

INFORMATION SUPERHIGHWAY AND THE PROCESS OF COMMUNICATION

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Abstract

The process called the «convergence of modes» or «media fusion» is blurring the lines between point-to-point communication, such as the post, telephone, telegraph, and mass communications, such as the press, radio, and television. The major stepping stones in these «mediatech» developments were the introduction of telegraph and telephone networks and cinematography in the nineteenth century, the invention of television in the 1930s and the digital computer in the 1950s, and the emergence of the microcomputer in the 1970s. The telephone network, which was once used almost entirely for person-to-person conversation, now transmits data among computers, distributes printed matter via facsimile machines, and carries sports and weather bulletins on recorded messages. A news story that used to be distributed only through newsprint nowadays may also be broadcast on television or radio, put on a telecommunication line for remote printing, and placed in an electronic morgue for latter retrieval. So the one-to-one relationship that used to exist between a medium and its use is eroding and that is what is meant by the convergence of modes. It was the emergence of these technologies in the late 1980s that finally provided the framework for the electronic media. Electronic media are an entirely new kind of media experience born from the marriage of TV and computer technologies. Their raw ingredients are images, sound, text, video, which can be brought together in any combination. It is a medium that offers «random access»; it has no physical beginning, middle, or end. It is this combination of random access with multiple media that opens up such exciting possibilities for radically new ways to communicate ideas, information, and entertainment.

Introduction

To discuss the process of communication in its complexity, its interaction with individuals and societies and its development is a task by itself. To analyze it in the framework of Information Superhighway is an impossible mission; but as a student in this field, I, among others, have the moral obligation to look at the future, taking into consideration the available data and seeing how this media highway will affect individuals and societies particularly if it is going to be free-flow one way. Mass media have evolved over the last few decades into a much bigger, more systematic and more competitive vocation. They have also taken upon themselves, a greater responsibility towards society.¹ And society has been making ever greater demands on mass media to get involved, not to isolate themselves as media institutions alone, but to become involved as social and economic institutions as well.

As social institutions, the mass media are (or ought to be) responsive to the environment in which they operate; this interaction between the media and their societies will be observable. This means that not only the media influence the social, economic, cultural, and political structures within which they operate, but also they are themselves influenced by them.² To understand the process of mass communication properly, one must understand the society in which the media exist, and in order to understand that society, one must have a clear picture of its values and basic beliefs.³

The Communication Revolution

The communication revolution appeared in the nineteenth and twentieth centuries and brought with it the motion picture, radio, computers, and satellites. It has transformed societies from agricultural to industrial societies, and now we live in an information society. The workforce in the later sector has been increasing. If one looks at a time span from 1880 to 2000, one can find the following as shown in figure 1.

If we compare the national income by industry from 1960 to we find the following: that the national income from communication in 1960 was 8.2 billion dollars which increased to \$17.6 billion in 1970, then increased to \$26.8 billion by 1975 and reached \$48.1 billion in 1980. In 1990 it leveled at \$96.4 billion and reached \$98.6 billion in the year 1992 as shown in figure 2.

Definition and Meaning of the Communication Process

The basic elements of the process of mass communication will stay intact during the new information superhighway, though the way we send and receive information might change drastically among individuals and nation states. Even the definition of communication will be just as familiar.

Figure 1. Manpower by Industry

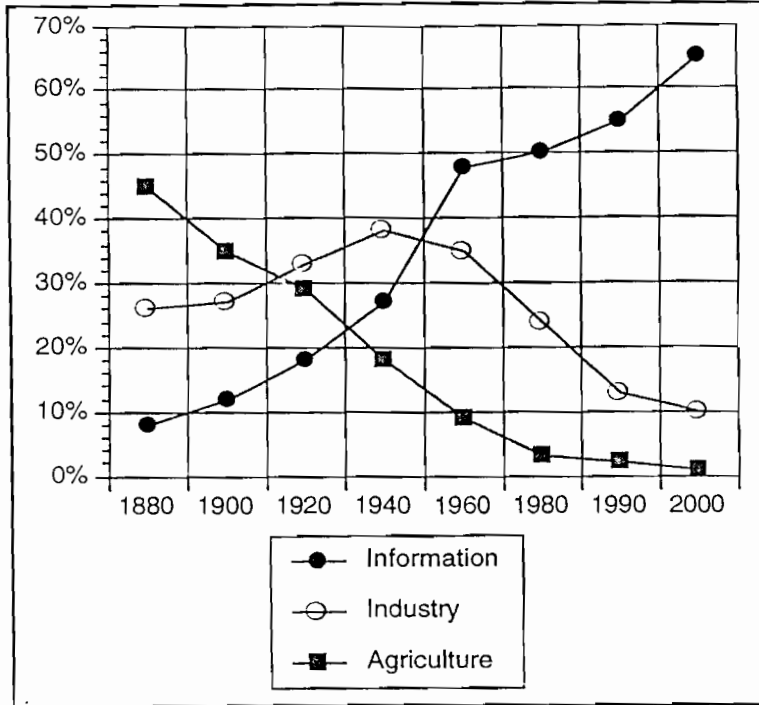


Figure 2. National Income by Industry
(billions of dollars)

	Private Industries	Agriculture	Communications
1960	371.6	17.8	8.2
1970	695.4	25.9	17.6
1975	1088.3	46.5	26.8
1980	1894.5	61.4	48.1
1990	3828.9	97.1	96.4
1991	3870.6	90.9	95.3
1992	4029.3	95.6	98.6

Source: Bureau of Economic Analysis, U.S. Dept. of Commerce

Definition

What is communication? Many theorists have differing views on the definition of communication: one suggests that it is the transmission of information to elicit a response⁴ ; while another feels that communication is founded on man's capacity to transmit his desires, feelings, knowledge or experience to others.⁵ Webster's dictionary says communication is «the act of imparting, conferring, or delivering, from one to another, knowledge, opinions, or fact", that it is an interchange of thoughts or opinions.⁶ Another definition, favoured by a number of authors, suggests that communication is the transmission of information or ideas by the use of such symbols as words or pictures.⁷

The study of human behavior is closely linked to communication and encompasses the fields of sociology, psychology and political science. Communication is a part of everything we do in life - our thoughts, ideas, dreams, desires or needs. Without the ability to communicate in some fashion, we would be living in a vacuum and would suffer terrible frustrations and anxieties.

There are different forms of communication and their differences are important. A dream, a thought, an unexpressed desire - these are all examples of a behavior which is classed as interpersonal communication. These are private, internal behavior patterns which are not communicated to others. It is the process of communicating with ourselves inwardly.

Inter-personal communication involves at least two people who are able to have personal contact and communicate either verbally or non-verbally with each other. Little movements of the hands and face, such as nods, frowns and smiles, are also forms of communication. What makes interpersonal communication differ from mass communication is that there is an immediate feedback - the parties involved are able to see, or feel, or hear each other's responses.

In mass communication, there is generally an unknown audience and the feedback, or their response, is either delayed or never received. In most cases the messages carried through mass communication are prepared by impersonal communicators who do not even know who their audience is. The audience's response, or feedback, is delayed, if there is reason for response, and it may reach the communicator in the form of letters, telephone calls, telegrams, or opinion polls. Generally, in mass communication, there is no face-to-face contact.

How does a mass communicator usually send his ideas, information or opinions? The technological means for such a transmission are usually the mass media which include: newspapers, magazines, books, radio and television

broadcasts and motion pictures.

To summarize, communication is the idea or act of transmitting knowledge or information, ideas, emotions, desires, feelings or experience from one person to another. Mass communication involves communicating with many people and usually involves use of the mass media. Now, before we go on to look at communication and how it affects the world around us, we should first understand the basic process of communication.

The Process of Communication

Through communication we learn about existence and about the nature of things. We learn about life, about order and priorities, about other points of view. To engage in communication, we interact through messages and learn the perceptions, thoughts and ideas of others. Communication to some people is merely the act of moving information from one place to another. If such is the case, then the message must be received in the same form in which it was sent. There are many factors that can affect the quality of information received. It must be accurate, easily understood by the receiver and it must be complete. Psychological factors also enter into a transmission and can affect its quality. If there is hostility between the sender and the receiver, the message could be interpreted incorrectly due to the psychological interference caused by the hostilities. To understand the process of communication, a basic communication model must be described. Most of today's communication models are based on the three communication ingredients suggested by Aristotle in his book *Rhetoric*: the speaker, the speech, and the audience. Each of these elements is necessary to communication. Other communication models have been developed throughout the years by different theorists such as Schramm,⁸ Shanon-Weaver⁹ and others, but they still, basically, rely on Aristotle's model.

Today's models are more complex and their ingredients have more contemporary names such as source for speaker, signal or message for speech and destination for listener, and may also have additional ingredients. Berlo¹⁰ has added an encoder, a decoder and a channel to this model. The encoder takes the source or speaker's message and puts it into a code used for transmission. For example, in person-to-person communication the encoding process is handled by the vocal mechanisms which produce the oral word and by the muscle system which produce messages made by the hand through the written word, pictures or gestures. They help to translate the speaker's purposes into a message, while the decoding process helps the receiver put the message into a form he can understand. In person-to-person communication the speech mechanism serves as the encoder while the hearing mechanism is the decoder.

The channel is what the message is carried by - in speech this would be the sound waves. In a place where there is a lot of noise or many people talking at once, the sound waves can become overloaded, thus causing confusion in the communication channel.

In communication, there are certain factors which can greatly affect the clarity of the message. The most important are good communication skills which include the ability to reason or think objectively, good speaking, writing, reading and listening skills, as well as the ability to assess and understand not only your own attitudes, but those of others also. A good communicator must be able to understand about the nature of things and about the nature of the communication process itself.

We are engaged in communication only when we interact through messages, so it is necessary to understand the message structure itself. A successful message is one that is received in the same form in which it was sent. The information must be accurate, of good quality, and in a form which is easily understood by the receiver. It is not easy to formulate adequate messages but through training and experience, the process can be refined and improved. It is important to know your audience so that you can formulate a message that can be understood by them.

The message itself can get into trouble if it is transmitted by the wrong medium or altered by physical or psychological interference or noise. For example, during a business meeting, if the company president is going to talk about profits and losses for the year, and plans to quote mathematical figures, it would be more effective for him to prepare a balance sheet showing these figures so that his audience can follow along while he speaks. This would help to clarify the figures in the receivers' minds. However, if the company has recorded a large loss that year, the psychological factor may enter into the situation and the audience's emotions may interfere with the speaker's transmission. They could begin talking or moving around to disrupt the speaker, and this physical interference can disrupt or alter the message completely. These factors can and do affect the quality of information received and can greatly affect its accuracy.

When formulating effective message you must remember that, although words make up our most common form of communication, they can also be the least efficient. Why is this? We must refer back to our earlier statement and emphasize the importance of knowing your audience. The same words can hold different meanings and connotations for different people. Every message is intended to bring about a change. It must have some kind of effect. When formulating messages, you must remember that communication is interaction through symbols and messages. It represents experiences, ideas and events.

You must understand the point of view of your audience so that you can communicate effectively.

How does the sender or source know if the message has been received by the listener in the manner in which it was intended? The effect of the message and the quality and accuracy of the information conveyed is judged by feedback. Feedback is an important element in communication but is one that is often very difficult to achieve. When we exchange messages face to face we have ample opportunities for feedback. We see our receiver and are able to view or hear the consequences of our message - we get an immediate response. When communicating to a group, there is a more generalized, less individualistic form of response, but you are able to receive some sort of feedback, even if it is only in the form of applause, or lack of it.

In a classroom situation, the teacher, through training and experience, learns to pay close attention to the communication process and learns to refine and improve it. By testing and observing, a teacher can easily judge the adequacy of his messages. If the students' response or feedback is not what the teacher desires, he or she alters the message or clarifies it, and then sends it again and again until the desired response is achieved.

When we are communicating through the technological medium of television and radio, as in mass communication, we face a more difficult situation in regard to feedback. We have the advantage - with radio and television - of sending messages across the boundaries of time and space, but this produces a bigger problem in the communication process. We lose the advantage of getting immediate feedback, so the source has no way of knowing if the desired response is attained. The source must wait for a delayed written or vocal response from the receiver.

In certain communications' systems where extensive competition exists among radio and television broadcasters, such as in the United States and Western Europe, producers rely heavily on delayed written response from the audience to measure the success or failure of the programs transmitted. Quite often, when asked to reply, the audience will respond in the manner they think the producers would like, rather than produce a true criticism. Also, since there is no way to get immediate feedback, audience responses may get cloudy, thus reflecting biased or unclear messages. In other words, the listener himself interferes with the feedback, consciously or unconsciously. The point we are trying to stress here is that in mass communication we cannot measure the success or failure of the message sent through the technological medium.

In commercialized mass communication (newspapers, magazines, radio, television, billboards, etc.) the best way to measure feedback is through the audience's response to the product advertised. If there is a surge in consumer

purchasing of a product advertised, both the broadcast producer and the advertiser know they have reached the desired effect, the purchase of the product.

A good communicator realizes that sending the message is not enough. He must devise ways to get feedback so that he can find out the effects of his messages until he gains his objective. The good communicator must also remember that if communication is the sharing of ideas, he too must learn to receive messages as much as he sends them. He must exercise the uniquely human ability to adapt and respond to an infinite number of situations because such interaction leads to good communication skills regardless of which society he is interacting with: the agricultural society, the industrial society or the information society.

Information Superhighway

Imagine the year 2000. It is morning and it is time for a cup of coffee. You turn on the PCTV and receive a personalized electronic newspaper filled with information on pre-selected topics: international finance, stock quotes and interest rates and relations among nation-states. On the bullet train to work, you pull out your palmtop computer and receive an E-mail message saying that you have just been appointed a senior partner at your publication firm. At the office you attend a video teleconference and send a 30-minute slide presentation to the sales office, thousands of miles away without even leaving your desk.

At night you relax by dialing up the movie of your choice, by ordering the products that you like, and all this can be achieved with the push of a button. You can tell yourself, «welcome to the information superhighway»¹¹ where PCs and TVs merge on the information highway, letting PC users juggle numbers inside a spreadsheet, dial up a cross-country video conference, then hot key to CNN international or QVC, and what roadblocks lie around the bend? Only time can tell.¹² What is the information superhighway? And what will it mean for people in both developed and developing nations? And what it will mean for people who own and use the PCs and those who don't? The answer to these questions are varied depending on whom you talk to. The highway could be the biggest leap in human communication.¹³ In theory, the information superhighway will be a high-speed data network, linking virtually everyone in the country with everyone else. All this may seem more like science fiction than reality. Indeed, in the history of the world, it has been only a few hundred years since gunpowder transformed human warfare and less than a century since television connected the world. But just as their inventions brought us to the twentieth century, so will digital information transmit us into the next, transforming everything from how we learn to how we work.¹⁴ The digital superhighway will be as important as an underpinning for the new global economy as the interstate highway system, international jet airports, television,

and the telephone system were for the industrial age.¹⁵

Twenty years ago, the only people who had almost immediate access to international news and events worked for intelligence agencies. But today, virtually all these options, which used to be available only to small and privileged elites, are almost completely universal¹⁶ and twenty years from now, people will look at the 1990's with some musement. They will wonder how we put up with daily two-hour commutes. They will find our dependence on inadequate educational resources archaic. In short, they will wonder why the ingenious application of knowledge technologies in the commercial sector lagged so noticeably in the personal sector. They will wonder how people who could replace steel with plastics seemed paralyzed by traffic congestion, urban pollution or falling educational achievement.¹⁷ Putting useful information in the hands of people, especially those who live in developing nations, will provide the building blocks that will help citizens; building blocks that will make them better informed and more involved people.¹⁸ We are at the beginning of our understanding of how communications and information technologies can evolve to solve or ameliorate what, to many, seem intractable problems.¹⁹

The Information Highway and Its Implications for Democracy

As the electronic information highways and byways continue on their speedy course of development, especially in the twenty-first century, their implications for society and democracy warrant serious consideration. Questions arise as to just how these highways should be constructed and what type of services should be offered. The most important issue is who should have access to the information flowing on these electronic roads, and who should pay for citizen' access to information. For the vision of an information highway starts, not with the technological side, but with the notion of the ordinary citizen.²⁰ The focus of democracy is the individual citizen, and it is with the citizen in mind that the information highways and byways must be developed.²¹ Another factor of vital importance to developing nations is cost. We must keep in mind that if electronic access is going to be widely available, it has to be cost effective. The use of the information superhighway system as seen by many, will mostly be for video and movie programming, rather than for acquiring knowledge, so the system will have to respond to that market demand. If this technological revolution is used and utilized properly, it can literally change our lives. This power comes largely from the confluence of fiber-optic technology, which allows the communication of more data at faster rates, and computer technology.²²

Information and knowledge

Today's use of information and the demand for specific programs will definitely play a vital role in deciding what kinds of services to provide in the

future. Today governments are trying to learn what kinds of information individual citizens need and want and how the networks can enhance the process of communication between citizens and government, and how their information can be a catalyst in the development process.²³ The terms data, information and mass media can be assembled in the meaningful patterns that enhance our ability to deal with each other and with the challenges of life. We tend to equate information with enlightenment.²⁴ For developing nations, to differentiate facts from fiction, what is useful and what is not, requires that information output from the highways and byways be managed - selected, packaged, measured and labeled; and when it reaches its destination, the same process will begin again by what is known as gatekeeper, but as we move closer to the information superhighway: the vision of free flow one-way, free accessible electronic information, we can imagine the following:

(1) More information is acquired intentionally and less serendipity as a result of a person's own editorial judgements.

(2) There is a growing preference for entertainment over knowledge.²⁵

Conclusion

The most important elements in the media theory of transformation is that:

- (1) News media often initially reflect existing media but eventually develop and display new characteristics and uses. The consequences, effects and developments are difficult to predict, but often become very important components of a new medium.
- (2) Technological information tend to appear and develop at an alarming rate of growth. This growth is being pushed by profits.
- (3) The content of messages is growing and will continue to grow at a very slow rate.
- (4) Free flow of information will continue to move in one direction.
- (5) Information will never replace knowledge, but will provide the building blocks of knowledge.
- (6) Vision of information highways and byways must start not with the technological side, but with the ordinary citizen in mind.
- (7) In the future there will be wireless services.
- (8) Advancement and mass production of mass media technologies must go hand in hand with low costs. Low costs must be kept in mind, if electronic access is going to be widely available.
- (9) It is imperative that strategies, for providing the poor with information, be designed to help them perceive this information as important.

The Implications of New Media Technologies on Society

The new media technologies and their applications have raised a number of questions and have various societal implications. These technologies have

profoundly affected our social structure. There is also a growing interdependence between technology, information, and society. For example, the new communications technologies have raised a series of ethical questions, including the use of computer-based scanning systems to duplicate another person's work. Using a scanner, a device that inputs graphic information to a computer, a user can alter a drawing or even use it in another publication without the original artist's approval or knowledge.

Some individuals are afraid that automation will accelerate the loss of jobs. This idea is typically linked with the belief that society is becoming increasingly dehumanized as the market is flooded with an ever-growing number of computer-controlled systems.

A new social class is also forming worldwide. In the past, distinctions between social groups were influenced by economic and educational factors. These same forces are present today, but the distinctions have become even more pronounced through the growth of our information society. This is especially true for those who do not know how to use a computer or who lack information-management skills. If we look around us, we notice that banks are shifting to computer-based tellers systems, and telephone lines are the key to vast information resources. But unless we know how to tap this information, we will join the ranks of the information poor and be unable to compete, for example, for a higher-paying job that may require a certain level of computer proficiency. This state of affairs also reaches beyond the boundaries of industrialized nations and influences those nations that do not have the economic, political, or educational resources to participate in the information age.

This situation presents a paradox. More people now have access to a greater volume of information than at any other time in human history. Nevertheless, as we accelerate toward a world that will become even more dependent upon information, there are those segments of society, on both national and international scales, that may not be able to take part of this information bonanza.

On the other side, the communication revolution has numerous positive implications. The same computer systems, that some people fear, have enhanced the treatment of cancer patients. Doctors have drawn upon the experience and knowledge of experts in this field by using computer software. Other computer systems have made it possible for individuals with physical handicaps to communicate better with the world around them. It can also be argued that, despite the unequal distribution of information in society, more people currently have greater access to a wider range of information, all at a lower cost.

Notes

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