledge of who should collaborate with who to achieve new ways of working together. Infobroker is just a starting point for the sharing of information.

The impact of the Infobroker solution is comprehensive as sharing quality data could lead to a more interactive healthcare. Where traditional boundaries are broken, novel ways of social collaboration are introduced and new ways of carrying out the work will be seen. *Sharing is caring.*

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