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Abstract

If you read the publications of the new communication technologists, the trade publications especially, you can quickly become enamored with the incredible potential many of the advances in communication technology offer. (See for example such publications as PC Magazine, Mini-Micro Systems, and MISWeek).

Research and the New Communication Technologies: Forecast and Possibilities

Clifford W. Scherer

If you read the publications of the new communication technologists, the trade publications especially, you can quickly become enamored with the incredible potential many of the advances in communication technology offer. (See for example such publications as *PC Magazine*, *Mini-Micro Systems*, and *MISWeek*). The technology now exists, for example, which allows you to connect a microcomputer to a laser disk containing an entire encyclopedia or, if you prefer the entire 6.5 million entries of the Library of Congress card catalog (Reid, 1986). There are of course many other examples of new technologies that promise revolutionary changes: interactive videotex for shop at home services and automatic banking, telecomputing for work at home, and interactive videodisk, among others.

The implicit promise of these new communication technologies is that everyone will soon have equal access to information. And because information will be equally available to everyone, individuals will be flooded with information and will suffer what is popularly called an "information overload," i.e., people being bogged down in an effort to sort out what is relevant to them. The underlying assumption here is that *everyone wants information*; individuals desire and therefore seek and will be willing to pay for the opportunity to be flooded with information.

A second major assumption, often explicit, is that the new communication technologies will replace existing systems; that interpersonal systems will become less important, that newspapers will undergo a transformation, perhaps moving towards a "paperless newspaper," that traditional broadcast TV will be replaced with direct cable or other systems, and that individuals will use computer terminals for most, if not all, of their information seeking.

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These two assumptions are prevalent in the thinking of the technologists—those who look only at the technological potential of the new communication technology. If, however, we examine what research is telling us about the new communication technology and its impact on society and we look at history to examine how past advances in communication technology have impacted on existing systems and on society, we are likely to reach different, and often quite conflicting assumptions about the future.

The goal of this paper is a modest one, simply to contrast the implicit and explicit assumptions in the development of the new communication technologies with what research tells us concerning the likely impact of these technologies on audiences and society.

What Research Tells Us

How much information can the new communication technologies deliver? Despite the talk and speculation about the information overload individuals will experience as a result of the new communication technologies, most audiences are receiving less information today than they have in the past. When they deliver information, the new technologies generally deliver condensed, summarized, and superficial information. (See for example Weaver, 1982.)

Consider for example that the majority of Americans report that television is their primary source of news today. When compared to the amount of news found on just the front page of the newspaper, it is clear that television delivers less news with less coverage and depth than do newspapers.

Contrast the amount of TV news with a microcomputer-cable linked news service where a microcomputer is connected to the cable news service and can receive text news 24-hours a day. At 9600 baud the system can receive and store approximately 576,000 words per hour. Reading from the video screen at 600 words per minute means that you would need to read for 16 hours for every hour your computer received information (Yarbrough 1986). Clearly, the potential for delivery of large amounts of information is there. The same can be said about traditional broadcast TV and radio. The potential for delivery of information 24 hours a day exists. We know why this potential isn't being fully realized: other factors including economics, human behavior, and public

policy have dictated that broadcast TV and radio be devoted for the most part to entertainment, not delivery of information. Perhaps the key point here is human behavior. Who wants 576,000 words per hour of news and information?

Less Information, Not More

The conclusion we draw from this is that contrary to what we might expect, the new technologies are likely to deliver less information to the general audiences—not more. The potential for obtaining more information is likely to be realized only with an elite audience, i.e., professionals in various high information professions who know how to use large amounts of information.

The second major conclusion we can draw from the research literature involves the fragmentation of audiences and the increasing difficulty of reaching those fragmented audiences with relevant information.

Early development of mass media systems brought about support for such ideas as the global village where mass audiences all experienced the same or similar events such as the moon landing. In the past, information could be delivered to rather large audiences simply by gaining access to the media. Twenty years ago most Americans had access to one or two TV channels, and extension was able to offer programming on many of those channels. Today, it is not unusual for an individual to have access to 30 or more TV channels, and it is rare that extension has any significant access.

The proliferation of communication channels—cable, interactive computer systems, videotex, teletext, direct broadcast satellite, and others yet to come—will continue to make access to audiences and channels more difficult rather than easier. Audiences will continue to be more fragmented as the number of alternative communication activities increase. Access to channels may become more limited as competition for the audiences' attention increases.

Individual Experiences

The newest communication technologies are moving us away from the idea of shared experiences to one of an individual experience. With an increase in the number of choices available to the individual—broadcast TV, cable TV

with 30 or 40 channels, satellite dishes with 100 or more channels, radio, newspapers, magazines, interactive computer systems, and others—the audience is fragmenting and becoming more difficult rather than easier to reach. Audience fragmentation increases the difficulty in gaining access to the channels they happen to be using. On the other hand, from a message design point of view, we may be more successful in delivering the information to the more segmented audience if we can gain access to the appropriate channel.

The third major conclusion in the research literature on communication technologies suggests that the technical capability of the new technology represents only one of many factors that will determine the future of the technology (see for example Elton & Carey, 1983; Goldman, 1980; and Easton, 1980).

How the new communication technologies develop will not be based on the technical possibilities, but rather on the social nature of the technology and how the audience interacts with them. If the audience interacts positively with new technology, we can safely predict that it will survive in the marketplace and become an economic success.

The communication industry is undergoing a somewhat dramatic evolution, but, probably not a true revolution from a social point of view. The introduction of television did cause a revolution. It changed the way we interact with one another, how we spend our time, and what we talk about. It is, however, unlikely that today's technological refinements will have as much impact on society as did the introduction of television. One could argue, in fact, that what we are seeing today are not new communication technologies but simply revolutionary advances in existing communication technology. These refinements center around advances in the storage and retrieval of information, not in the transmission of that information. Audiences still receive information in a manner not much removed from the telegraph system—serial transmission of messages to remote locations. In addition the new technologies are still transmitting two-dimensional color visuals and words, not much different from early television except for the color.

Holographic Images

Communication technologies in the future may involve transmission of holographic images linked with an interactive

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artificial intelligence. That would be a truly new communication technology. What we have seen, is at best, a burst of excitement centered around the microchip. That burst of excitement is about over. In other words, the initial excitement of the computer revolution is over. Household or individual non-job related computer adoptions have virtually stopped. None of the industry manufacturers today are trying to capture the household market. That market dried-up, or, more likely, never existed. What do individuals do with a computer in the home if it isn't job or school related? Balancing a checkbook on the computer just isn't an efficient use of one's time and resources.

Farm computer adoptions have slowed, perhaps partly because of the poor farm economy, but also, research suggests, many farmers don't know what to do with a computer. They simply aren't management oriented, and that's what computers do best (Scherer and Yarbrough, 1984).

Many of the new networking technologies such as videotex systems are not proving economically profitable at the present time. Field tests of the videotex system, for example, all show about the same thing: once the novelty wears off, the only information individuals will use from the semiinteractive systems is information they can't obtain in easier ways, information that is current and in high demand (see for example Bolton, 1983 and Rice and Paisley, 1982). If a system like videotex survives, it will need to change significantly from its present form. Again, the key is not the technical possibilities of the hardware system but rather those things the audience wants, their uses of the technology, and the cost they are willing to pay for the service.

A view of history suggests that the new communication technologies are unlikely to replace existing media. Radio did not replace newspapers, TV did not replace radio. The introduction of new technologies do cause major shifts in audiences, roles, content, and funding, but rarely do we find examples of the old being replaced completely by the new. Each simply shifts with social demand, policy, and economic forces to find a niche in our everyday life.

Nature of Audience

Human behavior is not changing as rapidly as the new communication technologies. We should not expect that audiences of the year 2000 will differ significantly from au-

diences today in how they go about information seeking and decision making. The new technologies are not helping individuals develop an organized information-seeking strategy. For a small portion of the audience, the high-information seeker, the process of locating relevant information will become easier. But for the vast majority of the population, the process will become more difficult, and we may see a withdrawal from the use of information in the decision making process by a significant segment of the audience (see for example Hardy, 1983 and Morelli, 1971).

While we do not have good evidence about how technology might change individuals, we do know that the changes are not likely to be revolutionary. Television did change the nature of interpersonal interactions. It did change how a majority of Americans get news. But television did not help us get more information or learn how to use information in a more complex world. It is likely that the new technologies, for the most part, will continue along the same lines.

This paper started with a description of the implicit assumptions made by the technologies that individuals will desire, seek, and pay for the opportunity to be flooded with information. While that is true for a very small percentage of our population, most individuals are not skilled in dealing with large amounts of complex, often conflicting information. They certainly won't pay for it with either dollars or effort.

Social Nature

In drawing our conclusions about the shape of the new communication technologies in the future we must not ignore the social nature of the workplace, the interpersonal exchange of information that takes place, the social nature of shopping, and of browsing through the library or the spontaneity of a professor writing notes on a blackboard in front of a class. The social nature of these situations cannot easily be replaced by technology. The formal communication of all of these institutions can, however, easily be replaced by existing technology. We don't need to have offices where everyone works. Formal communication can be handled via technology. We don't need to go shopping. The technology exists that will allow us to purchase everything from our computer terminal. The function of the library can easily be replaced with technology, and we have had the technology to replace the

classroom for some time. I am not arguing that the research suggests that the new technologies will not develop in some of these areas. I am arguing, however, that the social functions cannot be accommodated through any existing technology.

There are two possibilities in the future scenario of the new communication technologies: either those social functions will need to be handled in other ways, or the development of the technology will be retarded or even stopped. The experiments for example with banking at home, have for the most part, not succeeded perhaps because of social reasons (Ettema *et. al.*, 1984).

Technologies Continue to Develop

The new communication technologies are, and will continue to develop, in many areas, but one thing is certain: it is the already information-advantaged individuals in society who will be the first and most frequent users of new information sources. This, unfortunately, will increase the gap in knowledge between those who already have information and those who don't. Contrast the idea that most of the new technologies provide less information to audiences, not more, with the estimates that the amount of information available is doubling every four or five years.

I don't want to leave you convinced that I am a pessimist about the new communication technology. I am not. The key is not in the technology and its possibilities—it is in how individuals and organizations interface with that new communication technology. Extension and the experiment stations must get involved with the new technologies, but we must expect that the biggest gains between now and the year 2000 will be in improving our own internal communication systems and not in new ways to reach vast audiences. We must expect that the new technologies will change over the next few years while they define their niche in our social structure. Finally, we must not assume that the new technologies will make all of our audiences information rich. It may, as I have said, do the opposite with at least a segment, perhaps a majority, of the audience.

Conclusion

We are frustrated today because we can't get enough people to attend a meeting we consider important. We are frustrated because individuals don't use the information we have. That frustration is unlikely to go away. For a small portion of our audience the delivery of information will be easier. The high-information seeker will be able to find more information in the future causing a future increase in the gap between those who have information and those who don't. We may very well need to continue serving the high-information seeker. Can we ignore the majority of the population who cannot deal with the complexity of the information? Those who don't know how to apply information to their own situation? Those who don't know how to evaluate it? Those who don't know where or how to find relevant information?

Audiences of the future will need even more help in making sense out of an ever more complex world. Our educational role will be just as important as we enter the 21st century as it has been in the 20th century. The new communication technologies are not likely to make our job easier. At the same time they are unlikely to make our job more difficult. What they are likely to do is to make our job different in many ways.

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