



Media, networks, and content

by A. Lippman

The more distant a person is from technology, the greater that person deems it to be the engine of social action. The lay press and our own relatives constantly ask us at the MIT Media Laboratory whether the Internet will converge with television, and how television will become interactive. They tacitly assume that technology will drive applications instead of the other way around. The populace at large and the popular press seem to live in fear that we will forcibly yank away their remote controls and replace them with mice and joysticks, that we will transform the living room from a place of relaxation to a field of *Doom*, and that we will do so merely by inventing it. Adoption and alteration are not options.

For those of us engaged in research and invention in this area, these questions miss the point. We know that advances in communications will not change society by themselves. We create the easel, but the canvas will be painted by the public. To a great extent, the measure of a communications system is how rapidly control of it migrates from the laboratory to the kitchen—how quickly it becomes owned by its users rather than its inventors. Such technologies are, as Ithiel deSola Pool put it, true technologies of freedom. They are democratizing agents by their very nature.

The public has always rapidly taken charge of communications when the political structure permitted it, most obviously in the United States. (In more restricted places, the transition was merely artificially delayed.) The telegraph was not invented for news-gathering; it was intended to aid railroad signaling and the military. Yet the first newswire from Labrador to Maine and Boston was operating within two years of the invention of Morse code. Radio was the

savior of ships at sea, where no wire could go, but mention radio today and few think of a walkie-talkie, they think of AM and FM. The telephone was not invented for idle chatter, but such use became common, although at a slower pace. Indeed, if you ask a broadcaster or viewer about an invention in television, he or she is more likely to respond that it is the miniseries rather than color or clarity. The cassette rental store is a more seminal invention than the videocassette recorder (VCR) itself.

It is the content, not the intent that is the ultimate determinant of where any medium will go, and indeed, whether a technology is a medium at all. Is it rich? Can it carry the range of expression we demand? Is there a mechanism to accommodate it in the broader commercial world? The Internet has revived interest in these issues with new public force. Part of the reason is that the underlying bits and pieces, the personal computer and its various interconnections, have diffused through society in advance of its use for traditional entertainment. It begs linkage because the Internet and the television both routinely carry sound and images. Add to this the fact that television is on a course to end-to-end digital representation; the movies are already created in computers as much as on soundstages; and music is already digital. The days when more people think that their alarm clock is digital rather than their computer are past. Broadband networks are not merely getting closer to home, they are assumed. The future of media is on the public agenda. And although technical invention alone cannot define the issue or the outcome, it has a role to play. We as technologists can clarify the dimensions of the problem.

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Why the Internet will intersect with broadcasting

Broadcasting and publishing have two dimensions, a social one and a technical one. Socially, mass media bind us together as a society and as a world. If publishing did not exist, someone would invent it, either to find a way to obtain election results or to allow us to share our enjoyment of World Cup Soccer. Usually, there is also a technical component that creates publishing and broadcasting industries. Often this technology supports a limited monopoly on the means of creation, delivery, or reproduction. In the 1930s, Bill Paley ran a wire to Chicago, so he owned a network, and no one else did. Similarly, the radio frequency spectrum is allocated in all areas of the world; once granted, it becomes a monopoly. In the case of books, the printing press, paper, and type were initially beyond the means of the populace and kept so through the agency of guilds.

Technology evolves to erode this monopoly. We can now print books at our desks, we can make reasonably high-quality movies on a home computer, and the last of the first major recording studios (ElectroVox, in Hollywood) just closed. Recordings are made with equal facility in a garage or basement. This is natural evolution. It enhances access and is created as much by public demand as by technology push. All that is needed is the instinct to take a commercial or expensive resource and transform it into a personal utility, the rest will flow naturally.

The Internet is more disruptive than that. Previous inventions tended to support existing industrial structures and accelerate their efficiency at least as much as they shifted control to the consumer. The transistor radio supported broadcasting and helped it grow, as did the compact audio disk. The consumer VCR derailed television to some extent by moving an exotic device into living rooms, but it transformed the movie industry.

More than erosion, the Internet has exploded much of the basis for any monopoly associated with media. Nowhere is this more clear than in music, where a program written as a convenience for dormitory neighbors (Napster) has deeply threatened the music publishing industry. Visual entertainment is not far behind. On Friday, June 30, 2000, *The Wall Street Journal* published a story about a father who built a digital VCR for his home network so that his daughter could catch up on broadcasts that she had missed. He later expanded it into a Web page to let her

friends tune in to his programs, and ultimately built a business.

Both of these examples are striking because they wrestle distribution of media from the owners of that media and place it in the hands of the community. This is the sort of empowering act that rallied the public around the Internet in the first place. In the words of Howard Rheingold, the network is a *place of assembly*, a community space. The Internet responds to that in spades, and it is this community control that will dictate the way publishing and network merge. Further, the Internet is an empowering technology *by its very nature*. Broadcasting is one-to-many, telephony is one-to-one, but the Internet is many-to-many. Access and contribution go hand in hand.

The papers in this section of the issue consider the implication of this new technology on personal expression, both from the perspective of individual creativity and personalized access. Pinhanez et al. describe narratives that are propelled by the physical engagement of the participant or viewers; Davenport et al. envision stories that are told through architectural spaces instead of cathode ray tubes; Sparacino, Davenport, and Pentland imbue synthetic characters with intelligence and responsiveness to allow a new measure of control; and Bove et al. provide a scripting structure for distribution embedded in a demonstration that merges mass media with private interactions among the viewers. Elo Dean and Weitzman and Emnett and Schmandt address how the network itself becomes the basis for distribution that is quite literally created at the point of reception rather than origination. Bender et al., Haase, and Koen and Bender extend this to diverse language and large databases and include the temporal dimension. The remaining papers by Paradiso et al., Gruhl and Bender, Lieberman and Selker, Gerasimov and Bender, and Schmandt et al. form a suite in which the computer is replaced as the focal point with the physical world, both for its own sake and as a controller for content.

These papers present an unabashedly optimistic view of the potential for society and for invention. But each author accepts that the audience for his or her work may or may not be those for whom it is intended. Society at large, and particularly the young, who have no limiting history to escape, will do that part of the job.

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