Development of a Teleradiology web portal for the exchange of medical data using DICOM e-mail

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Abstract and Objective

The Teleradiology/Emergency Medicine Network (TEN) in the Metropolitan Rhine-Neckar Region (Germany) enables the exchange of medical data [1]. However, the inclusion is difficult for technical and financial reasons for some partners like general practitioners (GPs). For that reason a web portal for the exchange of medical data within the TEN is under development. The DICOM e-mail standard [2] offers the base for the data exchange. The portal itself will be developed by Java Server Pages (JSPs) and Java Servlets. The data will be saved in a MySQL-database and a LDAP-server. The DocCheck service will be also integrated into the web portal. The concept has been finished and the portal is under development. The concept foresees that the web server is located in the demilitarized zone (DMZ) of the Heidelberg University Hospital and the database as well as the LDAP-server are running within the clinical network. The client server architecture will be realised by Servlets and JSPs. The portal offers the possibility to use the TEN for free.

Keywords:

Teleradiology, DICOM e-mail, Telemedicine, Portals

Introduction

Despite successful projects, the intersectoral, electronical exchange of medical information and in particular images still constitutes a major problem with respect to the inclusion of low-frequency users. Existing solutions are expensive and often use complex infrastructures like virtual private networks (VPNs). GPs hardly deploy these solutions because of the inherent effort and the substantial cost. The exiting TEN in the Metropolitan Rhine-Neckar Region is expanded by developing a web portal functionality for "low-end" users which is based on the open DICOM E-mail standard and offers a low-effort, cost-effective alternative.

Methods

The existing solutions for the TEN requires a DICOM e-mail client (DEC) for data exchange with the servers and other partners. Installation, maintenance and configuration demand technical knowledge which especially low-frequented users like GPs seldomly have and which are hence "excluded" from the TEN. A web portal will be developed for a secure, simple and economic transmission to address this issue and promote the expansion of the regional TEN.

Results

All components are based on Open Source Software (OSS). The web portal itself will be developed in Java, JSPs and Java Servlets with a MySQL database running in the background. The user administration will be achieved with a LDAP server and the external DocCheck service. The DICOM e-mail protocol is used for the data transmission. The web server is located within the DMZ of the Heidelberg University Hospital; database and LDAP-server operate within the clinical network. This guaranties the maximum data security. The signature and encryption of the data will be achieved by a Java Applet, guaranteeing that all patient information on the portal will be encrypted at any time. The integrated DocCheck service enables a registered physician to use the portal without prior registration. The architectural decisions, the functionality and the technical implementation as well as the pros and cons for all aspects will be presented and discussed.

Conclusion

The web portal of the TEN offers GPs the possibility to use the advantages of the network for free, with minimal effort and connection with all partners within the network. The web portal is an important milestone for the expansion of the network and thus improves patient care in the Metropolitan Rhine-Neckar Region substantially.

References

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