

The Impact of Technology on the Production and Distribution of the News

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Part II: Delivering the News of the Future

When people find themselves in the midst of rapid technological change, its most significant dimensions often elude them. The apparent impact of computers, satellites and lasers on the production and distribution of news is a case in point.

During the last two decades newspapers have made increasing use of new electronic technologies to perform their familiar functions more easily: to handle increasing information flows, to select the content and construct the appearance of the final news product in a more flexible way, to print and distribute newspapers faster and more cheaply, and not least of all, to keep track of the cost of doing business. Original expectations for greater facility in the performance of all the old jobs have been handsomely met by the new technologies, and for all the public knows (since these transformations have taken place behind the scenes), newspapers are the same as they ever were. These appearances are very deceptive.

For the newspaper of the future, the heart of the significant technological change is the computer's transformation of print production, since the same digital signal which prints a newspaper can be converted to other final formats as well—such as teletext, or text displayed on a video screen. Because of the great variety of possibilities for print and teletext, in combination or separately, the forms and procedures through which each of us will receive news in the future, if there is a single future, is not yet fixed. But possibilities that have been only speculative for decades are now beginning to take form in public and commercial information systems both here and abroad. The challenge these developments pose to the printed newspaper could very well transform it.

The electronification of the newspaper, which we traditionally regard as the achievement of print technology alone, did not begin with the computer. The newspaper ceased forever to be solely a print medium with the organization of wire services more than a century ago. The telephone was a second important addition to the electrified apparatus of news gathering, and electric presses in the late nineteenth century made the newspaper a more efficient nervous system for expanding metropolises. In spite of the essential contribution of electricity and electronics to newspaper operation, newspaper people have continued to regard themselves almost exclusively as printers or print journalists, even though these labels have been inadequate for more than a hundred years. The habit of thinking of the newspaper solely as a print product may help explain why it took the industry so long to recognize that computers would transform it as surely as they are transforming so many other traditional information institutions.

The computer first came to work for the newspaper as a more efficient accountant, but it soon demonstrated that it could perform other tasks—such as printing the paper—better than these tasks had ever been performed before. Currently, in addition to their composing and printing functions, computers are helping metropolitan papers caught in the central-city squeeze pursue their audiences out of the city with suburban branch printing facilities that simplify distribution. The *Los Angeles Times*, with a circulation of more than a million, and the largest daily consumer of newsprint in the country, has established a remote printing plant south of Los Angeles in Costa Mesa and intends to establish one north of Los Angeles in the San Fernando Valley.¹ The *New York Times* is very cautiously contemplating a national daily edition printed at computer-controlled remote printing plants connected to the editorial operation by microwave links.²

The most spectacular possibilities of this kind of organization are being developed on a much larger scale. Electronic newspaper facsimile transmission by microwave, landline or orbital satellite to geographically remote printing plants makes it possible to have a newspaper as national or as international in its distribution as a network television show. This is the achievement the *Wall Street Journal* has been working toward for several years. Each day the *Journal* beams an electronic facsimile of its newspaper from a composing plant in Chicopee, Massachusetts, to Western Union's WESTAR I satellite.³ Each digitally coded page is read off the satellite at ground stations located in seven different states and equipped with automated printing facilities. More than half the *Wall Street Journals* sold daily are printed by these plants from two satellite feeds; eventually there will be just one feed for all copies of the *Journal*—wireless printing, if

you prefer. By the end of 1982, the *Journal* plans to build seventeen ground stations which will print the signal beamed by a single satellite.⁴ This is an ambitious undertaking, but the *Journal* recently estimated that the cost of buying satellite bandwidth to transmit coded facsimile to its remote printing plants is roughly thirty-five times less than the cost of equivalent bandwidth on telephone lines.⁵ Satellite printing makes a national *Wall Street Journal* exceedingly profitable to produce because the cost of long-distance facsimile transmission remains the same no matter how many receiving stations there are to read the signal. By shortening the delivery distance from plant to consumer, each new ground station also reduces the costs of delivery.

The *Wall Street Journal* has more in mind than transmitting newspapers to its seventeen ground stations. The *Journal* already has the machinery to send other kinds of information products by satellite, either its own products or someone else's, and it is building more machinery of the same kind. By 1982 it expects to have the largest private communications network in the country.

The real significance of the experiments of the *Wall Street Journal* and other newspapers with assorted forms of long-distance electronic transmission is that:

1. At virtually every newspaper which uses computers for editing and printing, because it is economically advantageous to do so, the basic machinery to convert news into digital impulses is in place.
2. While this digital signal now almost always ends up in a print-on-paper format, the same signal could also be transmitted by landline, microwave, satellite, or other, more exotic communications link to wire services, broadcast antennas, or directly to homes and businesses. Information held in a versatile electronic form, in other words, can be reconstituted in a variety of formats, of which only one is printed paper.
3. Some publishers already regard the electronic potential of their newspapers to produce other kinds of news and information formats as insurance. They believe electronic systems increase their options in case of a shift in consumer demand away from the printed page, a severe escalation in the price of newsprint, or a number of other possibilities. Some of these publishers are examining opportunities to market electronically generated information products besides their own newspapers. *The New York Times*, the *Wall Street Journal* and the *Los Angeles Times*, among others, are now forthrightly discussing how long the printed paper will be their primary information product. While none of them expects it to vanish, all are entertaining the possibility that the familiar printed paper will be one of several packaging options in

electronic home information systems sometime after 1990. They also are spending a great deal of money on this sort of speculation with future investment decisions in mind.

Representatives of the American Newspaper Publishers Association, Associated Press (AP) and United Press International (UPI) have, for example, organized a task force to explore not only the possibility of a satellite delivery system for newspapers, but also to identify "future newspaper...applications for satellite communications."⁶ And a group of major newspaper publishers, broadcasting companies, newsprint companies and electronics manufacturers recently spent more than half a million dollars to commission an Arthur D. Little study called "The Impact of Electronic Systems on News Publishing," which attempts to look as far ahead as 1992.⁷ According to the trade press, the major conclusion of the study, which sells for \$25,000 a copy, is that home electronic information systems will not pose a serious threat to conventional news publishing for at least a decade. After that, it predicts, print-on-paper news may be in for a fight unless newspaper publishers themselves try to satisfy new consumer tastes.

The factors that will shape the future of the printed page, whatever it may be, are basically three: (1) the costs of the newsprint, labor and gasoline required to manufacture and deliver the printed page, compared to the costs of electronic software and hardware alternatives; (2) consumer preferences shaped by what other information entrepreneurs do; and (3) regulatory change.

Economics

The most obvious factors are economic. Newsprint prices have doubled in the past decade, and tripled since 1950.⁸ Well over half of American newsprint consumption depends on Canadian supplies and is subject to the special vagaries of price hikes, mill and railroad strikes, and transportation difficulties in a foreign country. Conservationist concerns about forest destruction are increasing. All these factors point to future newsprint shortages and steeper prices. Experimental efforts to substitute new substances like kenaf fibers for wood pulp, or to process wood pulp in new ways to yield more and lighter-weight paper from poorer grades of wood, may eventually help to stabilize newsprint costs, but are unlikely to reduce them permanently in the long run.⁹ Petroleum-based fuels for trains and trucks that carry newsprint from mill to printing plant and ultimately to the subscriber, also make the price of newsprint and newspapers highly vulnerable to oil politics and supplies.

The only thing that costs most newspapers more than newsprint is labor, both in rising wage contracts and in losses incurred by strikes among

newspaper production workers, and in transportation and newsprint production. Thirty strikes took place in the newspaper industry alone last year.¹⁰ Labor costs are also going up at the post office, one of the traditional delivery systems for newspapers. Those costs are now a major factor in postal rate hikes.¹¹ Newspaper publishers must balance all these costs against those of electronic news delivery formats. Hardware costs, which are primarily engineering costs, are declining, but software costs, representing brains rather than machined parts, are more complicated. The more flexible and complex software is, generally speaking, the more expensive it is. And not only newspaper entrepreneurs are considering electronic alternatives from an economic perspective. Since the revenue to meet newspaper production costs comes mostly from advertising, the future of the printed page rests in part with advertisers who must decide whether to buy space on the printed page or its electronic counterpart.

Consumer Preferences

Any economic advantage in electronic news formatting is of little importance if the habits of generations of newspaper readers cannot be budged. The litany of benefits of the little black box in every living room—a convenient shorthand which takes in a vast literature of dreams for home information systems—has often been publicly rehearsed. The variety of information functions imagined for these systems includes novel ways of presenting the news which are simply impossible in a printed newspaper. For example, a householder would be able to access information which now ends up on the newsroom floor because there is no space for it in the next edition, even though that information might interest him or her more than what does get into the paper. By means of electronic information retrieval he could also select from a vast data base of constantly updated news at his own convenience, since electronic information retrieval operates on demand and not on fixed or infrequent distribution schedules as newspaper editions and broadcast news programs do.

The question, however, is whether such novelty can displace the comfortable routines of newspaper reading. Not all newspaper aficionados will want to give up browsing the generalist newspaper for the specialist and narrow efficiency of a dial-up newsscreen, and the modest price and great portability of the newspaper that gets on the subway with its reader will be hard to beat in any electronic form. If, in an increasingly energy-conservative world, more and more people give up private driving, for example, reading the newspaper aboard public transportation might be an option of increasing preference. It is a mistake, however, to imagine that consumers will suddenly be asked to choose between newsscreens and newspapers. People who use computerized information services on VDTs

at work soon begin to imagine ways they could be put to use at home. Houses and apartments with built-in microwave ovens can have built-in cable and information service connections as well, especially when these are linked to temperature control and home security functions. When such facilities are available as a matter of course, people will learn to use them. A shift in the kinds of information consumers want is less likely to be initiated directly by electronic news than by other kinds of information services which, in achieving acceptance, absorb or reshape those of the traditional newspaper. Consumer preferences, in other words, will be shaped by the entire range of available information options as well as by the features of any single one.

However conventional newspapers choose to develop in the meantime, telephone- and television-based information services are already entering private living rooms in Western Europe. At least two European-based commercial services are surveying market possibilities in California and New York.¹² Since 1977 the British Broadcasting Corporation has offered a service called Ceefax which brings subscribing British television viewers news and weather data, travel and financial reports, consumer affairs and entertainment information, airline schedules, job listings, and stock exchange indexes.¹³ A similar service, Oracle, is operated by independent commercial television. Ceefax is free; its costs are covered in the mandatory license fee all British television set owners pay yearly. Oracle is financed by advertising in the form of sponsored pages and classified advertising. On June 1, 1978, the British Post Office inaugurated an interactive wired-teletext service called Viewdata, now renamed Prestel, which offers electronic mail services between subscribers. In addition, more than one hundred third parties, including the Stock Exchange, Reuters, the Consumer Association, local newspapers, chains of shops, the Meteorological Office, travel agents, the Sports Council, and special electronic publishing companies set up expressly to exploit the new medium, market a wide variety of information services. The Prestel combination of telephone, broadcasting and computer technologies in a single home information system is a portent of things to come. Prestel counted 1500 subscribers last December, and the post office hopes for 50,000 by the end of this year.¹⁴

France is at work on a similar interactive system called Antiope, and Canada, West Germany and Japan are experimenting with systems of their own. Tama New Town, a Tokyo suburb, has become a test community for cable news and information services provided free by the government and fifty corporations, including banks, broadcasters, publishers and electronics manufacturers.¹⁵

By comparison, development in the United States has been more cautious. Equipment manufacturers are jockeying for position at every

level—with cable systems, with cassette and video recording equipment, with intelligent terminals or minicomputers, with satellite dishes to receive information services on rooftops, and with decoders for over-the-air broadcast services like Ceefax. (Texas Instruments manufactured the original decoders used in British systems, and is now working on a decoder which will meet the technical specifications of American broadcasting systems.¹⁶)

In spite of the activity of equipment manufacturers, information services vendors who aim directly at households instead of at large firms or government agencies have been slower to move in the marketplace. A broadcast teletext news service is now being tested by KSL-TV in Salt Lake City. Ceefax-like information is carried piggyback on the normal broadcast signal, and may be called up for display on a television screen with a special decoder. The only regular viewers of the service in its present testing stage are KSL-TV personnel who describe its capacity in the following terms:

Station officials say the number of "pages" that can be transmitted is virtually endless....A computer takes about two minutes to send out...800 pages, then repeats them in sequence, so that depending on when in the cycle you punch a page number, the wait for it to appear on the screen could vary from 1 to 120 seconds.

Each page can display about 120 words, so the total capacity of the 800 pages is more than 100,000 words....That is the equivalent of a 50-page newspaper, not counting the advertising.¹⁷

The vertical scanning interval of the broadcast signal on which teletext travels is a subject of contention, however. Other uses could be made of the same spectrum space, like transmitting captions for the deaf, or monitoring viewer channel selection and television use. Such requests have already been filed with the Federal Communications Commission (FCC), which must resolve this allocation question before deciding whether to grant final permission for the KSL-TV service. KMOX-TV in St. Louis, which is owned by CBS, has also been experimenting with teletext by comparing advantages and disadvantages of a Ceefax-type signal and an Antiope-type signal. And a committee of the Electronics Industry Association has been meeting regularly to work out agreements on technical standards and specifications for teletext which it will soon recommend to the FCC.

Other information vendors are also moving into place. AP offers an abbreviated news wire formatted for video display to a number of operating cable systems, and UPI will soon market world news reports to home

computer owners through an arrangement with Telecomputing Corporation of America, whose computers will provide the access point for customers of that service.¹⁸ QUBE, a much-publicized interactive cable television station operating since December 1977 in Columbus, Ohio, is well set up to distribute news and information services, but it has so far made only primitive use of its capabilities, mainly by extending game show participation beyond the production studio to the viewing audience.¹⁹ In 1980 one of the very largest newspaper chains in the country, Knight-Ridder, will begin testing Viewtron, a video news and information service modeled on Prestel, in about 200 homes in the Miami area. Cox Cable, the distributor of the service, also plans to make an entire channel available to the University of Florida College of Journalism and Communications for an experimental cable "newspaper."²⁰

Regulatory Changes

Regulatory uncertainty is an important factor in the slower willingness of electronic information vendors to tackle the home market. The rules which govern the different parts of the telecommunications industry are under intensive review as a congressional subcommittee works out a long-overdue replacement of the Communications Act of 1934. Several mammoth antitrust suits are also testing current industry practices and alignments. Until information entrepreneurs know the outcome of the battle for marketing territory between cable television and broadcasting, and of similar territorial struggles among unregulated data processors like IBM and Xerox, specialized common carriers like Satellite Business Systems, and regulated common carriers like the telephone company and the United States Postal Service, they are sensibly biding their time. Whether conducted within the framework of regulation, legislation or litigation, these are all battles about who shall be permitted by law, and in what markets, to provide various communications and information services.²¹ Much of the confusion has occurred because digital electronic technology has played havoc with traditional legal divisions between telecommunications and data processing. This is the line the new Communications Act is trying to redraw, and along which the courts will distribute victory and defeat.

The newspaper is an interested party in all these rearrangements. Its future product, print, teletext or both, will compete with some emerging electronic information services and make customers of others. Some newspapers and wire services may even seek to set up their own electronic communications channels to distribute information products directly to individual subscribers. This is clearly what the *Wall Street Journal* has in mind.

In order to be ready for anything—in order not to become paper dinosaurs—many newspaper publishers are also rapidly diversifying into as many different kinds of media and media products as they can. In so doing, newspapers not only make larger regulatory targets of themselves, but their identities and concerns as publishers are no longer necessarily paramount. Otis Chandler, publisher of the *Los Angeles Times* and chairman of the board of the Times-Mirror Company, which owns a variety of publishing, broadcasting and newspaper interests, foresees a day when there may be a half-dozen media companies (and nonmedia companies like Gulf and Western as well) dividing not only ownership of all newspapers among themselves, but large chunks of other media also, including magazines, books, periodicals, films, the allowable number of radio and television licenses, cable franchises, data banks, and information retrieval services.²²

Cross-media ownership and concentration are facts of life with which we have lived for years. Is it therefore really true that in the future different media will simply be the different packages in which relatively few vendors sell the different kinds of information that interest us? The prediction that all development in communications technologies will come to nought but greater concentrations of media ownership and less and less information diversity is as classic as the alternative prediction that new communications technologies will inaugurate an era of perfect democracy and well-being. So predictable a prediction deserves to be regarded a little skeptically.

A future of ever-contracting media control extrapolates trends that do exist in the present, but in communications history, the future has not always been just more of the present. The printed book, for example, seemed at first to be only an extension of the manuscript, but it created completely new information structures and infrastructures.²³ Although it seems quite likely that new information technologies will accelerate concentration, it is equally possible that they will create distinctively new media formats which will not fit into and which will undermine the old monopolies of information. If they are truly revolutionary technologies, this is exactly what they will do. (Of course, nothing in history suggests that revolutionary change does not produce new forms of monopoly in its own good time.)

The capital requirements of profitably operating the new communications technologies suggest that we do face greater concentration of media ownership in the short run. Imagine the likely outcome, for example, of the contest for a local audience between a small, independent newspaper and a communications conglomerate with the electronic resources to deliver area news and advertising in either electronic or paper form

through the modified living room television set. Besides doing everything the small newspaper could do with greater flexibility, efficiency and resources of talent, the conglomerate could do more as well, with information services the newspaper could not possibly provide. The embodiment of "localism" which is often thought to be the unique strength of the independent newspaper may affect such contests decisively, but just as often will prove unequal to the struggle. On the other hand, an accessible, computer-linked cable television system could strengthen the small, independent newspaper—truly a dying breed in the present newspaper world—by providing it with an economical delivery alternative, a cable channel, to rid it of the albatrosses of gasoline, newsprint and labor costs. But whether or not this is salvation depends on who owns the cable franchise. It could be the Times-Mirror Company.

All of which brings us to an aspect of the newspaper press that everyone hopes will survive and prosper in any electronic evolution of the newspaper format. That aspect is the *freedom* of the press. The issue can be simply sketched. Our government does not directly regulate printed media like books, periodicals and newspapers. It does regulate some electronic media, such as broadcasting, telephones and satellites. If newspapers begin to distribute their news messages over the electromagnetic spectrum, the traditional distinctions which have kept them safe from regulation are in danger of being blurred. It is very hard for governments to regulate media without interfering in some way with the message. To the extent that newspapers do come to resemble their electronic media counterparts, it will be more difficult for them to maintain their separateness in law, and their traditional independence from government may become more and more fragile.

One of the concerns behind current legislative efforts to deregulate electronic media is the belief in some quarters that newspapers must eventually bow to the same pressures.²⁴ The traditional rationale for regulating broadcast and not newspaper outlets has been the relative scarcity of radio and television stations. Today, however, there are nearly as many broadcast outlets in the United States as there are daily and weekly newspapers, and cable technology promises greater electronic abundance still. Why newspapers should be exempt from regulation under these circumstances is not clear, and any movement of the newspaper toward electronic distribution will be closely scrutinized by regulators. The gradual convergence of electronic and print media technologies, the dependence of newspapers on a variety of electronic information sources, and the belief, widely subscribed to, that Big Media have much too powerful an impact to be left to go their own way, all point to a coming reconsideration of the traditional privileged status of the newspaper.

New electronic news and information formats may engineer completely new social and political roles for themselves, but they must do so in an electronic environment that has rarely seen a true diversity of cultural and political viewpoints, and which has been hampered in this by both private concentration and government regulation. Perhaps this aspect of our future is most difficult to foresee. It is not too hard, after all, to rearrange our imagination to trace the logical processes by which the newspaper industry is developing. It is much harder to imagine just what the eventual social significance of technological rearrangement in the production and distribution of news will be.

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