On-Line Data Exchange in Slovenian Healthcare and Health Insurance

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Abstract. In 2009 the Slovenian healthcare and health insurance sector is implementing a national system for the secure on-line exchange of administrative and medical data. All general practitioners, hospitals, pharmacies and other healthcare providers will connect their information systems to this electronic service. Solutions have been built upon, as well as the renovation of the existing well recognized national Health Insurance Card System. Using the On-line System, health professionals directly access centrally stored patient medical data (data on prescriptions issued, on medical technical aids, pregnancy, etc), and a comprehensive set of administrative data. The on-line system is a solid infrastructure for the further development of applications for direct data exchange between the information systems of healthcare providers. It has significant benefits for patients, healthcare professionals and health administration.

Keywords. eHealth, on-line, medical data, administrative data, infrastructure

1. Introduction

In 1999/2000, every Slovenian citizen received a Health Insurance Card, which is a patient’s identification document containing electronic data on their health insurance status and a set of medical data. Citizens update the data on their cards at self-service terminals installed at hospitals, healthcare centres and other frequently visited points. Some data is written to the card by physicians and pharmacists as well.

The data on the cards can be accessed by health professionals using their health professional cards. Strict access rules have been defined and technically implemented for every group of professionals.

For business and technical reasons, healthcare and health insurance partners in Slovenia decided to renovate the card system. The main goal was to switch from the existing off-line system to a new on-line system. Instead of using cards as a media to transfer data between organisations, a new On-line System has been built which enables direct data exchange. This new mode of operation has become possible with the rapid development, better accessibility and lower costs of telecommunications.

In Slovenia, every hospital, healthcare centre, general practitioner, pharmacist, provider of emergency transport, supplier of medical technical aids and optician has their own information technology infrastructure and application software for registering patients’ visits, registering performed services, statistical reporting and invoicing to health insurance organisations. In recent years, most have also provided access to the
Internet at most of their business locations. Internet connection capacities are at least 1Mbit/sec, mostly on ADSL technologies. They have also provided appropriate data and system security and system availability measures.

2. Project Implementation

The construction of the On-line System has been performed as a multi-institutional project, managed and technically coordinated by the Health Insurance Institute of Slovenia, and in cooperation with all three insurance companies who offer voluntary health insurance (AdriaticSlovenica, Triglav and Vzajemna), and partners providing IT equipment and services (IBM, NIL and others).

The introduction of this new system to healthcare providers is supervised by a project management board consisting of representatives of Ministry of Health, Chamber of Physicians, Association of Hospitals and Healthcare centres, Chamber of Pharmacists, Chamber of Nursing, and others.

The first (pilot) implementation of the system was in October 2008 in Nova Gorica general hospital. In February 2009, pilot implementations were performed in the first pharmacy and at a general practitioner. In March 2009, national implementation began and has been progressing region by region. It is planned to connect the last region in February 2010.

3. System Characteristics

The On-line System provides for the real-time, direct and secure exchange of data messages between information systems. It enables direct connections between the application software at healthcare providers with established national backend systems. Figure 1 shows the main components of the system’s architecture.

Healthcare providers connect to this system using regular internet connections. Data security is ensured by using encrypted communication channels. For this purpose, the TLS protocol is used. All data messages are sent through a central component, called the Entry Point, which identifies, authenticates and authorises users. Entry Point also routes messages to appropriate back-end systems. Entry Point is implemented as an application server with application software developed in Java. Back-end systems hold well-organised and up-to-date databases. Every access to data is comprehensively logged, as required by the legislation. The electronic services (functions) of the On-line System are implemented as Web Services, following the standards of the World Wide Web Consortium. Data messages between users and Entry Point and to back-end systems are structured as XML documents, with SOAP envelopes, according to the standardised XML schema. Every message can consist of data blocks to exchange several groups of data in one request.

In both Entry Point and back-end systems several technical mechanisms are in place to provide high availability of equipment and electronic services (redundant servers and telecommunications, software solutions for routing of requests). Continuous system surveillance provides for the timely identification of availability threats and activation of technical support teams at any time.
Software companies who develop application software for healthcare providers have upgraded their products by using standardised software libraries which simplify the tasks of integrating cards, card readers and on-line system web services to their applications.

Both types of cards (Health Insurance and Health Professional Cards) are used in the on-line system. Health Professional Cards contain digital certificates, which are used for user’s identification and authentication. Health Insurance Cards (patients’ cards) are used as keys to access personal data. A health professional can only access patient data with a patient’s card, which is presented to the system (inserted into the reader).

In the first phase, which is being implemented in 2009, the on-line system offers the following electronic services, offered by the back-end systems of Health Insurance Institute of Slovenia and all three voluntary health insurance companies:

- access to the following data:
  - basic patient’s data (identification, name, surname, address, …)
  - health insurance data (compulsory insurance, voluntary insurance)
  - patient’s personal physician
  - medications issued to the patient at pharmacies
  - medical technical aids issued to the patient
  - patient’s pregnancy
  - patient’s willingness to be an organ donor
• submission of the following data:
  o new selection of personal physician
  o issue of medication at pharmacy
  o issue of order form for medical technical aid
  o issue of medical technical aid at a supplier or optician
  o new pregnancy

4. Future Plans

The on-line system is a solid infrastructure for the direct exchange of data in the Slovenian healthcare and health insurance domain. It contains all the components to provide the reliable and secure transfer of patient data, which is the key enabler for providing comprehensive and high quality healthcare treatment.

The following new electronic services for health professionals have been planned or have been identified for development in the next phases of the system’s development:

• ePrescription (storing ePrescriptions to a central electronic archive, and using data when issuing medication at a pharmacy),
• exchange of data of referrals (referring patients from primary to secondary healthcare services),
• on-line approvals of expensive healthcare services by health insurance organisations,
• on-line collection of certain information from the personal Electronic Healthcare Record data in a central database (e.g., vaccination record, data of allergies),
• on-line collection of data when contagious diseases appear (e.g., influenza),
• on-line collection of data on waiting lists for certain healthcare services.

5. Results

The system has important advantages for everyone in the healthcare system. For citizens, it means the discontinuation of health insurance card data updates at self-service terminals. The wider sets of data available through the On-line System with respect to those previously available on the cards will further improve the quality of healthcare services and reduce the possibility of administrative and professional errors. Future solutions of the On-line system will enable the simplification of procedures for acquiring various certificates and approvals in connection with using healthcare services.

For healthcare providers, the system simplifies procedures for determining the status of a patient’s health insurance and for determining the scope of their rights. The new data sets enable easier communication between healthcare workers. The established key public infrastructure and new health professional cards, as well as the technological upgrading of information equipment and the inclusion of providers in the Internet network enable the development of new information solutions, which will contribute to more effective and better services from healthcare providers; it will also improve their communication with the business environment.
For the Health Insurance Institute of Slovenia and voluntary health insurance companies, the system eliminates risks associated with the unauthorised use of healthcare services in the event of a patient not having the appropriate insurance, enables the more rapid implementation of changes and ensures a platform for the implementation of new electronic communication functions.

The renewal of the system is one of the most important and expensive tasks in realising the Slovenian eHealth strategy. It will provide important infrastructure and solutions for all three strategic development areas: electronic medical records, communications between healthcare organisations, and accessibility to data and electronic services for citizens.

6. Conclusion

The renovation of the Slovenian Health Insurance Card System with the implementation of on-line data exchange between information systems is a significant step in Slovenian health informatics.

The national scope of the system’s implementation has immediate broad benefits for individuals and all healthcare and health insurance stakeholders. The implemented infrastructure enables the further development of reliable and secure eHealth solutions following the directions of the Slovenian eHealth strategy and European Commission.

References


