An Open Cultural Digital Content Infrastructure

Ioanna-Ourania Stathopoulou, Haris Georgiadis, Vangelis Banos, Panagiotis Stathopoulos, Nikos Houssos, Evi Sachini

National Documentation Centre / National Hellenic Research Foundation
Athens, Greece

Outline

- Objective and scope
- Approach and design choices
- Architecture and implementation
- Related work
- Status and future work

Context and objectives of the activity

- The funding environment
  - More than 70 digital cultural heritage projects / about 60 million Euros
  - Co-funding by Greece and EU structural funds
- Assist the funder to ensure the availability and quality of project output
  - Availability of the produced material (metadata and digital files) at a central, secure, enterprise-grade infrastructure
  - Infrastructure and mechanisms to check the quality of metadata and digital content generated through the projects

A suite of services for repositories

- Harvesting and aggregation of content
  - Single point of access to content / unified search and browse
- Validation (metadata + digital files)
  - Largely automated checking of compliance with specifications
- Safe-keeping of digital files in the highest available quality

Why validation?

- Problems identified in project output of past funding programmes (indicative list):
  - Inadequate quality of metadata records – use of custom data models and formats instead of standard schemata
  - Poor digitization quality, lack of basic features like OCR for text material
  - Lack of standard programmatic interfaces for continuous access to the material
  - Inadequate infrastructure to ensure availability and safekeeping
- Result: Low reuse and return on investment

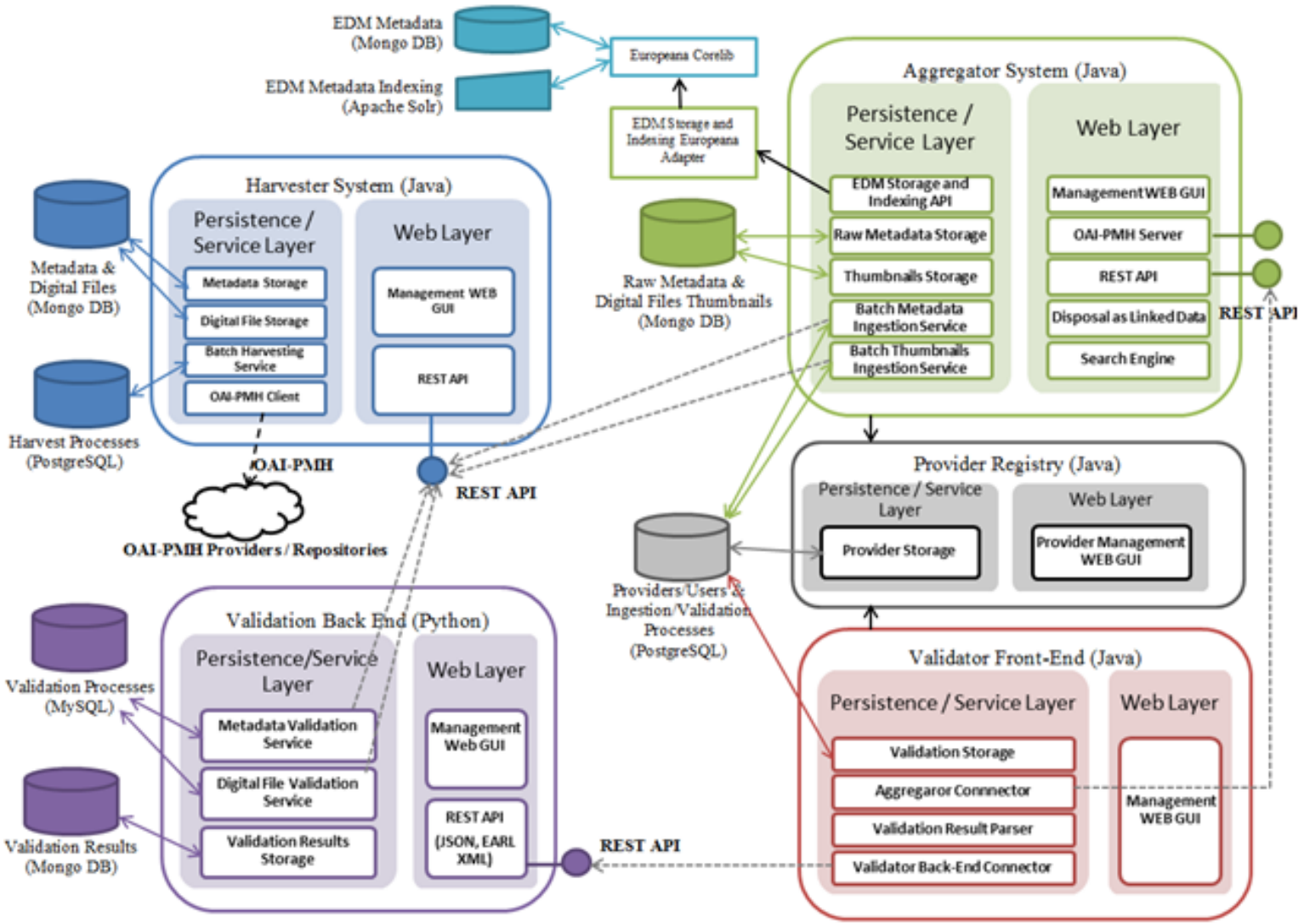
Overview of the validation approach

- Publish interoperability specifications in advance
- Associate successful validation with funding cash flows
- Validate multiple times throughout project - first during initial stages to provide early feedback
- Validation of both metadata and digital files
- Validation is largely automated – essential for scalability, feasibility and sustainability
- Validation of live systems
  - The material is validated by directly retrieving it through programmatic interfaces (e.g. OAI-PMH)
- Modular and extensible validation infrastructure – gradual support of multiple schemata, formats

Interoperability requirements

- Specifications have been published in advance, before the beginning of the projects
- Available at http://hdl.handle.net/10442/8887
- Cover interoperability at the system, syntactic/structure, semantic levels
- Availability of the metadata as linked data is mandatory
- The funded institution is required to provide also information such as the detailed specifications of the primary cataloguing schema used, mappings to standard formats, the controlled vocabularies / thesauri utilised

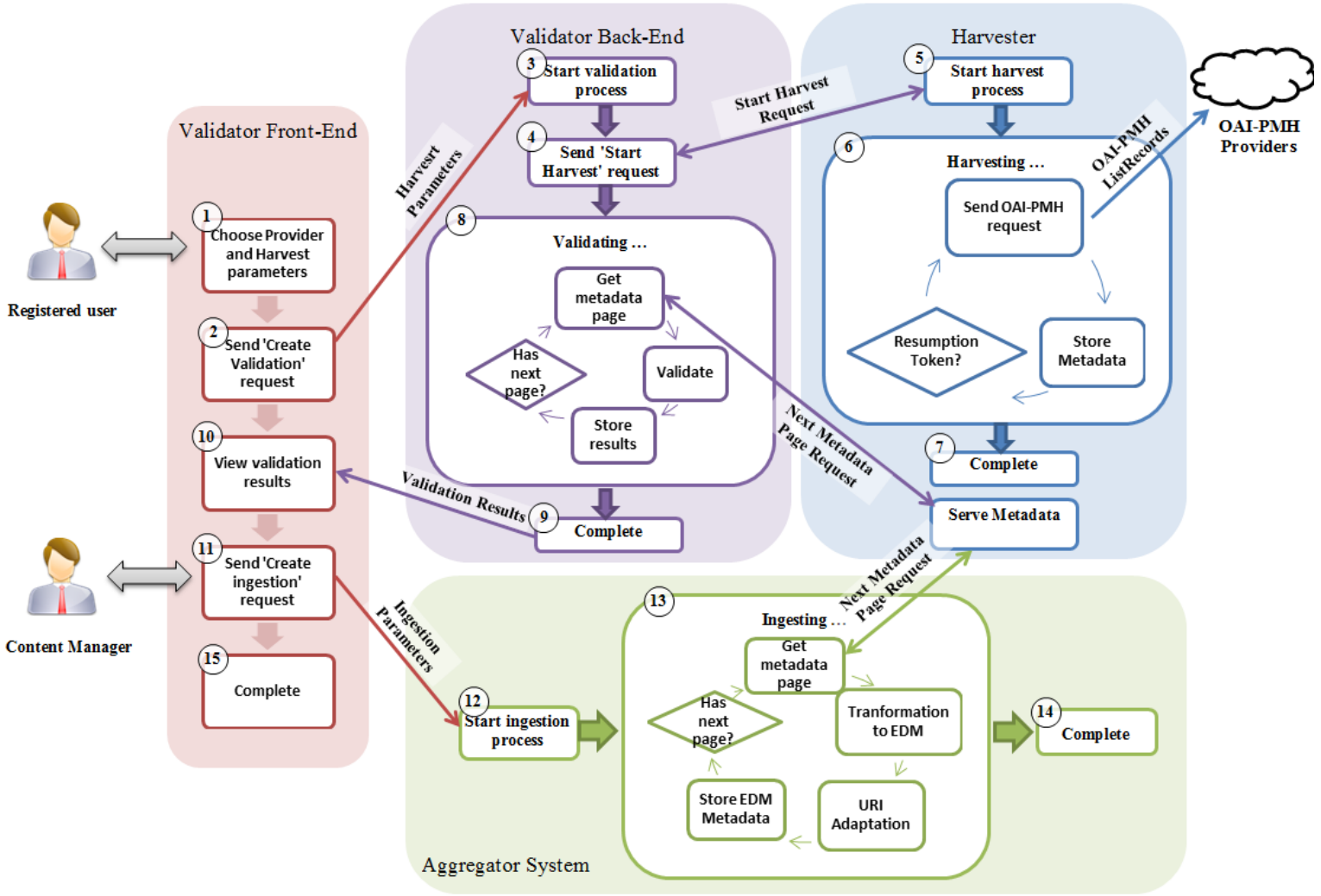
System architecture



Data model and implementation aspects

- The aggregator uses the Europeana Data Model (EDM) as the main data model and metadata schema
- Infrastructure implemented using certain components of the Europeana open source software infrastructure
- A range of utilised technologies: Java, Python, REST APIs for interactions among components, Solr, MongoDB, PostgreSQL

Validation workflow



Validation logic architecture and implementation

- Two interacting components
  - Front-end and back-end
- Front-end provides UI for authorized users to carry out validations / get results / produce reports, back-end provides the core validation logic
- Modular and extensible scheme for the definition and insertion of rules in the system
- Validation Domain-Specific Language (VDSL)
  - Rules and rule-sets, boolean operators, control flow
  - Simple JSON format
- Gradual support for checking compliance with various schemata and formats

Comparison with related work

- Validators exists in various international systems (e.g. OpenAIRE, ARIADNE)
- Distinct features of our approach:
  - Validation of both metadata (records, controlled vocabularies) and digital files
  - Extensive validation at the semantic level
  - Modularity and extensibility allows combined validation along multiple dimensions (e.g. check availability of metadata in multiple formats)
  - Validation Domain Specific Language
  - Support for connecting validation with administrative procedures in a decoupled fashion

Status of implementation and operation - further work

- The infrastructure is in production since Spring 2014
- Several validations have been already completed with the infrastructure
- Next steps:
  - Provide a user interface for repository managers to perform test validations before actually submitting their content
  - Refine validation rules and aspects of their implementation
  - Public operation of the aggregator portal

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Thank you for your attention!

- More info:

http://www.epset.gr/en/SaaS_Services

http://www.epset.gr/en/SaaS_Services/Interoperability-Testing

iostath, hgeorgiadis, vbanos, pstath , nhoussos, esachin AT ekt.gr