



# 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

# 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

# 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

# A repository ecology?





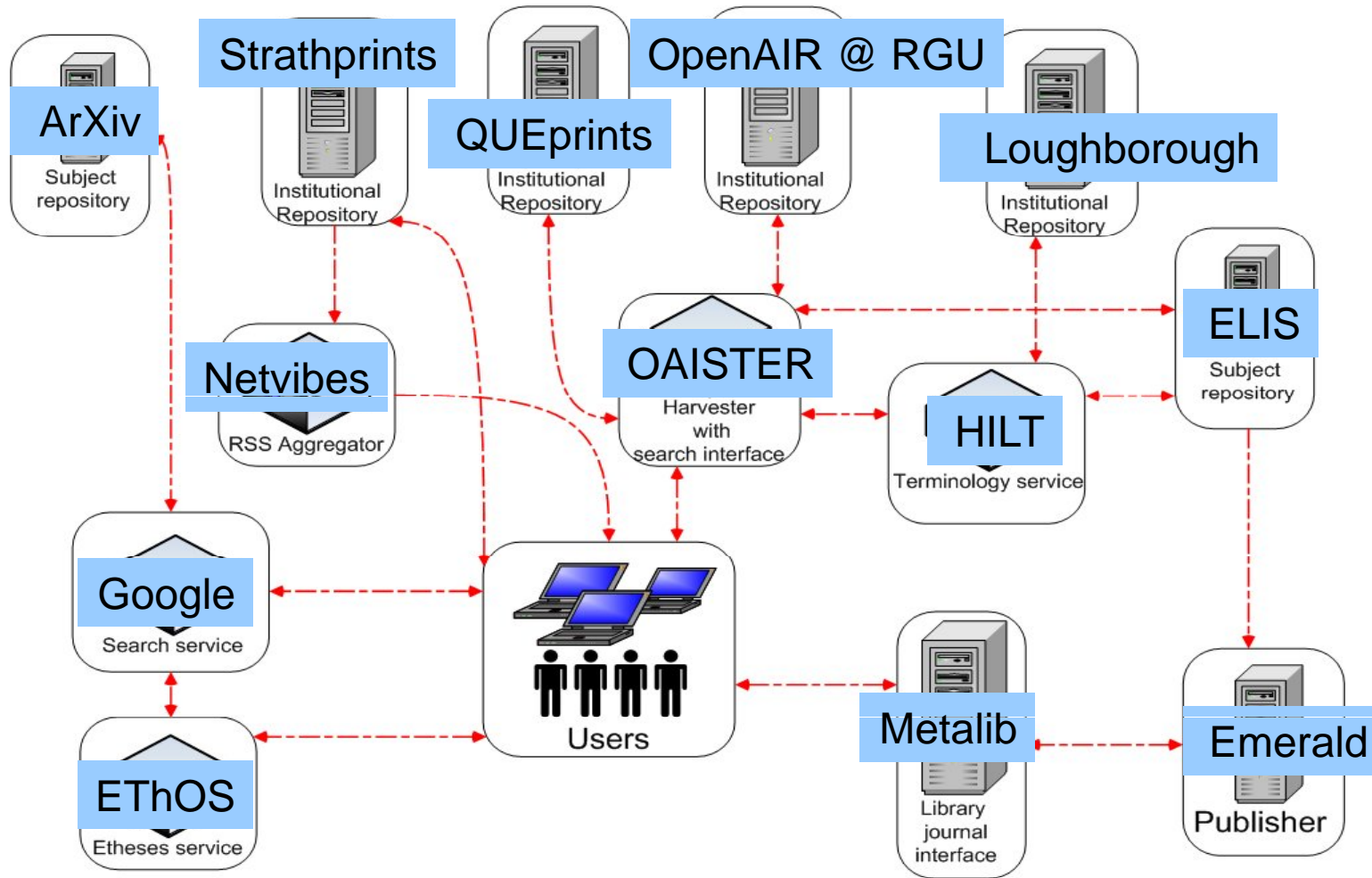
## A repository ecology? (2)

- 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

# 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

# A scholarly research ecology (2)







# 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](http://www.firstmonday.org/issues/issue4_5/nardi_chapter4.html)

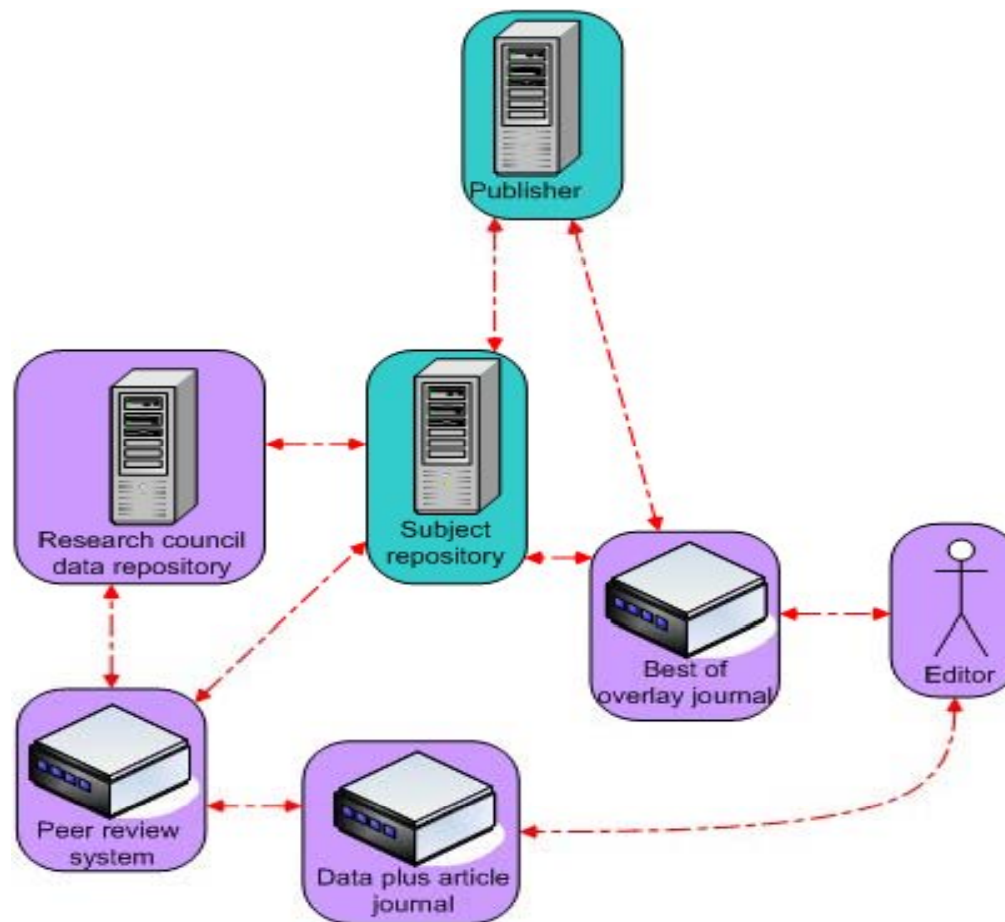
## Ecology concepts (2)

- *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.”

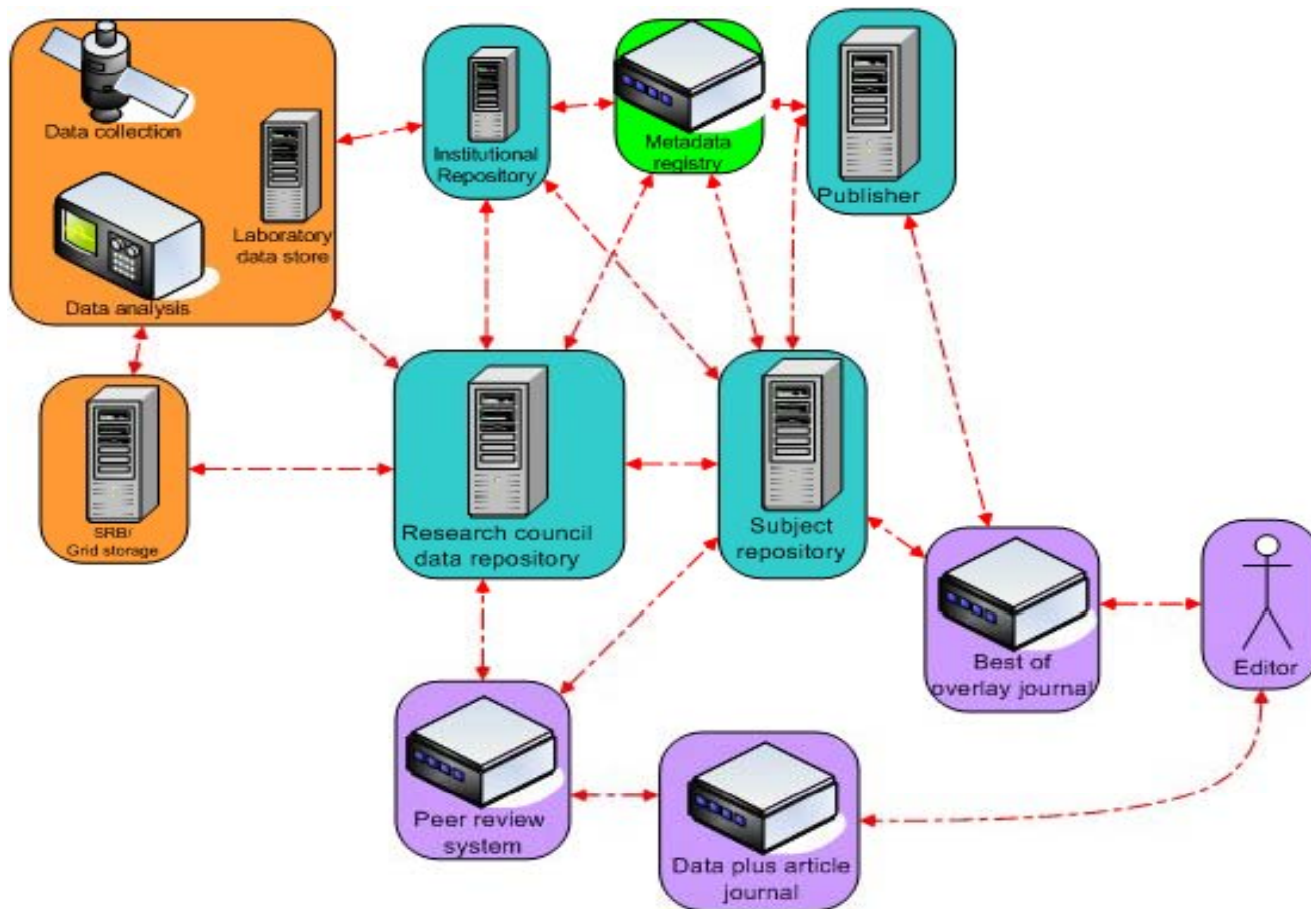
# Ecology concepts (3)

- *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

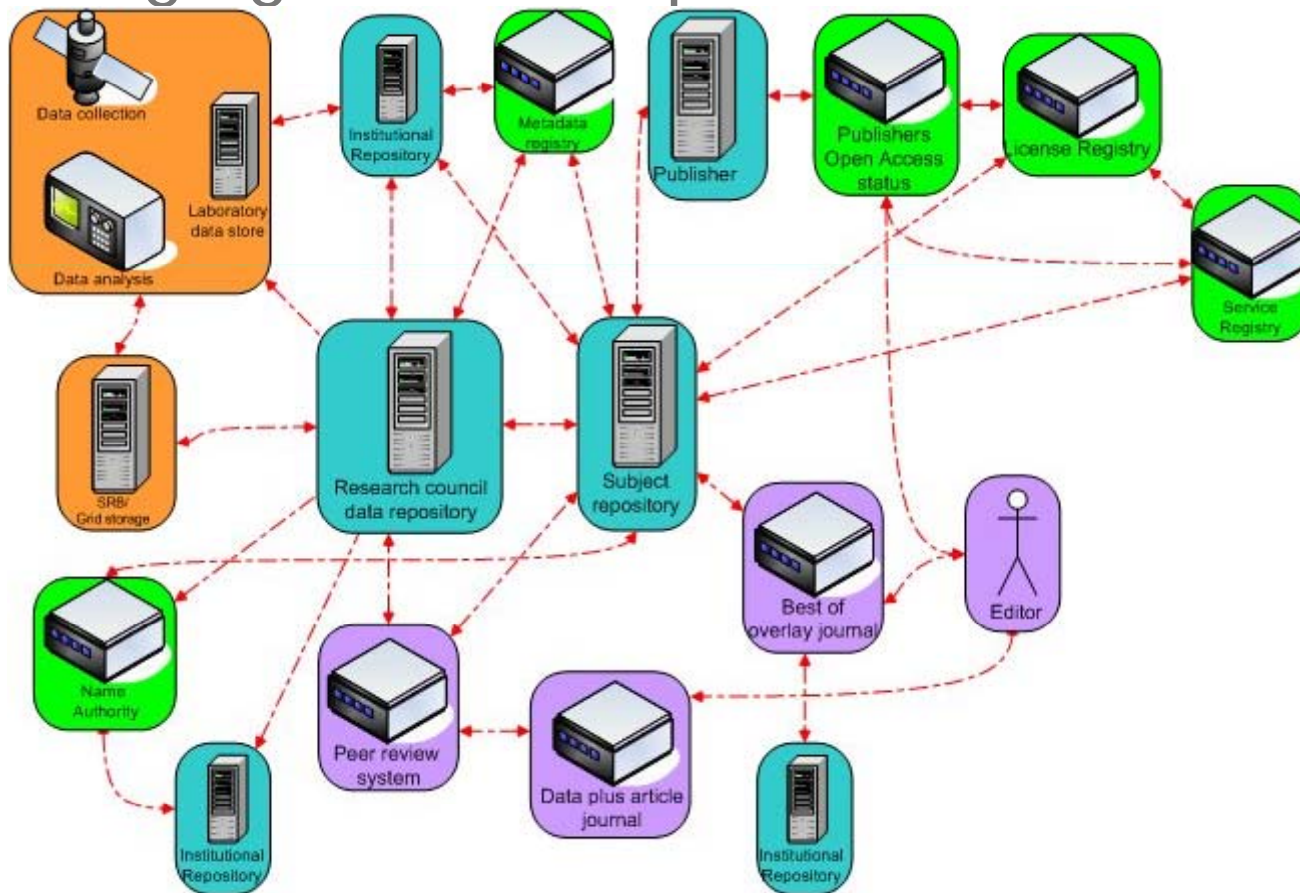
# An scientific overlay journal ecology: basic elements



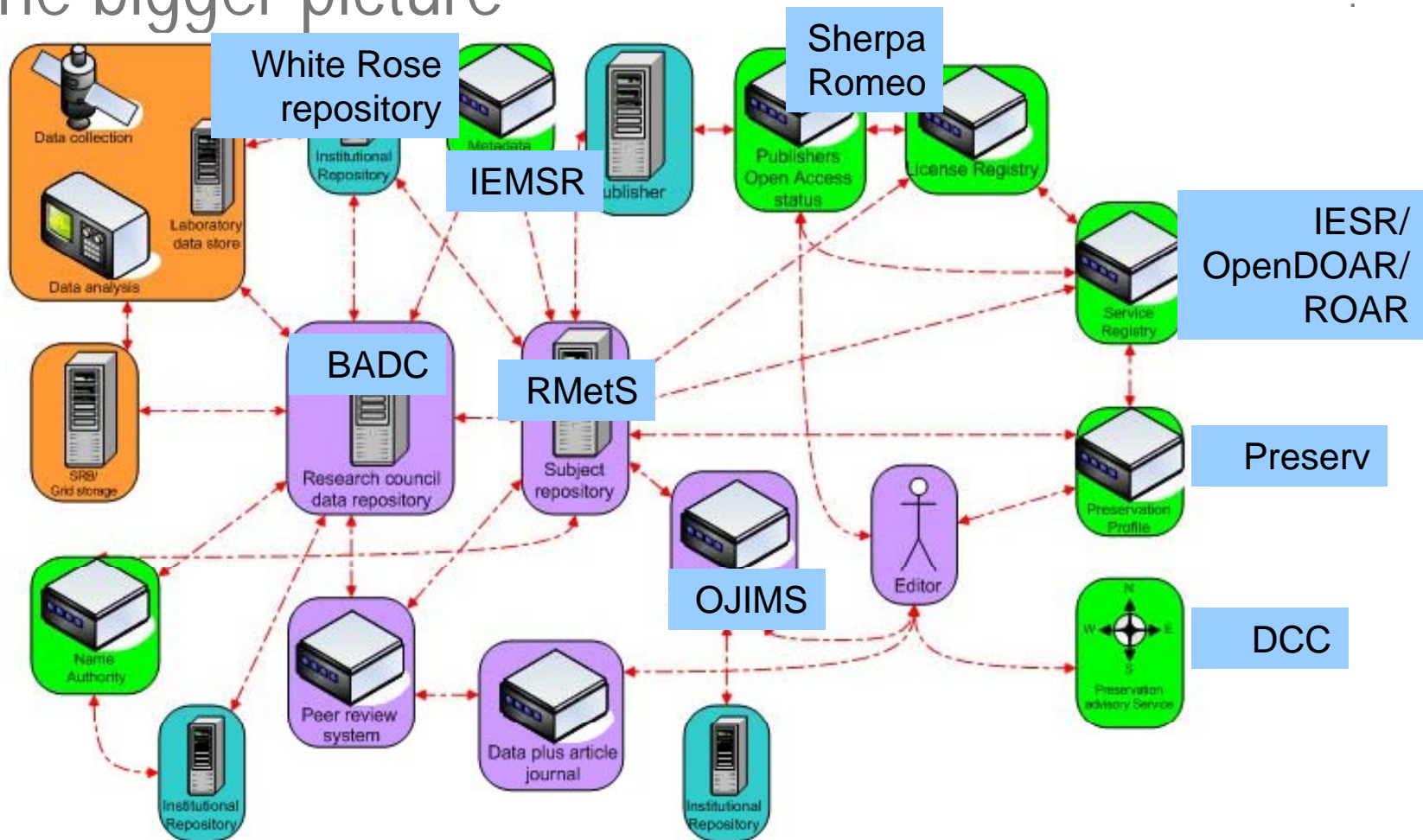
# An scientific overlay journal ecology: adding data capture



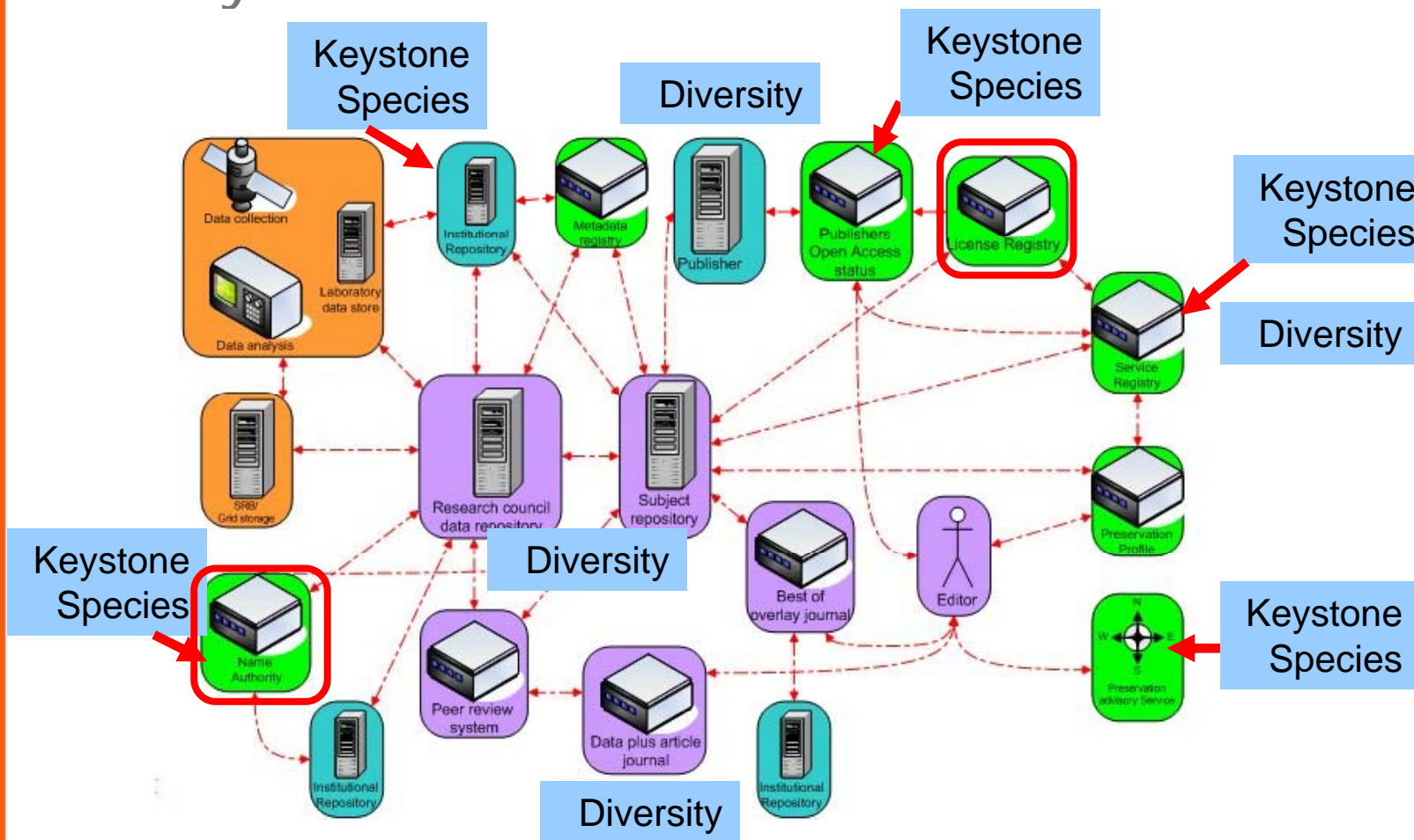
# An scientific overlay journal ecology: bringing in other repositories



# An scientific overlay journal ecology: the bigger picture

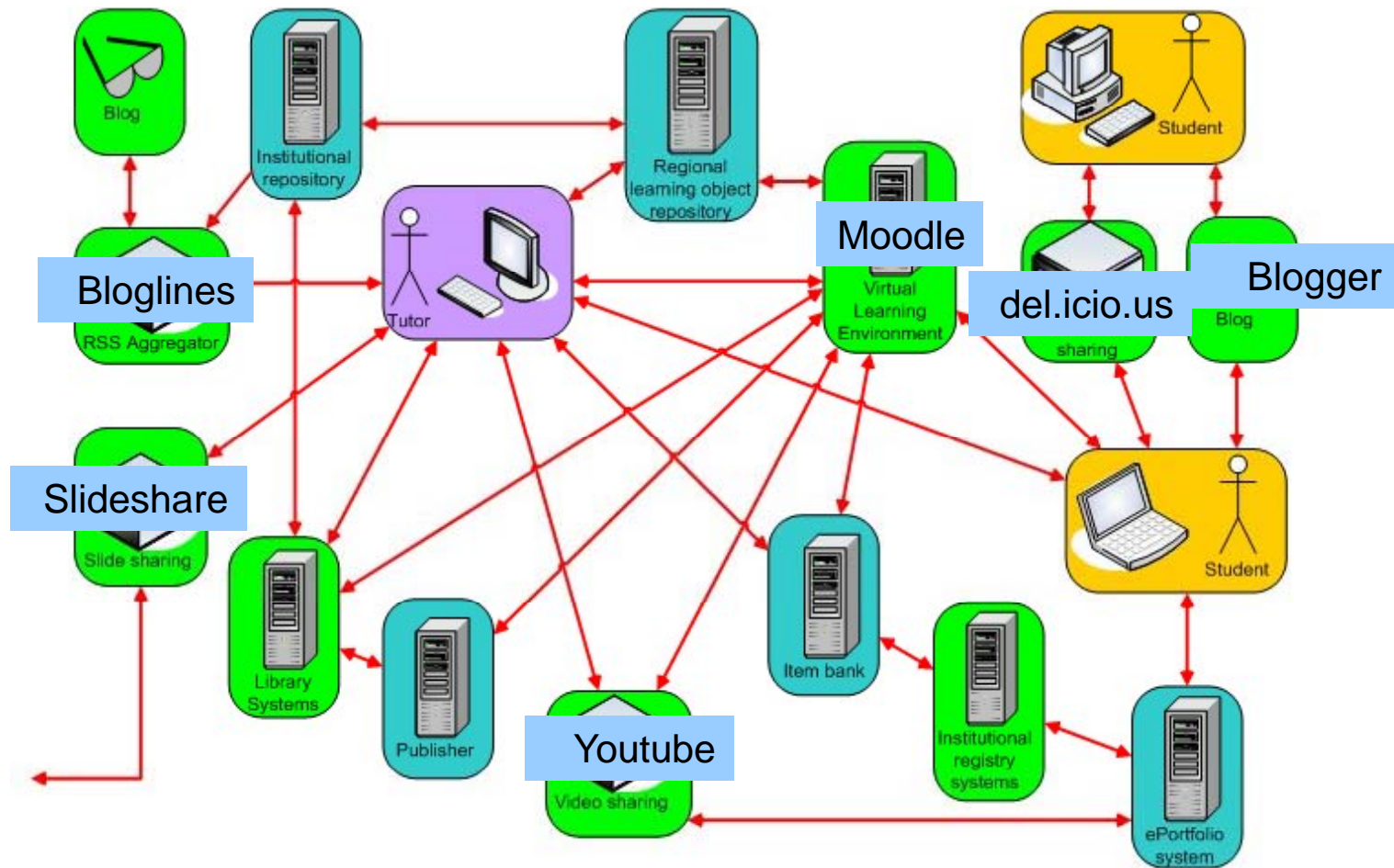


# An scientific overlay journal ecology: analysis

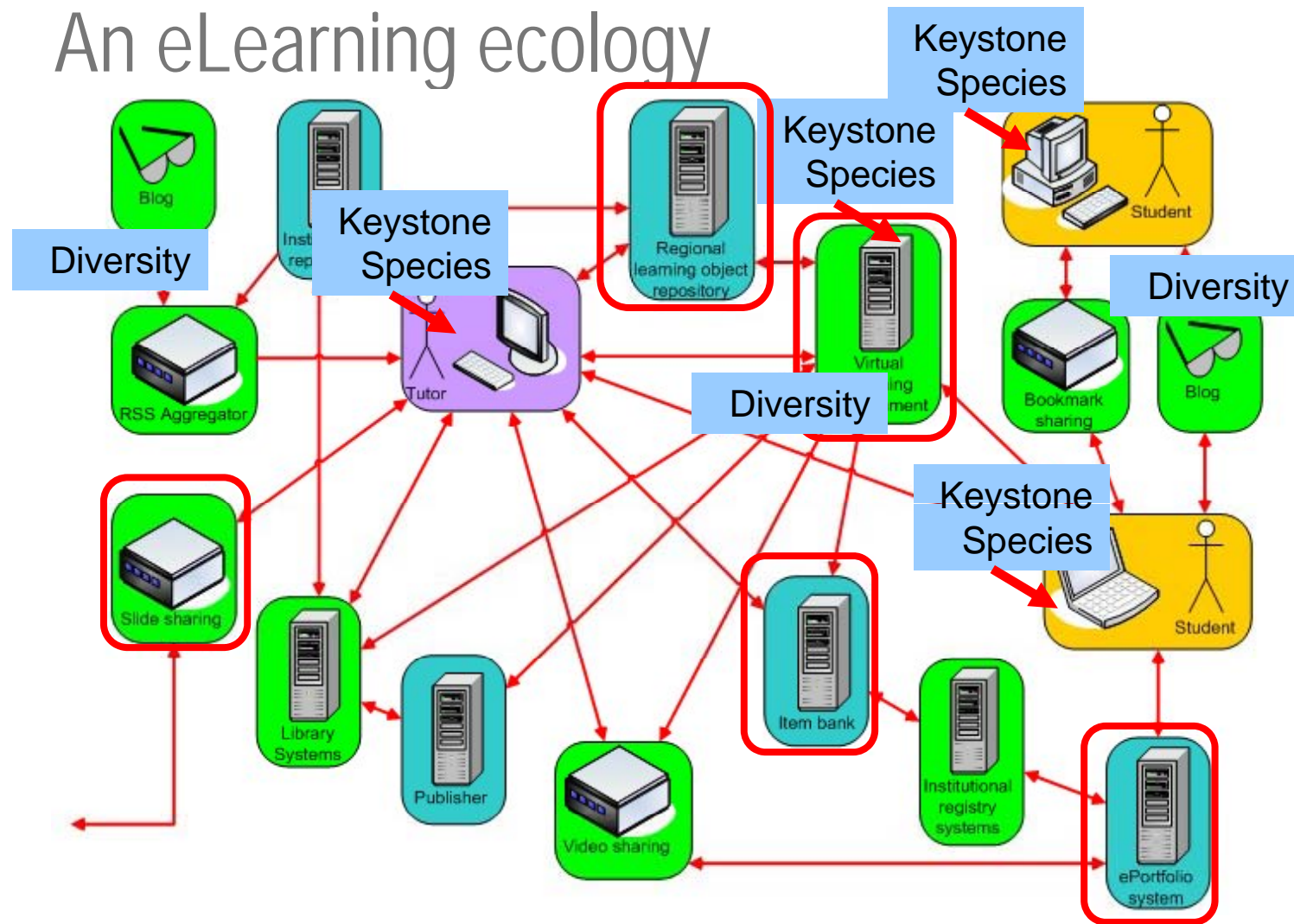




# An eLearning ecology



# 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

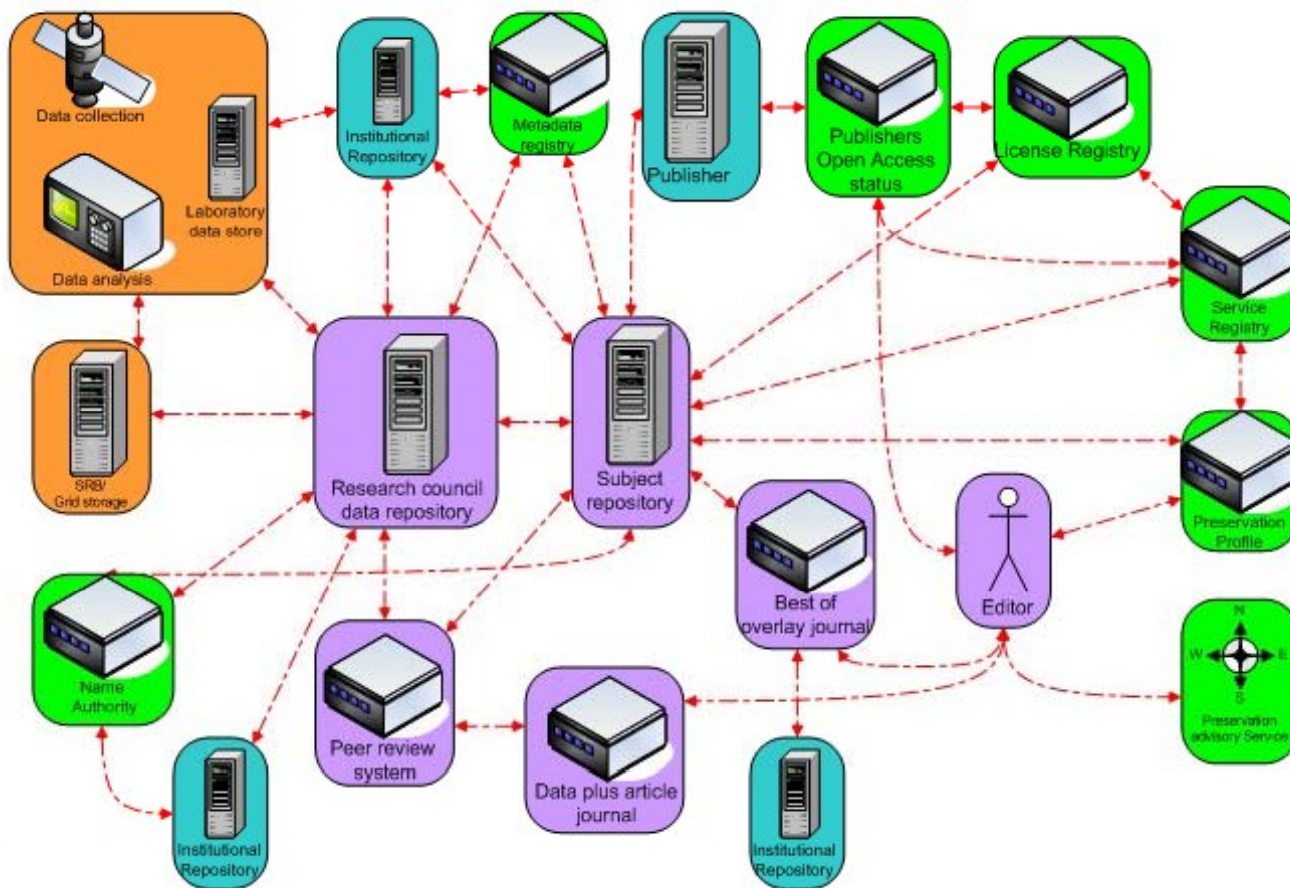


# Using this approach: thinking ecologically

## **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?

# An scientific overlay journal ecology: the bigger picture - revisited



# 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

# 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



# 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



# Further information

## ■ Information Ecology

- ◆ Bonnie A. Nardi, and Vicki L O'Day, First Monday Vol 4 No 5 May 3, 1999. Information ecologies: using technology with heart. Chapter Four: Information ecologies. [http://www.firstmonday.org/issues/issue4\\_5/nardi\\_chapter4.html](http://www.firstmonday.org/issues/issue4_5/nardi_chapter4.html)
- ◆ Thomas H. Davenport, Information ecology, OUP, 1997

## ■ Repository Ecology and related work

- ◆ R. Heery and A. Powell, Digital Repositories Roadmap: looking forward <http://www.ukoln.ac.uk/repositories/publications/roadmap-200604/>
- ◆ Rachel Heery and Sheila Anderson, Digital Repositories Review, UKOLN and AHDS, 2005 (Final version) [http://www.jisc.ac.uk/uploaded\\_documents/digital-repositories-review-2005.pdf](http://www.jisc.ac.uk/uploaded_documents/digital-repositories-review-2005.pdf)
- ◆ 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>
- ◆ Robertson, R.J. et al. EThOS, the new UK e-theses service, national and institutional repository interaction. JISC Conference, March 2007. <http://www.jisc.ac.uk/media/documents/events/2007/03/ethos.ppt>
- ◆ J. Barton and R.J. Robertson, "Developing a metadata lifecycle model" Workshop at CoLIS 5, June 2005, <http://mwi.cdjr.strath.ac.uk/Colisworkshop.htm>
- ◆ Kerry Blinko and Neil McLean, 'A 'Cosmic' View of the Repositories Space (Wheel of Fortune)', 2004, <http://www.rubric.edu.au/extrafiles/wheel/main.swf>