The repository ecology:
an approach to understanding repository and service interactions

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Outline

- The implementation challenge
- A repository ecology?
- A scholarly research ecology
- Ecology concepts
- Data and eLearning ecologies
- Using this approach
- Future developments

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The implementation challenge

- The repositories domain is well served by technical specifications and architectural models
- Implementers of repositories and dependent services are however, still faced with a challenge to plan and manage their service in relation to the rest of the information environment
- In particular they face challenges when trying to:
  - Articulate needs
  - Identify opportunities
  - Express complexity
  - Manage development

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The implementation challenge (2)

- Boundaries
  - Primarily interested in the academic sector
  - A focus on the institutional and subject repository domain
  - An interest in interactions (technical and non-technical) between services and between repositories and services
- Characteristics
  - A semi-structured information space – sitting between the highly-ordered library world and the unstructured web
    - Between AACR2 and agreeing a del.icio.us tag
    - Often using OAI-PMH and Dublin Core
    - Interacting with both library catalogues and web 2.0 tools
    - Frequently providing a service based Open Source software such as, ePrints, DSpace, Fedora
    - 'Repository' as an abbreviation for a particular set of functions implemented and used in a particular cultural setting
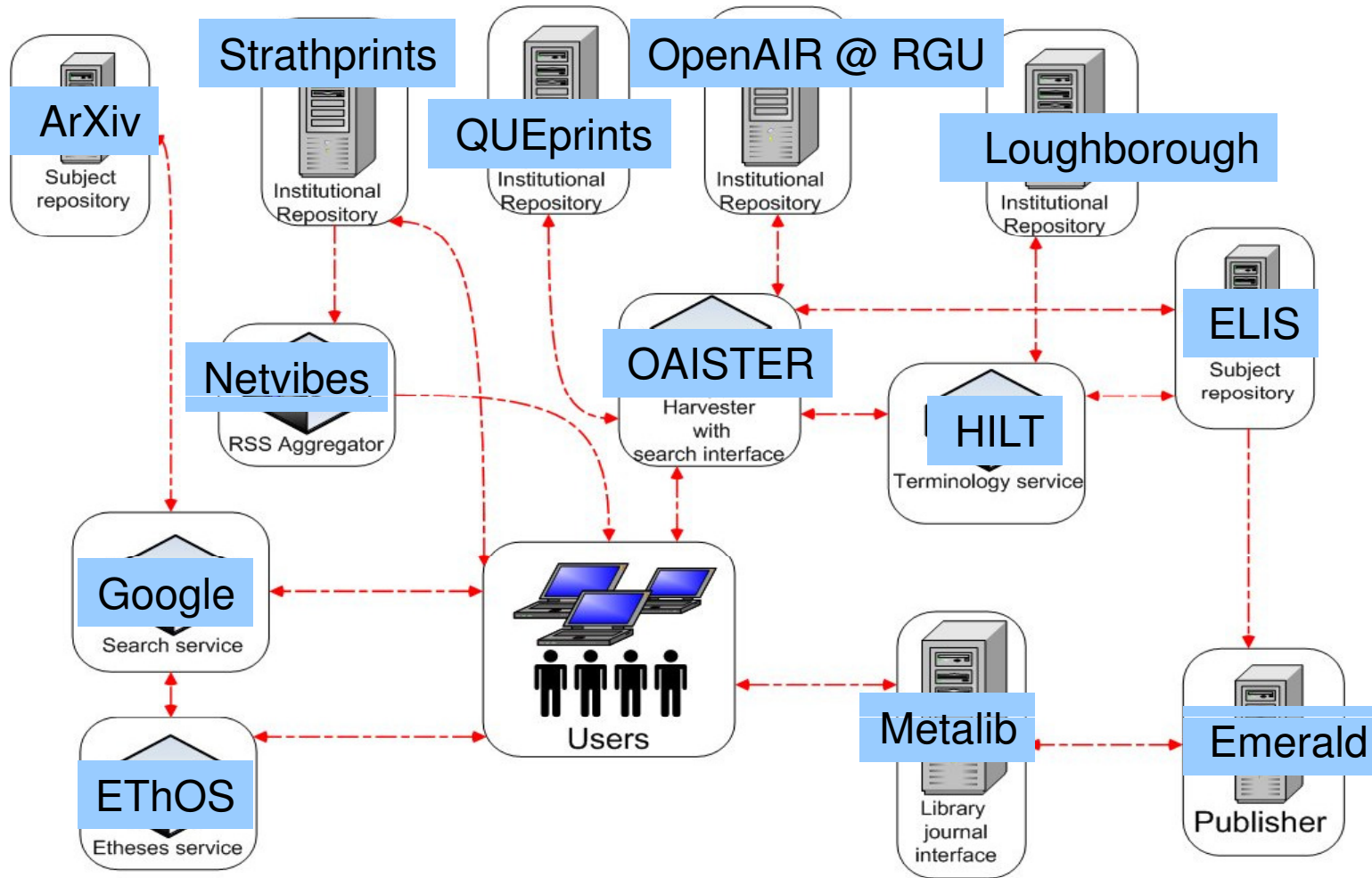
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A repository ecology?

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A repository ecology? (2)

- The idea of an information ecology
  - A way of thinking about the relationships between information systems and services
- Information systems are like ecologies:
  - Multiple interacting things
  - Dependent on each other
  - Connections are not always obvious to participants
- A repository ecology as a type of information ecology

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The example of a scholarly research ecology

- The first stage of the research process – the initial literature review/search process
  - User carries out a number of different search tasks
    - Looks in Google
    - Finds eprints in a relevant subject repository
    - Checks recent theses
    - Is notified by RSS of recent deposits in subject domain at local institutional repository
    - Checks aggregated search service for other eprints
    - Finds additional papers because harvester enhances query using subject terminology mapping
    - Uses library interface to locate publisher's version of an article

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A scholarly research ecology (2)

ArXiv
Subject repository

Strathprints
Institutional Repository

QUEprints
Institutional Repository

OpenAIR @ RGU
Institutional Repository

Loughborough
Institutional Repository

ELIS
Subject repository

Netvibes
RSS Aggregator

OAISTER
Harvester with search interface

HILT
Terminology service

Google
Search service

Users

Metalib
Library journal interface

Emerald
Publisher

EThOS
Etheses service

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Ecology concepts

"We believe that the ecology metaphor provides a distinctive, powerful set of organizing properties around which to have conversations. The ecological metaphor suggests several key properties of many environments in which technology is used. An information ecology is a complex *system* of parts and relationships. It exhibits *diversity* and experiences continual evolution. Different parts of an ecology *coevolve,* changing together according to the relationships in the system. Several *keystone species* necessary to the survival of the ecology are present. Information ecologies have a sense of *locality*."

Nardi and O'Day (1999) First Monday 4 (5)
http://www.firstmonday.org/issues/issue4_5/nardi_chapter4.html

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Ecology concepts (2)

- *System*
  - changes can affect whole ecology
  - local changes not in line with dynamic of the ecology may fail
- *Diversity*
  - different kinds of species can work together
  - species overlap and duplicate to a degree
 - "Monoculture - a fake, brittle ecology - gives sensational results for a short time, then completely fails."

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Ecology concepts (3)

- *Coevolution*
    - the ecology is constantly changing
        - new things develop
        - existing things continue to develop
        - existing things are used differently
- *Keystone species*
    - critical species needed for ecology to survive; these are often 'middleware' - infrastructure and people who make and assist connections
- *Locality*
    - 'name': what something is used for in a particular location
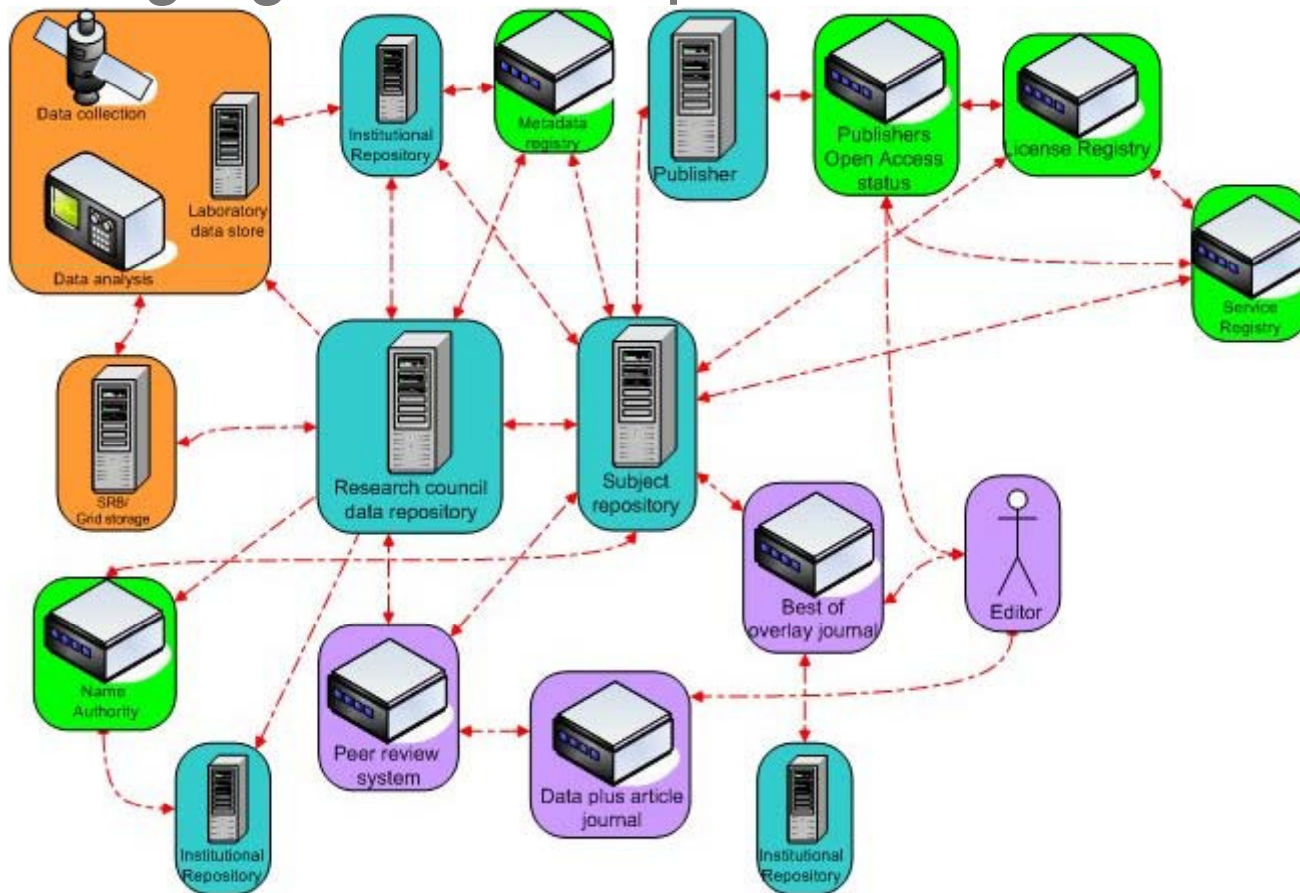   - 'habitation': how this thing sits within a network of relationships with other things

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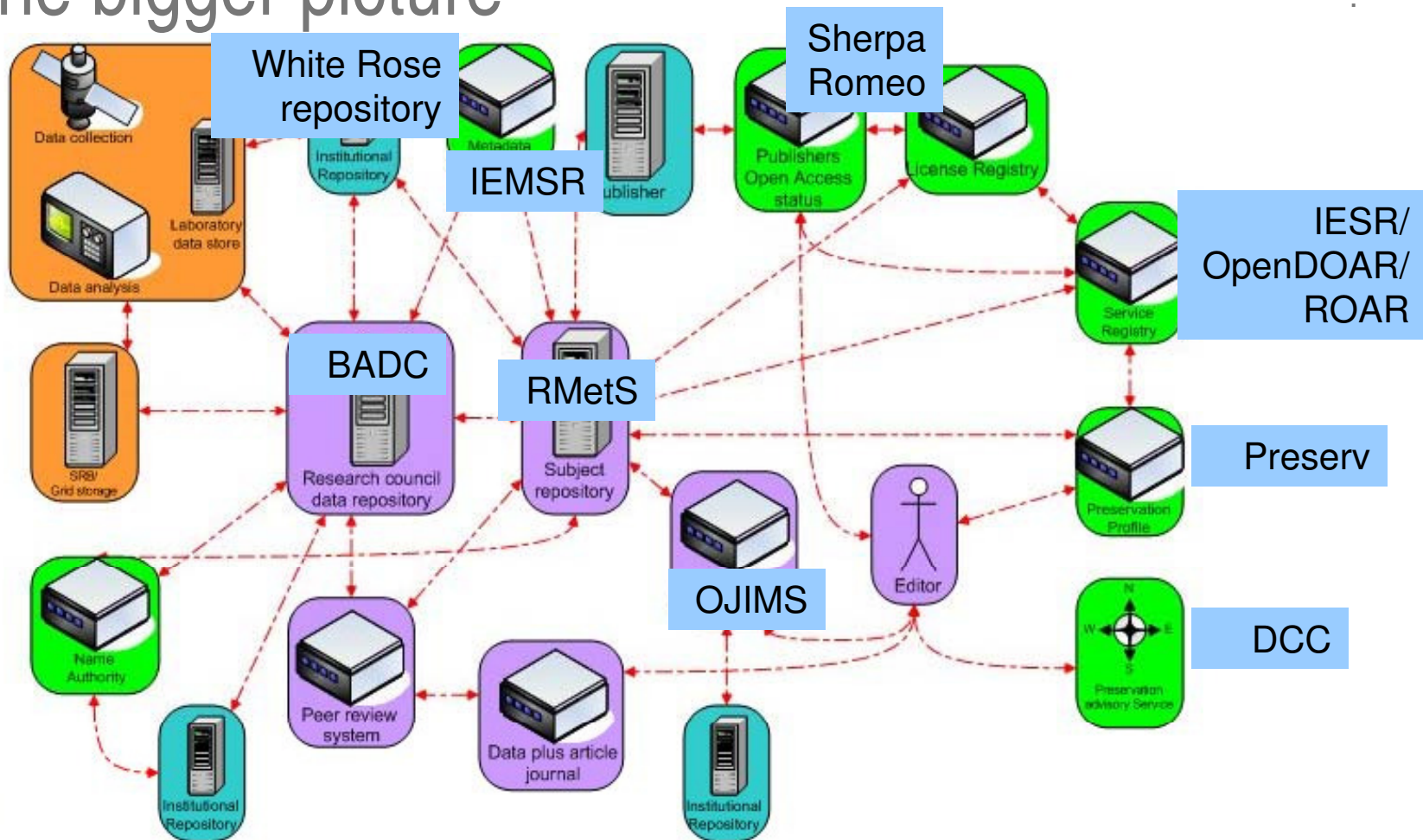# An scientific overlay journal ecology: basic elements
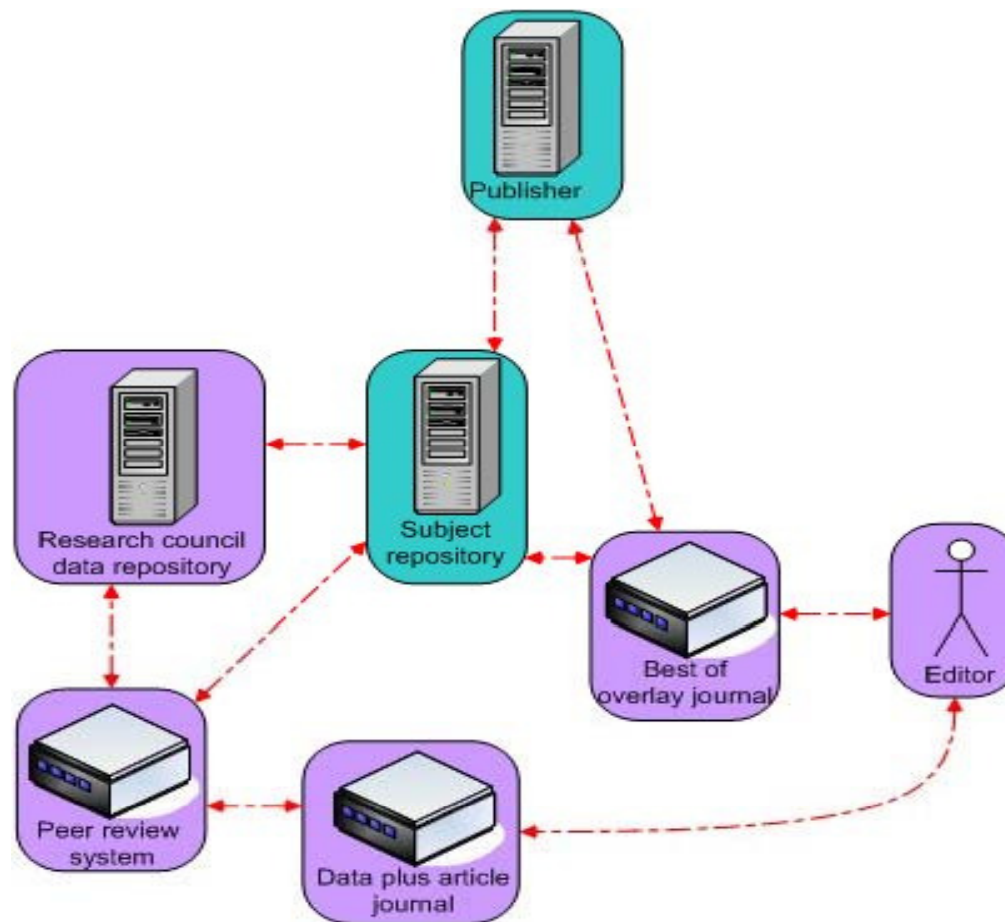
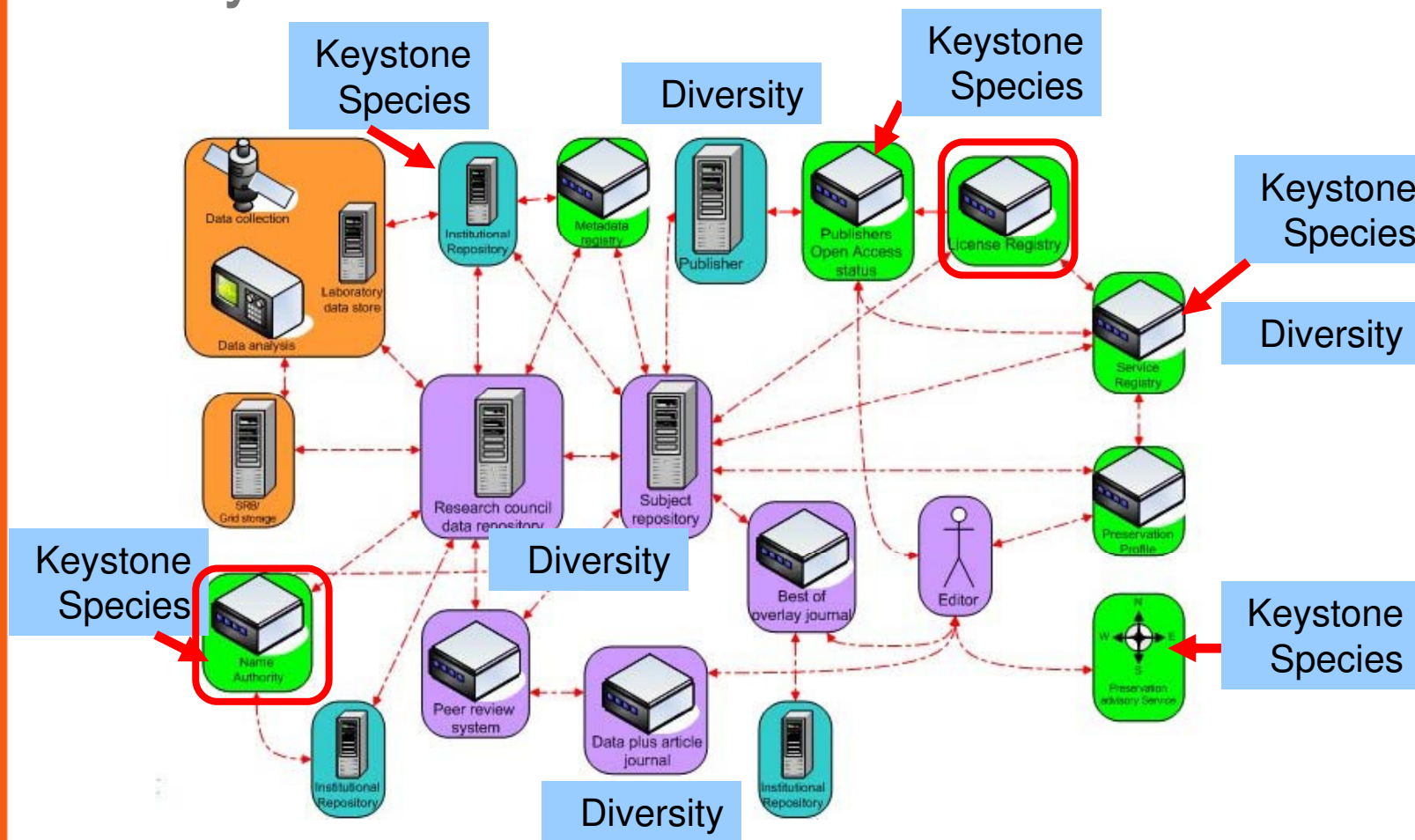# An scientific overlay journal ecology: adding data capture

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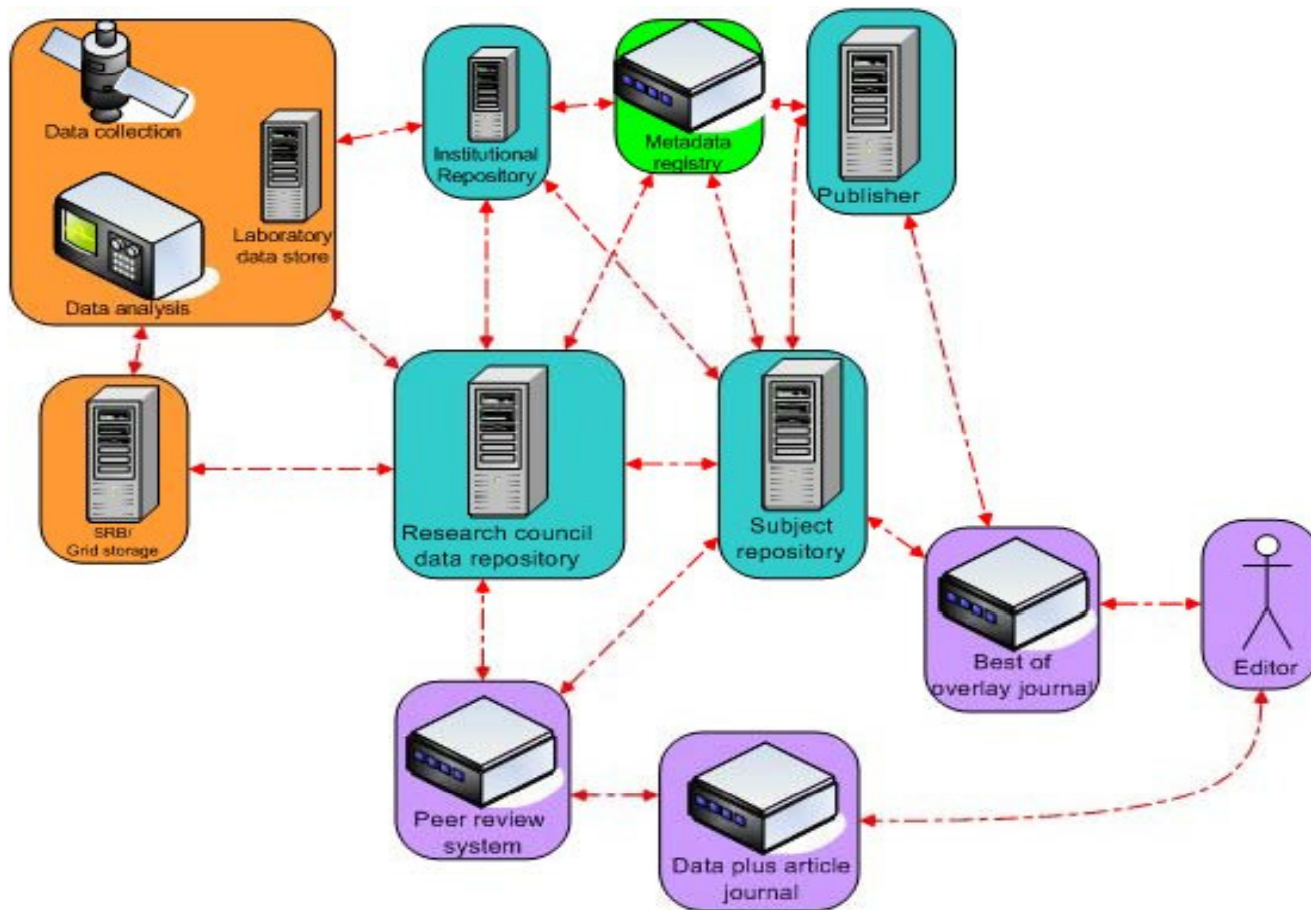
An scientific overlay journal ecology: bringing in other repositories

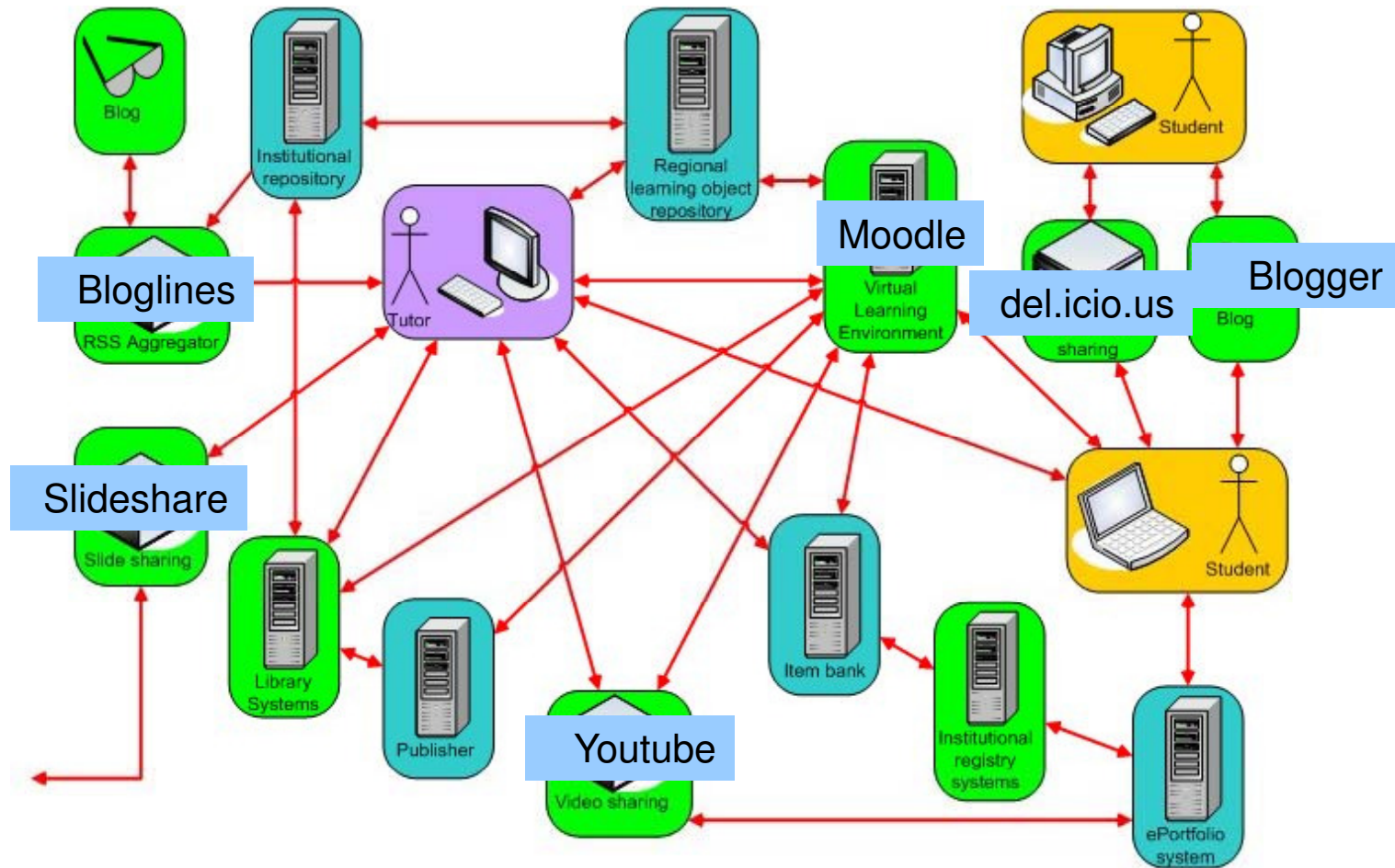# An scientific overlay journal ecology: the bigger picture
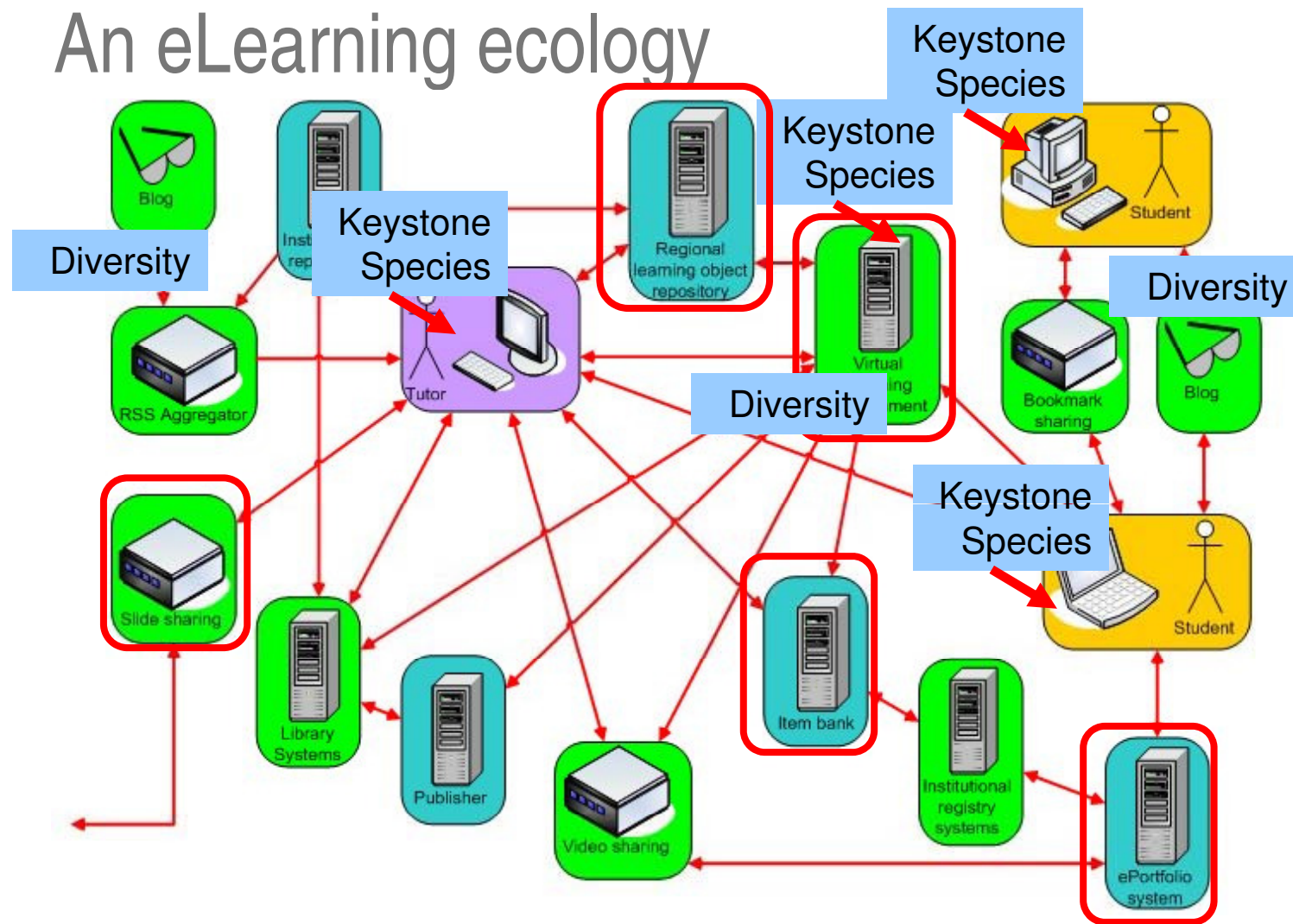
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An scientific overlay journal ecology: analysis

An eLearning ecology

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An eLearning ecology

Using this approach:
what benefit does it offer?

- ## For an 'end user'

  - Services that have thought about their place in a wider network may offer the user a richer, multifaceted, and more personalised service

- ## For a repository or service administrator

  - The ecology approach offers the opportunity to looking for efficiencies and, as indicated above, to offer better services

- ## For developers and funding agencies

  - The ecology approach offers another approach to examining how services and repositories relate and interoperate and what aspects of the environment present opportunities or are under threat

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Using this approach: thinking ecologically

Key questions for thinking about interactions between repositories and services

- What sort of thing (repository or service) is this?

- What does it relate to (other repositories or services)?

- What does it depend on?

- How adaptable is it?

- What helps it to thrive?

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An scientific overlay journal ecology: the bigger picture - revisited

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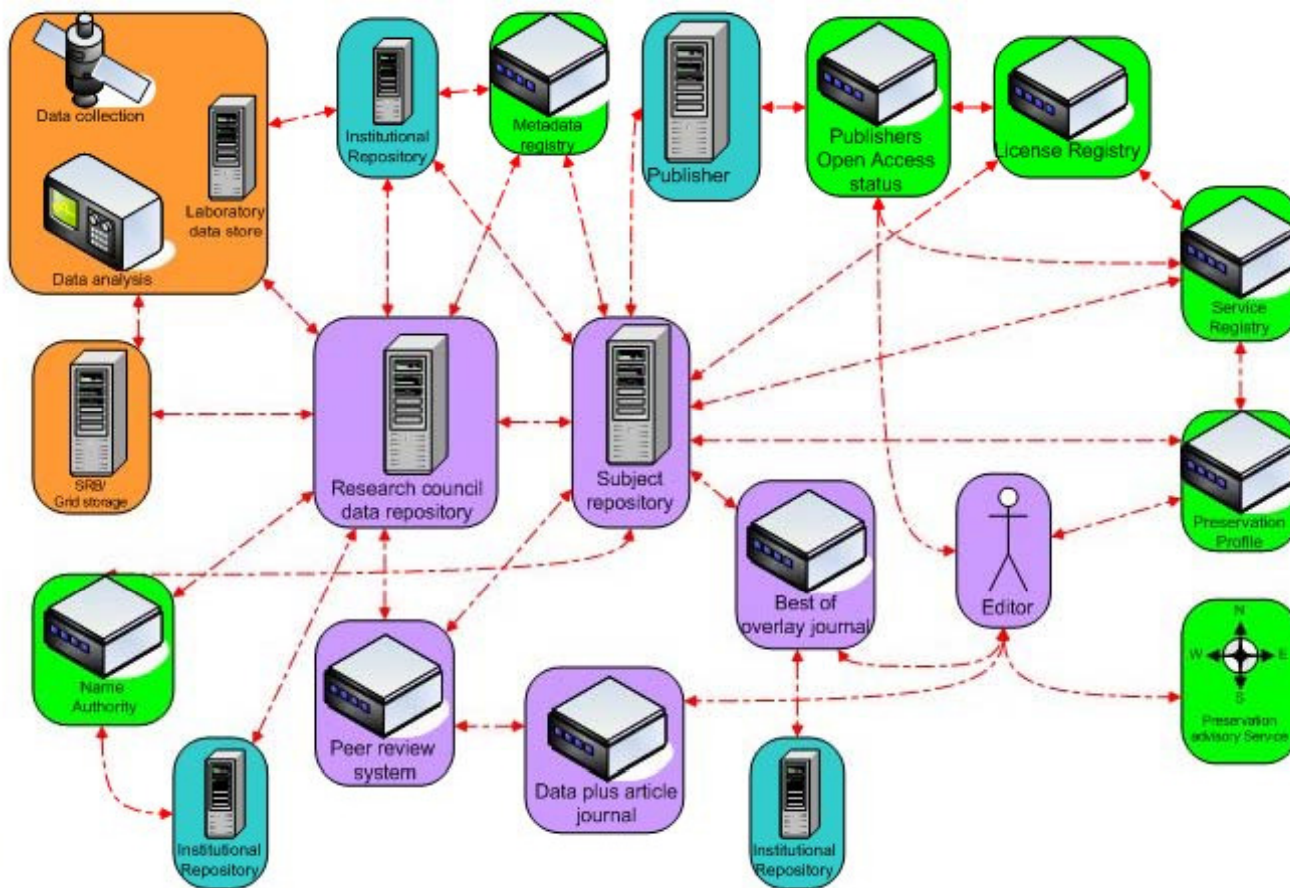
Using this approach:
the scientific overlay journal

- **What sort of thing (repository or service) is this?**
  - Overlay journal based on subject and data repositories
- **What does it relate to (other repositories or services)?**
  - illustrated connections (and more)
- **What does it depend on?**
  - Success of DR and SR – advocacy as well as technical deposit mechanisms
  - Publishers licensing agreements and being able to discover this information
- **How adaptable is it?**
  - Presenting different views of data
  - Offering lots of service discovery points
- **What helps it to thrive?**
  - Google visibility / fit with RAE (or equivalent exercise)/ other measurable prestige

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A repository ecology

- It is not the only way to approach any of these issues but a repository ecology allows:

  - A way for repositories and services to articulate their place in the information environment

  - An approach for implementers to identify areas of opportunity within their communities

  - A mechanism to present the complexity of real settings (with different views on them)

  - A support for planning and decision making that can identify missing links and crucial elements

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Future developments, Acknowledgements, Questions

- Further developments
  - In the coming months, we will:
    - ★ Explore useful extensions of the metaphor
    - ★ Produce a report for JISC
    - ★ Hold a workshop on developing and applying the approach
- Acknowledgements
- Questions

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Further information

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  - R. J. Robertson and J. Barton, "Optimising Metadata Workflows in a Distributed Information Environment", Digital Repositories: Interoperability and Common Services, The Foundation for Research and Technology, 11-13 May 2005 , Hellas (FORTH), Heraklion, Crete, 2005, http://delos-wp5.ukoln.ac.uk/forums/dig-rep-workshop/robertsonbarton.pdf
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