

Disruptive Transformations and Open Access

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Overview

- The Digital Revolution and Its Disruptions
- Who Values the Communication?
- New Trends Gaining Momentum
- Anchors of Established Habits
- Preserving Essential University Values
- Challenges and Questions

Phenomena of the Digital Revolution

Assertions:

- Information technology has fundamentally changed “publication,” the means for disseminating and accessing information and images, and will soon supplant printed media in the vast majority of fields and usages.
- The technology advances that accelerate this transition will continue for the foreseeable future. Scholarly publication will continue to piggy-back on much larger investments driven by other business and government sectors. The economics have been completely destabilized, and universities must adapt their practices to the emerging new context.

Digital Revolution (2)

- **Computational Power**

The price/performance of computation follows an exponential curve of improvement (Moore's law*).

Impact  On-the-fly typesetting, file compression and decompression, data presentation, Javascripts, Flash, encryption, etc.

- **Communications and Infrastructure of the Internet**

Massive investments since the 1990s by the government and the telecommunication industry in support of telephony and the Internet make the marginal cost of transmitting “normal” files (1MB) to anyone on the Internet close to **zero**.

(Long-haul fiber optics; data rates now reaching 10 Gbyte/sec.; Networks; Broadband–DSL, cable modems, and fiber to the home; Mobility–Wi-Fi, Wi-Max, Internet anywhere)

Digital Revolution (3)

- **High Resolution Displays and Printers**

Pixels and color accuracy matter, especially in graphic-intensive fields (e.g., dentistry, medicine, art history). Quality and resolution are critical to acceptance of screen displays and print-on-demand in lieu of conventionally printed materials.

Proof that the resolution and color accuracy have crossed the acceptance threshold: Digital cameras¹

- **Storage/Retrieval Media**

Storage densities in magnetic media continue to follow another version of Moore's law. (500 GByte hard drives in laptops) Flash memory drives

- **Internet Search Engines - Google, Yahoo, Bing, etc.**

Continuously caching and analyzing web content; massive server-farms and communication infrastructure; powerful search algorithms

¹ 2009 Nobel prize for physics to Charles K. Kao for fiber optic transmission and Willard Boyle and George Smith for the creation of CCDs (charge-coupled devices)

Digital Revolution (3)

- **Archiving Media**
 - DVDs for data, disk farms, tapes(!), magnetic bubbles, etc.
- **Software and User-friendly Interfaces**
 - Access to IT power by non-specialist users
- **Mobile Platforms – Smart Phones, Kindles, iPads**
 - Convenience and ubiquity

Assertion:

Convenience and flexibility of digital media are making access to printed media of dwindling importance.

*From information deprivation
to information saturation*

Historical Transformative Moments in Written Communication

*Quantum leaps in speed and volume of reproduction
and breadth of access*

- Papyrus, scribes, and portable media
- Invention of printing (China ~11th century)
- Printing press (~Gutenberg, ~1450)
- Offset rotary presses (~1900)
- Internet and the Web (~1990)

Digital Disruptions: Industries being rocked

- Recorded Music

Vinyl => CD => Peer-to-Peer => iTunes

- Photography

- Moving Pictures

Film => DVD => On Demand => Downloadable

- Newspapers

Print Subscription => Online Subscription => “Free”

- Book Sales

Retail Store => Online Purchase => Downloadable

- Commodity Generic Sales

Retail Store => Online Purchase => Downloadable

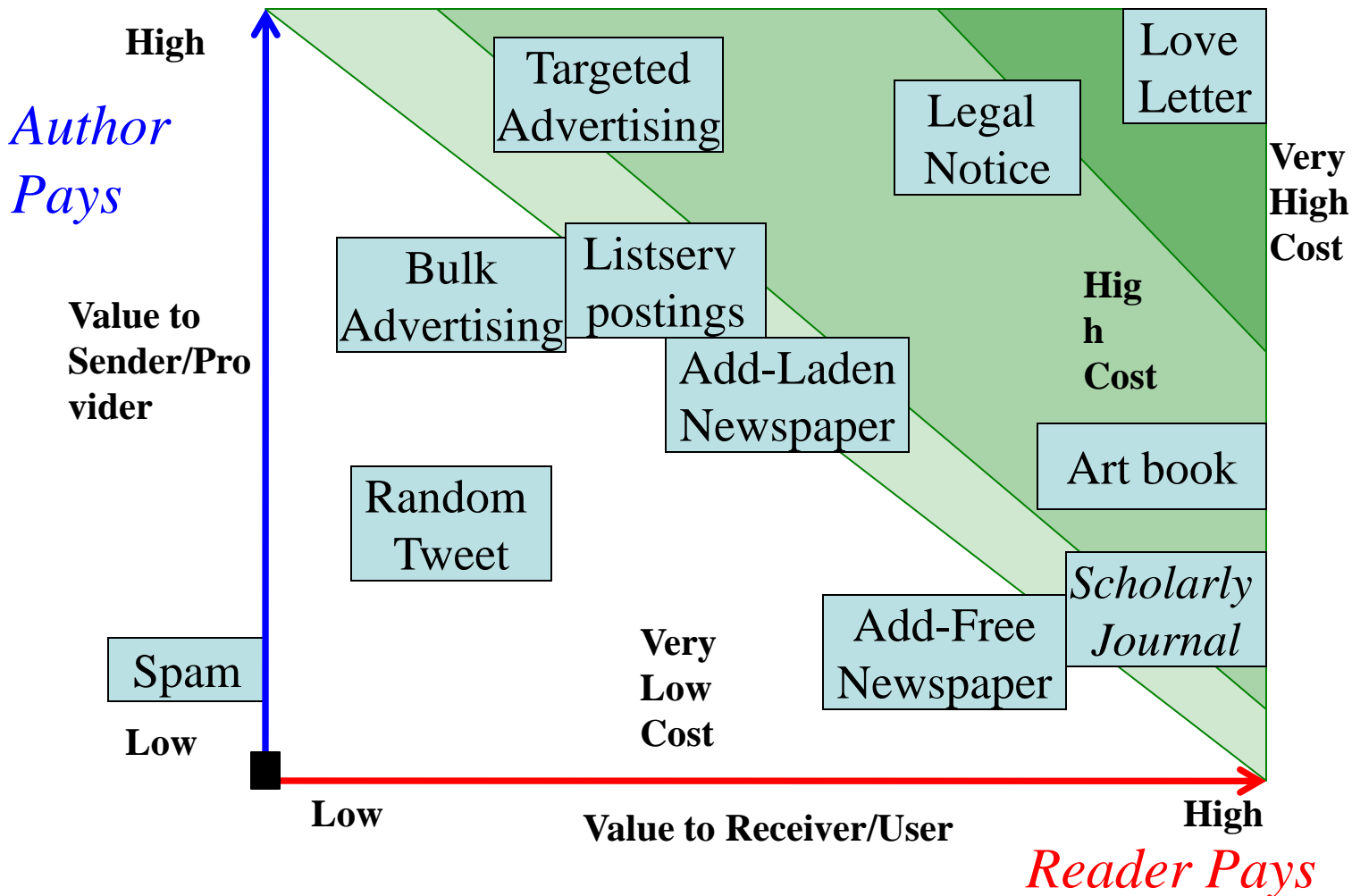
- Next??? [Scholarly Publication]

Fundamental challenge of the new digital world

Historically, control of the distribution channel allowed the cost of generating content to be amortized through pricing mechanisms connected to the physical distribution of the content.

Who will cover the costs of generating high-quality content when **perfect** digital copies can be distributed virtually for free?

The Value of Communications



**Who is willing to pay, the user or the provider?
At what price will the communication take place?**

New Trends Gaining Momentum

- Pre-print archives – e.g. ArXiv in Physics
- Self-publishing via the Web
- Access mandates: Harvard, Cornell, Dartmouth, MIT and UC Berkeley signed the *Compact for Open-Access Publishing Equity*
- Repositories
- U.S. Federal Government (NIH) required 12-month access policy (Proposed Federal Research Public Access Act of 2009 [FRPAA] would extend public access to all major Federal Agencies.)
- Open Access Journals – arising in many fields
- Google Scholar and Google Books

Is Open Access having an impact?

"Despite some tremendous efforts by proponents, open access (OA) initiatives have had only a modest effect on the publishing industry as a whole. Open access journals are not yet considered mainstream publishing venues. And while the number of peer-reviewed, full open access journals represents ten percent of all peer-reviewed journals, **estimates are that only two percent to 4.6 percent of total articles published are OA.** Experimentation continues, nonetheless. Cornell, Dartmouth, Harvard, MIT, and UC-Berkeley announced their joint support for a Compact on Open-Access Publishing that promotes the economic advantages of a robust author-pays option for scholarly publishing and urges the academic community to step up universitywide efforts to make the author-pays model more viable."

- <http://www.libraryjournal.com/article/CA6725256.html>

Seeking the New Normal: Periodicals Price Survey 2010

Budget strains force radical change

By Kittie S. Henderson & Stephen Bosch -- Library Journal, 4/15/2010

Anchors of Established Habits (1)

To what extent has scholarly publication shifted to new on-line models? Not very much to this point.²

- Tenure review process validates the quality of intellectual contributions by the number of publications in recognized high-quality journals.
- Younger faculty follow the path established by senior faculty, when senior faculty will sit in judgment.
- Journals establish their reputations over many, many years.
- Scholarly journals maintain their standing by rewarding distinguished scholars who serve as editors.

² Harley, Diane et al. (2010), *Assessing the Future Landscape of Scholarly Communication: an Exploration of Faculty Values and Needs in Seven Disciplines*. UC Berkeley: Center for Studies in Higher Education.
<http://escholarship.org/uc/item/0kr8s78v>

Anchors of Established Habits (2)

- Journals maintain the economic value of their issues by demanding assignment of the author's copyright to the publishers.
- Marketing and promotion help preserve the status of established journals.
- The comparative ease of mounting a new electronic journal causes a new journal to be viewed skeptically.

If commercial journals can move seamlessly to an on-line subscription licensing model, they will have captured the benefits of the digital revolution for their shareholders.

Alternative Open Access Model

- Research arising from university work prepared and published on-line.
- Instead of buying content from publishers (“reader pays”), universities can subsidize the operation of journals and repositories (“author pays”).

At present universities are subsidizing content creation and paying for access.

- Universities may have to help subsidize some scholarly societies, for example, by paying membership fees.
- Users can access the content without charge.
- Negotiate new archiving models and standards.

Preserving university values while transforming scholarly publishing (1)

- Retain copyright in possession of the principal generators and funders of the creative process. (Authors addenda, mandatory public access, Creative Commons license)
- Educate faculty about publishing options and promote the selection of a publishing outlet with cost consciousness.
- Support the growth of high-status highly selective Open Access journals. (Seize the benefit of the digital revolution for the sake of the generation and dissemination of research.)

Preserving university values while transforming scholarly publishing (2)

- Quality of Open Access journals must be maintained through establishing journals with rigorous peer review comparable to existing print journals. (This entails the enlistment of distinguished senior editors and credible reviewers, and developing recognition for the journal.)
- Governance of Open Access scholarly journals must preserve independence from contaminating political or commercial influence.
- Open Access journals need to be hosted by universities or other institutions (e.g., Google, cloud computing) that can recover the cost of maintaining access.
- Long-term preservation of electronic journals must be assured.

Questions and Challenges (1)

- If I am an author, why should I “give away” my work?
 - You may not be deriving any direct economic benefit already.
 - Broad recognition of the value of your ideas is paramount.
 - Sharing knowledge is a moral imperative.
 - For many creative artists, the answer is: you shouldn’t!
- Is publishing in an Open Access journal the same as placing the work in the public domain?
 - No, a work in the public domain can be incorporated into derivative works for commercial use. Open Access generally protects against commercial exploitation.

Questions and Challenges (2)

- Will my Open Access publication be recognized in promotion, tenure, and advancement?
 - The depends on your colleagues and the development over time of high-status Open Access journals.
- How will my scholarly society continue to operate without the revenue from subscriptions to our journal?
 - Universities could shift to other forms of subsidy to scholarly societies, e.g., supporting increased membership fees.
- Does Open Access provide a sustainable business model that will assure dependable access over time?
 - A shift from “subscriber pays” to “author pays” could be sustainable in many instances.
 - Journals with large audiences could adopt an “iTunes” model.
 - Direct support for Open Access journals could be partitioned.

Questions and Challenges (3)

- Simultaneously supporting both standard journals and Open Access journals will tax university resources.

Intellectual content is still very valuable and costly to produce.

- Is the Open Access model truly viable for the long term? Who will pay for the original creative work? The U.S. Federal Government (presently running massive deficits)? The State governments (presently straining to balance budgets)?

Copyrights

“The Congress shall have Power ... To promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries”

(United States Constitution, Article I, Section 8)

The original author of a work is the holder of the copyright until the author legally transfers the copyright to another agency. Copyright law provides an incentive for the creation of new works – from both proper intellectual credit and the possibility of financial gain.