

# The ELGA initiative: A plan for implementing a nationwide electronic health records system in Austria

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## Summary

The European eHealth action plan states that member states of the European Union should support and promote eHealth on a national level. Electronic health records, which integrate medical data of patients across the borders of individual health care institutions, are widely seen as a central backbone of eHealth applications. This paper gives an overview of the Austrian ELGA initiative, a plan for implementing a nationwide electronic health records system in Austria.

## Introduction

Increasing specialization of modern medicine has given rise to substantial medical progress but also requires a higher degree of multidisciplinary cooperation. At the same time, the amount of health data collected for individual patients continuously grows due to the development of novel data collection methods. In order to ensure an efficient cooperation between the different health care providers involved in the care of a patient, these data must be communicated.

The integration of all health data of individual patients within a single electronic health record (EHR) no matter from which health provider they originate, is a topic that has been intensively worked on by the medical informatics community over the past decade. Such records allow authorized health care providers, as well as patients, to access complete medical histories – typically in standardized form – as well as medical knowledge at any time, regardless of location, and suitably presented for the respective user. EHRs can thus, particularly when they are introduced on a broad scale such as nationwide for example, considerably contribute to an improvement of modern health care.

The European e-Health action plan [1] states that the member states should support and promote e-Health on a national level. In accordance with this recommendation, the Austrian Ministry of health plans – analogous to several other nations [2-4] – to implement a nationwide EHR called “ELGA”<sup>1</sup>. This paper describes the existing eHealth environment in Austria, the concept of the Austrian ELGA initiative, and the presently published plans for its implementation. It updates previous work [5] that describes Austria’s considerations of a national EHR as of 2006.

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<sup>1</sup> German acronym meaning “life-long electronic health record”

## Current eHealth environment in Austria

From the current eHealth environment in Austria three developments have to be particularly pointed out, as they constitute an essential framework for the realization of ELGA.

- the **MAGDALENA-guideline**: In 2000 this guideline was published by the STRING commission, an expert gremium advising the Austrian ministry of health in the eHealth domain. It includes several technical and organizational recommendations for the development of an Austrian health data network, which will build a foundation for data exchange within ELGA. In [6] the MAGDALENA guideline is compared with the Health Insurance Portability and Accountability Act (HIPAA), which pursues a similar goal in the United States.
- the **eCard**: In 2005 the so-called „eCard“ system went into operation in Austria to replace the previous system of paper-based health insurance certificates. The system is based on (a) chipcards for the identification of patients and medical practices, (b) card reading devices in medical practices, and (c) an intranet that connects the latter with the social insurance computing centre. The patient card essentially only stores the name, gender, birth date and social security number of the patient and is used to request the insurance status of a patient previous to treatment. After purchasing an optional certificate, it can also be used as a signature card. The patient card also serves as the European health insurance card, as its backside contains the corresponding data. These data are currently only conventionally printed on the card but will be electronically stored on the card in the future. The eCard is, amongst others, planned to be used as a keycard for controlling access to ELGA data. In this context, the current health practice card will have to be replaced by a health provider card.
- the **Health Telematics Law**: This law<sup>2</sup>, which was enacted in 2005 as part of the Austrian health care reform act, defines minimum standards for a secure health data exchange and shall provide the regulatory basis for the development of eHealth in Austria in the international context. It obligates health care providers to verify previous to any health data communication, whether the identity and role of the receiver authorizes the latter to receive the corresponding data. This verification shall be realized by accessing a national eHealth-index, which will store, amongst others, names, identifiers, addresses, and public keys of health care providers. The health telematics law further prescribes that any data exchange over a medium that is not exclusively controlled by the sender and receiver must be encrypted. Electronic signatures have to be used to ensure data integrity. For the contemporary detailing of the different prescriptions of the health telematics law, the ministry of health can enact corresponding regulations. The health telematics law stipulates different sanctions for the violation of its prescriptions, which will become effective after a transition period that was recently prolonged until December 31<sup>st</sup>, 2008.

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<sup>2</sup> See [http://www.hpm.org/en/Surveys/IHS/06/Health\\_Telematics\\_Law\\_\(GTelG\).html](http://www.hpm.org/en/Surveys/IHS/06/Health_Telematics_Law_(GTelG).html) for an overview

## The ELGA initiative

After the ELGA initiative was initiated by the Austrian ministry of health in 2005, it commissioned a feasibility study concerning the implementation of ELGA – a nationwide EHR – in May 2006. In parallel, a task force named “ARGE-ELGA”<sup>3</sup> was founded in June 2006, with the mission to plan and coordinate the implementation of ELGA.

The results of the before-mentioned study were published in January 2007 and positively judged the feasibility of the Austrian ELGA. On the basis of the study, the ARGE-ELGA developed an architectural framework for the first implementation phase of ELGA. This framework defines three primary fields of activity:

- **Prerequisites for ELGA:** In this domain several key factors are compiled that cannot solely be implemented by technical measures. Factors that are particularly pointed out are
  - *Legal measures and data protection:* Based on an analysis of the consequences of ELGA in the domain of data protection published in 2005, the arising legal problems and the necessity of particular legal regulations shall be examined in close cooperation with the Austrian Commission for Data Security and the Austrian Data Protection Council. Considering the European Convention of Human Rights, the installation of a particular ELGA law will be inevitable according to the conclusions of the feasibility study.
  - *Acceptance management:* The integration of all parties involved, in particular the patients and the health care providers, is deemed essential. In this context, corresponding informational material shall be compiled by the ARGE-ELGA to universally present ELGA to the public.
  
- **Basic components of ELGA:** Here, different components are defined that shall realize in concert the eHealth infrastructure that will be the basis for an efficient implementation of ELGA. In the first implementation phase, the following components shall be installed:
  - *Indices for patients and health care providers:* The main function of the planned central patient index is the consolidation of the different patient identifications of local patient indices to an unambiguously identifiable person. The health care provider index shall enable the unambiguous identification of health care providers. Referring to the eHealth-index mentioned in the description of the “Health Telematics Law”, a national index of all health care providers including their roles and authorizations shall be realized that can also be used as a public reference book for finding a particular health care provider.

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<sup>3</sup> <http://www.arge-elga.at/> (in German only)

- *Concept for the representation of roles and authorizations:* In this component, clear rules shall be worked out, who may access ELGA contents and under which conditions. In the feasibility study a role-based authorization concept is recommended, which allows to generically define via profiles, which roles are prerequisites for operations (e.g., read, modify, ...) on ELGA contents. The option of obtaining the individual acceptance of the patient for each single operation is considered as not viable. To punctually overrule the generically defined authorizations (e.g., if the patient desires to grant his family doctor extended rights), the additional assignment of authorizations by means of electronic tickets is stipulated.
- *Specification of the networking concept:* Here, the integration of the eCard intranet of the general practitioners, the network of the social security carriers, as well as the different hospital networks to a so-called "Health-Ring" are seen as minimum requirements for a suitable ELGA communication network. All ELGA participants shall be connected over a secure transport layer, to allow integrating ELGA subsystems over the internet.
- *ELGA Portal:* The portal shall provide citizens access to general medical knowledge of certified quality (e.g. via links to professional societies, self-help groups and social facilities) and to his personal health data within ELGA. In the future it is further planned to allow citizens to personally enter data into ELGA via the portal. Further, any access to ELGA data may be retraced via the portal.
- *Document-Registry:* The central document registry does not store the source data themselves, but only links to the latter and describing metadata. The source data remain at the site where they originated, which means that they are stored decentrally at each corresponding health care provider (see figure 1). Documents formatted according to the Health Level Seven (HL7) Clinical Document Architecture (CDA) Standard – which may include structured and unstructured text data as well as multi media data – build the "storage units" of source data that may be released to other health care providers.

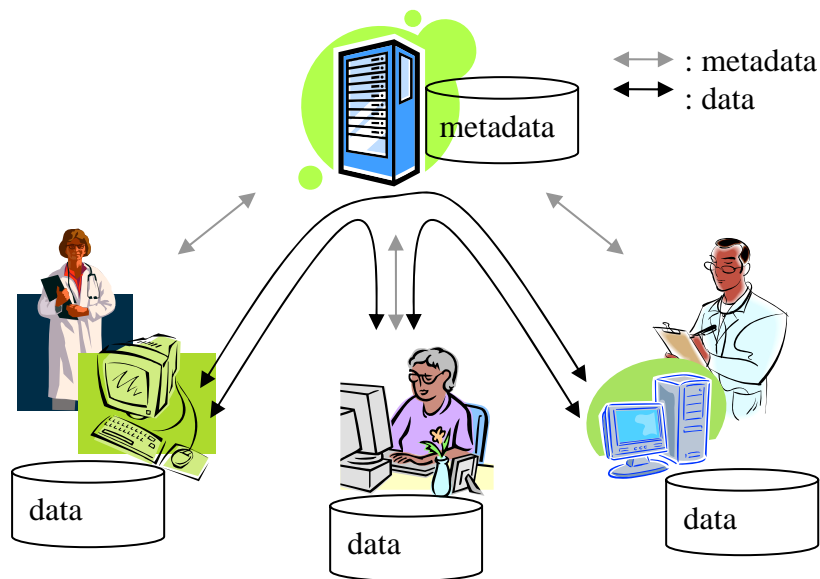


Figure 1: Distributed data storage with a central document registry, which stores metadata and links to the source data and decentral document repositories, which store the source data at the location of their origination. In the course of the ELGA project the IHE-XDS (Cross-Enterprise Clinical Document Sharing) profile of the IHE domain "IT Infrastructure" will be applied for this purpose.

- **Core ELGA applications and services:** Here, different applications and services are subsumed that are frequently needed by health care providers in the course of patient care. As the first step, four document types were appointed, which health care providers shall create for other, respective shall access from other health care providers within ELGA.
  - *e-discharge letter:* The discharge letter, which is created in the course of a hospital stay shall be electronically integrated into ELGA.
  - *e-medication:* The goal of this core component is the avoidance of drug interactions and multiple prescriptions of the same drug, as well as the correct implementation of a drug therapy. A corresponding pilot project has been running since February 2007 in the province of Salzburg.
  - *e-radiology report:* Here the findings of a radiological examination shall be electronically registered in ELGA, including the underlying images.
  - *e-laboratory report:* This core component serves to electronically register the results of a laboratory analysis in ELGA, including the underlying primary data.

Since fall 2007, several teams of domain experts have been working on the development of implementation guides for the structure of the four document types based on the HL7 CDA standard.

In the context of ELGA health data shall be exchanged on the basis of international standards. For this purpose the following standards have been named as starting points

- **Integrating the Healthcare Enterprise (IHE), Technical Framework** (as communication architecture)
  - IT Infrastructure Technical Framework Revision 3.0, December 9, 2006
  - Patient Care Coordination Technical Framework Revision 1.0
  - Laboratory Technical Framework, Revision 1.1, August 10, 2004
  - Radiology Technical Framework, Revision 7.0, May 15, 2006
- **HL7, Version 3, RIM** (as basic data model)
  - ISO/HL7 21731:2006(E), Health informatics – HL7 version 3 – Reference Information Model – Release 1
- **HL7, Clinical Document Architecture (CDA), Rel. 2** (as document standard)
  - ANSI/HL7 CDA, R2-2005
- **Logical Observation Identifiers Names and Codes** (laboratory domain)
  - LOINC® 2.19:2006-12-22
- **DICOM 3.0 und WADO** (radiology domain)
  - ISO 12052:2006(E), Health informatics – Digital imaging and communication in medicine (DICOM) including workflow and data management
  - ISO 17432:2004(E), Health informatics – Messages and communication – Web access to DICOM persistent objects

On the basis of a cost-benefit analysis that is currently being worked on, the ministry of health will decide at the latest by the end of 2008 over the final implementation of ELGA. In the case of a positive decision, which the authors deem likely, the concrete implementation measures will be executed in the following. According to the current planning status, the implementation of the ELGA core applications and services shall be finalized by the year 2012.

## Conclusion

In this paper the current status of the ELGA initiative was presented, a plan to implement a nationwide EHR system in Austria. If realized as planned – what the authors deem likely due to its intensive political backing, ELGA will have an essential impact on the Austrian health care system. Much will depend on how well ELGA will be accepted by health care providers. The benefit of having broader access to patient data is confronted with the extra time needed for studying these data and being liable for having studied them. Consequently, methods will have to be found to efficiently filter the partly huge EHRs for a reduced set of information that is relevant in a particular patient care situation.

## References

1. European Commission. e-Health - making healthcare better for European citizens: An action plan for a European e-Health Area. 2004.  
[http://ec.europa.eu/information\\_society/doc/qualif/health/COM\\_2004\\_0356\\_F\\_EN\\_ACTE.pdf](http://ec.europa.eu/information_society/doc/qualif/health/COM_2004_0356_F_EN_ACTE.pdf)
2. Perina F. Italy's eHealth Strategy. eHealth Conference 2007 – Policies and Strategies for eHealth across Borders: 157-60. Bonn: nanos Verlag; 2007.
3. Maat E. Roadmap, Status Quo of Current Activities in the Netherlands. eHealth Conference 2007 – Policies and Strategies for eHealth across Borders: 171-78. Bonn: nanos Verlag; 2007.
4. Bernstein K, Bruun-Rasmussen M, Vingtoft S, Andersen SK, Nohr C. Modelling and implementing electronic health records in Denmark. *Int J Med Inform* 2005; 74(2-4):213-20.
5. Dorda W, Duftschmid G, Gerhold L, Gall W, Gambal J. Austria's Path toward nationwide Electronic Health Record's. *Methods Inf Med* 2008; 47 (2):117-23.
6. Duftschmid G, Wrba T, Gall W, Dorda W. The strategic approach of managing healthcare data exchange in Austria. *Methods Inf Med* 2004; 43 (2):124-32.