Call for Papers:
Applied Clinical Informatics Special Issue on New Trends and Experiences in Interoperability and Electronic Health Records (EHR)

Summary and Scope:
The recent focus on HL7's emerging Fast Healthcare Interoperability Resources (FHIR) has directed attention on the fact that attempts to achieve interoperability have been only partly successful in the past despite a host of existing terminologies (for example SNOMED CT, ICD and LOINC) and standards for health information exchange and EHR (HL7 v2,v3/CDA, *open*EHR/13606, IHE, DICOM etc.).

This special topic feature of Applied Clinical Informatics will focus on applied, practical approaches of achieving and maintaining interoperability among disparate systems, including EHRs. We are soliciting submissions that focus on best practice approaches, lesson learned or evaluation of interoperability and EHR systems development or identify causes of failures.

Topics of interest:

This focus theme will enlist and assess different approaches of realizing interoperability and electronic health records. More specifically, topics include:

Current applications of methods and standards

- Applications and lessons in real world scenarios
- Assessments of application areas of particular approaches

Innovative solutions to using existing methods and standards

Evaluation and comparison of methods and standards

- Determining overlaps and gaps in coverage and knowledge on application
- Identifying patterns of good use (e.g. fitness-for-purpose) and meaningful ways for using different approaches together
- Evaluation of existing interoperability projects

Implementation strategies

- Information and knowledge representation, transfer, retrieval, formal semantics, interoperability etc. which can be shared between HIE and EHR approaches
- Studies on persistence, querying, clinical guideline/workflow support, automated graphical user interfaces, software maintainability and usability – mainly around EHR systems

Challenges

- Selection of methods and standards
- Studies of challenges in development of applications, including social and business related

Background:

Semantic interoperability is the ability of different information technology systems and software applications to communicate, exchange data, and use the information that has been exchanged with the same confidence as if that information has been generated in the same system. However, this requires standardization at clinical terminology, information model, and clinical workflow levels and thus continues to be a very active field of research and practice.

Existing attempts to achieve interoperability have only been implemented in practice to a limited extent. Clinical terminology standards are mature and while there is convergence around use and adoption of mainstay terminology standards (in particular SNOMED CT, ICD and LOINC), the use of terminology and information models together (terminology bindings) continue to be a hot topic. Health information exchange (HIE) standards for interoperability, which define explicit models of structured content have existed for a while already (e.g. HL7 v2,v3/CDA, *open*EHR/13606, IHE, DICOM). HL7's emerging Fast Healthcare Interoperability Resources (FHIR) is now a working standard (although still in draft status) providing lightweight and implementer-friendly ways to structure and encode clinical data over the wire. While FHIR allows for extensibility by design, there is an expectation for systems to conform to a single set of resources, thus enabling interoperability at a global scale. FHIR's rapid adoption by key vendors and the worldwide technical enthusiasm generated have inevitably resulted in looking at FHIR beyond an HIE/API standard to deliver on the requirements of EHR. According to Gartner, FHIR is at the peak of the *hype* cycle! Extensive and mature ongoing research and practice around electronic health records (EHR) in terms of architecture, functionality and implementation methods and technologies exists. Standards also exist in the EHR domain addressing various aspects such as ISO 18308 Health informatics-Requirements for an electronic health record architecture, ISO/HL7 10781 (Health Informatics-HL7 Electronic Health Records-System Functional Model, Release 2 (EHR FM)), *open*EHR (defining EHR structure, semantics, and record organization), and ISO/EN 13606 based on openEHR but limited to HIE. The *open*EHR/13606 standard has already been adopted by national and regional EHR programmes and has a dedicated community of business users and implementers. Development of detailed clinical models (Archetypes) occurs through voluntary participation of a wide range of users using online tools in grass-roots and crowd-sourcing fashion. Archetypes are designed to fulfil a very broad set of EHR use-cases and hence are maximal datasets in contrast to FHIR resources for HIE, which capture a minimum set of data elements implemented by most systems. While openEHR doesn't prescribe a single set of content definitions for global interoperability it is envisioned that natural adoption of core clinical models will lead to interoperability. The Clinical Information Modelling Initiative (CIMI) has recently become an HL7 working group with the aim to drive downstream HIE specifications (such as FHIR profiles) based on the Archetype methodology. Both, HL7 and *open*EHR/13606 communities feel alignment (of content) will be essential and both groups have successfully undertaken a joint modelling exercise. We believe time is ripe for bringing attention on the current slice of methods and trends in EHR and interoperability research and practice, which will hopefully act as a starting point for informed and evidence based discussion around how to leverage relevant standards and technologies.

Submission Types

Research Articles

Research Articles contain original work based on original research or experimentation not previously published or under consideration by another journal.

State of the Art / Best Practice Paper

State of the Art / Best Practice Papers would be generally solicited contributions that describe the state of the art in a particular area of Clinical Informatics. These papers will be based on published research and personal experience with the topic. They will be heavily geared towards lessons learned, best approaches, safety and quality considerations, and outcomes. These submissions are intended to serve as an evidence-based summary of current thinking and practice on an issue with the aim of providing individuals and organizations with a condensed, practical, highly applicable resource relating to an applied clinical informatics issue. They may also signal areas for future research. Systematic literature reviews are not required for this type of submission.

Case reports

Case reports are intended to be an ACI equivalent to case reports in clinical medicine. However, the focus in case reports will be an information system. Case reports focus on cases of interest with the emphasis on „lessons learned“. Case reports that focus on failures or successes and their analysis are preferred. Short case reports are preferred and they should not exceed 2,000 words.

Paper submission:

Submitted papers should describe original work, present significant results, and provide rigorous, principled, and repeatable evaluation. Papers must be formatted according to the guidelines for Applied Clinical Informatics authors. **Please indicate your intention of submission by sending a short E-Mail to kerstin.denecke@bfh.ch**
To ensure that your paper is considered for the special issue, the title must start with “Special Topic Interoperability and EHR: ” followed by your paper title.

Guest Editors:

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Important Dates

Paper submission: January 15, 2017

First Round Review Notifications: March 30, 2017

Revision Due: April 31, 2017