4 FORCES THAT ARE TRANSFORMING SCIENTIFIC COMMUNICATION

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Forces of change

INTERNET

Technical possibilities

SOCIETAL COMMUNICATION

Societal benefits

Scientific challenges

FINANCIAL / MARKET IMPERATIVES

COMPUTING
1) Scientific challenges

Knowledge is cumulative
• New knowledge builds on earlier findings.
• Faster and wider sharing fuels scientific progress.

Knowledge in the Internet Age
For the first time in history, we have a practical opportunity for unlimited sharing of knowledge at virtually no cost beyond that of providing it to the first reader.
1) Scientific challenges

Changes in how scientists communicate

“The grand challenge for scientific communication is not merely to adjust the economics of publishing… [but to] help accelerate the pace of scientific discovery now that we are unconstrained by many of the restrictions imposed by print.”

– Toward 2020 Science, Microsoft Research-Cambridge

“The traditional linear, batch processing approach to scholarly communication is changing to a process of continuous refinement as scholars write, review, annotate, and revise in near-real time using the Internet….”

– Revolutionizing Science and Engineering Through Cyberinfrastructure, National Science Foundation Blue-Ribbon Advisory Panel on Cyberinfrastructure
2) Technological possibilities

- Registration of intellectual priority
- Certification of quality/validity of research
- Multiple articles
- Awareness of new research by potential users
- Archiving of scientific record for future use
- Rewarding of scientists
2) Technological possibilities

UNBUNDLING OF FUNCTIONS
in networked environment

REGISTRATION
of intellectual priority

CERTIFICATION
of quality/validity of research

ARCHIVING
of scientific record for future use

AWARENESS
of new research by potential users

REWARDING
of scientists

ARTICLE

ARTICLE

ARTICLE

ARTICLE
3) Financial/market imperative
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New business models born of the Web

- Availability of digital publishing technologies
- Availability of ubiquitous network
- Economics of Internet – near-zero marginal cost of dissemination

“...it’s clear the current model is breaking up.”

Outsell (content industry analysts) report on journal publishing (February 2004)
Leverage enhanced return on investment in research

By ensuring research is available to all who can use it, we can:

• Stimulate & accelerate further discovery
• Translate knowledge into public benefits
• Improve information access & sharing
• Reduce inefficiency
• Enable new research strategies (e.g., data and text mining)

Most Americans Back Online Access to Federally Funded Research

May 31, 2006 – A majority of U.S. adults say federally funded research findings on health issues and other topics should be available for free to doctors and the general public, according to a recent Harris Interactive poll.
4) Societal benefits
“Public Access”

- Free online access to full-text, peer-reviewed journal articles arising from publicly funded research
- Calls for deposit of funded research in open archives
- Does not mandate journal business model
- It’s about data, too
- Foundation for integrated research environment

NIH Public Access Policy Objectives

- **Archive** – Create a stable archive of peer-reviewed research publications resulting from NIH-funded research to ensure the permanent preservation
- **Advance science** – Secure a searchable compendium of these publications that NIH can use to manage its research portfolio and that investigators can mine.
- **Access** – Make peer-reviewed results of NIH-funded research more readily accessible to the public, health care providers, educators, and scientists.
Taxpayer equity

“[W]e would expect governments (and taxpayers) to examine the fact that they are essentially funding the same purchase three times: governments and taxpayers fund most academic research, pay the salaries of the academics who undertake the peer review process and fund the libraries that buy the output, without receiving a penny in exchange from the publishers for producing and reviewing the content....

“We do not see this as sustainable in the long term, given pressure on university and government budgets.”

—Credit Suisse First Boston

Sector Review: Scientific, Technical and Medical Publishing
April 6, 2004
Authority

In US, language in federal grant agreements:

“The Federal awarding agency(ies) reserve a royalty-free, nonexclusive and irrevocable right to reproduce, publish, or otherwise use the work for Federal purposes, and to authorize others to do so.”

– 2 CFR 215.36
Expanding interest

- National Institutes of Health
- US Congress
  - American Center for Cures bill
  - Federal Research Public Access bill
- Canada
  - Social Sciences and Humanities Research Council
  - Canadian Institutes of Health Research
- UK
  - Parliamentary hearings
  - Research Councils UK
  - Wellcome Trust (private funder)
- Germany
  - German Research Foundation (Deutsche Forschungsgemeinschaft, DFG)
  - Max-Planck Society
- European Commission
Challenge for societies

Will the research you publish be part of the emerging scientific communication environment?

Source: The 2003 OCLC Environmental Scan: Pattern Recognition
The Scholarly Publishing and Academic Resources Coalition
www.arl.org/sparc

Create Change

Shouldn’t the ways we share research be as advanced as the Internet?
www.createchange.org