



From the Editor in Chief...

## Not Free, But Relatively Inexpensive

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I have many hats. For my day job, I hang out at NASA and try to figure out how to simplify building software for flying things. In my copious free time, I'm a journalist. This entitles me to do things like attend conferences as "press" (the power of the media being such that one is sometimes better treated than the paying attendees), write this column, and worry about how all this great Internet technology we're creating is busily destroying the economics of academic publishing.

A.J. Liebling once observed, "Freedom of the press is guaranteed only to those who own one." Liebling wrote for *The New Yorker* and was a pointed commentator on the press (newspapers) of his day. He was concerned that coverage of politics and news was concentrated in the hands of a few unscrupulous newspaper publishers. Liebling died before television came to dominate the shaping of popular opinion. Presumably, today he'd be concerned about the few large broadcast corporations' control, although he wouldn't be surprised about the extent to which these corporations are more concerned with preserving their continuing profit streams than actual politics, or how criticism of the government has become muted in service of those ends.

### Information-Distribution Technologies

Books, newspapers, television, and the Internet are all technologies. It's worthwhile remembering that Gutenberg was an inventor, not a writer. The social revolution he launched was technologicaly based. Its first social bomb was not a new radical tract but a reprint of an old book. Before Gutenberg, books were the precious, labor-intensive creation of rare and skilled workers. Gutenberg's technology made it feasible for many (and, ultimately, almost everyone) to be direct information consumers and for more than a few to be direct information producers. Gutenberg's invention led to the decline of centralized authorities,

such as kings and bishops, and the rise of democracy. The powers-that-were understood this transformation's revolutionary impact — restrictions such as royal or ecclesiastical censorship in the seventeenth century were as real as totalitarian press restrictions in the twenty-first. The printing press ranks at the top of many lists of second-millennium socially transforming technologies.

### Internet Publishing

Print has defined publishing for half a millennium. Printing technology (including inexpensive paper manufacturing) has taken "things with words" from precious works of art to fish wrappers. Print has made words cheap (though color is still relatively expensive). Print provides a linear progression that demands that the mind imagine connections. Literate minds think differently; print has encouraged humanity to lose the rhythmic linguistic skills that support memorization while gaining more symbolic thinking and continuity of knowledge.

The Internet (including inexpensive semiconductor manufacturing) turns the print world upside down. You don't need to own an expensive printing press (or possess a rare broadcast license) to be a publisher. Every other grandparent or teenager has his or her own Web page or blog. However, actually getting anyone to notice what you've written remains primarily the province of big media (unless you can conspire with enough friends to distort Google's page-ranking algorithm<sup>1</sup>). On the Internet, hyperlinks, color, music, speech, video, and interactive documents are all possible, often at little additional cost or effort. The long-term intellectual effect of this change isn't clear. (I shudder at the prospect of having to include movies with my research papers. Producing words is difficult enough.) Text enhancement can clearly lead to better understanding, but it's not obvious that television, the primary exemplar of video, has honed the intellectual skills of its audience.

## Academic Publishing

Last issue I discussed disruptive technologies in the context of pervasive computing. For academic publishers, the Internet is a very disruptive technology.

Academic publishing (including professional societies like the IEEE and commercial academic publishers) has long been an interesting (and often profitable) niche. Research produces results of economic value, so society and commerce have long supported it, both through direct funding (for example, through the National Science Foundation, National Institute of Health, and Defense Advanced Research Projects Agency in the US (DARPA) and corresponding agencies in other countries) and through legal and social mechanisms (such as patents, copyrights, and public support of labor-intensive universities). It has come to pass that an “academic culture” has arisen over research, centered on paper writing, peer-reviewed publishing, and archiving.

Academic publishing has been sup-

ported by a singularly noneconomic model: most of the labor involved is unpaid. Authors write articles for the academic brownie points, and reviewers referee for the sense of contribution and membership in the community. They do these things independent of the direct economic effects. Book authors and rock-and-roll bands sign with the publishers that will produce the largest economic pie for them to share; academic authors publish with the organization with the best reputation, independently of how much money is made or lost off their work. (Academics and customers of vanity presses are the only ones willing to pay to have their work published.)

Actually creating a printed journal has real costs. People with more skill in language than engineers genuinely edit the material; typographers format it in comprehension-friendly layouts; factories with large machinery, using materials produced by other factories with large machinery, render the ideas in ink and paper;

and uniformed employees of the government deliver the results to subscribers’ doorsteps. All these activities cost money. None of the people involved seems to want to volunteer to perform them purely for the benefit of the scientific community.

## The Future of Academic Publishing

What keeps academics from just publishing on the Internet? Very little. Purely Internet journals are springing up. (See, for example, <http://info.lib.uh.edu/wj/webjour.html> or [www.pubmedcentral.nih.gov](http://www.pubmedcentral.nih.gov).) Even conventional publishers recognize the need to make their journals available on the Web. The tendency is constrained by the actual editing services offered by revenue-generating publications, the proclaimed desire of academic libraries to own their own archival copies, the desire of existing publishers not to kill their ongoing revenue streams, the inertia of readers tending to seek information where they’ve previously found it,

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and the peculiar currency of academic publishing: the “reputation” of journals.

Academic publishers do add value. I see the original submissions to this journal, and the reviewers’ comments guide the authors to great improvements. I am often astonished at how much better the articles read after our editors have exercised their magic. But these are expensive activities. We live

in a world rushing toward the most economical way of doing things. Web publishing is inexpensive with especially low marginal cost, and the population has come to believe that (except for financial information and pornography) information on the Web is naturally free.

Academic publishers still offer certification, which remains one of the

few places that people ignore price tags. (My private-university tuition, 30 years ago, was half my daughter’s inflation-adjusted tuition. I don’t think her education has been twice as good.) Universities have remained fairly immune to the evolution of technology – PowerPoint may have replaced chalk, but instruction still more closely resembles the nineteenth century than the twenty-first. The continued existence of the formal, paper-based, peer-reviewed publication depends on the (primarily University-based) research community’s resisting the powerful economic forces. Unfortunately, I bet society will take the less-expensive road in the long term.

Keep your copies of *IEEE Internet Computing*. Someday they’ll be valuable antiquities. □

**Reference**

1. J. Ogles, “Kerry Gets Google-Bombed,” *Wired*, 24 May 2004; [www.wired.com/news/politics/0,1283,63557,00.html](http://www.wired.com/news/politics/0,1283,63557,00.html).

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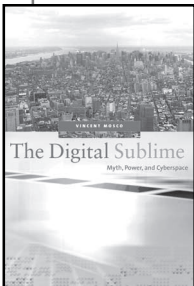
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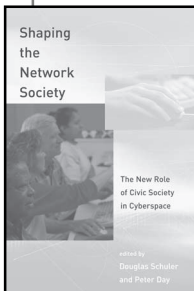
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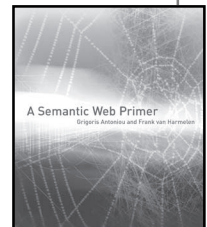
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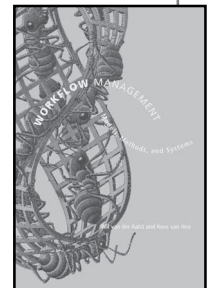


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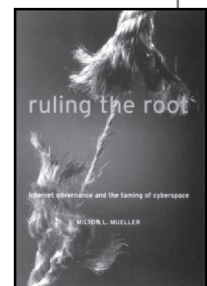


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