ASPECT
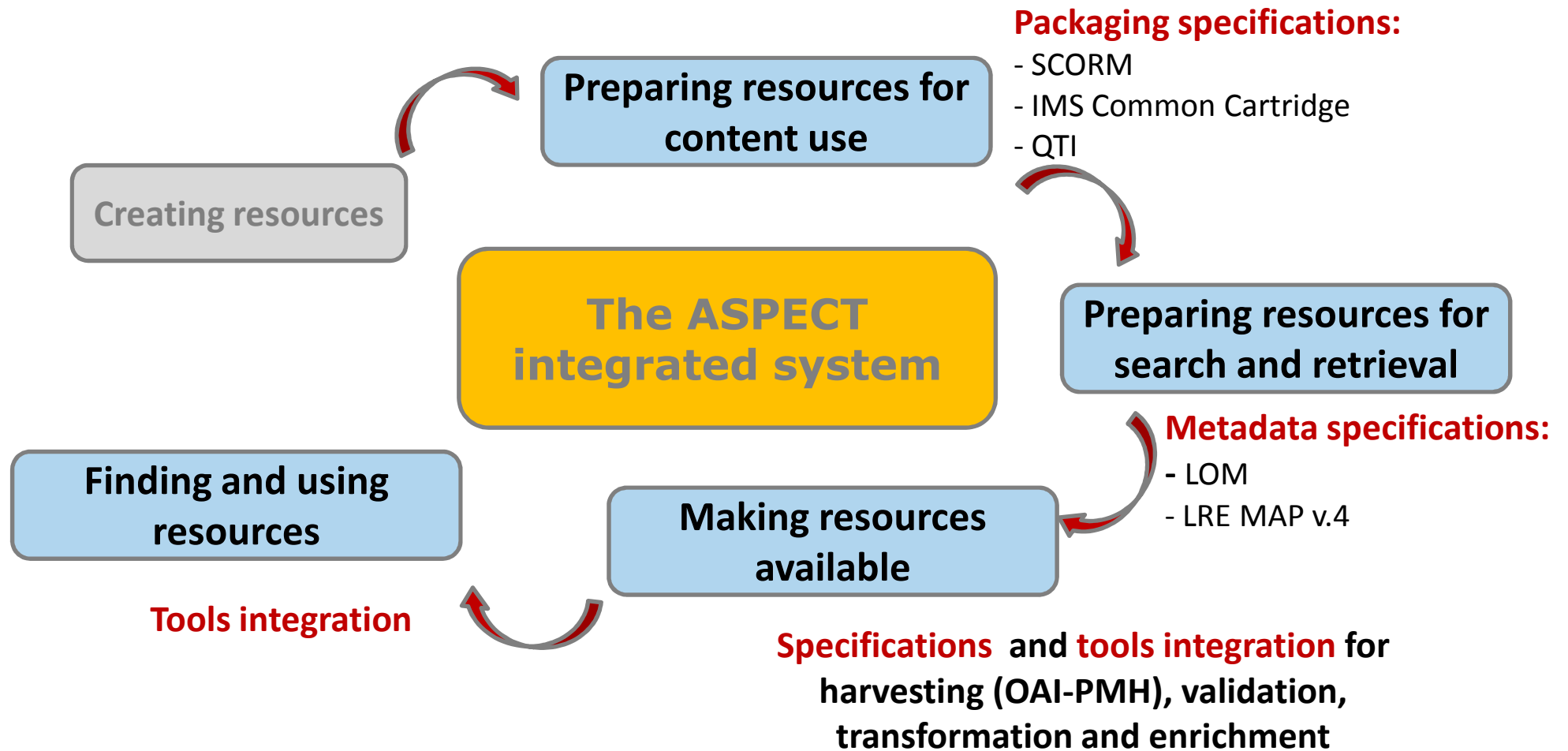
RESULTS AND LESSONS LEARNED

Educational Publishing Futures, Brussels
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The ASPECT integrated system

Packaging specifications:
- SCORM
- IMS Common Cartridge
- QTI

Preparing resources for content use

Creating resources

The ASPECT integrated system

Preparing resources for search and retrieval

Finding and using resources

Making resources available

Metadata specifications:
- LOM
- LRE MAP v.4

Tools integration

Specifications and **tools integration** for harvesting (OAI-PMH), validation, transformation and enrichment
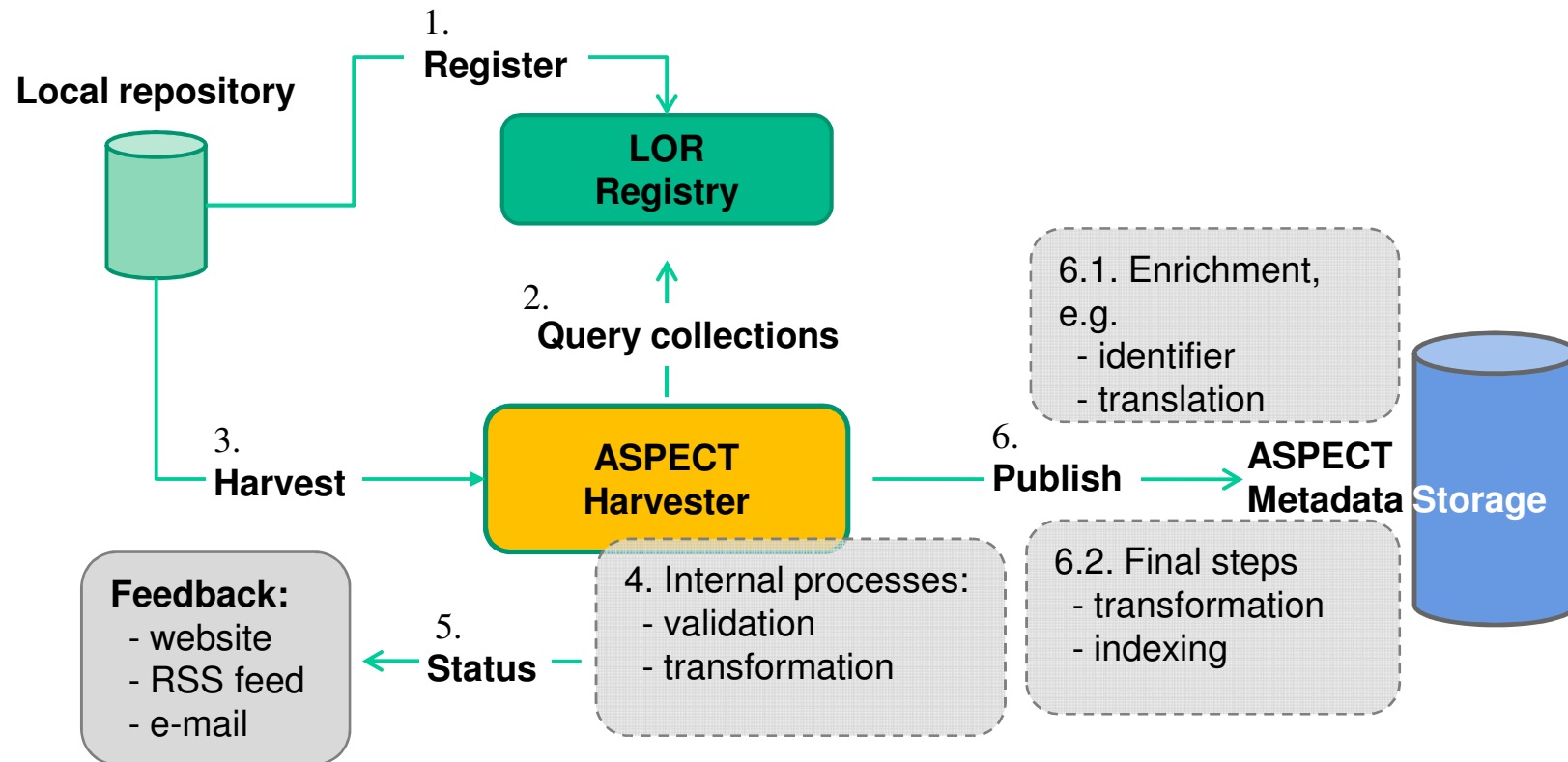
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Results: a federation of repositories

Federation of repositories: connections between the Learning Resource Exchange and the repositories of the content providers involved in the ASPECT project.

All content providers implemented harvesting-based connections using the OAI-PMH specification.

All content providers implemented the metadata specification required by the integrated system (LRE MAP v.4).

Technical partners developed new services for backbone system of the federation.

The backbone system

Local repository

1. **Register**

LOR Registry

2. **Query collections**

3. **Harvest**

ASPECT Harvester

4. Internal processes:
- validation
- transformation

5. **Status**

Feedback:
- website
- RSS feed
- e-mail

6.1. Enrichment, e.g.
- identifier
- translation

6. **Publish**

ASPECT Metadata Storage

6.2. Final steps
- transformation
- indexing

4

ASPECTs of the system

The validation service in action:

Validation services

The LRE in action:

ASPECT LRE portal

Results: resources and metadata

Although ASPECT is not about adding content to the LRE, we have, nevertheless, added a considerable amount of new or updated content as part of the project.

In figures: after the first approximately 18 months of the project approximately 48,000 learning object descriptions had been added to the LRE and made accessible via the ASPECT portal.

Results: packaged resources

Content providers have converted a number of SCORM resources into IMS Common Cartridge format.

And carried out a considerable amount of work on the IMS Common Cartridge format in particular – some experimental, others large-scale.

Results: tools integration and content use

Our tools providers have done considerable work on integration:

- LRE – Icodeon CC platform integration based on BLTI (*Basic Learning Tools Interoperability)*

- LRE – Moodle integrated search and retrieval of ASPECT resources

- Moodle import and handling of Common Cartridge packages

- Integration of packaged content in blogs, facebook and other contexts (by Icodeon and OpenLearn in particular)

Lessons learned: technically

The OAI-PMH protocol is recommendable as a best-practice specification when setting up federated repositories:

- The specification is easy to read and understand.

- The protocol is simple and efficient.

- There are freely available libraries for a number of different development environments and programming languages that one can use when implementing the protocol.

Lessons learned: technically

The LRE Metadata Application Profile v.4 specification is recommendable as a key specification for metadata issues:

- It provides a high degree of flexibility in the management and exchange of metadata.

- It responds to a number of information management problems that some repositories are experiencing at the moment.

Lessons learned: technically

The IMS Common Cartridge specification is recommendable as a key specification for packaged content in a wide number of cases:

- It is fairly easy to read and understand.

- There are simple tools that allow users to get started easily and quickly.

- It is easy to develop a script-based packaging process capable of handling large number of resources.

- It responds to the need for resources that support blended learning scenarios and the wish of teachers to be able to pick and mix resources from different places.

Issues: packaged content

We need to look at packaged content specifications in a broader perspective than the purely functional one:

Functionality

- Rather few SCORM packages by our content providers actually include complex SCORM-specific functionality such as sequencing and navigation.

Tools

- Many authoring/packaging tools produce non- or only partially-compliant SCORM or Common Cartridge packages.

- Some runtime tools, LMS/VLEs, implement only parts of the SCORM or Common Cartridge specification

- Tools for validation and a general conformance testing programme are extremely important.

12

Issues: packaged content

Functionality and learning design

- The SCORM-specific functionality reflects a certain learning theory and learning design strategy that is not valued by everyone.

- The Common Cartridge specification reduces the functionality and, in the view of some, the power of the learning resources.

Usage situation

- SCORM packages provide benefits if users rely on presentation and tracking by means of an LMS.

- CC packages need a Common Cartridge compliant LMS or environment in order to run.

- SCORM packages need a SCORM player or a SCORM-compliant LMS or environment.

Issues: packaged content

Distribution

- Many content providers find that packaged content does not provide any particular benefits because they use websites as their 'distribution mechanism'.

Organizational issues

Standards and specifications should not be seen in isolation – they must be seen in a wider perspective.

- 'Benefits' (e.g. improved functionality) are not the only thing that matters for the uptake of a specific standard or specification.

- Needs and business models of the organization and its specific area of content are also factors to be considered.

- The wider organizational issues of disrupting an existing system also need to be considered. There are issues relating to implementation, changes in workflow and tools, and of course the training and support of users.

- Most organizations value a certain level of maturity and stability.