Peer-review's future in a world of open archives

The APS Point of View

Mark Doyle

The American Physical Society

March 23, 2001 - CERN

The APS

- Scholarly society of 40,000 physicists
- Mission is to “advance and diffuse knowledge of physics”
- Mission is not to publish journals or to make money doing it

APS Journals

- Physical Review Letters
- Physical Review A,B,C,D, and E
- Physical Review Special Topics - Accel. Beams
- Reviews of Modern Physics
- PROLA (all APS content back to 1893)
- ~25,000 manuscripts reviewed, ~14,000 published per year

Economics of APS Journals

- Budgeted to break even
- Journal income not used for other society activities (reserve fund used instead)
- ~$25 million/year
- $1000/manuscript, $1800/published article
- Reject articles actually cost more money than accepted articles (more cycles,appeals)

APS Journals Provide Services

- Peer-review
- Copy-editing and typesetting
- Distribution
- Persistent names
- Linking
- Archive

More on Services

- Phys. Rev. Lett. 86, 1 (2001) is a persistent name that results from peer-review
- Linking and archiving are new services that weren't required in paper world
- Distribution is now electronic
- Which services should the APS be responsible for?

arXiv.org

- Low cost of distribution
- Archive
- Increasing percentage of literature (90% of PRD appears on arXiv.org)
- Persistent naming

APS and arXiv

- APS and arXiv have a cooperative agreement
- APS (with BNL) hosts mirror
- APS copyright statement explicitly allows authors to use and update e-prints
- APS allows submissions directly via arXiv
- Phys. Rev. allows referees to get paper from arXiv

Overlays

- Freely accessible literature
- Low cost distribution
- Integrated metadata via OAi

Could Phys. Rev. be an overlay?

- Some might say Phys. Rev. D already is
- How does one recover costs for peer-view?
- Dependent on (unstable) subscription model
- More than just peer-review related costs need to be covered

What's missing from arXiv.org?

- True archival formats with potential for distribution via new media (XML enabled web browser, e-book, etc.)
- Robust handling of non-TeX submissions
- Rich metadata (tagged references for linking and searching)
- Quality-control
- Multimedia support (format conversions)

Orders of magnitude

e-Print Distribution	$1 - $10 per paper
Small e-journal (JHEP)	~$500 per paper
APS journal	$1000 - $2000 per paper
Commercial journal	$5000 - $15000 per paper

Paying for the added services

- APS believes missing services are essential to long-term future of the literature
- Subscription model (Reader pays…)
  - All costs wrapped up into one sum
  - Distributed costs
  - Serials crisis spiral
- Writer pays
  - Where does the money come from?
  - 2/3 from overseas
  - High energy physicists got this wrong

Cutting costs

- How much can APS costs be reduced?
- Includes editorial costs, production costs, and distribution costs.
- Distribution costs could be greatly reduced
- Electronic composition/typesetting costs could be greatly reduce
- Editorial costs are very inelastic at the scale and quality level of Phys. Rev.

The crux of the problem

- APS probably can’t get its costs below $500- $700 per article
- arXiv.org can’t add functionality without increasing it’s costs by large amounts ($100,000 per person)
- Where is the money going to come from?

arXiv and OAi aren't enough

- Automated metadata extraction
  - Authoring tools
- Automated archival format
- Automated typesetting of archival format
- Institutional permanence of archives

APS and OAi

- Starting to experiment with mode 0
- Make metadata available to various services (SLAC/SPIRES, ADS, ISI, etc.)
- Metadata export will be a service with a fee structure.