Interoperability specifications and an automatic validation tool as a key factor for the support of a repository ecosystem

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digitalgreece
Everything is possible
Operational Programme "Digital Convergence"

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Implemented in the scope of "Platform for the Deposit, Management and Delivery of Open Metadata and Digital Content"
http://epset.gr/en/SaaS_Services/

Agenda

1. The National Documentation Centre
2. The Problem
3. The Solution, part A: Interoperability specifications
4. The Solution, part B: Automatic Validation Tool
5. Current Status
6. Conclusions and future work

The National Documentation Centre (EKT)

- The national organisation in Greece:
  - for scientific documentation, metrics, online information and support services on research, science and technology
  - Incorporated in National Hellenic Research Foundation (NHRF)
- Core technical and scientific areas of expertise:
  - Digital Repositories, OA E-Publishing, Digital Libraries, Current Research Information Systems (CRIS)
  - www.openacces.gr & Greek National Aggregator: http://openarchives.gr
- Core OA related EC and EU/National projects:
  - "National Information System for Research and Technology": http://epset.gr
  - "Platform for the Deposit, Management and Delivery of Open Metadata and Digital Content" http://epset.gr/en/SaaS_Services/ (under development)
  - MEDOANET, EuroRIS-NET, RECODE, OpenAIRE/OpenAiRE+

Background

- On going, country-wide efforts and project to digitise a vast Cultural Heritage
  - Make content (where applicable) open & reusable to new uses: move away from “static” “lo-fi” content
  - Provide interfaces in order to built value added services and applications: make a dynamic ecosystem
  - Provide an integrated view of the digitised content available: overcome content fragmentation
- Clearly Open Repositories are a part of the solution

Environment

- Hundreds of organisations with highly acclaimed content and domain expertise:
  - Museums, Archaeological sites and Schools, Cultural Organisations, Libraries, etc.
  - Over a wide geographical location
- High domain expertise but in many small critical size in the technological domain
  - Fast pace of technological changes
  - Not in their's core business
  - Needs sustained and invested expertise

Opportunity

- Operational Programme “Digital Convergence” (http://digitalplan.gov.gr) framework program:
  - **60M€** work-programme to fund a variety of Digital Culture services and projects, with a **part being digital repositories**
  - **4M items are expected to be documented and digitized, among others**
  - **75 different organizations** supported by this work programme
  - Very different needs, domains, and areas for each organization
- Develop an “Ecosystem” not a massive top down solution
  - One size fits all out of the question!
- Each organization defines and runs a separate project
  - Individual projects are usually implemented by an external third parties based on a appropriate Public Tender

Problem

- How to ensure the high quality of implementation:
  - Make content (where applicable) open & reusable to new uses
  - Provide interfaces in order to built value added services and applications
  - Provide an integrated view of the digitised content available
- Over so many different organisations, needs and with a rigid public tender procedures in place
- With significant time constraints in place
- And with a one size fits all approach out of the question

Solution

- Part A: Specify a base **Interoperability Framework and Specifications**
  - Generic and based on international best practices
  - Funding authority mandating the implementation of this framework for relevant projects funded in this work programme
- & Part B: Provide an automatic framework **Validation Tool**
  - Specific to this framework
  - The Digital Convergence funding authority signifies successful projects milestone completion (and relevant payments) based on the validation tool output

The Interoperability Framework

- Specifications and interoperability features for open digital content", P.Stathopoulos, N.Houssos, http://hdl.handle.net/10442/8887.
- Ensures a minimum level of interoperability
- Builds on past experiences, other interoperability frameworks, (DRIVER, Europeana, etc)
- Tailored in order to be **readily included in official Public Tenders**

Main Points

Digitisation practices
- Need for “uncorrected” OCR everywhere

Interoperability at the level of repository:
- OAI/PMH or SRU/SRW

Interoperability at the level of syntax and structure,
- DC, ESE

Interoperability at the semantic level
- Thesaurus, EDM, CIDOC-CRM

Persisted Identifiers
- Handle system

Best practices for content presentation
- According to content kind

User Experience aspects

Value added services

- Services provided by EKT to the repositories:
  - Basic bit-wise remote replication of data ("Safe Deposit" service) for organization: Disaster Recovery based on repositories properties
  - Unified Search for all the items over different organisations
  - Readily interoperable with Europeana
  - Validator tool

The Validator Tool

- Influenced by:
  - the Europeana Validation tools, the OAI PMH, OpenAire validators
- Expands on the specifics of the workprogramme
- Plugable definition of validation rules
- Includes also per digital item validation (digitization,OCR,etc)

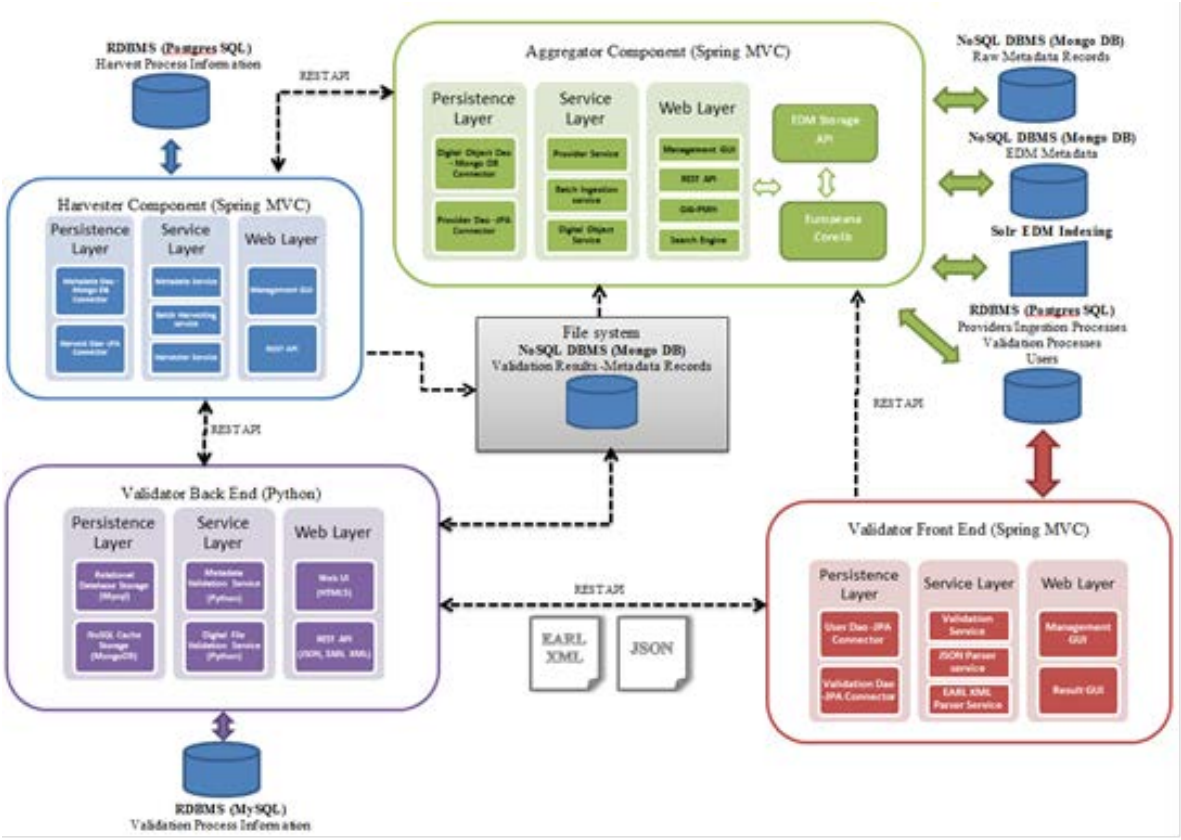
Features

- Combination of mature and innovative technologies
  - Support: DC, ESE, EDM
  - Capability to validate/store > 4M items
  - noSQL elements (mongoDB), highly clustered backend
  - Provides validation reports as EARL XML format
  - Validation Domain Specific Language for dynamically defining validation rules
- Details at ACM/IEEE JCDL 2014 (Sept 2014, London)

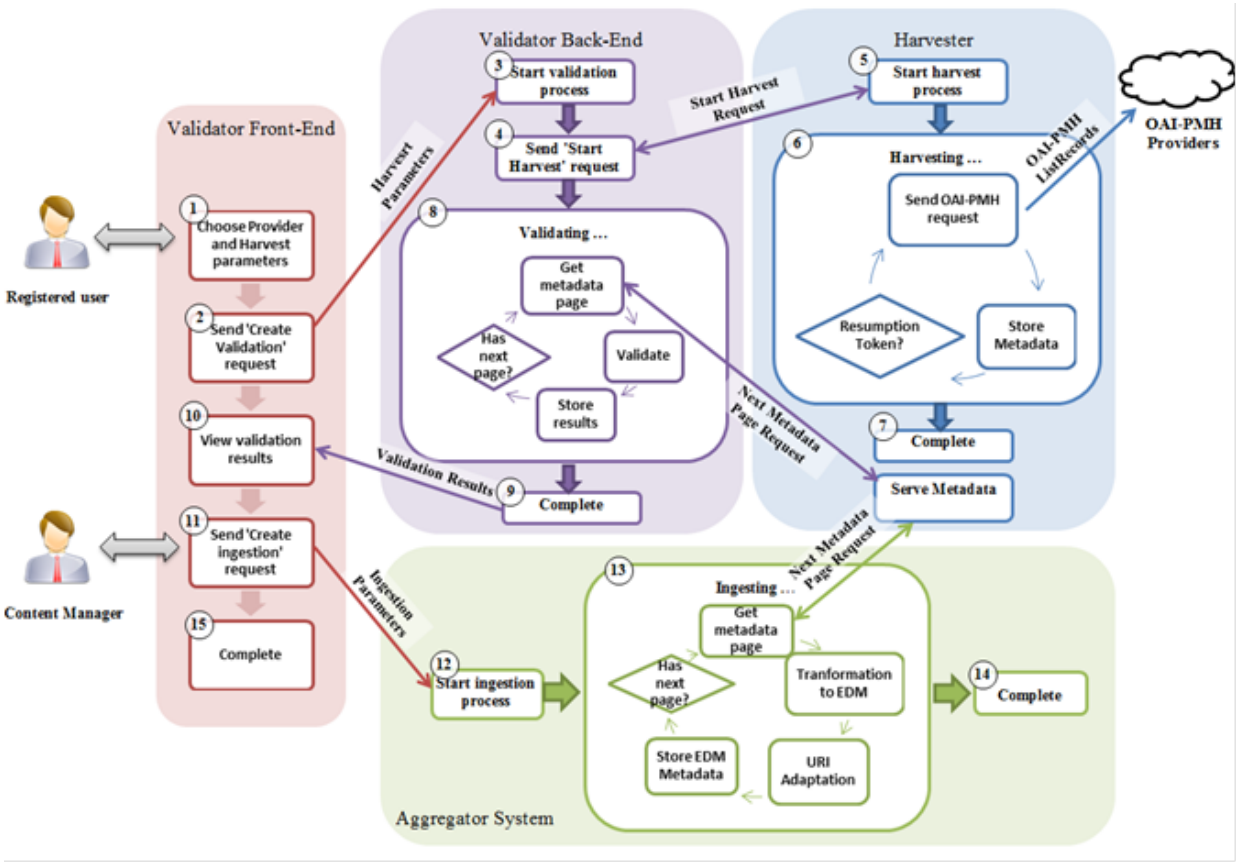
Components

- Validator Front End: user management, validation management, validation reporting
- Validation backed: Produces JSON, EARL reports and performs the tests
- Aggregator: based on Europeana Corelib, stores EDM data and stores them to a SOLR
- Harverster
- Implemented with a SOA approach, different language for subsystems according to demands

Architecture



Workflows


Validator Back-End
Harvester
Validator Front-End
OAI-PMH Providers
Registered user
Content Manager
Aggregator System
Choose Provider and Harvest parameters
Send 'Create Validation' request
View validation results
Send 'Create ingestion' request
Complete
Start validation process
Send 'Start Harvest' request
Validating ...
Get metadata page
Has next page?
Validate
Store results
Complete
Start harvest process
Harvesting ...
Send OAI-PMH request
Resumption Token?
Store Metadata
Complete
Serve Metadata
Start ingestion process
Ingesting ...
Get metadata page
Has next page?
Tranformation to EDM
Store EDM Metadata
URI Adaptation
Complete
Harvest Parameters
Start Harvest Request
OAI-PMH ListRecords
Next Metadata Page Request
Validation Results
Ingestion Parameters
Next Metadata Page Request

Current Status

- Interoperability specifications:
  - Tenders conforming to the Interoperability Specifications.
  - Projects implementation is under way
- Organisational, legal and management infrastructure has been setup among EKT, Digital Convergence funding authority and organisations
  - Very important step
  - Not covered here
- Validator Tool:
  - First version implemented
  - First organisation has submit its systems/content and has get the results of the first validation run!
- 10ths more validations to follow on last semester of 2014
- Validation of 75 different data sets by 2nd semester of 2015

Future work

- Update specifications and validator
- Provide the value added services (unified search/safe deposit)
- Provide them as a continued service

Thanks for the attention!

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