

Before the Internet, There Was Cable

Jennifer S. Light
Northwestern University

Internet history, it seems, has arrived. From Janet Abbate's *Inventing the Internet*¹ to Robert Cailliau and James Gillies' *How the Web Was Born*,² over the past several years, historians of computing have turned the increasingly pervasive present-day network into a subject for rigorous historical inquiry. As we continue to uncover more details to explain the Internet's metamorphosis from a defense communications system to a civilian communications network, it is important to recognize how many of its uses today realize the fantasies and forecasts attached to earlier innovations. This is most clear when we examine the Internet's development in light of cable television history.

To date, historians of computing have paid limited attention to cable television. Cable, a broadcast system delivering information via underground coaxial cables rather than over-the-air signals, has been a popular medium for entertainment in recent years. Yet earlier in its history, cable looked quite different. Developed in the 1940s as a technical solution to retransmit broadcast signals for residents of mountainous areas with poor television reception, in its infancy, cable functioned as an alternative television technology—it was sometimes called *community antenna television*. By the 1960s, however, the potential of cable-based networks to deliver two-way communications led users to reconceptualize the technology as a provider of services beyond the traditional network shows. For two decades, the innovation we today think of as an extension of television came to be known as *cable communications*, a system not merely for broadcasting but also for communication and information exchange. With channels planned to deliver advanced interactive services ranging from continuing education to home banking to participation in local government meetings, cable was the information technology forecast to provide the route to a future networked society that looks strikingly familiar to Internet enthusiasts today.³

Early aspirations

Consider the work of RAND Corporation analyst Paul Baran. Working on contract military research in the early 1960s, Baran was keenly aware of vulnerabilities in the nation's centralized defense communications systems; a single strike could disable the entire network. Baran sketched plans for a distributed system designed to survive a nuclear attack, and Arpanet, the military's precursor to the Internet, followed from his proposal.

These ideas, as Baran explored them in *On Distributed Communications*,⁴ are well known to computer scientists and computing historians. Less well known is how Baran built on the concepts in a later paper, *Urban Node in the Information Network*,⁵ a collaboration with Martin Greenberger of the Massachusetts Institute of Technology and Project MAC.⁶ As his RAND colleagues began to court new contracts for domestic urban research in the latter half of the 1960s, Baran began to consider how his ideas about the organization of defense communications infrastructure might have civilian applications for improving life in American cities.

The collaborators' 1967 report characterized cities as overgrown "nodes" in the nation's information infrastructure. Baran and Greenberger urged that steps be taken to disperse America's urban populations and suggested that "emerging computer-communication networks"—more specifically, cable-based communications—be further developed to maintain human connections:

Let us visualize a society where each person has simultaneous access to a large life-size, TV-like screen and computer input device that can communicate with one or more individuals or computers simultaneously anywhere and at tolerable cost.⁷

Such distributed communications, they proposed, could "help alleviate some of the urban sores which previous technologies have aggravated."⁸

Baran and Greenberger were not alone in seeing promise for improving the quality of life across the US by combining innovations in computing with cable communications. In the late 1960s and early 1970s, a cadre of academics, activists, and local government officials shared that view. Computing researchers at universities and think tanks flirted with cable only briefly, but that so many turned their attention to this technological system hints at a missing chapter in the history of information technology and the conceptual history of the Internet. Long before Arpanet escaped the confines of the specialist worlds of military and academic research, it was cable-based communications that seemed poised to provide the nation—and eventually the world—with the infrastructure for two-way communication and information exchange in business, government, and everyday life. From Paul Baran and Lloyd Morrisset,⁹ to RAND and MITRE, to the Markle Foundation and the National

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Science Foundation, more than a few of the individuals and institutions recognized today for their participation in Internet history explored related ideas about information networks in their work and the medium we now call cable television.

Substitute the word Internet for cable in documents on information infrastructure from this period and one could be reading a news story or government report of recent vintage. At RAND, for example, Baran's colleagues in the Communications Policy Program turned their attention from research on defense communications to questions about policies for the nation's cable infrastructure. Robert Yin summarized their visions of the future in a 1972 report:

The new systems will mean that television can be used for many new services. These include: a) personal services, e.g. shopping, banking, and voting, in which the services can be carried out via television and hence without requiring a person to leave his home; and b) new community services, e.g., opportunities for improved communications among community and governmental groups. Indeed, one consistent theme is that advanced cable systems can provide the opportunity for people to communicate more with each other, whether through "community information centers" that connect residents and governmental services into one happy electronic clan, through group dialogs among geographically dispersed communities, or through uses by public institutions like hospitals, schools, and other public services.¹⁰

Hopes for cable networks' social and economic possibilities look especially familiar. Like the multisector coalition committed to closing the digital divide today, for a time, efforts to promote cable as an instrument for improving the quality of life for impoverished Americans brought together a collection of individuals and organizations who otherwise rarely saw eye to eye. Defense-oriented think tanks, public access promoters, and black activist organizations such as the Mafundi Institute all expressed the belief that social and economic inequality were "problems of communication"—and that cable communications were poised to provide the solution.⁹

At MITRE, for example, researchers in the early 1970s began testing a two-way cable communications system to deliver social services and community information in Virginia. Based on the belief that "one-way TV communica-

tions may be adding to, rather than ameliorating, basic problems of our society," MITRE staff proposed to develop two-way cable communications as the centerpiece for a future urban communication infrastructure. Once cable networks were deployed more widely, they speculated, "new forms and imaginative uses of telecommunications" would "make contributions of fundamental importance to meeting and solving nearly every major problem of urban society and life." Subscribers to the Virginia pilot system could only call up MITRE's information and entertainment database one at a time, but MITRE planned to expand network capabilities so that "hundreds of families" would have access to "scheduled, real services available on a time-share basis, in which approximately 20 lines are available simultaneously."¹¹ Eventually, system designers hoped to link their cable network into Arpanet.

Changing focus

Despite all the brainpower and cross-sector cooperation, efforts to transform cable into a national information infrastructure to match these forecasts and fantasies were largely unsuccessful. American cities and towns eventually were wired for cable, but the technology's imagined potential as a forum for political debate, adult education, and job information was eclipsed when new regulations, and cities' changing financial concerns, set a course for the technology that remade it into an arm of existing broadcast empires. By the mid-1970s, plans for cable prepared just a few years earlier, with their emphasis on two-way communications for business and civic applications—for example, banking and social services via television—came to seem increasingly out of touch with the nation's economic climate, especially in its cities. Experimental systems such as MITRE's were suspended, and cable communications became cable television as it has been known for the past three decades—a subject for research and analysis in media and broadcast history but not the history of computing and information technology.

With Internet users now seeking faster connections to the online world, cable and computing once again are converging. In recent years, cable networks—repositioned by the cable industry as the "innovation" broadband—have begun to provide access to a range of Internet-based information, goods, and services. Only time will tell if the return to a conceptualization of cable as an information infrastructure will prove to be a marketing detour or a lasting industry standard. Whatever

the fate of these systems in shaping “emerging computer-communication networks” for the 21st century, computing historians who write the next generation of network histories must not forget what their computer scientist colleagues knew in the 1960s and 1970s—that before the Internet, there was cable.

References and notes

1. J. Abbate, *Inventing the Internet*, MIT Press, 1999.
2. R. Calliau and J. Gillies, *How the Web Was Born* Oxford Univ. Press, 2000.
3. J. Light, *From Warfare to Welfare: Defense Intellectuals and Urban Problems in Cold War America*, Johns Hopkins Univ. Press, to be published Dec. 2003.
4. P. Baran, *On Distributed Communications*, RAND, 1964.
5. P. Baran and M. Greenberger, *Urban Node in the Information Network*, RAND, 1967.
6. MAC stood for multi-access computer, man and computer, or machine-aided cognition.
7. P. Baran and M. Greenberger, *Urban Node in the Information Network*, RAND, 1967, p. 10.
8. *Ibid.*, p. 20.
9. Lloyd Morrisett, former head of the Markle Foundation and a leading sponsor of efforts to apply cable communications to improving the lives of impoverished Americans, is credited with coining the phrase *digital divide* in 1996.
10. R. Yin, *Cable on the Public's Mind*, RAND, 1972, p. 4.
11. K. Stetten and J. Volk, *A Study of the Technical and Economic Considerations Attendant on the Home Delivery of Instruction and other Socially Related Services via Interactive Cable TV, Volume 1: The Social Aspects of Interactive Television*, MITRE, 1973, pp. 37-38.

Readers may contact Jennifer S. Light at light@northwestern.edu.

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