

# THE END OF INFORMATION & THE FUTURE OF LIBRARIES

by Phil Agre

**M**y work has involved thinking about basic ideas of technology in ways that let us see them as products of social processes, and as part of social processes. For example, computing has very particular ideas about how to represent human activities. These ideas have histories. They could be different, and they have significant consequences for privacy.

Let us consider a basic idea of computing, information. We all think we know what information is. Computer people and librarians both define their work in relation to something they call information. But I want to suggest that information might be an obsolete concept, and that emerging technologies are yelling in our ears to move along to other, different concepts.

What is information? We can define it in a narrow technical way. Shannon defined one notion of information in his theory of the capacity of a communications channel; information for him is measured in bits, and each bit is a distinction that is meaningful to the parties on each end of the channel. Bateson said something similar when he defined information as differences that make a difference. Computer people often speak of information in terms of the states of digital circuits that represent binary states of affairs in the world.

In each case, information is an idea that builds a bridge between the states of artifacts and meanings in people's lives. We often hear that this is an information age, or an information revolution, or that information rather than capital is now driving the global economy. It is not at all clear what any of this means. I think that in practice we tell three stories to ourselves about information. Each story profoundly affects our thinking by encoding particular views in us about the relationship between designers, information users, and information itself. I will refer to these stories as information processing, masculine transcendentalism, and information professionalism.

### Story #1 — Information Processing

Computers originate in automation; "computer" was originally a job title, not a machine. Early computing methodologies were modeled on industrial automation methods — a flowchart is really an industrial process chart. When you hear the phrase information processing, therefore, I want you also to hear phrases like food processing and sand and gravel processing. Information, according to this story, is an industrial material like corn or oil or metal. The information processing story assigns particular roles to designers, users, and information:

- designers — industrial engineers
- users — factory machines
- information — processed material

### Story #2 — Masculine Transcendentalism

I take this marvelous phrase, masculine transcendentalism, from the historian of technology David Noble. We can see masculine transcendentalism at work in *Wired* magazine, or in all of the hype around artificial intelligence or virtual reality. The story is this: someday soon, the physical world is going to wither away. Everything is going to become digital. All of our minds will be downloaded onto machines. All of our books and paintings will move into digital media. We will no longer have bodies, and, most amazingly of all, we will work in the paperless office. Noble's brilliant insight is that this is a religious worldview, and his historical research demonstrates compellingly that it developed *out of* a religious worldview without any particular discontinuity along the way. It is a millenarian worldview in that it posits a perfect future in which everything will be transformed. It is a transcendental worldview in that it calls for the whole world to be raised up and dissolved into an incorporeal realm that leaves the body and all the messy stuff in the social world behind. It sounds funny and hyperbolic when you frame it this way, but it is an enormously influential way of speaking in industry and elsewhere.

Here, then, are the basic relationships posited by masculine transcendentalism:

- designers — prophets
- users — caught up in an inevitable rapture
- information — the fabric of heaven

### Story #3 — Information Professionalism

Information professionalism is a story that both computer people and librarians tell, but I want to focus on the librarians' version here. This story goes: we are professionals; there is this stuff called information; and our professional expertise consists of managing large bodies of information and connecting people with information. These professionals are generalists, or specialized at most to very broad areas, and libraries treat very disparate kinds of stuff in the same way. This view is understandable when you have a dozen librarians in a library building, and they are buying, cataloguing, and managing information that a hundred different kinds of people are using. The librarians need to routinize their work, and they need highly rationalized, detailed procedures so that the product of their work — a catalog, for example — is uniform and so that this product can be produced efficiently. Libraries have themselves been factories in many ways — thousands of books just have to get catalogued. None of this is a criticism of librarians, who have been working within the constraints of particular technologies and institutions. Here, then, are the relationships that the information professionalism story posits:

- designers — professionals
- users — individuals with information needs
- information — homogenous stuff to be stored and retrieved

I do believe that information technology is contributing to a major change in the world, but I think that this is precisely a change that makes each of these stories obsolete. The old-fashioned factory story is already under heavy attack — we've automated an awful lot of tasks already, and the resulting machinery requires a lot of skill and expertise to use. But it is striking that we haven't often questioned this view in the context of information.

Masculine transcendentalism, for its part, is really one of those yesterday's tomorrows, like the Jetsons. If we look at what is really happening in the world, we see information technology as a nervous system for the physical world, not as a replacement for it. (See, for example, TNO 1(5).)

But it's information professionalism that I really want to focus on. The problem with information professionalism is really a problem that the others share underneath: it treats information as a homogenous substance. A good way to think about information is that it's the professional object of librarianship. Every profession has its object: for law everything is a case, for medicine

everything is a disease, and for librarianship everything is information. In each case, someone walks in the door with a problem, and the professional's job is to find their object in that problem, and to talk about the problem in a way that makes it sound like a case, a disease, or information that can be compared with other cases, other diseases, or other information.

There's a deep trade-off: each profession achieves generality by reducing everything to a common denominator, leveling everything to common terms. Each profession can help everyone, but they cannot help them very well. Library materials are indexed in a very sophisticated way — certainly much more sophisticated than the keyword searches that prevail on the Internet — but it is one uniform indexing scheme, despite the many different places that different patrons might be coming from in their lives.

We can think about solving this problem by using information technology to support several different coding schemes, and I think this is a good thing to do. But I want to back up and suggest a more radical approach. Let's get beyond the stories we have told ourselves about information and tell different stories about different sorts of objects.

I want to suggest that the defining feature of our new world is that people talk to each other, a lot, routinely, across distances, by several media. It makes no sense any more to ask how individuals use information. Instead, let us ask how communities conduct their collective cognition. Let's define a community as a set of people who occupy analogous structural locations in society. The residents of Palo Alto are a community, but so are cancer patients, corporate librarians, and people who are in the market to buy any particular sort of product. Emerging technologies allow communities to think together. The fact that cancer patients can think together is already turning medicine inside-out. The fact that customers in computer-related markets talk intensively to one another on the Internet is increasing the amount and variety of information in the marketplace. The future, in my view, belongs not to information but to this active process of collective cognition in communities.

It might be objected that we will always have libraries and bookstores, and they will still be full of information. But that's not the best way to look at it. The first thing that library cataloguing schemes lose is the dialogic nature of articles and books: they are all turns in a conversation, responding to a particular literature or cultural background and addressed to a particular audience. Every community conducts its collective cognition through diverse mechanisms, from

rumors to conferences to newsletters to wandering bards to Internet mailing lists to articles and books. The library is one window on this whole dynamic interplay, but it is not a window that lets us see that dynamic interplay very clearly. Perhaps it is an artificial window, a means to serve a subset of "information needs" that is largely an accident of past technologies and institutions. Many different kinds of energy pass through the library, but the library reduces them all to information retrieval, a homogenous category that it can work with.

The solution, I think, is not to pave the cowpaths by automating the institutions we have now. Instead, I think we should explore the full range of means by which we can support the collective cognition of communities. Every community has its own mix of communications mechanisms, its own history and institutions, its own symbols and vocabularies, its own typified activities, its own constellation of relationships, and perhaps most importantly its own genres of communicative materials.

If we want a focal concept to replace information, we might want to choose genres. Genres are stable, expectable forms of communication that are well-fitted to certain roles in the life of some particular communities. Business memos, opinion columns, action-adventure movies, Interstate Highway signs, business cards, and talking-head TV political shows all have stable forms that evolve to serve needs in the midst of particular activities.

I don't think we should be automating information professionals out of business. Quite the contrary, I think we should be giving them a bigger job: reaching out to support the collective cognition of particular communities. This might include systems to support the creation, circulation, and transformation of particular genres of materials. It might include setting up and configuring mailing lists or other, more sophisticated tools for shared thinking. It might include both face-to-face and remote assistance. Distributed alliances of librarians might support specific distributed communities, while comparing notes with one another and sharing tools.

This view has many consequences. It follows, for example, that a digital library isn't one big system but a federation of potentially quite different systems, each embracing a range of functionalities and fitting into people's lives in potentially quite different ways.

It also follows that each community will have, to some extent, its own

infrastructure with its own evolution. Standards are crucial. Tools for shared thinking work best when everyone is using them, and so supporting a community's transition to new tools will require consensus-building, well-timed coordination, training, and a shifting division of labor between professional librarians — or, as we might start calling them, communitarians — and mutual aid and self-help among a community's members. No more factories, no more millenarian fantasies, no more isolated information warehouses. Instead, perhaps, we might be able to build, and help other people to build, the interconnected pluralistic society that we so badly need.

## **A HOUSE DIVIDED AGAINST ITSELF: ACRL Leadership, Academic Freedom & Electronic Resources**

**by John Buschman**

**B**ecause of our affiliation with the values and norms of higher education, I believe that academic librarians have a key role to play in articulating what intellectual freedom means as it is applied to our profession and new information resources. Specifically, the privileges and responsibilities of academic freedom are a strong — and respected — partner to our policies on access, equity, and intellectual freedom. Academic librarians, therefore, should have a particular insight and responsibility for articulating these issues with clarity of language and purpose. However, ACRL's leadership has a mixed record in the case of the interpretation of the Library Bill of Rights, "Access to Electronic Information, Services, and Networks" passed by the ALA Council on January 24, 1996, and I believe the principles of academic freedom form a benchmark against which we can take some measure of this.

Let me first say that I believe it is good news that the American Library Association (ALA) has spelled out some professional principles regarding electronic information resources — and has linked those to longstanding professional values in the Library Bill of Rights. Freedom of expression is described in the January 24, 1996 document adopted by the ALA Council as "an inalienable human right and the foundation for self-government" and this right is expressly linked to "the corollary right to receive information." It is encouraging to see ALA stake its turf by claiming that "based on its constitutional, ethical, and historical heritage, American librarianship is uniquely positioned to address the broad range of information issues being raised" by electronic information resources. In the process of articulating these principles in sections on the "Rights of Users" and "Equity of Access," the interpretation mentions a right to privacy, the need for preservation, and a special obligation to make electronic government information available. Finally, I am relieved to see ALA recognize the need to review these new