Secure web-based distribution of medical images and findings based on the Austrian eHealth

Thomas KURMANN a,b,1, Daniel SLAMANIG a, Christian STINGL a, Karl RÖSSL b

a Carinthia University of Applied Sciences, School of Medical Information Technology, Klagenfurt, Austria
b Siemens AG Austria, Department of Medical Solutions NLG, Graz, Austria

Keywords: Telemedicine, Radiology, Data Protection, Security, eHealth

The high availability of digital radiological examinations offers an efficient and highly qualitative opportunity to exchange medical images and findings. Using an open environment like the Internet an enhanced security concept needs to be designed, due to privacy issues and legal requirements in Austria. In the research project Teleimage, developed as collaboration between the Carinthia University of Applied Sciences and Siemens AG Austria, the workflow at radiological institutes, assigning physicians and patients was analyzed, optimized and implemented. The main focus was to fully digitize the overall process in accordance with the very restrictive Austrian laws and to improve the efficiency and the quality of this process. Teleimage additionally considers issues of the Austrian eHealth strategy, namely security and privacy aspects, identity and role concepts, documentation, auditing and statistical analysis. All medical data which are involved in the radiological treatment process will be managed by Teleimage and can be accessed by qualified participants. The access is realized time and location independent via a web-based application whereas access rights are implemented by means of cryptographic mechanisms to prevent privacy violations, in contrast to traditional access control methods like role based access control (RBAC). It must be emphasized that the security concept is provably secure and therefore does not depend on any mechanism at the application layer (e.g. RBAC). The regular operation shows that besides enhancing the privacy of patients there are enormous improvements regarding the reduction of costs, e.g. printer and film material, and the duration of the treatment process. Consequently, medical images and findings are available for all qualified users immediately after the examination. Considering an average radiological institute our analysis of the system yields that there are 50 to 100 studies processed per day. Considering one institute Teleimage reduces the film costs about 3.000€ per month whereas cost savings resulting from administrative tasks and printer hardware are not included. Hence a projection for a whole year implies a reduction potential of about 40.000€ per radiological institute. Currently we are analyzing the auditing data that is documented by the system, firstly to optimize the settings at the participant’s side and secondly to additionally benchmark the radiological process. At the moment we are developing a CDA-based finding for radiologists in order to be compatible with the Austrian eHealth strategy.

1 Corresponding Author: Thomas Kurmann, Siemens AG Austria, Department of Medical Solutions NLG, Graz, Austria; E-mail: thomas.kurmann@siemens.com