Understanding User Needs for Interoperability: Collaborative Approach

Save to myBoK

By Karima Bourquard, PhD; Anna Orlova, PhD; and Charles Parisot

AHIMA in collaboration with Integrating the Healthcare Enterprise (IHE) International has been publishing the findings of the Use Case Task Force in a series of articles in the *Journal of AHIMA*'s Standards Strategies section. The first article in this series, published in the June 2017 issue of the *Journal*, provided definitions for the concepts that define user needs for the adoption of health information technology (HIT) to support HIT systems interoperability and information sharing across systems.[1] These concepts are business cases (breakthrough areas), use cases, realization scenarios, technical use cases, and storyboards. The second article published in the July 2017 issue of the *Journal* presented the hierarchy between concepts, illustrated the hierarchy using the examples of assembling the artifacts in the domain of clinical imaging, and described the approach and standards for building the business cases.[2] The third article, published in the September 2017 issue of the *Journal*, presented another example of applying the concept hierarchy in the domain of e-prescribing and medication management and described the approach and standards for building the use cases and realization scenarios for information exchange in healthcare.[3]

This is the fourth article in this series. It presents a framework for implementing use case-driven HIT solutions as well as a collaborative approach for various stakeholders involved—or those who are affected by these interoperable solutions—thus enabling interoperability in healthcare.

Defining a Use Case-Driven Approach

In computer science, a use-case driven approach is the foundational methodology for documenting user needs. This has been adopted by national and international health IT (HIT) efforts to support HIT systems interoperability and information sharing across systems. Breakthrough areas, business cases, use cases, realization scenarios, technical use cases, and storyboards are concepts used to document user needs.

These concepts are used differently by different projects, which creates confusion among HIT users and implementers about how the user needs have to be supported. To enable harmonization of various concepts, IHE International partnered with AHIMA to form the Use Case Task Force. The task force objectives are to define these concepts and their relationships to facilitate better understanding of the standards-based technical solutions specified in the IHE interoperability standards (profiles) across users, thus facilitating the adoption of these standards in eHealth interoperability projects.

Framework for Implementing Use Case-Driven HIT Solutions

The main issues that HIT implementation teams generally face are related to how to bring at least three major components of the project together, namely: policies, people, and technology. Currently, HIT projects often include enterprise-wide (within a healthcare organization) and cross-enterprise (between organizations) information exchanges that include various information systems and healthcare stakeholders. To address perspectives from various stakeholders, their needs in the HIT project should be examined in terms of their business needs, workflow management, the information that they will exchange, and how they will use the information. Several methodologies or frameworks are available that focus on the organizational level (i.e., business case), process level/functional level (i.e., use case/realization scenarios), and technical infrastructure level (technical use case) of the HIT project (see the June and July 2017 Standards Strategies articles for definitions and hierarchy, respectively).

Figure 1: European Union (EU) Interoperability Framework

Figure 1A shows the "High-level View"[4] of the framework while Figure 1B shows the "Detailed View."[5]

Figure 1A

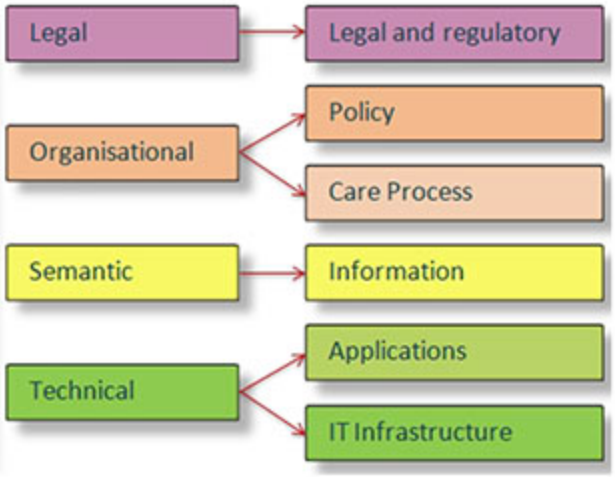

Figure 1B

Table 1: Refined eHealth European Interoperability Framework and Hierarchy of Concepts Alignment

EU Framework Layers	IHE Concept Hierarchy
Functional Interoperability (Legal and Organizational Regulation and Policies)	
1. Legal and regulatory framework	Business Cases
2. Organizational policies for information exchange needs and collaboration agreements	
3. Collaborative care and workflow processes	Use Cases/Realization Scenarios
Semantic Interoperability (Content)	
4. Information content and exchange structures	Use Cases/Realization Scenarios
Technical Interoperability (IT Infrastructure)	
5. Applications and services: Transport and exchanges services	Technical Use Cases / Integration Profiles
6. IT Infrastructure: Communication protocols including security and privacy constraints	

In the past few years, the European Union (EU) formulated an interoperability framework (see Figure 1 above). This framework is consistent with the technical, semantic, and functional (organizational and legal) components of interoperability defined by Health Level Seven (HL7),[6] a standard development organization (SDO). The Refined eHealth European Interoperability Framework (ReEIF)[7] includes six layers (Figure 1B) derived from experiences, best practices, and lessons learned in eHealth projects. Table 1, above, shows the hierarchy of business case, use case, realization scenario, and technical use case concepts in the context of the EU Interoperability Framework's layers. It demonstrates that our hierarchy of concepts is well aligned with the overall EU framework and its layers.

Collaborative Approach for Enabling Interoperability in Healthcare

To guide the requirements analysis for HIT products to be implemented in healthcare organizations, there is a need to simultaneously accommodate perspectives of the multiple stakeholders involved. They include:

- Policymakers, funders, organizations' executive officers, legal counsel and senior management involved in formulating business requirements (business cases) under functional interoperability tasks/layers 1-3

- Healthcare providers, health information managers, and system analysts involved in formulating functional requirements (use cases/realization scenarios) under both functional and semantic interoperability layers 3 and 4
- IT personnel involved in implementation of the HIT product under technical interoperability layers 5 and 6

Table 2: Requirement Analysis in HIT Interoperability Projects

Interoperability Layer	Concept	What	Who	Output
Functional Interoperability (Legal and Organizational Regulation and Policies)				
Legal	Business case	Set national, regional, and organizational eHealth strategy(ies) and priorities	Policymakers, decision makers, professional associations, industry, public	List of business cases in the context of eHealth strategy
Organizational	Business case	Support organizational business needs in the context of eHealth strategy Use the use case driven approach to select and prioritize business cases	Organizations' executive officers, legal counsels, and senior management	List of priority business cases to support business needs Business process analysis documents for priority business cases
Collaborative care and workflow processes	Use case/ realization scenario	Specify interoperability goals, actors, workflow, and data flow requirements in the context of care and organizational needs	Healthcare providers, health information managers, and system analysts	List of use cases/realization scenarios to support priority business cases Functional requirement analysis documents for specific use cases/realization scenarios
Semantic Interoperability (Content)				
Information content and exchange structures	Use case/ realization scenario	Specify interoperability goals, actors, workflow, and data flow requirements in the context of care and organizational needs	Healthcare providers, health information managers, and system analysts	List of use cases/realization scenarios to support priority business cases Functional requirement analysis documents for specific use cases/realization scenarios
Technical Interoperability (IT Infrastructure)				
Applications and services	Technical use case	Specify interoperability needs for specific applications and services to support requirements in the use case/realization scenario(s)	Project managers, system architects, implementers	Documentation on standards-based applications and services to be implemented (i.e., IHE Technical Frameworks and integration profiles)
IT Infrastructure	Technical use case	Specify interoperability needs for IT infrastructure to support requirements in the use case/realization scenario(s)	Project managers, system architects, implementers	Documentation on standards-based interoperable IT infrastructure to be implemented (i.e., IHE Technical Frameworks and integration profiles)

Table 2, above, shows how this multilayer/multi-concept analysis that involves various stakeholders can be executed in HIT interoperability projects. The analysis is based on the approach developed under the EU Interoperability Framework.[8]

The approach shown in Table 2 was used for selection and prioritization of business cases in the European eHealth projects.[9] Based on these business cases, the interoperability use cases and their realization scenarios were defined in the Refined European Interoperability Framework and its use case repository at https://usecase-repository.ihe-europe.net/. This tool will be described in the upcoming November/December 2017 *Journal* installment of Standards Strategies.

Collaboration by the various stakeholders listed above is foundational for achieving trusted information sharing via HIT. Understanding user needs documented in the business process standards (business cases) and functional standards (use cases/realization scenarios) are essential for specifying technical use cases for developing interoperability standards and deployment of standards-based HIT products in healthcare organizations. The presented approach advocates for such collaboration and provides means—standards-based documentation for each step in the process formulating the eHealth strategy and business priorities (business cases), specific interoperability needs for trusted information capture, sharing and use at the point of care (use cases/realization scenarios), and technical solutions to address these needs (technical use cases).

This approach will help:

- Accelerate the adoption of interoperability standards in HIT products deployed in healthcare
- Increase the quality and usability of the deployed solutions
- Facilitate education of various stakeholders about their specific and essential roles in the collaborative effort of achieving interoperability in healthcare

For more information about the AHIMA-IHE collaboration, please contact Anna Orlova, PhD, at anna.orlova@ahima.org.

Notes

[1] Bourquard, Karima, Anna Orlova, and Charles Parisot. "Understanding User Needs for Interoperability: Defining Use Cases in eHealth." *Journal of AHIMA* 88, no. 6 (June 2017): 42-45.

[2] Orlova, Anna, Karima Bourquard, and Charles Parisot. "Understanding User Needs for Interoperability: Standards for Business Cases in eHealth." *Journal of AHIMA* 88, no. 7 (July 2017): 34-37.

[3] Orlova, Anna, Karima Bourquard, and Charles Parisot. "Understanding User Needs for Interoperability: Standards for Use Cases in eHealth." *Journal of AHIMA* 88, no. 9 (September 2017): 40-44.

[4] Frømyr J. UN/CEFACT Presentation. Memorandum of Understanding Management Group (MOUMG) meeting, December 2015.

[5] eHealth Network. "Refined eHealth European Interoperability Framework." eHealth Network meeting, November, 23, 2015, Brussels, Belgium.

[6] Health Level Seven. "Coming to Terms: Scoping Interoperability for Health Care. " February 7, 2007.

[7] The Antilope Project. Home page.

[8] eHealth Network. "Refined eHealth European Interoperability Framework."

[9] Bourquard K., A. Berler. "Use case driven approach for a pragmatic implantation of interoperability in eHealth." *International Journal of Reliable and Quality eHealthcare*. In press.

Karima Bourquard (karima.bourquard@in-system.eu) is engineer-consultant at IN-SYSTEM, France, director of Interoperability IHE-Europe, Belgium, and co-chair of IHE-France. Anna Orlova (anna.orlova@ahima.org) is senior director of standards at AHIMA. Charles Parisot (Charles.parisot@ge.com) is the manager, standards and interoperability, at GE Healthcare, and chair, IHE-Services at IHE-Europe, Belgium.

Article citation:
Bourquard, Karima; Orlova, Anna; Parisot, Charles. "Understanding User Needs for Interoperability: Collaborative Approach" *Journal of AHIMA* 88, no.10 (October 2017): 58-61.