

E-Health and the Future of Healthcare Information Systems

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Almost 15 years ago, the publication of the “Roland Berger Study” (Roland Berger & Partner 1998) initialized a comprehensive process aiming at a sustainable utilization of information and communication technologies (ICT) in the German health care system.

After a longer period of conceptual development, “better IT for health” (bIT4health) started in September 2003 as the first project to tackle concrete realization issues:

“The objective of the project “bIT4health” is to prepare the launch of the electronic health card throughout Germany. The project “bIT4health” focuses on the definition of a vendor-independent telematics and security infrastructure. Further accompanying activities are bundled together into the areas of creating consumer acceptance, project management, quality assurance, and scientific monitoring. The “bIT4health” project consortium provides support for launching the electronic health card beyond the phase of defining the framework architecture, during the test and the introductory phase, and the first year of operation in 2006” (ZTG-Telematik-Glossar nd).

More than seven years later, the prospective applications, which were originally supposed to be launched in January 2006, are still not widely available. Mertens (2009, pp. 29–42) describes the reasons for this in detail. However, these reasons are not in the foreground here because, in the meantime, the ICT-world has witnessed significant changes. Service-oriented architectures, cloud computing, and the app-economy have revolutionized the organizational and technical prerequisites so that fundamental aspects of the early architectures originating from the years 1998 and 2003 necessarily need to be rethought and redesigned.

The recent changes in ICT development form the background and reason for the present special focus issue. This special focus issue considered a total of eight articles but, after three intense review phases, two research articles were accepted for publication. Therefore, our special thanks go to all the reviewers and authors whose commitment and dedication paved the way for the high quality of the published articles. We would also like to thank the editors for the possibility to design this special focus issue and the professional support throughout the overall process.

At its early beginnings, health care telematics originally relied on the conception – incidentally against the explicit recommendation of several renowned Information Systems researchers – that the electronic health card and the associated applications such as electronic prescription or emergency data management should finally be determined by law. In contrast, it now appears possible that the electronic health card in its capacity as a “smart device” further develops towards a self-sustained platform hosting a plethora of “health-apps” and thus, competes – more precisely needs to compete – with the already very successful iOS and Android app-platforms. It is already evident today that numerous vendors in the highly fragmented market for health care software offer their applications in app stores and on Android markets. In the near future, this development can be expected to have a direct bearing on the architecture of present information systems used in medical practices and hospitals.

In their paper on “Modular software architectures for value-adding applications in German health care telematics”, Sunyaev, Dünnebeil, Leimeister, and Krmar focus on the development of an architecture that allows for a smooth integration of innovative value-adding applications. These value-adding applications rely on a telematics infrastructure and aim to enhance patient-orientation, quality, efficiency, and effectiveness in the digital health care system. The article presents a software architecture for value-adding applications of the telematics infrastructure according to the approach of design science research. The requirements for software architecture development were derived from the requirements of the service providers. Using an example of electronic appointment and referral management, the value-adding application was verified in cooperation with a large German medical association. For the first time, the proposed modular software architecture provides the possibility to develop any desired value-adding application in an easy, systematical, safe, and reliable way. On top of this it can provide and operate the applications via a future health care telematics infrastructure.

In the second article, Rohner applies a maturity model to study the status of identity management for hospital physicians in charge. Although this ought to be an indispensable part of hospital information systems, identity management still leaves substantial gaps. However, confusions or a lack of access to information could possibly lead to fatal consequences in emergency situations. The increasing importance of collaboration (medical treatment processes that involve multiple professional groups) and cooperation (cooperation between different service providers, e.g., hospitals, rehabilitation facilities, family physicians) make it essential to improve identity management. The article develops a maturity model for identity management that covers responsibilities, organizational aspects, and Information Technology. Further, the article proposes an application of the maturity model and, according to Design Science Research, reports on an evaluation of pilot applications in two large Swiss hospitals. – It should be noted that already existing solutions for a sophisticated and efficient identity management in the health care system could be of high interest to other sectors with regard to the convergence with the emerging “Internet of Things”.

In the interview of this special focus issue, Dr. v. Baehr, managing director of Bosch Healthcare GmbH, deals with key issues of innovation management, innovation and diffusion processes, as well as typical obstacles in the health care system. The interview clearly shows that the – in international comparison – large number of powerful stakeholders in the German health care system have created and can still create high obstacles even for the introduction of innovative, digital solutions. However, the interview also discusses that specifically recent developments in the software industry, e.g., service-oriented architectures, cloud computing, and the app-economy, together with the “internet of things” and the program “Industry 4.0” launched by the federal government, are capable of triggering new and significant waves of innovations whose range and scope is not yet foreseeable to its full extent. – Prospects remain exciting.

Dear readers, we hope you will enjoy the articles and gain new insights when reading them: the health care system offers many fascinating challenges and opportunities for researchers and practitioners in the field of Information Systems. This special focus issue contains some of the essential challenges and opportunities and we hope to see you embrace and tackle these in the near future!

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