IHE Gazelle *ObjectsChecker* : Concepts, Benefits, Demonstration and Access

IHIC 2015

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Abderrazek Boufahja

- IHE-Europe software developer/consultant on gazelle team since 2009
- Participation at 8 European and North American Connectathon
- Certified HL7 CDA / HL7 V3 Specialist
- Experienced with national and international CDA implementations
- Main designer of IHE Gazelle *ObjectsChecker*
- Created more that 30 CDA validators based on the *ObjectsChecker* Methodology for multiple projects : IHE / epSOS / ASIP santé / etc

Context

- IHE / IHE-Europe
  - IHE is an initiative by healthcare professionals and industry to improve interoperability between healthcare IS
  - A non-for-profit association attached to IHE
  - Develop Test tools and organize European Connectathon
- Connectathon
  - A meeting between healthcare systems developers in order to test the interoperability between their systems/devices => next one : Luxembourg
- Gazelle
  - an open source test-bed platform that provides a wide set of tools to validate information exchange between healthcare system => for more details visit the website : http://gazelle.ihe.net
- IHE CDA content profiles
  - A list of profiles restricting the CDA standards with specific requirements

Outline

- IHE Gazelle *ObjectsChecker* : Principles and advantages
- Gazelle Validation of CDA documents
- Combined use of Art-decor and IHE Gazelle *ObjectsChecker*

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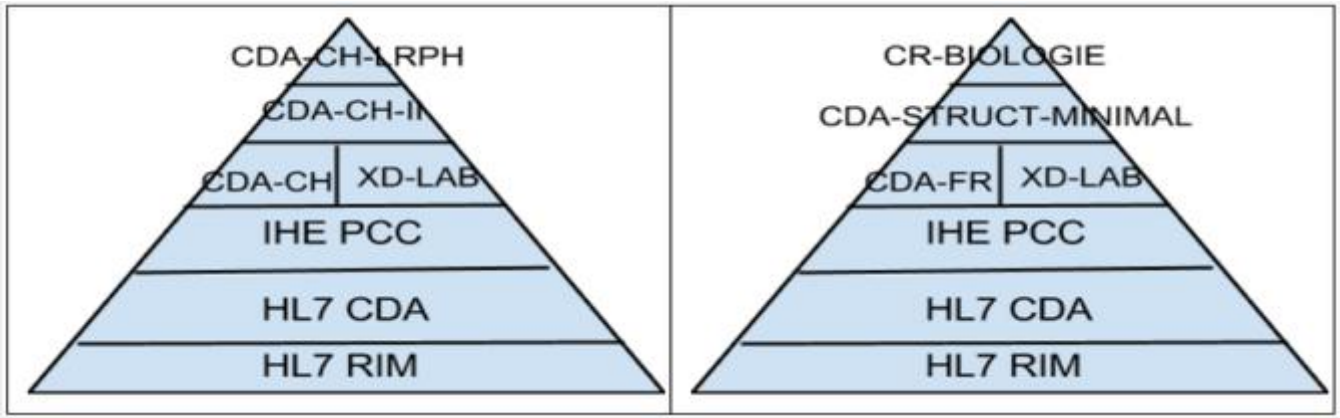
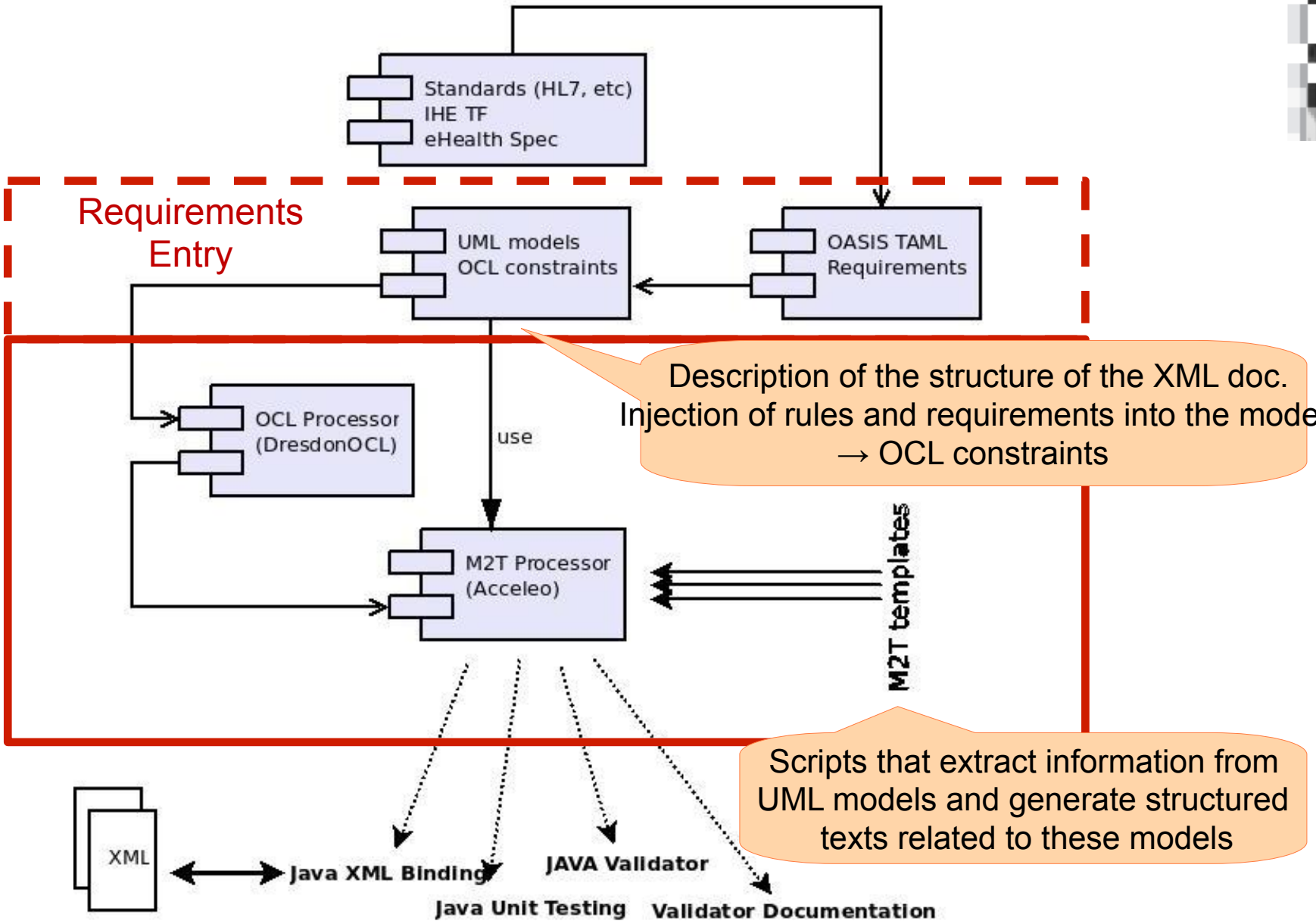
Gazelle *ObjectsChecker* Principles (1)

- A methodology to describe informal requirements in healthcare IT specifications based on CDA standard, into a formal description
- An architecture that allows :
  - The validation of the conformance of any kind of XML requirements
  - Provide metrics and documentary features
  - Improve the coupling between rules and requirements
  - Support the validation of inheritance between healthcare standards



Source : eHealth Suisse, Format d'échange, Rapports de laboratoire soumis à déclaration en Suisse (Projet)

Gazelle *ObjectsChecker* Principles (2)



Gazelle *ObjectsChecker* Implementation

- Multiple CDA validators (each testing one “content profile” specification) were developed and used by IHE and multiple national projects around the world :
  - 14 IHE validators
  - 11 epSOS validators
  - 15 CDA validators for different national projects
- 30 000 CDA documents validated against Gazelle *ObjectsChecker* generated validators
- Heavily used during European and North American Connectathon and epSOS Projectathon
- Easily integrated into third party repositories as a front end validation tool

Gazelle ObjectsChecker Advantages

- Requirement coverage capability
  - support of complex requirements (complex algorithm, etc)
  - conditional /iterations validation
  - XML elements type verification
  - Data types requirements checking
- Runtime access to coded value sets from a repository of terminologies
- Easier to maintain than hand written schematrons
- Validation is faster than schematrons
- Linking between the rules tested and the requirements from the specifications

How does IHE Gazelle ObjectsChecker compares to Schematron

- Schematrons are useful but have inherent limitations in term of coverage. Requirements generally not covered :
  - CDA R2 base standards requirements :
    - Generic data types requirements
    - Complex requirements between CDA elements
    - XML elements type checking
  - Typical Content Profile/implementation Guides requirements
    - Complex attributes specifications (like the person identifiers structure/ algorithm, telecom structures, etc)
    - Complex Conditional requirements between sections or entries
    - Specific data types requirements
  - Relationships consistency with other document content and metadata
- Elements based on the paper to be presented on Tuesday at IHIC conference: **"Model-based Analysis of HL7 CDA R2 Conformance and Requirements Coverage"**
  - Coverage of CDA R2 requirements improvements : typically from 50-60% to 100%. For details see above paper.

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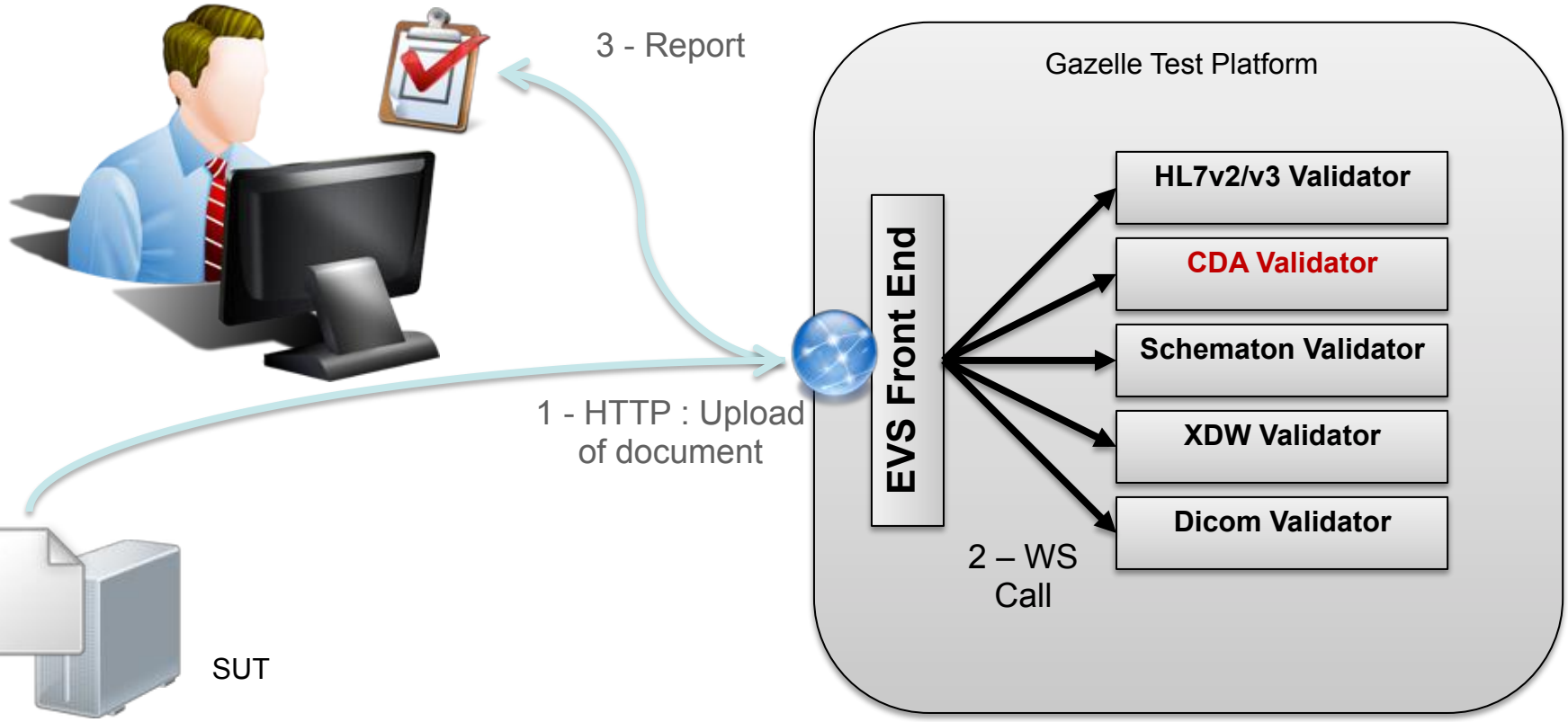
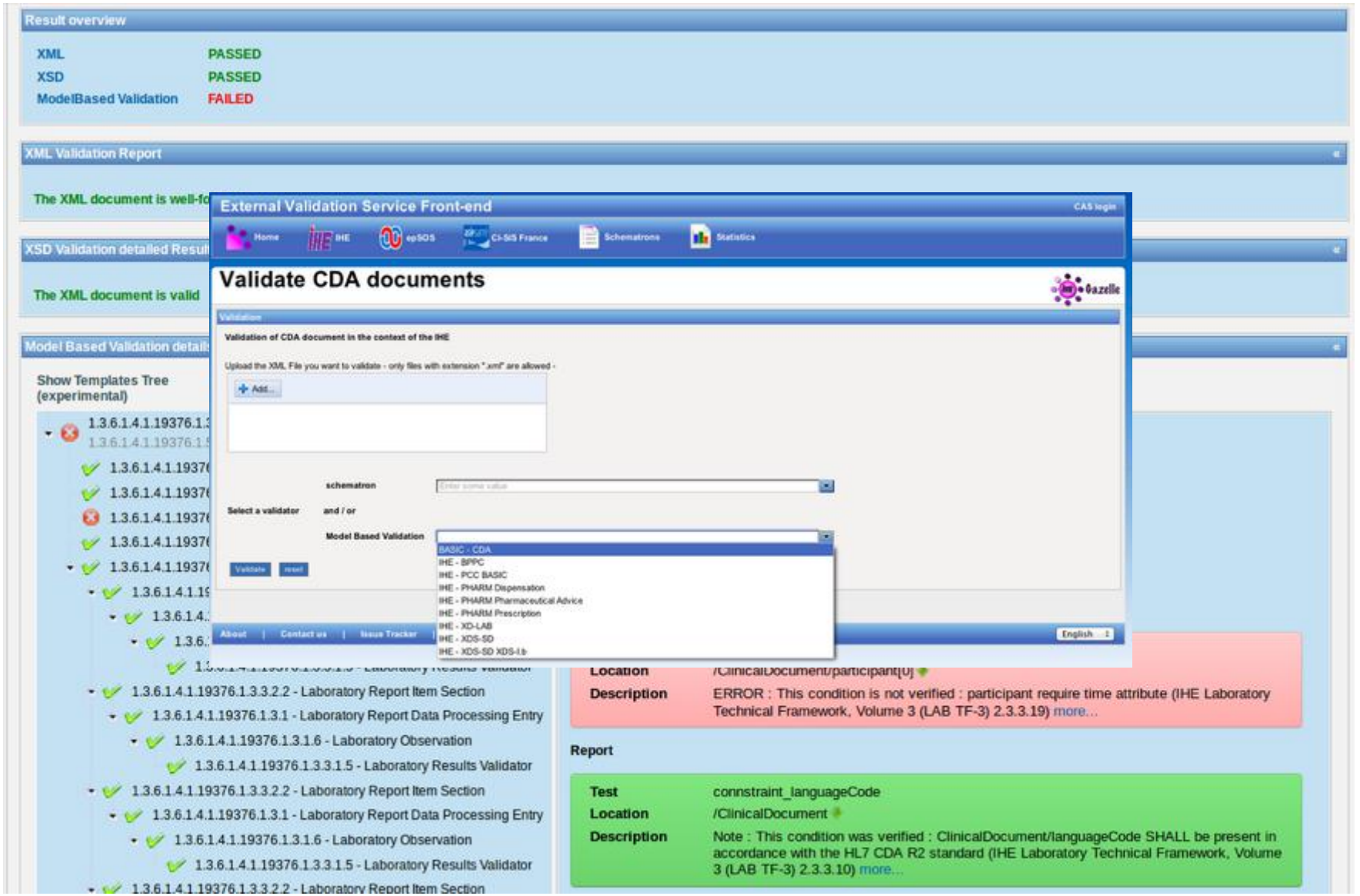
Standalone Document/Message Validation EVSClient

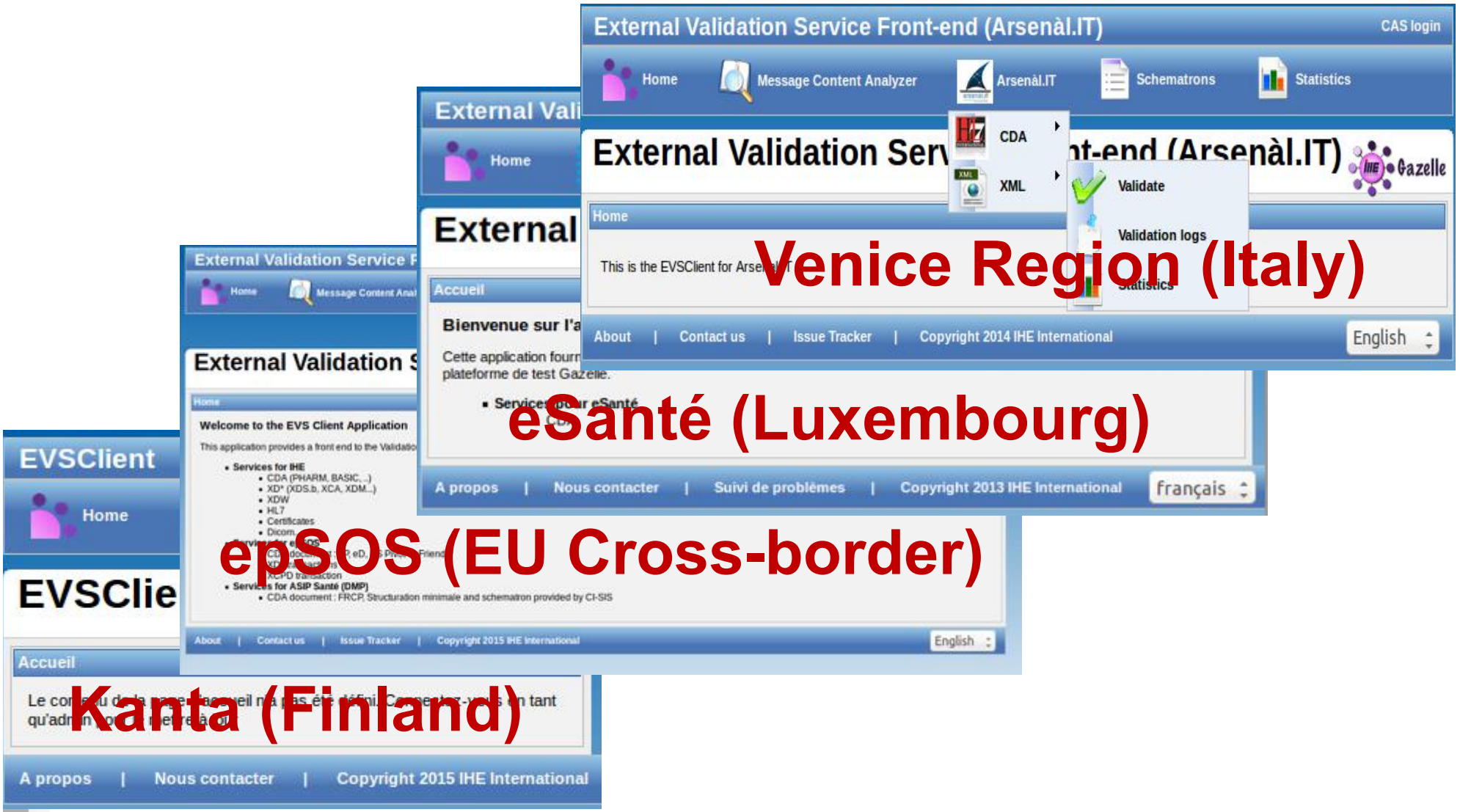
EVSClient : a front end to the conformance validation services used by the Gazelle Platform (http://gazelle.ihe.net/EVSClient)



EVSClient demonstration for CDA validation



EVSClient installations



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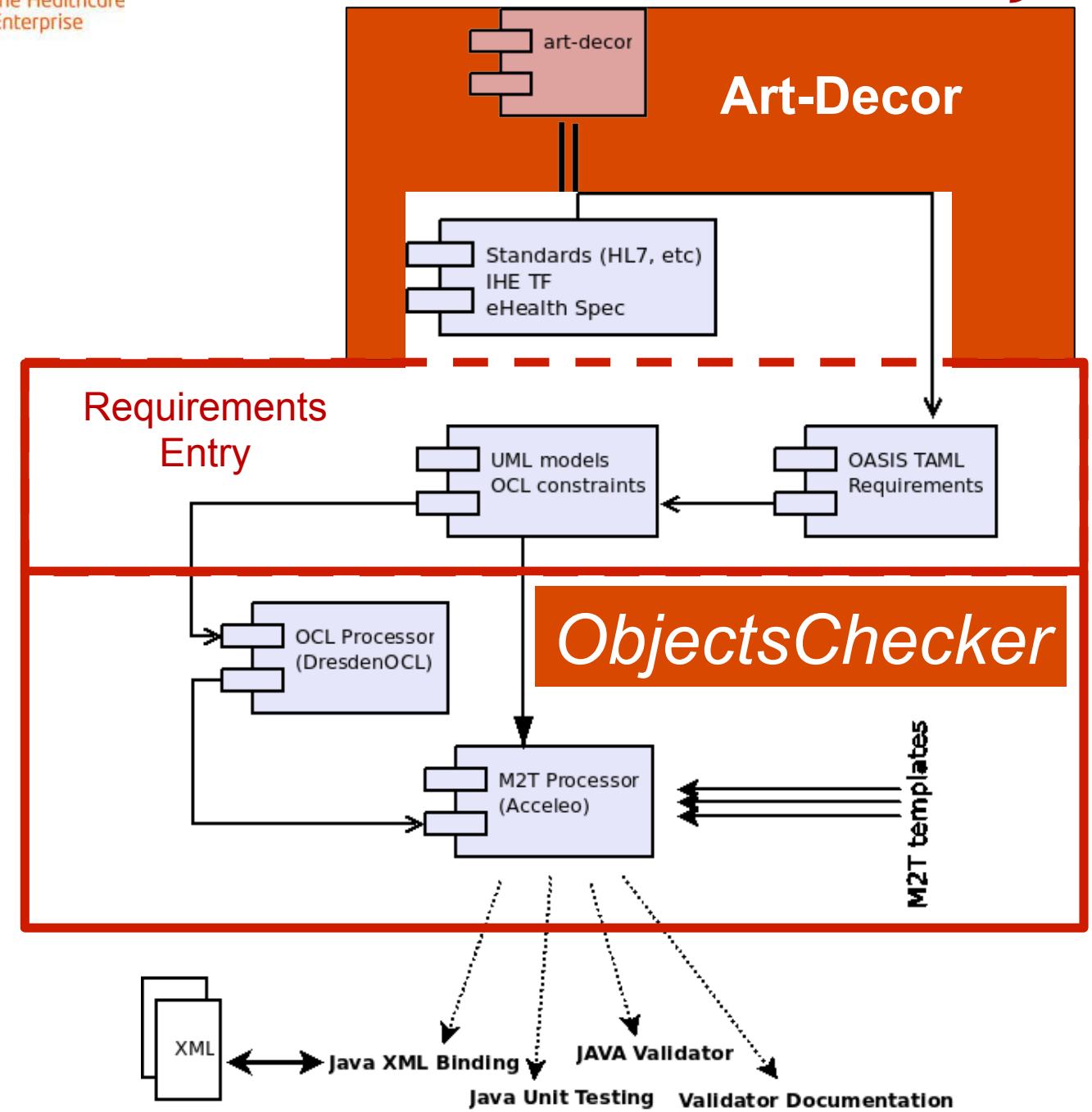
Advantages of coupling ObjectsChecker with art-decor

- Art-decor moves rigor at point of Content Profiles/Impl. Guides documentation and avoid discovery of issues/gaps at the time *ObjectsChecker* input is created.
- Reduces gaps and misunderstanding of CDA specifications
- Automate the generation of formal OCL description avoiding test tool manual entry

Art-decor and Gazelle *ObjectsChecker* coupling



More details..

- More details : tomorrow paper **“Model-based Analysis of HL7 CDA R2 Conformance and Requirements Coverage”**
- Visit our web site : http://gazelle.ihe.net
- Email address : abderrazek.boufahja@ihe-europe.net

Any question ?

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