Interoperability testing in Finland

Konstantin Hyppönen
Summit on Interoperability (DK)
21.1.2014
Contents

1. Overview of the Finnish national eHealth infrastructure
2. Interoperability testing requirements and procedures
3. Test infrastructure and tools
Overview of the Finnish national eHealth infrastructure
Citizens (> 5,000,000)
Pharmacies (~800)
Hospital districts (20)
Primary care org. (192)
Private healthcare providers (4000)
Swedish epSOS NCP
Other NCPs not yet connected

Main standards
- HL7 V3: CDA R2 Level 3 and Medical Records
- IHE IT-I Profiles
- W3C XML DSig
- WS Addressing, WS-I
- TLS, X.509

Other national services
- National code server
- Code lists and terminologies
- Form and document structures
- Certification services
- HCP register
- Pharmaceutical database
- Healthcare and social care organizations register
- Pharmacies register

Kanta services
- My Kanta pages
- ePrescription service
  - Renewals
  - Prescriptions
  - Dispensations
- Patient data repository
  - Radiology studies
  - Metadata
  - Logs
- Health records (CDA)
- Health records (legacy)
- Patient data management service
  - Patient summary management
    - Diagnoses
    - Vaccinations
    - Radiology
    - Procedures
    - Lab
    - Physical findings
    - Risks
    - Health and care plan
    - Medications
- Consent and will management
  - Organ donation wills
  - Living wills
  - Opt-ins and opt-outs

The Kanta messaging layer

Kanta services
- Aged 18 and older
- ePSON CP
- IHE XDS-I

Other national services
- National code server
- Code lists and terminologies
- Form and document structures
- Certification services
- HCP register
- Pharmaceutical database
Interoperability testing requirements and procedures
Testing requirements

- Interoperability testing is a prerequisite for using Kanta services in EHR and pharmacy systems
  - Testing is mandatory
- In addition to testing, systems must pass audits
  - National audit criteria defined
  - Audits focus on data security and privacy protection
  - Criteria different for EHR and for pharmacy systems.
- Kela is responsible for organizing interoperability testing (incl. organization expenses)
- Software vendors are responsible for participating to the testing (incl. own participation expenses)
**Testing process**

**Vendor 1**
- Apply for testing
- Run tests, produce data, use data produced by Vendor 2
- Report test outcomes, provide evidence
- Apply fixes if needed

**Kela**
- Establish testing session
- Assign test cases, scenarios, provide instructions, coordinate
- Analyze evidence and verify outcomes
- Provide feedback

**Vendor 2**
- Apply for testing
- Run tests, produce data, use data produced by Vendor 1
- Report test outcomes, provide evidence
- Apply fixes if needed

**Iterate for as many tests as needed/allowed**

Declare results: pass, partial pass, fail
What is tested (examples)

- Ability to communicate with national services
- Correctness of messages on the messaging level (HL7 MR)
- Validity of document structures produced by the system
- Ability to correctly interpret document structures produced by test partners and by systems tested previously (documents are available in the test environment)
- Support for all required use cases
What is tested (examples)

- Examples of functionality that is tested (ePrescription, pharmacy systems):
  - Fetch the list of available prescriptions, take prescription status, potential locks and reservations into account
  - Fetch prescriptions (documents) to be dispensed
  - Prepare dispensations, sign them digitally and submit
  - Cancel a dispensation
  - Modify a dispensation
  - Cancel a prescription
  - Reserve a prescription for daily dosage dispensations
  - Submit a prescription renewal request
  - Check the status of submitted renewal requests
Testing methods

- **ePrescription service**
  - Systems need to produce all required types of prescriptions and be able to correctly process such prescriptions made in other systems.
  - EHR systems and pharmacy systems have different requirements.

- **Patient Data Repository service**
  - Tests are based on a number of “patient stories”.
  - Systems must be able to correctly support HCPs working with the stories, produce documents with correct structures and interpret documents produced in other systems.
Test infrastructure and tools
Test infrastructure

- All parts of the national eHealth infrastructure have test environments for interoperability testing
  - ePrescription test environment
  - Patient Data Repository test environment
  - My Kanta pages service with access to the two environments above
  - Separate code server environment for testing reasons, as access rights are handled through the code server
  - HCP register for testing reasons, maintained by National Supervisory Authority for Welfare and Health
  - Test smart cards with certificates issued under the national Test CA maintained by the Population Register Centre
  - epSOS environments for pre-pilot testing
Test infrastructure

- Software versions in the test environment are the same or slightly newer than in the operation
  - Two interoperability testing environments in the near future:
    1) the same version as in production and
    2) the version to be installed next to the production

- Access to the test environments on the need-to-use basis, vendors must apply for access
Testing tools

- Document validation service freely available
  - An instance of Gazelle EVSClient
  - Validation rules based on HL7 Finland specifications
- Kanta extranet for providing testing guidance
- Test management mostly manual (standard Office suite programs)
  - The main challenge at the moment
- SoapUI commonly used for testing national components
- Gazelle test management under consideration
Additional slides (standards)
Timeline of Finnish Healthcare ICT Standardization for Interoperability

- HL7 Finland founded
- ICD-10 adopted in Finland
- First national HL7 v2 profiles
- PIKAXML definition for electronic referral process
- National code server founded
- Finnish profile for CDA R1
- Finnish basic profile for CDA R2
- National core datasets defined
- Regional hospital information systems starting
- Experimental legislation on seamless service chains
- Legislation about the national Kanta system and supporting services
- Kela appointed as a national actor in national healthcare ICT services
- ePrescription service production phase incl. My Kanta pages service for citizens ->
- Revised legislation on consent management and patient summary service
- Patient Data Repository production phase ->
- Finnish IHE SIG founded
- epSOS work started in FIN
- HL7 Medical records specifications for ePrescription and Patient Data Repository
- Program Data Repository
- epSOS national contact point in production
- National core datasets defined
- Ministry decision on CDA R2 for national standard for structured dataset
- CDA R2 becomes ANSI standard
- National Kanta architecture defined
- National pharmaceutical database founded
- KVARKKI national imaging architecture to be defined
- Oral and dental healthcare structured documentation specs
- All public healthcare uses the Patient Data Repository, phase I content
Standards at a quick glance

- In healthcare organizations
  - HL7 v2.X (mostly 2.3)
- National services (ePrescription and Patient Data Repository)
  - HL7 CDA R2 (xx content profiles)
  - HL7 V3 MR
  - IHE XDS and related profiles (XCPD, XCA, XDR, ATNA, CT, XUA++, PCC, XDS-SD) in epSOS and radiology
- In some regional solutions
  - CDA R1 and CDA R2
- In the future
  - mHealth, personal telehealth, etc. standards will be relevant and there is interest to evaluate and start using relevant standards