

## **Toward the Implementation of Integrated eHealth Solution: the Luxembourgish Experience**

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***Abstract:* eHealth is a neology commonly employed to state the utilization of Information and Communication Technologies (ICT) to improve exchanges of medical information. Luxembourg is currently working on the definition and implementation of a national eHealth platform in order to improve the connectivity between different health actors (caregivers, administrators and patients) and to facilitate the access to medical information in a standardized and safed way. The adopted strategy is composed of three phases: a national survey to determine the current use and needs of ICT; the elaboration of technical concepts that satisfy those needs; and the implementation. This paper reports the main results of the first phase.**

### Introduction

Since 2008, Luxembourg has inquiring different categories of healthcare professionals and patients. The survey consists on a questionnaire sent to all doctors' practices and pharmacies, and several meetings with representatives of caregivers, hospitals' administrators, health insurance and patients. These exchanges are essential to determine what has been used, why, what is necessary to improve/create and how important are these needs. This paper reports the main outcomes from the questionnaires' analysis. The questionnaire was prepared to clarify the current situation of the following topics:

- General information
- Informatics tools
- Internet
- Security
- Main used software facilities
- Utilization of electronic health records
- Medicament reference database and knowledge database
- Needs and priorities for sharing/exchange medical information

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The questionnaire was sent to all doctors and pharmacies (one questionnaire by pharmacy) registered in Luxembourg. In order to improve the pertinence of the questions and highlight the importance of the work, the questionnaires were prepared by a group of experts in technology for health from the Public Research Center Henri Tudor (department SANTEC) and validated by the national representatives of doctors (AMMD – Association des Médecins et Médecins-Dentistes) and of pharmacists (SDP – Syndicat des Pharmaciens). Each questionnaire was submitted by post attached to a letter from the Health Ministry explaining the objectives of the survey. The letters were also signed by the respective representatives of each professional. An electronic version of the questionnaire was also available on the Internet where users could fill in the answers on a webpage. 32% of doctors and 55% of pharmacies sent the answers.

As a result of the analysis, we could observe that in Luxembourg the majority of doctors are between 44 and 59 years and they are 86% to use informatics tools to manage their practices. A deep analysis shows that the age, the demographic situation (work in cities, work in rural areas) and the informatics knowledge do not influence the choice of using ICT solutions. Another characteristic of Luxembourg is the diversity of solutions adopted. More than 50 solutions were identified, some of them were designed to be used in other countries and are not adapted to the Luxembourgish market. However, 3 software producers dominate 50% of the market.

An Internet connection is available in 81% of practices and it is mainly used to search for medical information. Luxembourg has also HealthNet, a secure network implemented in the healthcare sector, for medical data exchanges. However, it is only used by 5% of doctors and the most used service is the reception of electronic versions of laboratory results. The main barriers to the development of this network seem to be the registration costs, the (few) quantity of services offered via HealthNet, and some restrictions imposed to guarantee the security level.

The security aspect of this study shows an important paradox between what healthcare professionals have been doing to protect their data and what they want from ICT solutions. Healthcare professionals request ICT solutions that guarantee that collected data are validated by experts and that they are not modified during the transmission and storage process. They want to be sure that the data presented on the screen is the one validated by the expert. It is normal when we know that medical data are very critical and need to be protected from any illegal utilization. But each side of this interaction needs to proceed carefully to do not break the security chain. For

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example, the analysis of the survey shows that doctors and pharmacies (50% and 37%, respectively) do not apply what we had defined as minimal security procedures:

- ✓ Access to the software by a login and password
- ✓ Make regularly backups of important data
- ✓ Use an updated antivirus
- ✓ Use a firewall
- ✓ Have a maintenance contract for Hardware and Software problems

However, they are 85% and 100%, respectively, having patient data stored in an electronic media and manage them everyday (this is the most used Software facility).

When inquired about a national eHealth platform and how it can improve their work, doctors give priority to receive (or access) data through (in) the platform. Send data was classified as a low priority task. Fig. 1 presents the 8<sup>th</sup> most priority services to be implemented in the eHealth platform according to doctors (General Practitioners, Specialists and Dentists) and pharmacists. This opinion could be confirmed within the interviews. The precise reason of it could not be determined, but they consider themselves as beginners or intermediary users of Informatics resources and they want to use the ICT solutions to facilitate their work. Fill up forms, validate and send data, and correct errors (in the Software) will increase they workload.

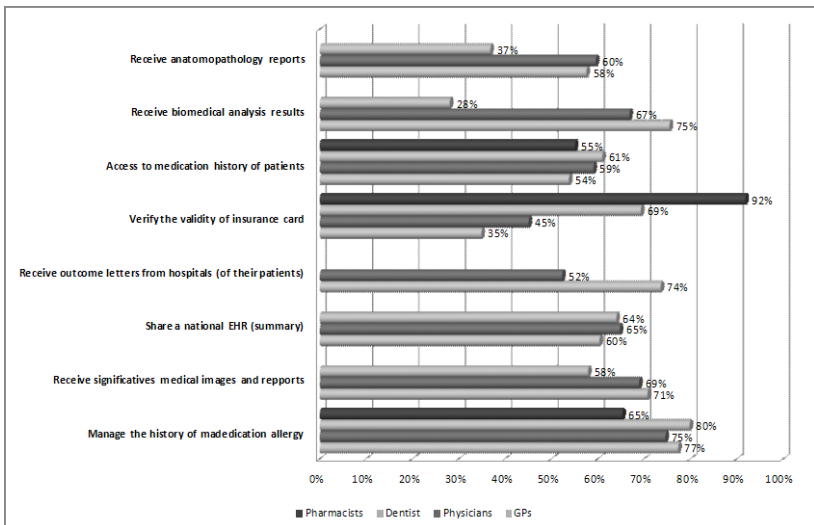


Fig. 1: Synthesis of healthcare professionals needs

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The main challenge of the platform concerns the technical and semantic interoperability of systems. Many renamed organizations have proposing standards to improve the interoperability of systems, but there still have some critical problems to solve: Intersections of standards, uncovered data, incompatibilities between standards, etc.

In Luxembourg, the used ICT solutions were not designed to be interoperable. Even if two doctors use the same ICT solution, they are often unable to exchange data. The multi-linguistic context of Luxembourg makes semantic interoperability more complex. Several workgroups has been created to deal with this problem, but a new solution will take time to be implemented by the Software producers and used by doctors.

### Conclusions

This paper presents the profile of doctors and pharmacists working in private practices/pharmacies with respect to the utilization of ICT solution to manage medical data. The outcomes will be used to define a set of services to be implemented in the eHealth platform and some actions to motivate professionals to use standard solutions.

In order to prepare those professionals to use new technologies, it is necessary to offer them some basic supports. Practical activities with different scenarios must be defined and used in training programs. It is important to make them participate also in the designing phase of the project, explaining them what is planned, how it can be used, what is expected from them, and take note of their feedback to improve the pre-concept. In this sense, the eSanté project creates workgroups with users, technical stuff, administrators and patients. They will participate to the definition of a test environment which will be used to get experience and prepare mature concepts for the final platform, in one side. Training users, inform Software producers, simplify administrative procedures, redefine documents, and evaluate user's satisfaction, in the other side. Behind this process, there is a methodology to implement step-by-step new services and with the agreement of all parts in order to avoid misvaluations of the consequences (learned from other countries experiences) and loose the confidence from the users.