



Management Summary

Feasibility Study for implementing the electronic health record (ELGA) in the Austrian health system

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2. Results - Management Summary

2.1 General Recommendation

Based on the results of the ELGA¹ feasibility study, our recommendation is to implement ELGA in a step-by-step approach and to continue the detailed planning.

The recommendation is based on the evaluation of the potential added value which ELGA can create for Austrian citizens/patients and for the Austrian health system, as well as on the feasibility evaluation from technical, economic, organizational, content and legislative point of view and on the evaluation of the health care stakeholders' acceptance and potential resistance.

2.2 Motivation for the General Recommendation

2.2.1 Added value by ELGA

ELGA can **improve the quality** of the healthcare services for prevention and treatment and can cause an **increase of the effectiveness and efficiency of the Austrian health system**:

Quality added value

- ELGA effects a transition from provider oriented to patient oriented documentation taking the protection of data privacy into consideration. The quality of healthcare services for prevention and treatment can be considerably increased by the availability of patient centered documentation. A quicker and safer decision making is possible for the health service provider. An essential contribution to the rise of equal treatment opportunities can be achieved for all patients by means of telemedical services.
- The **current** Austrian health system holds a **high fragmentation** (also of the existing data) resulting in a high number of interfaces/seams and communication problems. An **integrated supply** is only possible with ELGA. The data and information derived from different health service providers and from the patients themselves is provided by ELGA to be accessed by authorized persons only.

¹ ELGA is the abbreviation for "Electronic Health Record". We have used the German speaking abbreviation since ELGA is part of the title of the feasibility study.

This **virtual** health record can be accessed any time (and cost effective) at the place of the treatment and in the required form by authorized persons (according to their roles and to the data privacy legal terms).

- ELGA will lead to an **increased communication and particularly to an augmented cooperation of the Health Care Providers (HCPs)**. ELGA will cause an essential gain of time and an enhanced linkage of the treatment chain both from the inpatient area to subsequent suppliers and from the areas preceding the preliminary health areas to the inpatient domains. Seam problems (e.g. a patient chooses a different doctor) can be reduced and the possibility to access relevant health data (depending on the permissions) will exist in emergency situations in a really quick and efficient way.
- ELGA is **the tool for modernizing and optimizing the processes of the Austrian healthcare system**.
- The realization of ELGA also accommodates the EU (European Union) specifications which demand the introduction of health information networks, electronic health services and target settings for the interoperability in the health service in order to increase the effectiveness and efficiency of healthcare services for prevention and treatment.
- Results of international and national projects show and confirm the added value for patients and for the health system both with regard to the citizen's quality of life and to the increase of the effectiveness and efficiency of the health service. However, the evaluation of existing projects has also pointed out, that the achieved success (added-value) **strongly bases on the deployment of acceptance measures, as well as of organizational measures, content regarding issues and legislative aspects**.

Economic added value

- The economic added value of ELGA empirically cannot be proved obviously, not least due to the different and therefore not comparable markednesses of the electronic health records in the international context. However, the results of selective studies and evaluations absolutely speak for the economic usefulness of ELGA.
- Within a health organization the benefit can be proved by the better availability of the patient data. An essential aspect of ELGA is that providing data by a HSP will not only be an advantage for the patient but will additionally become a great improvement and benefit for other HCPs if these can access the data.
- The economic usefulness is proved by different examples in the course of the literature research. It can be assumed that due to an immediate access to relevant data through ELGA multiple examinations can be avoided, a specific therapy can be started sooner, less errors in patient medication will occur, etc. Last but not least hospitalization can be shortened.

Survey added value: By use of the potentials of information and communication technologies the realization of an electronic health record will lead to a qualitative improvement in the healthcare treatment and therefore to an economic added value for the Austrian citizens and for the Austrian health system.

2.2.2 Feasibility

Based on the evaluation of international and national projects as well as of scientific studies the feasibility of ELGA was estimated regarding technical, legislative, organizational, medical, content related, economical and acceptance aspects in Austria. Under the prerequisite of the implementation of the recommended actions to the particular aspects we rate the feasibility of ELGA in Austria as positive.

- **Technical feasibility:** We assess the technical feasibility of the recommended frame architecture presented in the context of this study as given. In some areas the proposed base applications are already implemented by applications in different areas, essential existing infrastructure elements can serve as a base for ELGA and be enlarged. **The feasibility study points out that the challenges will be the organizational, the legislative and the content related topics and not the technical realization part.**
- **Legislative feasibility/protection of data privacy:** ELGA and protection of data privacy are not conflicting topics; on the contrary, they complete and are in a constructive way encouraging each other, since ELGA will stimulate the protection of data privacy. However ELGA is not a data-application according to the Data Protection Law 2000 (DSG 2000). Different demands of the DSG 2000 (e.g. circumstance-aware coercion-free agreement for the particular case, etc.) simply are not practicable in a rational administrative effort. The demand of the patient-agreement for each single data-transmission (after an appropriate education has taken place), appears not really practicable. Concerning these points, ELGA is currently not realizable compliant to the DSG 2000. International comparisons show that those countries which have already implemented ELGA have a subtly differentiated access to the protection of data privacy.

To take the Austrian access to the protection of data privacy into account a general contradiction principle is an alternative (analog the process for organ donation) with an extension for special cases where the consent of the patient is still necessary.

Since there is a discrepancy to the mentioned existing legislative foundations these matters need to be regulated by a special law. It is indispensable to build a new law for ELGA.

The accurate type of an ELGA implementation with regard to consent and contradiction of the patients is reserved for the politics. Suggested hard and software architecture remain consistent for all different analysed variants.

The Treaty on Organization and Financing the Health System is an agreement between the federation and the countries and was approved constitutionally. ELGA is quoted there in the article 7, paragraph 3: ... *the contract parties confess for the conception and introduction of the electronic health record (ELGA) with priority ... paragraph 4: The contract parties will take all organizational, technical and **legal measures** in their domain, which also makes the electronic health data interchange possible for persons affected and accordingly also supports transparency and makes it traceable.* The implementation of ELGA is a concern of great importance and therefore the circumstance that legislative measures are required does not represent any novelty.

A fact is that for ELGA no centralized storage of individual-related health data is envisioned/planned. The document registry solely contains the links to the local stored data at the HCPs. Thus, by ELGA no organizational interferences in the documentation are undertaken.

- **Organizational feasibility:** Based on the knowledge from the evaluation of international and national projects we recommend **a gradual step-wise implementation of ELGA** and the quick execution of pilot projects to make successes of ELGA quickly visibly and then to continuously communicate the successes.
- **Economic feasibility:** To ensure a realization of ELGA as economical as possible we recommend for reasons of investment protection to use or build upon components already existing and use the existing experiences from the available regional projects and flow this knowledge into the countrywide implementation of ELGA.
- **Content related feasibility:** A challenge of ELGA consists in the fact that all relevant documents will be digitally available in future, i.e. also, that they are created digitally, what means at least an essential rearrangement for a wide circle of HCPs. This cultural change requires an extensive support of the HCPs. To gain a profitable communication in the long-term, the structuring of relevant documents is required unless they are not already existing in an interoperable form.

Feasibility survey: Under the prerequisite of the realization of the recommendations to the individual aspects we estimate **the feasibility** for ELGA in Austria as **positive**.

2.3 Recommendations for the First Implementation Phase

2.3.1 Recommended Architecture/Base Components of ELGA

During the evaluation of the architecture options and the corresponding recommendations the focus has been set on the fulfillment/consideration of the following issues:

- Fulfillment of the Treaty (Article 15a of the Federal Constitution)
- Feasibility under consideration of the protection of data privacy
- Feasibility under consideration of the data security
- Fulfillment of specifications (interoperability etc.)
- High-quality health care delivery by connecting the HCPs; 7x24h availability (independent of the opening hours of the HCPs) of relevant and structured patient related documents and data
- Growing mobility of the patients (at home and abroad)
- Autonomy of the patients (e.g. free doctor choice)
- Turning from directional communication to nondirectional communication
- Investment protection - feasibility in an economical way: Consideration of the investments already done by the Healthcare Service Providers; Avoidance of long conception phases by development of the target system based on the available components; Consideration of the feasibility according to the administration effort; Operation by several providers (avoidance of cost driving monopolies); etc.
- To integrate also future applications in ELGA as efficiently as possible we recommend furthermore to guarantee the ELGA conformity by countrywide binding specifications. We recommend to quickly define the applicable IHE profiles as standard for the interoperability as well as IHE as a standard for ELGA compatible core applications and to establish the HL7-CDA as an interoperable documentation standard by the Federal Health Commission to ensure that ongoing and new projects are ELGA compatible.

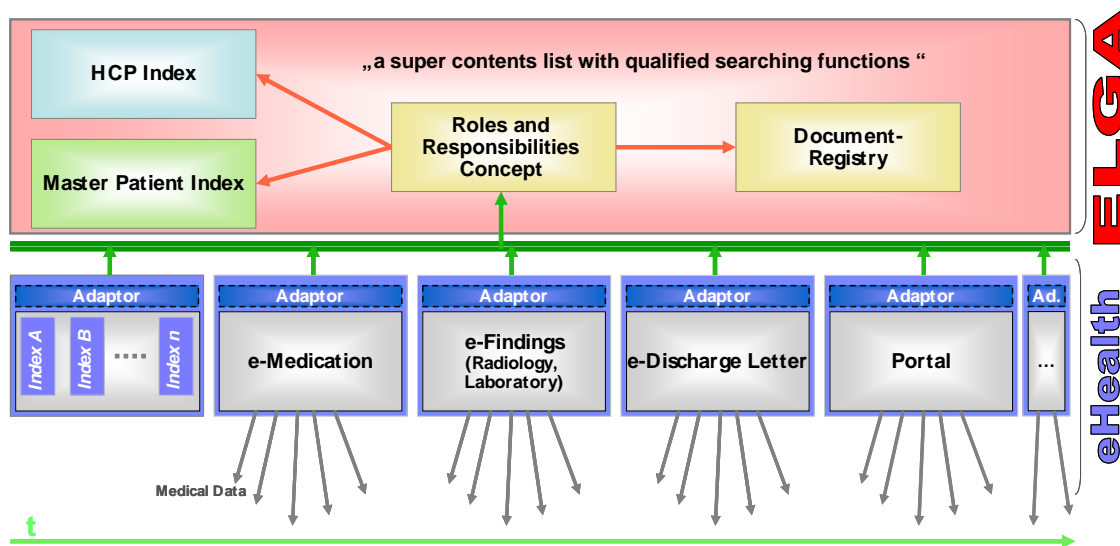
The suggested architecture solution supports the fulfillment of the primary aim, the guarantee of the high-quality care of the patients under consideration of all national and EU broad legal specifications, all protection of data privacy and under consideration of the organizational and economical feasibility.

The recommended architecture makes a quick implementation possible since no basically new concepts have to be developed because the architecture builds up on base components already available in Austria.

At present, we do not see any applicable alternative to the suggested architecture under consideration of the mentioned framework conditions and prerequisites.

We recommend creating test environments for already ongoing projects which produce the evidence that the recommended architecture works and fulfills all requirements.

In the first implementation phase of ELGA the base components for ELGA (health care provider index - HCPI, master patient index - MPI, roles and responsibilities concept, expansion of networking, register and repositories for the first core applications) as well as the first core applications (e-medication, e-finding, e-discharge letter and portal) shall be implemented. The following graphic shows the recommended schematic basic construction of ELGA:



Adaptors: Adaptors are interfaces which make existing applications ELGA compatible. In future, these adaptors will already be integrated in the applications. With the help of IHE as a system-technical conception tool and the ELGA standards, the applications need only a minimal adapter layer

Briefly, the base components are explained as follows more precisely:

- Health Service Provider Index:** A central prerequisite is the identification of Health Service Providers for ELGA. The requirement is to realize a uniformly structured, easily accessible, complete index of the current, valid health service providers with their access structures, roles and rights. We recommend building up and enlarging the index on the existing eHVD (eHealth-Verzeichnisdienst) implementation. Additional already available lists of similar functionality should be subordinated to the eHVD where the eHVD acts as root.
- Roles and Responsibilities Concept:** For the ELGA implementation a national overall roles and responsibilities concept is necessary for the access to patient-related information. In this concept the protection of data privacy laws related issues and legislative concerns have to be taken into account to guarantee a sufficient safety and to promote the acceptance of the complete project. The patient can request an overview of the read and write accesses (log-data) and/or

access rights on his electronic health at any time. Through this the acceptance and the confidence in ELGA are also promoted.

- **Networking:** The use of the available infrastructure and the networks is recommended analogously for the recommendations of the eHI (eHealth Initiative)² study group in the area of networks. The connections between all systems which takes part in ELGA shall be protected according to the IHE (Integrating the Healthcare Enterprise) profile ATNA (Audit Trail and Node Authentication) using SSL (Secure Socket Layer)/TLS (Transport Layer Security), respectively with client authentication. Therefore systems can be connected to the central ELGA components also over the internet.

This serves primarily the preservation of the investment protection as well as to the avoidance of a monopoly of single suppliers.

- **Patient identification & patient index countrywide & EU compatible (master patient index):** A quite essential prerequisite for the electronic health record is a clear patient identification. The recommended **central** austrian-wide patient index also forms the interface to the country specific and local patient indices and creates an index at a national level. The existing regional patient indices can be tied to the Master Patient index.
- **Document Registry:** The registry (Document Registry) shall be located **centrally** and is responsible for the storage of the information (metadata) about the documents so that documents importantly to the treatment of the patient are found fast, selected and received independently of the place where they are stored. Regarding a decentralized storage to support an efficient and high-performance search to realize the potentials of e-Health, information must be managed in suitable metadata indices (every HCP does not operate his own metadata index) about the HCPs in which data are saved to a patient.
- **Document Repository:** The storage of the documents (Document Repository) shall be realized in a **decentralized** system carried out in the responsibility of the respective health service provider. There is no central storage of the health data but rather the data shall remain at the originators or their service providers. The health service provider is responsible for the storage of the documents and has to respond to requests of documents from authorized persons. The repository is responsible for the durable storage and for the registration of the documents in the document registry. The repository transfers an URL (pointing at the requested document) to the requesting user, where he can use this URL to receive the documents.
- **ELGA Portal:** The ELGA portal shall primarily provide quality secured health relevant information to the patient on the one hand and represent a user friendly access to ELGA applications on the other hand. During the first implementation

² eHI: Austrian eHealth Initiative, started in 2005.

phase the portal shall serve as an information portal and contain publicly accessible information like health information, current themes, prevention information, HCP information etc. The portal shall also make a personal profile possible for patients as well as realize an access to relevant ELGA data in a very safe area in further extended editions.

2.3.2 Core “Applications” for the First Implementation Phase

Core Applications provide information in ELGA. They are connected with ELGA by adapters. Core applications as well as adapters are in charge of HCPs. Thus, **for ELGA no centralized storage of individual-related health data is envisioned/planned. The document registry solely contains the links to the local stored data at the HCPs.**

The prioritization of the core “applications” is carried out on the one hand after the feasibility criterias concerning the factors under the factors of investment protection (available/planned pilot projects, infrastructure and applications), acceptance of the stakeholders as well as organizational and technical practicability and on the other hand under the consideration of the obtainable use. On the basis of the base components we recommend the implementation of the following core applications for the first implementation phase:

- **e-medication:** The e-medication supports threads from the prescription to the distribution of the medicine and therefore increases the treatment quality for the patient. Subareas of e-medication care about the avoidance of medically unwanted drug interactions also under inclusion of OTC-drugs and remedies, the avoidance of multiple prescriptions as well as the support of the correct realization of the medication therapy (compliance/reach regulation). The medication data are stored in a central e-medication database for disposal.
- **e-radiology finding:** Electronic provision of the result of a radiological examination (diagnostic findings and necessary pictures) in the context of ELGA and registration in the document register. The e-radiology finding offers radiological images in ELGA, incl. the access for authorized persons to the radiology finding.
- **e-laboratory finding:** Electronic provision of the results of the laboratory analysis (diagnostic findings and necessary primary data) in the context of ELGA and registration in the document register. The e-laboratory finding offers the access for authorized persons to the laboratory finding as well as filter functions, process optimization and the access to pre-findings in ELGA.
- **e-discharge letter:** The electronic provision of the discharge letter in the context of ELGA and registration in the document register. Implementation of the access to discharge letters by authorized persons using a uniform access on one hand to domains preceding the inpatient area (e.g. doctors, social care services, etc.)

and on the other hand to subsequent domains following the inpatient area (e.g. doctors, social care services, hospice facilities and rehabilitation centers).

- **portal:** The portal offers an access to quality protected health relevant information and a user friendly access to the ELGA applications, incl. authentication for patients.

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