

Thoughts about Tomorrow's Scholarly Communication System

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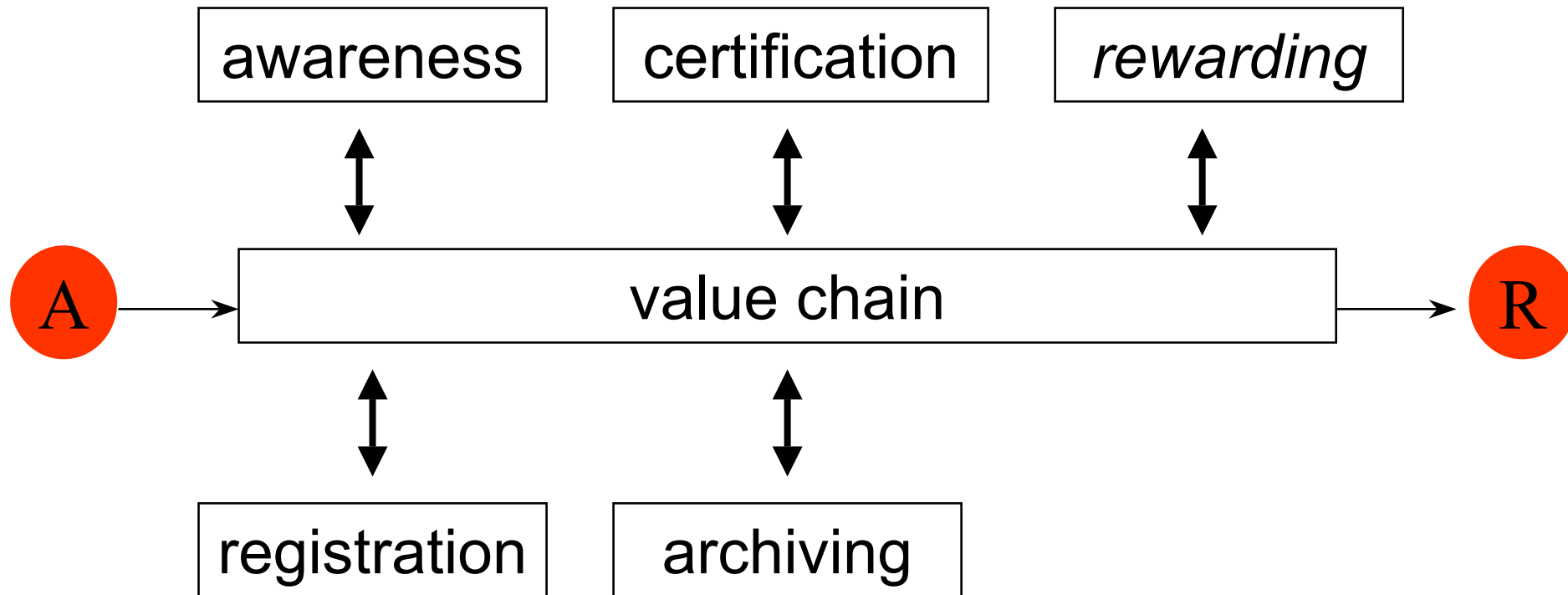
A few bold statements about the scholarly communication system

- The current electronic scholarly communication system is a mere scanned copy of the paper-based system.
- The networked environment begs for another scholarly communication system to emerge.
- 'open access' is just one – be it a very important - characteristic of that other system.
- We really need to start creating that other system.

Systems for scholarly communication {Roosendaal, Geurts}

Registration	claiming intellectual priority
Certification	certifying quality / validity of claim
Awareness	ensuring actors are aware of research
Archiving	preserving research for future use
<i>Rewarding</i>	<i>evaluating & rewarding performance</i>

Value chain perspective of scholarly communication system

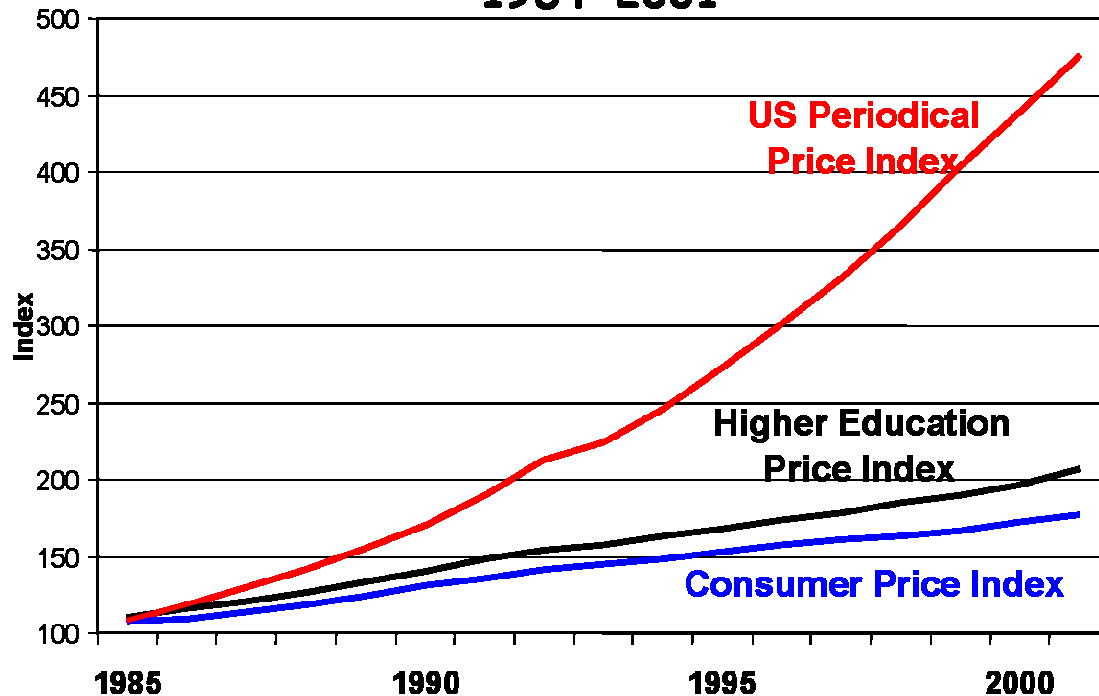


What is driving the Need for Change?

- The Usual:
 - Serials crisis
 - Permission crisis
- The New ~ networked environment
 - The changing nature of research
 - Repository model: Institutional Repositories, Grid repositories, ...
 - Rights framework

The Usual: serials crisis

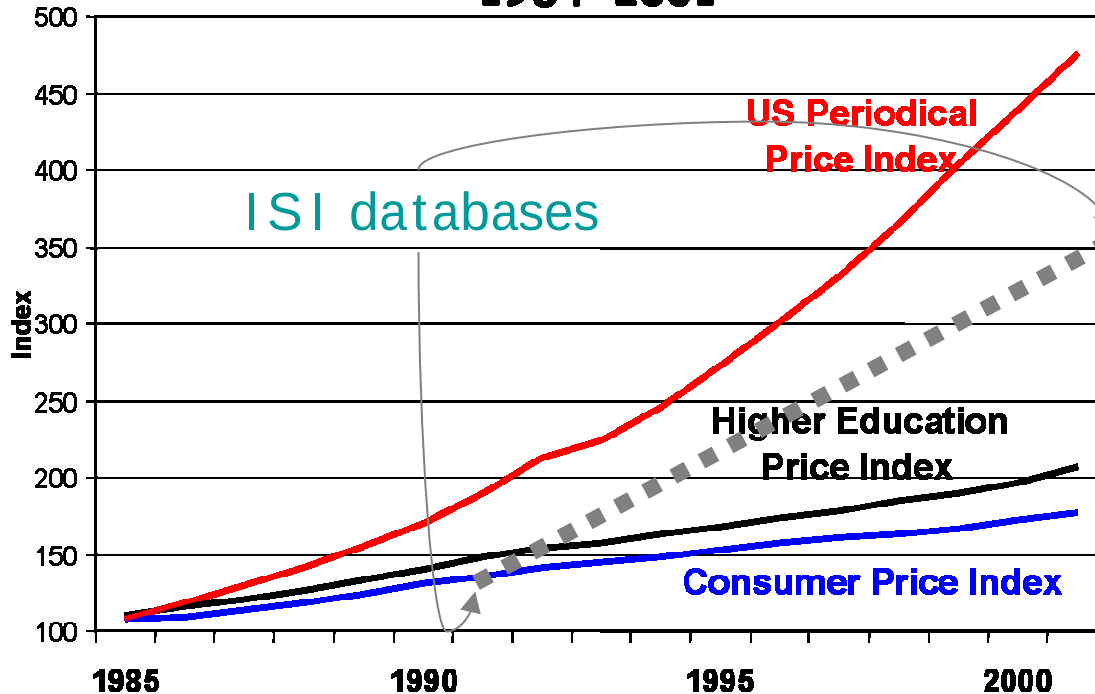
Periodical Price Increases in Comparison with Common Inflation Indexes: 1984-2001



http://www.ala.org/Content/NavigationMenu/Products_and_Publications/Periodicals/American_Libraries/Selected_articles/charta.htm

The Usual: serials crisis

Periodical Price Increases in Comparison with Common Inflation Indexes: 1984-2001



- Competition-less market
- Related to policies in academia re promotion, tenure, funding based on ISI metrics?

Price for ISI databases as paid by LANL 1991-2002

The Usual: permission crisis

- Legal barriers - copyright & licensing contracts
 - Some rights generously granted by ...: *“Authors may distribute or transmit their own paper to not more than 50 colleagues. Authors may post the title, abstract (no other text), tables, and figures from their own papers on their own Web sites.”*
- Technological barriers limiting libraries` use of journals
 - Control of the IT that adds value to content

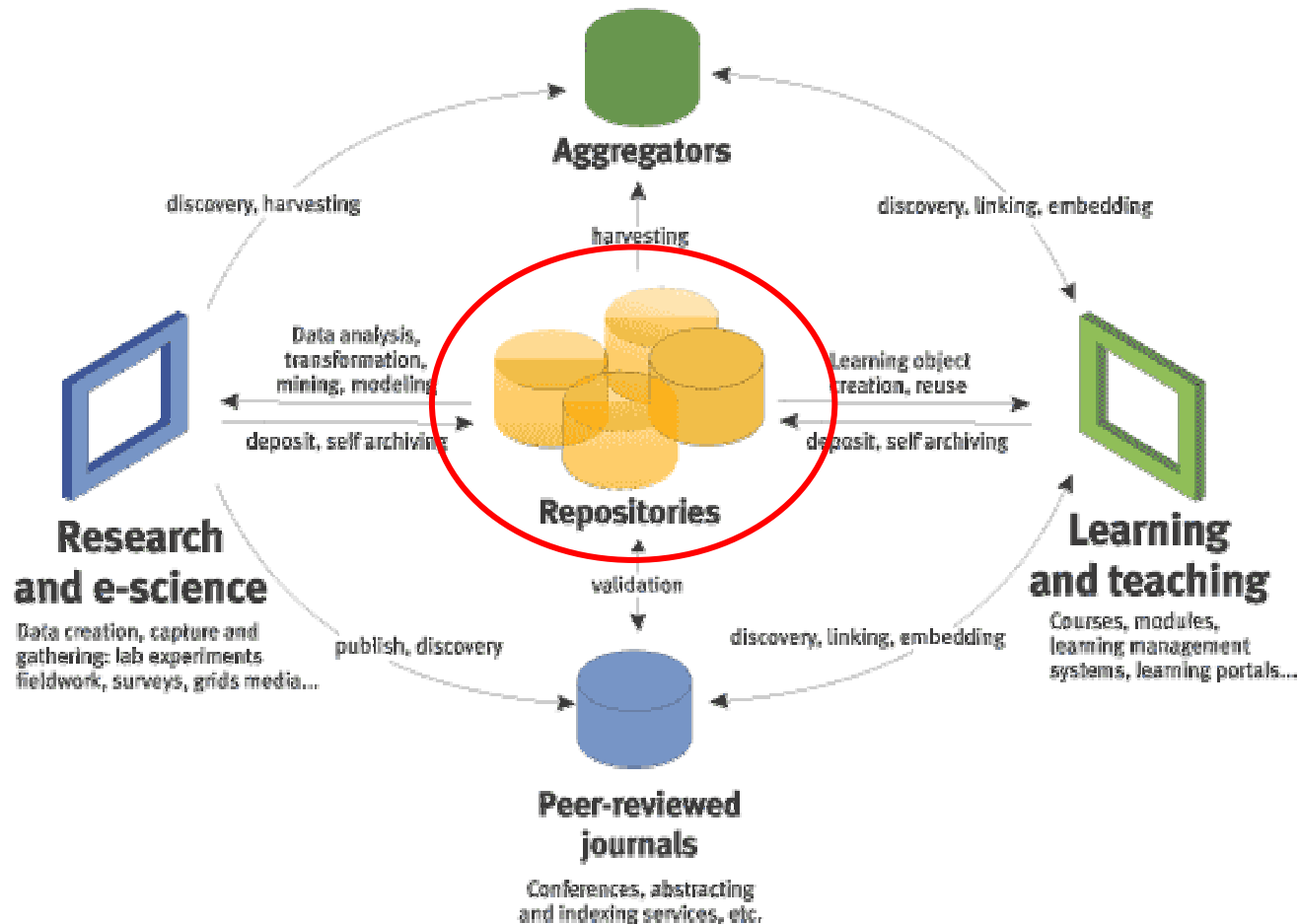
The New : the changing nature of research

- Dramatic changes in the way research is conducted
- Influenced by:
 - Vast improvements in computing and network technologies
 - Digital data capturing techniques
 - Powerful data mining techniques
- Evolution towards:
 - Highly collaborative
 - Network-based
 - Data-driven
- Visible in Science & Engineering (Cyberinfrastructure report), but also in humanities

The New : the changing nature of research

- The scholarly communication system has not kept pace with the ongoing revolutionary changes in research practice.
- For example: remarkably little interoperability across digital publishing venues: pdf, doi, OpenURL, OAI-PMH
- The system is in the early stage of the “modernization / innovation / transformation” cycle typical for absorbing disruptive technologies
- The system must move on to become a natively digital network-based system.
- The system must become intertwined with the scholarly endeavor, not be its after-thought or annex.

The New: Repository model



"Pattern Recognition: The 2003 OCLC Environmental Scan"
<http://www.oclc.org/membership/escan/toc.htm>

The New: Repository model



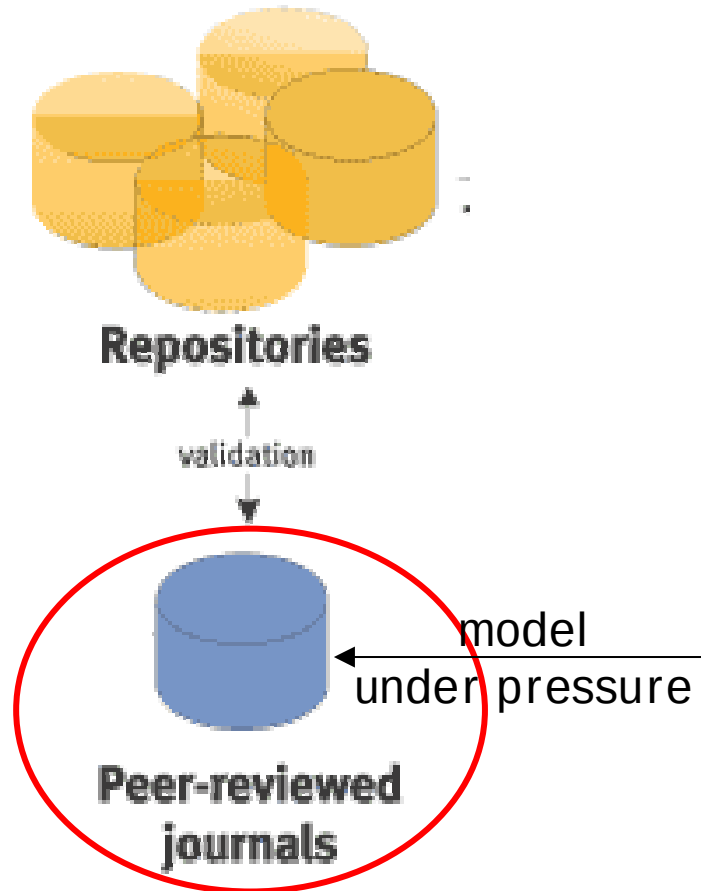
- Materials become available in repositories
- Different repository types: IR, Grid repositories, e-learning repositories, software repositories, digitized materials, ...
- Many materials in open access

The New: Repository model, IR-type



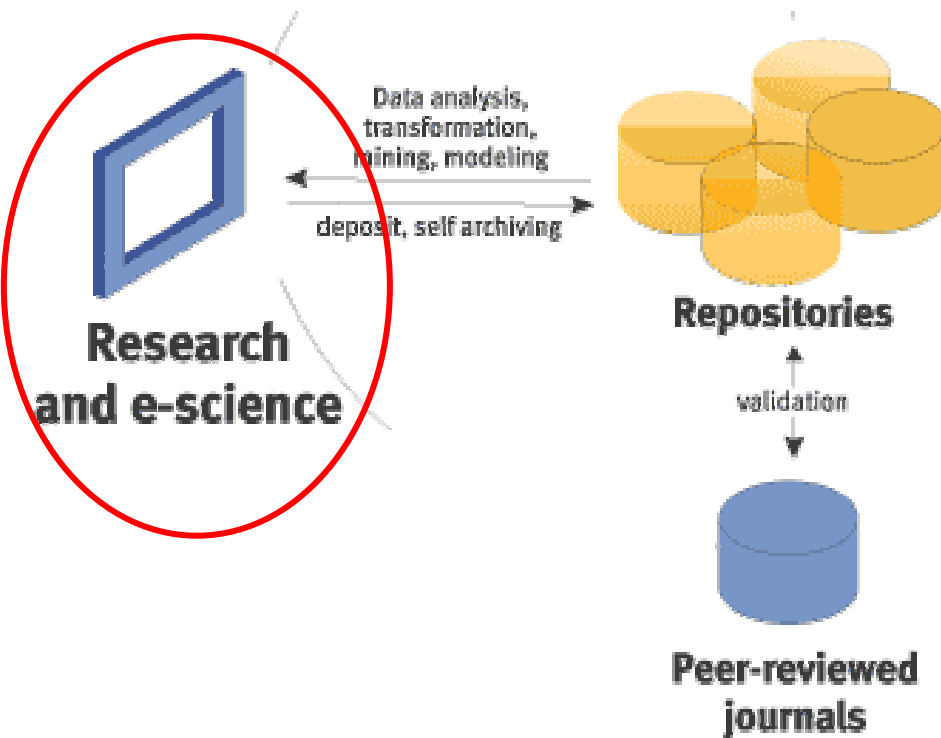
- Case 1: IR-type repositories
- Typically textual materials
- Different levels of **Certification**: no review, internal review, curatorial decisions, peer-review, ...
- New value chains will emerge with these materials as their starting point
- Example arXiv.org

The New: Repository model, IR-type



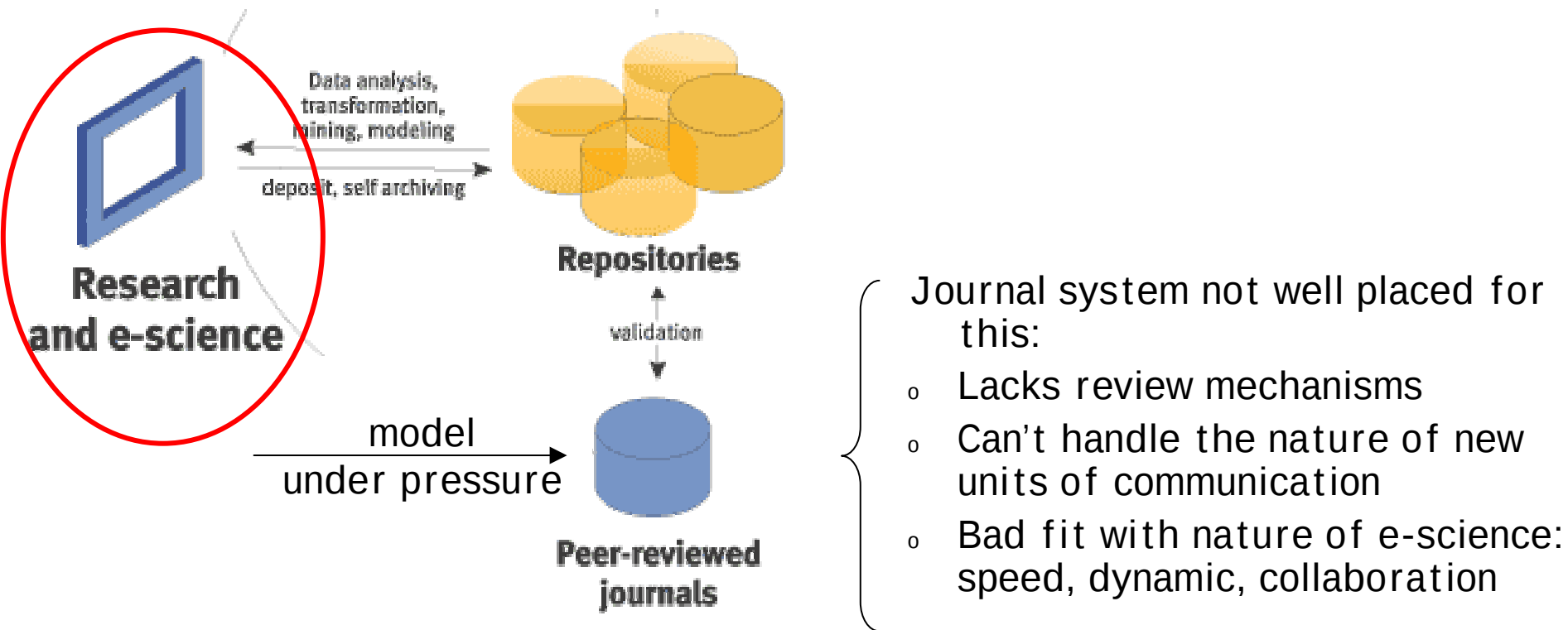
- Journal system is just one possible, vertically integrated value chain
- In a networked world, the functions it performs can/will be handled in a deconstructed/distributed manner:
 - **Registration** in repository
 - **Certification** by different nodes/parties
 - **Archiving** by different nodes/parties
 - **Awareness** by different nodes/parties

The New: Repository model, e-Science-type



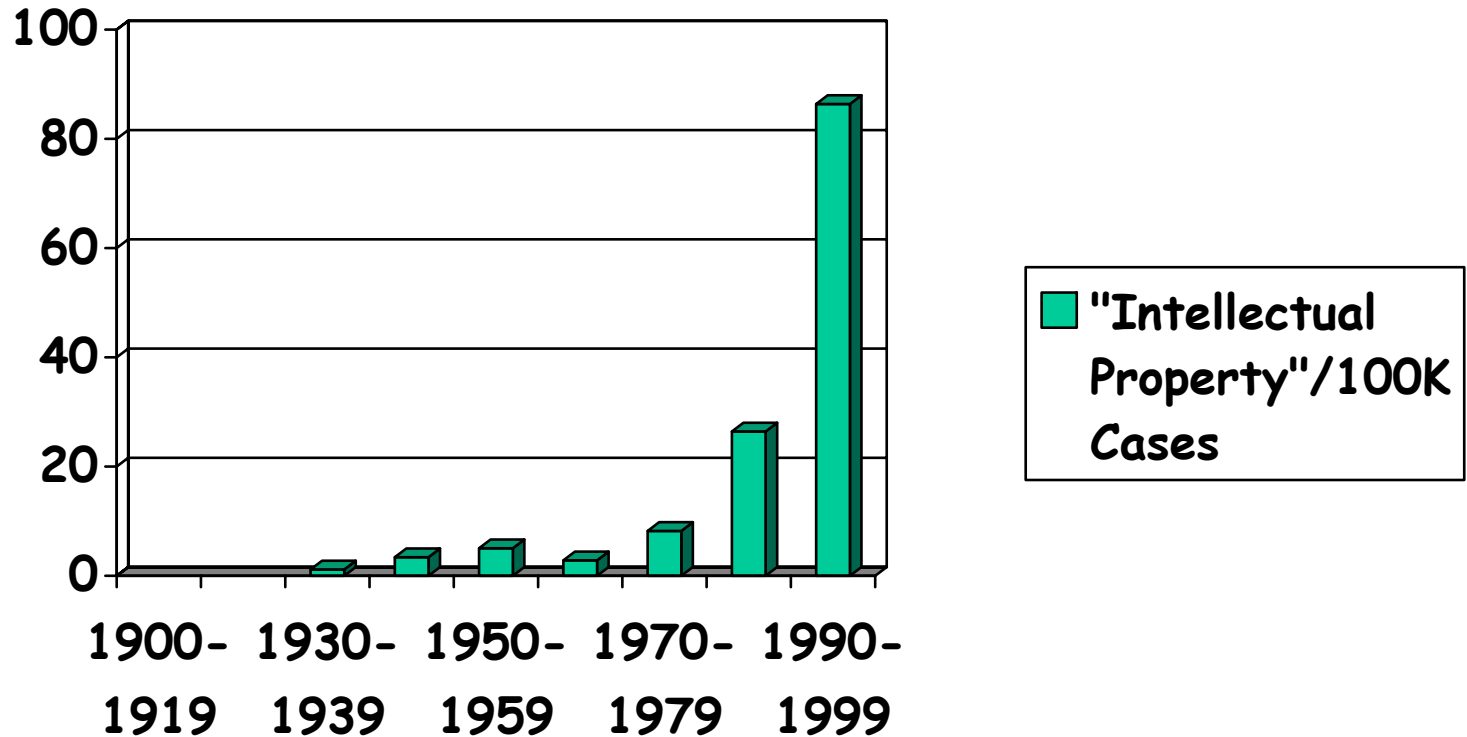
- Case 2: e-Science-type repositories
- Materials include results of data analysis, transformation, mining, modeling, etc...
- These materials need to be **Certified** too
- New value chains will emerge with these materials as their starting point
- These become 'communication units' in their own right, the start of scholarly communication value chains

The New: Repository model, e-Science-type



The New: rights framework

occurrences of the phrase “intellectual property” per 100,000
U.S. Federal Cases



“Professor Hank Greely” Cited in Lessig, L. The future of ideas: the fate of the commons in a connected world. NY, Random House, 2001. P. 294.

The New: rights framework

- James Boyle: Think about what we loose by sticking with the current paradigm!
- In this context:
 - complexities built into systems to accommodate existing rights framework
 - enormous constraints on ability to use scholarly assets: process to extract knowledge, attach knowledge, mine, evolve, build upon: **robots are the next generation readers**
 - There will be an enormous need for such use of data, information, etc
 - The established rights framework does not provide guarantees with this respect.

=> Model under pressure

Characteristic of a new system?

- Pathways model ~ NSF proposal
 - Revision of the nature of a unit of communication
 - Flexible and modular implementation of the functions of scholarly communication
 - Recording and exposing dynamics of scholarship
- Rights framework
- A barter trade ecology

New system: Pathways – Unit of Communication

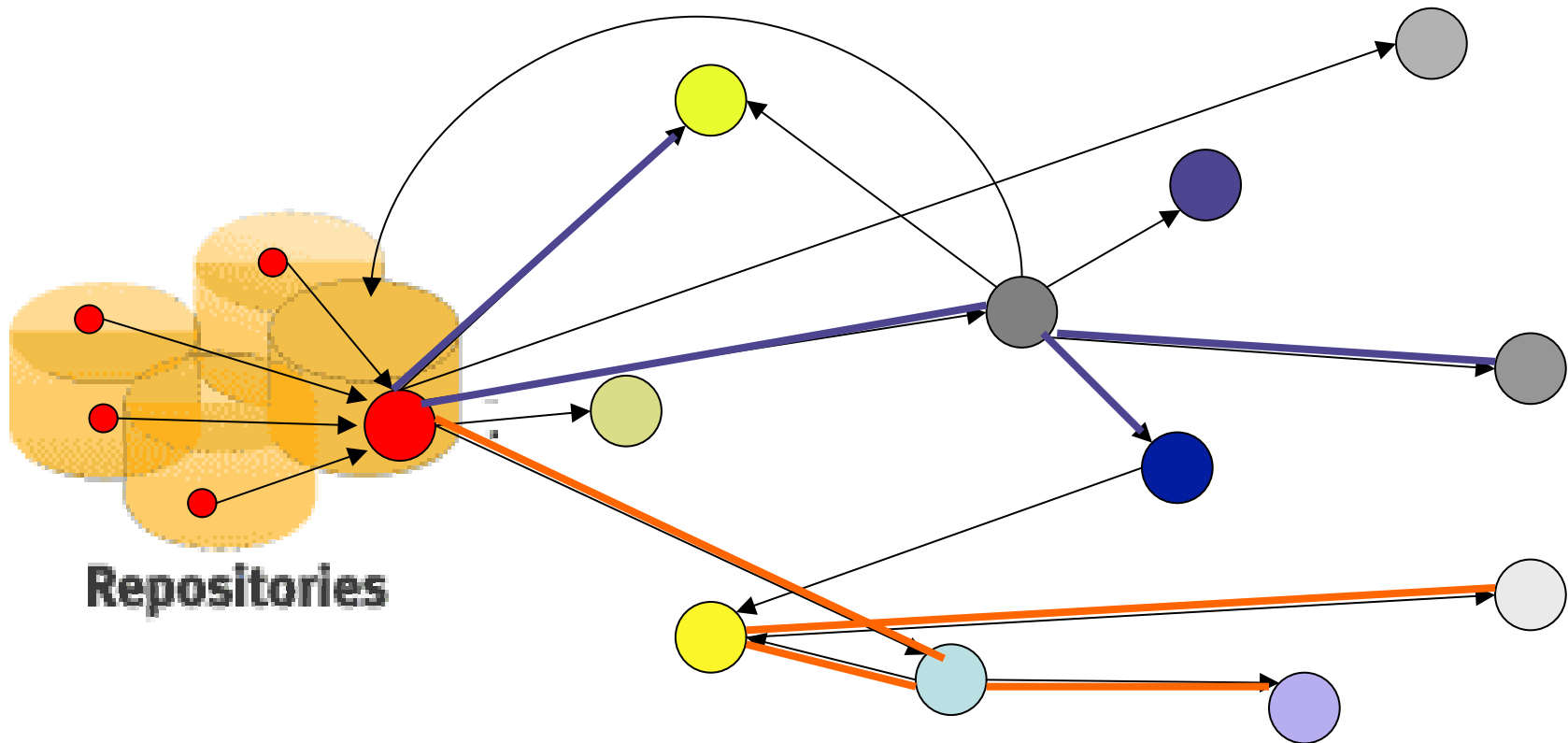
- Revision of the nature of a unit of communication:
 - Data-oriented research
 - ⇒ not only textual materials, but also datasets, software, simulations, dynamic knowledge presentations, ...
 - Research results represented by variety of digital media
 - ⇒ these media must receive status similar to that of text in current system
 - ⇒ compound objects as unit of communication
- ⇒ Facilitate collaboration, increase speed of discovery
 - ⇒ allow for early **Registration**
 - ⇒ units of communication not only 'papers' but also preprints, raw datasets, prototype simulations, ...

New system: Pathways – Modularity

- Modular implementation of the functions of scholarly communication

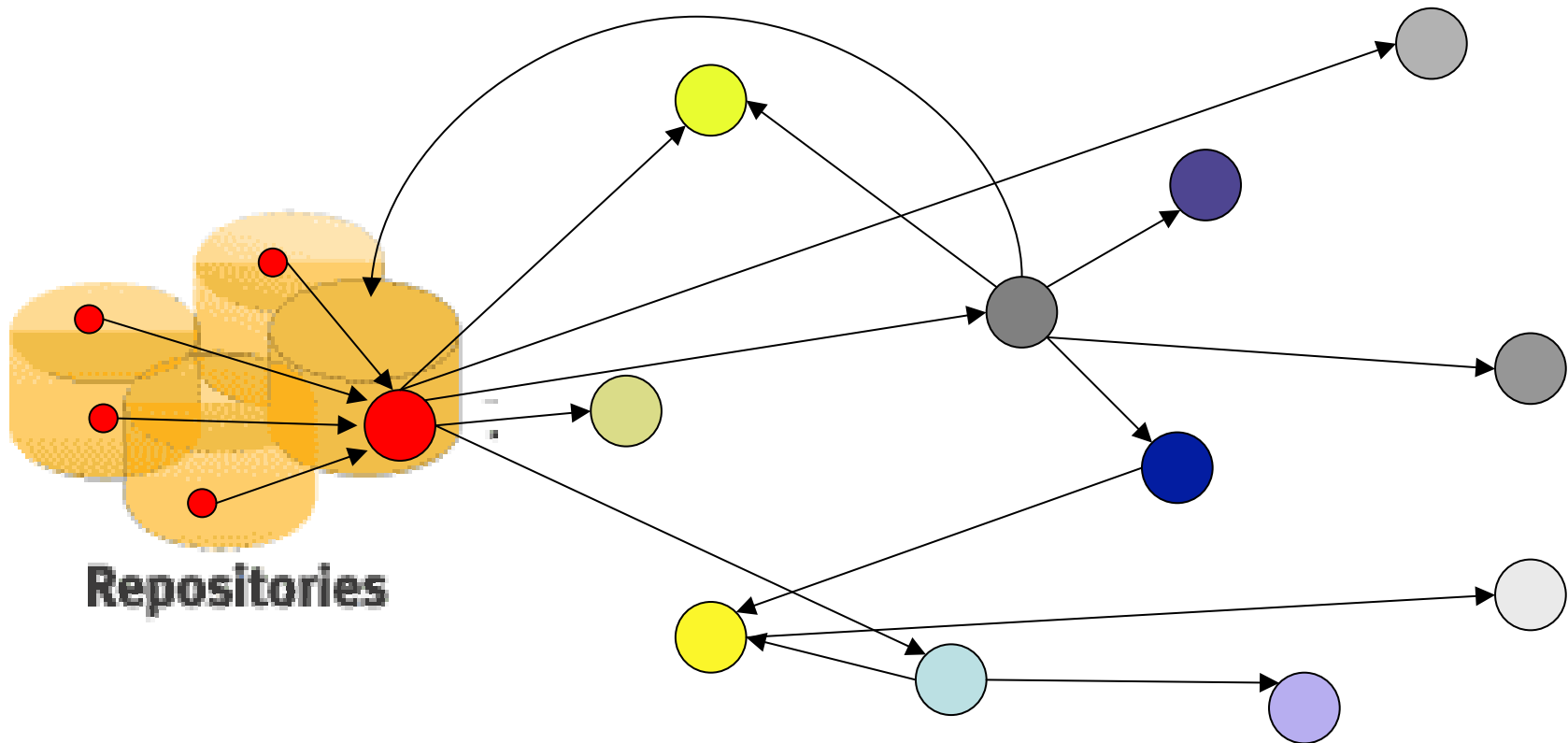


Pathways model



Registration Awareness Certification Archiving Rewarding

A global Workflow System



Registration Awareness Certification Archiving Rewarding

New system: Pathways – Modularity

- Why a modular implementation of the functions of scholarly communication?
 - => Reflects an emerging reality
 - => Leads to flexibility that is essential to be able to experiment with new ways to fulfill the functions of scholarly communication
 - => Allows for emergence of competition in a largely monopolized market
 - => Holds a promise of the democratization of access to the scholarly record

New system: Pathways – Relationships

- Scholarly system does not record an unambiguous trace of value chain of a scholarly asset
- Relationships known at the moment an assets goes through a step in a value chain are lost the second thereafter
 - *Example: preprint ~ journal article ~ A&I records ~ citations*
- The dynamics of scholarship are lost. Such information can be crucial for the development of new knowledge.

New system: Pathways – Relationships

- Need to record/expose scholarly dynamics, relationships and interactions between assets: many arcs, many types of relationships interconnect assets and actors. An audit trail of the Pathways workflow system.
 - => Trace ideas back to their origins
 - => Analyze trends at a specific moment in time
 - => Predict future research directions
 - => Basis to start defining new metrics to assess quality of scholarly assets, performance of actors
 - => Introspection of the dynamics of scholarship, very much in line with data-driven direction of research itself

New system: Rights Framework



seems to resonate better with scholarly communication

You're probably familiar with the phrase, "All rights reserved," and the little (c) that goes along with it. Creative Commons wants to help copyright holders send a different message: "Some rights reserved."

For example, if you don't mind people copying and distributing your online image so long as they give you credit, we'll have a license that helps you say so. If you want people to copy your band's MP3 but don't want them to profit off it without your permission, use one of our licenses to express that preference. Our licensing tools will even help you mix and match such preferences from a menu of options:

-  **Attribution.** Permit others to copy, distribute, display, and perform the work and derivative works based upon it only if they give you credit.
-  **Noncommercial.** Permit others to copy, distribute, display, and perform the work and derivative works based upon it only for noncommercial purposes.
-  **No Derivative Works.** Permit others to copy, distribute, display and perform only verbatim copies of the work, not derivative works based upon it.
-  **Copyleft.** Permit others to distribute derivative works only under a license identical to the license that governs your work.

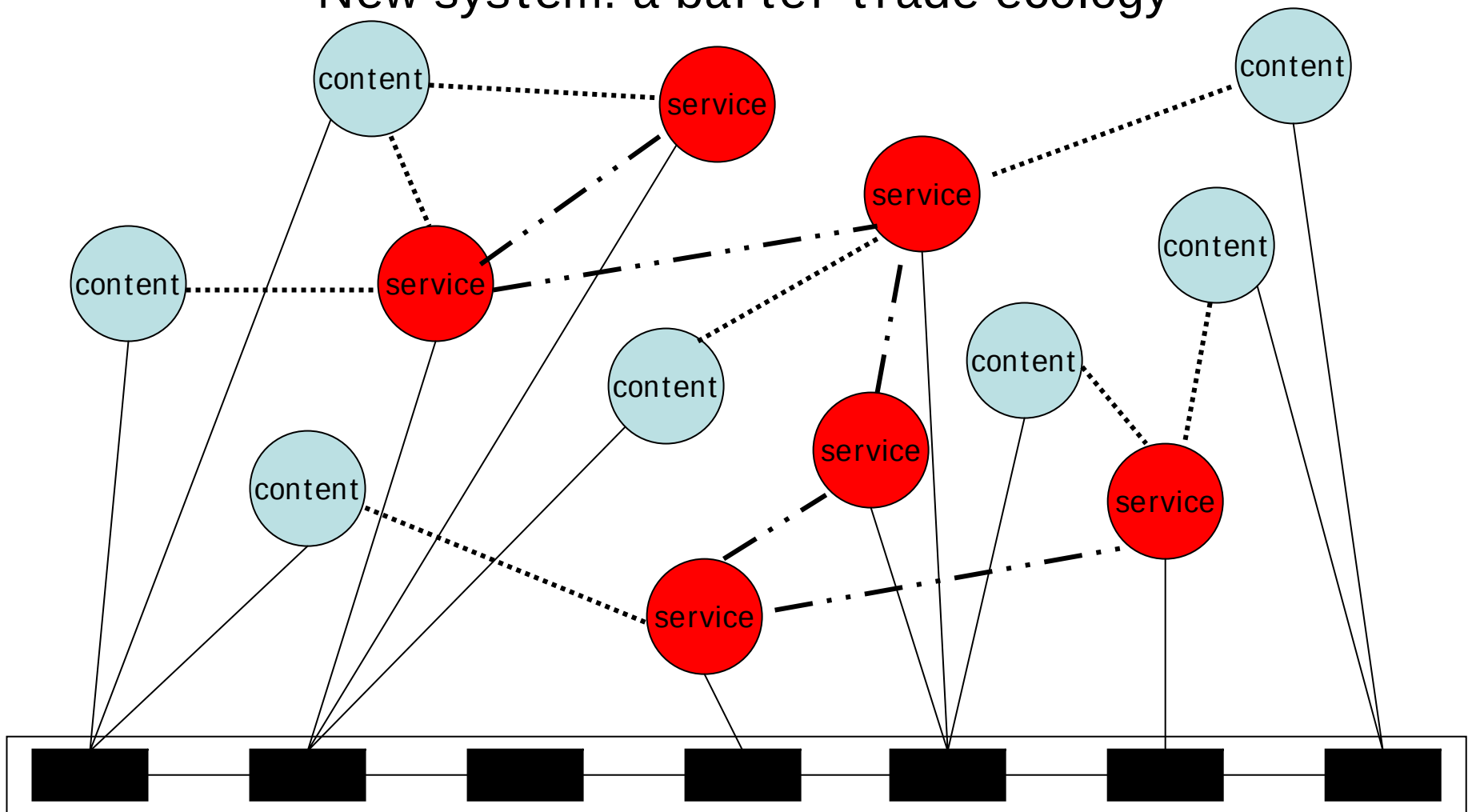
New system: a barter trade ecology

- A new scholarly communication environment based on 2 types of nodes:
 - Content-nodes ~ repositories, **Registration** function
 - Service-nodes ~ other **Functions**
- “Open access” movement focuses on open access to materials in content-nodes
- But what about service-nodes? Is the next crisis a Service Crisis?
- How about bartering content for services in an academic/research environment?

New system: a barter trade ecology

- Repository network:
 - Vision: A network of federated repositories that makes available the collective intellectual output of faculty and researchers of the world's research institutions
- Service network:
 - Vision: A network of federated services that turns into a new global scholarly value chain, and makes the collective intellectual output of faculty and researchers of the world's research institutions (re)useable

New system: a barter trade ecology



content/service Clearing House

Conclusions

- The scholarly communication system needs to be thoroughly redesigned.
- Such redesign must go beyond the – very important – open access issue.
- Other issues include:
 - Rethinking the unit of scholarly communication for it to be in sync with the changing nature in which research is conducted.
 - Rethinking the implementation of the functions of scholarly communication
 - Establishing a rights framework that resonates with the gift exchange mentality of scholarly endeavors

Comments