



# A Paperless Gamble

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*For the first time in nearly half a century, a printed copy of Computer won't be shipped as an included member benefit. I offer some thoughts on the matter.*

**A**s our 2015 IEEE Computer Society membership renewal form made clear, a mailed hardcopy of *Computer* no longer will be a core member benefit, as it has been since 1968. Print copies—for those members opting to purchase them—will now cost an additional US\$149. To paraphrase the legendary New Zealand philosopher-politician Fred Dagg, “We don’t know how unpropitious are these circumstances.”

In my view, including a print copy of a flagship publication as a member benefit is part of the cost of doing business for any professional society. In the present situation, not only is the print copy withheld, but the charge for it as an option is exorbitant. I fear that in 10 years’ time this decision will have produced undesirable consequences for the CS.

## DIGITAL INK

I’m not a print Luddite, and I’m not against online publishing. To the contrary, I envision the ultimate extension of future digital publishing to be an interwoven fabric of thought threads rather than a slowly expanding repository of static documents-cum-metadata—the latter being subsumed under what we now call digital libraries.

As things stand, content continues to be controlled exclusively by the content provider. The information consumer is passive as far as the creation of the artifact is concerned.

Even if information retrieval is nonlinear (as with hyperlinks), the traversal remains prescriptive.

For many years I’ve argued that this is an unacceptable restriction that ensures suboptimal information uptake. There should be a way to distill information into nonprescriptive presentations to more closely mirror information consumers’ interests, rather than simply formatting an author’s brain dump. The information consumer could attach information from one source to another and digitally reassemble the information into new, more relevant thought frames. Of course, a looming digital challenge is how to retain links back to the original sources so that authorship metadata will always be available and the thought threads can become multidirectional from any node.<sup>1,2</sup> (For more on my vision of digital publishing see “A Cyberpublishing Manifesto.”<sup>1</sup>)

Years back, I developed a few prototypes of such a system using the alternate data streams built into earlier versions of Microsoft Windows file managers. If you’re familiar with ADS data structures, you can imagine how bidirectional authorship chains might work.<sup>3</sup> You can’t implement such a model with a straightforward application of a cut-copy-paste



desktop metaphor. Nor can you accomplish this with the conventional storage and indexing technologies present in modern digital libraries.

With this in mind, the migration to digital print is all but inevitable. For the past six years, *Computer's* publishing philosophy has focused on digital content enrichment, including convergence formatting via PDF so that all content would be compatible with both print and digital formats. Multimedia content has been expanded and enhanced, including Chuck Severance's Computing Conversations column, featuring video interviews and so on. Software simulations and voiceover slide presentations are now a *Computer* staple. These features are noteworthy digital enhancements and innovative uses of computer.org bandwidth in service to CS members. Kudos to former Editor in Chief Ron Vetter and the *Computer* staff for all the value that's been added to the magazine's digital edition.

So, if I'm committed to new digital publishing technologies, especially those creating data structures to extend collaboration in support of thought frames and nonprescriptive, nonlinear information traversal, why would I defend the inclusion of a mailed *Computer* hardcopy as a CS membership benefit? The answer gets at the heart of what it means to be a member of a professional society. For want of a term, let's call this brand effusion.

## PROFESSIONS AND THEIR ASSOCIATIONS

Peter Denning has spent many years ruminating about what constitutes a profession.<sup>4,5</sup> He has this topic pretty well nailed down at this point. According to Denning, the four hallmarks of a profession are

1. A durable domain of human concerns,

2. A codified body of principles,
3. A codified body of practices, and
4. Standards for competence, ethics, and practice.

Over the past few decades he's validated these points within the computing profession; and, by most accounts, IT and computing professions satisfy these criteria.

But what is it to be an association serving such a profession?

Let's drill down a bit into Denning's analysis. He distinguishes between a discipline and a profession. Disciplines are fairly well-defined areas of scholarship, and traditional university areas of study are disciplines in this sense. Disciplines also contrast with crafts, trades, and guilds, members of which share an affinity and perhaps an organizational membership but aren't bound together by a well-defined, widely accepted body of knowledge that would qualify as a discipline in a diversified, well-rounded university or college. On this account, computer science and computer engineering would be disciplines within the profession of computing, while sundry tech support

could have very different expectations in terms of services. Societies must also understand that if they're to be successfully inclusive, there must be some overarching service or brand that *all* members can relate to. That includes symbolic information-rich vehicles for communication that are shared among all members.

## DIGITAL LIBRARIES 101

I was on the ACM Publications Board as its digital library was evolving and taking shape. The ACM DL was one of the first—if not *the* first—complete offerings of this type for a professional society. It was designed to simultaneously satisfy several membership demands.

First and foremost, it attempted to provide quicker delivery of scholarly research to interested members via networking. When it launched in the early 1990s, ACM's and the IEEE Computer Society's academic and institutional subscribers were connected to the Internet, so the timing was right.

Second, it sought to reduce the cost of information delivery. By the time of the DL launch, most of ACM's

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areas would fall within subprofessions, crafts, trades, or guilds where licensing and certification rather than university degrees are the coin of the realm.

A professional computing association must focus on the profession as a whole, not just one of the disciplines, trades, crafts, or guilds that make it up. These inclusive societies must be mindful that their constituencies

leadership felt that digital delivery was inevitable, and that such delivery would significantly reduce the marginal cost of publications to the point where it would be economical to bundle digital collections to consortiums of libraries, universities, and so on at a fraction of the individual subscription cost. Two very attractive consequences were also anticipated: first, the effort

would ultimately save ACM money, and second, as a result of the new cost structure, it could offer more publications to serve increasingly smaller niche audiences.

In addition, there were collateral advantages. SGML-derivative document structures could render easily for both print and digital output via Postscript/PDF/LaTeX and HTML (well, not so much in LaTeX, but that's another story). Moreover, the peer-review system could be automated by means of the same digital infrastructure as the

innovators in the included disciplines rely on DLs and websites far more than other members. So neither the DLs nor the websites are ideal candidates to carry brand identity.

Part of what it is to be a professional is to network with other professionals in related areas. And the success of such networking requires self-identification with the group. Sociologists explain this in terms of social identity theory. Our

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production system. Finally, the entire repository would be indexed and searchable virtually without limit. This experience has since been replicated many times by professional societies worldwide with widespread success.


The reasons for the ACM DL's successes are now pretty obvious to all: separation of production costs from the subscription base, lower overall marginal production costs, amortization of expenses over a subscription base that can expand after production, ability to economically deliver information and content to ever-narrowing constituencies (because publication content comes from volunteer editors and reviewers, the cost of content generation to the organization is essentially in the editing and layout), integration of peer review with the production process, and so forth. DLs translate into more cost-effective information delivery to members, pure and simple.

As great as DLs and online publications are, they don't satisfy our criteria of being information-rich communications vehicles sharable within affinity groups. Only a subset of a society's membership relies on the DL and digital push products as primary information feeds. Simply put, researchers and

self-image is a function in part of the many groups with which we identify. Part of such self-identification and shared experience involves shared communication and association with a brand, and that's where the print version of *Computer* comes in. In other organizations that I've been associated with, their printed magazines have been in more or less continuous circulation. It's part of the professional hand-off process for potential members, colleagues, and interested students: *Computer* helps the profession focus on the relevant issues of the day.

*Computer* remains the CS's most visible brand. Think of it as an organizational logo with content. The fact that it will still be available in digital form via the CS Digital Library and IEEE Xplore isn't the same: you can't circulate a copy to a kindred spirit with an earmark or sticky note attached using Xplore. You don't get attracted to an affinity group through indexable and searchable databases. Facebook is ubiquitous; SQL isn't. Members of organizations associate themselves with objects of common interest that are portable across social situations. *Computer* qualifies; DLs don't. Neither do membership cards. DLs are the ideal

vehicle for technical research publications, but not for casual reading by colleagues. It's both inconvenient and impersonal to share mutually interesting information from opposite sides of a Web paywall. The barrier is too high to be effective for bonding.

Now for the coup de grâce of my argument: Berghel's Digital Epidemiology Hypothesis. Reading the print edition of *Computer* is 97.6 percent safer than reading it on a mobile platform—hardcopy is a poorer habitat for bacteria and viruses. Eliminating the print copy as a member benefit may lead to a sudden increase in *E. coli* dispersal in high-tech offices globally. If there's a sudden outbreak of MRSA in Silicon Valley, don't say I didn't warn ya! (The validation of my hypothesis is left to the reader, but remember to wash your hands after reading—unless you're reading the print copy, that is!) 

## REFERENCES

1. H. Berghel, "A Cyberpublishing Manifesto," *Comm. ACM*, vol. 44, no. 3, 2001, pp. 17–20.
2. H. Berghel, "Value-Added Publishing," *Comm. ACM*, vol. 42, no. 1, 1999, pp. 19–23.
3. H. Berghel and N. Brajkovska, "Wading into Alternate Data Streams," *Comm. ACM*, vol. 47, no. 4, 2004, pp. 21–27.
4. P.J. Denning, "The Profession of IT: Who Are We?," *Comm. ACM*, vol. 44, no. 2, 2001, pp. 15–19.
5. P.J. Denning and D. Frailey, "The Profession of IT: Who Are We – Now?," *Comm. ACM*, vol. 54, no. 6, 2011, pp. 27–29.



Selected CS articles and columns are also available for free at <http://ComputingNow.computer.org>.

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