Mastering the Interoperability Challenge

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1 Introduction

This Special Issue of the European Journal for Biomedical Informatics is dedicated to the International HL7 Interoperability Conference 2018 "Mastering the Interoperability Challenge" (IHIC 2018), 11-12 July 2018 in Portsmouth, UK (http://ihic.info/2018). It contains papers selected by an independent peer review process, strictly performed by experts from countries different from the authors' country of residence.

IHIC 2018 is the 18th event of the International HL7 Interoperability Conference series, which was inaugurated in 2000 by the Board of HL7 Germany and its unforgettable Chair and interoperability pioneer Joachim W. Dudeck. The first event in Dresden, Germany, was entitled "Advanced Healthcare Information Standards". While the first conferences were characterized by focusing on CDA, over time, the scope of the conferences has been extended towards all aspects of health information interoperability. The concept of interoperability has dramatically changed from standardized electronic data interchange (EDI) based on data representation at application level, the 7th level of the ISO Open Systems Interconnection stack and basis of the name Health Level 7. Meanwhile, the semantics of shared data as well as service level interoperability, but also domain-specific issues and even social aspects are considered, bringing terminologies and ontologies, but also implementation and conformance challenges on board. The relations to IHE and the FHIR success are especially highlighted at IHIC 2018. So it is just consequent to address also in 2018 both technological and non-technological issues of interoperability.

IHIC 2018 is framed by an Opening Keynote and a Closing Keynote. In the Opening Keynote, titled "Solving the Modeling Dilemma as a Foundation for Interoperability", Bernd Blobel, University of Regensburg (Germany), addresses all levels of interoperability, i.e. technical, structural, syntactic, semantic and organization/service interoperability most of health informatics interoperability standards are limited to, but also non-ICT interoperability such as knowledge-based domain-to-domain interoperability and even skills-based interoperability supporting end-user collaboration. The paper introduces different data model classification systems to analyze widely spread data model based interoperability specifications in comparison with the ISO Interoperability Reference Architecture Model. In his Closing Keynote, Ed Hammond from Duke University (USA) focuses on ICT-specific interoperability specifications and implementations provided by international standards and specifications, thereby especially highlighting HL7 standards and artifacts. In that context, he presents multiple aspects of and perspectives on, interoperability, thereby considering not just technical issues, but also expectations and needs of specific user communities.

IHIC 2018 is structured into four sections: a) Quality Improvement, b) Testing and Implementation, c) Overcoming Local and Global Barriers, and d) Consent and Trust for Care and Research. The papers published in this EJBI Special Issue address different aspects of the interoperability challenge from a theoretical and methodological perspective, usability requirements, professional groups' preferences, process design, semantical ambiguity, and implementation details.

In the first section on Quality Improvement, Peter Seifter and colleagues from HL7 Austria report about clinical decision support systems using data from structured CDA documents collected in the Austrian national EHR solution ELGA (Elektronische Gesundheitsakte - Electronic Health Record). For that purpose, open source platforms such as the Drools business rule management system or the

ArdenSuite software for managing knowledge represented in Arden Syntax Medical Logic Modules have been successfully used to manage the Austrian Patient Summary and the Austrian Microbiology Report. Frank Oemig and Bernd Blobel from HL7 Germany discuss the deployment of FHIR specifications and implementations for standardized quality assurance and control in Germany.

The second section on Testing and Implementation is introduced by a paper from Sebastian Bojanowski and others from HL7 Poland. The authors present the national online platform Tukan – compliant with the IHE Gazelle environment - to publish and to test HL7 CDA Implementation Guides and related HIE profiles for future Polish eHealth services.

Within the fourth section on Consent and Trust for Care and Research, an international Austrian/Canadian team lead by Anna Lackerbauer from Austria developed architecture to implement an interoperable e-consent form for medical treatment using the FHIR methodology.

Ed Conley (UK) and Mathias Pocs (Germany) finally tackled the challenge of personal data protection as foundational to successful eHealth and interoperability implementations. In that context, they highlighted the new European General Data Protection Regulation (GDPR) to be met by all European service providers, but also by all global service providers directly or indirectly serving European citizens. The work aims at enabling GDPR-compliant large scale health information exchange as well as trustworthy research environment within the UK NHS, but also regionally or even globally.

Additionally to the papers presented here, practice reports and implementation experiences will be shared at the conference.

The IHIC 2018 Program is completed by a Panel on Resolving Practical Implementation Issues as well as Tutorials provided on the day prior to the conference.

The Editors whish all interested parties enjoyable reading.

The Guest-Editors are indebted to thank all authors and reviewers for their excellent work. Finally, they thank HL7 International, HL7 UK and HL7 Germany for supporting the event, but also HL7 International and HL7 Germany for financing the Joachim W. Dudeck Award.