

Security Improvements for Better and Safer Cross-Border ePrescription and Patient Summary Services

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ABSTRACT

Large-scale deployment of electronic Prescription and Patient Summary services (eP/ PS) is expected to enable seamless cross-border care and secure access to patient health information between European healthcare systems. Guaranteeing national readiness to support priorities, determined at the political level, is also considered a key prerequisite for the facilitation of access to health services across borders. This work focuses on required technological improvements to address reliability and quality challenges through the adoption of generic/ non-health specific building blocks (BBs) for basic cross-border public services in Europe. More specifically, what is presented is the introduction of generic components for non-repudiation, end point detection, and electronic identification, to effectively support the implementation of Directive 2011/ 24 on the application of patients' rights in cross-border healthcare. These interventions are considered to be necessary steps for the introduction of better quality, trustworthy, cross-border eP/ PS across Europe.

KEYWORDS

Cross-Border Public Services, eHealth, Electronic Health Record, ePrescription, Patient Safety, Patient Summary, Security Technologies and Solutions

INTRODUCTION

The use of electronic Prescription and Patient Summary services (eP/ PS) has been recognized as an important strategic policy to improve health care across Europe and to support access to safe and high-quality, cross-border healthcare (Tinholt et al., 2013). Electronic prescribing has already proved that can help patients by providing easier prescription and medication pick-up procedures, fewer difficulties over prescription insurance coverage and an increase in patient safety (e.g. by checking legible prescriptions for harmful interactions) (Hollingworth et al., 2007; Wang et al., 2009). Key benefits of ePrescription (eP) have been identified as improving the quality of health care services, increasing the efficiency and effectiveness of prescribing and dispensing medications, reducing medication errors, and health care cost savings (Pangalos et al., 2013). It is important to note that failure to properly implement eP systems can result in new types of errors that can reduce workflow efficiency, increase medication cost, and threaten patient safety (Zadeh & Tremblay, 2016). At the

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same time, during the past few years many regional and national healthcare networks have been deployed in Europe to support Patient Summary (PS) and Electronic Health Record (EHR) solutions (Stroetmann et al., 2011). The gains from EHR systems depend on meaningful sharing and rely on access to information regardless of place and time, and from re-using information for multiple purposes (Dobrev et al., 2010; Prey et al., 2016).

The deployment of eHealth solutions for eP/ PS is expected to increase safety and quality of care throughout the European Union and associated countries (EU), by ensuring continuity of care across borders and by providing immediate clinical information needed in an emergency situation abroad. Greater knowledge of patients' clinical characteristics and treatment is expected to improve clinical decision making (Moharra et al., 2015). It is a fact that despite favourable attitudes towards both cross-border eP/ PS, multiple perceived barriers impede their incorporation and integration in clinical practice. Infrastructures are not in place to support the system and stakeholders in some jurisdictions are reluctant to embrace eHealth due to the high cost and the lack of security of the systems (Kierkegaard, 2013). Patient identification and consent processes are currently laborious and somewhat time consuming, and member states have varying degrees of health care policy, privacy enforcement and laws concerning data protection (DG Santé, 2014). In most of the cases integration with national, health service Information Technology (IT) systems is still missing.

This work presents how epSOS (<http://www.epsos.eu/>) uses cases for eP and PS cross-border exchange is enhanced with cross-domain building blocks (BBs) to support a safer environment for citizens traveling within the EU to safeguard the continuing applicability and legitimacy of clinical data processing and support the implementation of Directive 2011/24 on the application of patients' rights in cross-border healthcare. This work was conducted within the context of the e-SENS (<http://www.esens.eu/>) Large Scale Pilot (LSP) project (2013-2017), and is built on top of assets developed in previous LSP projects to provide common solutions for seamless public service delivery across borders (Katakakis et al., 2015). Focus is put on the ongoing activities for implementing non-domain specific solutions in the eHealth domain, to facilitate cross-border eP/ PS services, in order to improve efficiency, cost-effectiveness, safety and confidence. In that sense, the aim is to enhance already developed solutions to resolve pending issues related to cross-border eP/ PS, by integrating standardized and mature software components that can be developed and deployed independently. In that perspective this work introduces BBs for non-repudiation (to support evidence emission when backend systems exchange documents, data and/ or messages through access points), end point detection (to facilitate electronic document exchange across borders), and electronic identification (eID) (to enable the use of IDs across countries in the EU). The objective is to facilitate cross-border access to health services within the EU and to enhance the technology used with cross-domain technical BBs.

What is envisioned is less concerns about possible adverse interactions with current treatment and health conditions (allergies, drug interaction etc.) and the provision of safer healthcare, in cases of emergency or on occasional basis abroad. Other benefits foreseen include lower cost and improved efficiency, through the mutualisation of some technological assets with other domains, in order to enable sustainability of eHealth cross-border services through maintenance cost reduction.

In the sections that follow the approach followed for improving the existing epSOS cross-border eP/ PS care process involved is presented, as well as links to background work. Incorporation of cross-domain BBs to provide enhanced, better quality eP/ PS is described. Prospective issues and the foreseen potential are discussed.

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