2002

Regulating media technologies : a historical comparison of radio and the internet

Jessica Schneider Davis
San Jose State University

INFORMATION TO USERS

This manuscript has been reproduced from the microfilm master. UMI films the text directly from the original or copy submitted. Thus, some thesis and dissertation copies are in typewriter face, while others may be from any type of computer printer.

The quality of this reproduction is dependent upon the quality of the copy submitted. Broken or indistinct print, colored or poor quality illustrations and photographs, print bleedthrough, substandard margins, and improper alignment can adversely affect reproduction.

In the unlikely event that the author did not send UMI a complete manuscript and there are missing pages, these will be noted. Also, if unauthorized copyright material had to be removed, a note will indicate the deletion.

Oversize materials (e.g., maps, drawings, charts) are reproduced by sectioning the original, beginning at the upper left-hand corner and continuing from left to right in equal sections with small overlaps.

Photographs included in the original manuscript have been reproduced xerographically in this copy. Higher quality 6" x 9" black and white photographic prints are available for any photographs or illustrations appearing in this copy for an additional charge. Contact UMI directly to order.

ProQuest Information and Learning
300 North Zeeb Road, Ann Arbor, MI 48106-1346 USA
800-521-0600

REGULATING MEDIA TECHNOLOGIES:

A HISTORICAL COMPARISON OF RADIO AND THE INTERNET

A Thesis

Presented to

The Faculty of the Graduate School of

Journalism and Mass Communications

San Jose State University

In Partial Fulfillment

of the Requirement for the Degree

Master of Science

by

Jessica Schneider Davis

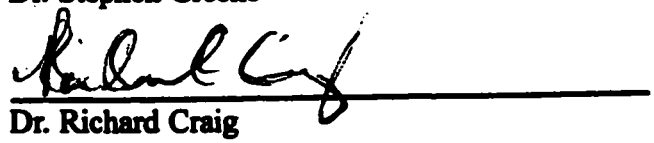
May 2002

ProQuest Information and Learning Company
300 North Zeeb Road
P.O. Box 1346
Ann Arbor, MI 48106-1346

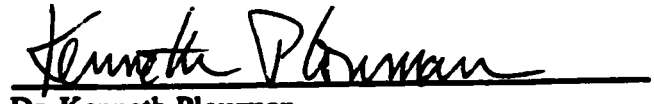
APPROVED FOR THE GRADUATE SCHOOL

OF JOURNALISM AND MASS COMMUNICATION

Dr. Stephen Greene

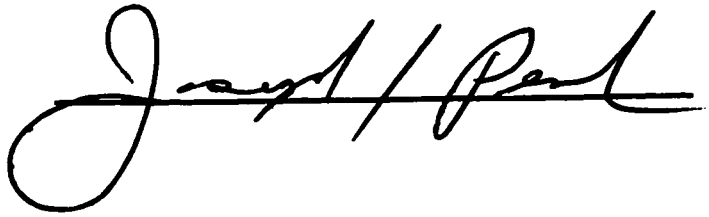


Dr. Richard Craig



Dr. Kenneth Plowman

APPROVED FOR THE UNIVERSITY



ABSTRACT

REGULATING MEDIA TECHNOLOGIES: A HISTORICAL COMPARISON OF RADIO AND THE INTERNET

by Jessica Schneider Davis

This paper explores new media technologies and their impact on communication policy in the United States. The purpose of the research is to contribute to the understanding of why different forms of mass media that have the same objective—to communicate information to the public—fall under different regulatory schemes.

This research paper presents a comparison of radio and the Internet, two forms of mass media that introduced new technology and subsequently acted as the *raison d'être* behind the two most sweeping pieces of media-regulatory legislation in modern times—the Communications Act of 1934 and the Telecommunications Act of 1996. This historical research traces the development of each medium, from conception to invention to adoption and ultimately to the U.S. regulatory decision-making process surrounding each.

The results of this research revealed clear, significant patterns in media development and adoption and unfocused media policies in the United States.

CONTENTS

Chapter Page

CHAPTER 1

INTRODUCTION:

MEDIA REGULATION IN THE UNITED STATES

Legislation of United States mass media has continued to evolve throughout the history of the country. The First Amendment of the United States Constitution states: "Congress shall make no law respecting an establishment of religion, or prohibiting the free exercise thereof; or abridging the freedom of speech, or of the press. . ."[1] The framers of the Constitution no doubt intended to allow the press to operate independently from the government. This system they thought was important to a democratic society.

As media technology has evolved, so too have the interpretations of the First Amendment, and the United States has continually evaluated its media-regulatory policies in response to new technologies. Currently, three communications regulatory policies exist in the United States. This trifurcated policy includes separate principles for print media, electronic broadcast media, and common carriers.

While the "press"—media that are actually printed on paper—continue to enjoy broad First Amendment protections, other communication media do not. Newspapers and other print media operate independently from government intervention—theoretically. The government does exert some indirect control over the print media's content and growth through such actions as restricting of access to

information, subsidizing postal rates, and enforcing libel and pornography laws. However, the print media continues to enjoy the broadest First Amendment protection and is essentially unregulated.

The government does regulate broadcast media—television, radio, and cable—under the authority of the Federal Communications Commission (FCC). The FCC issues broadcast licenses, mediates disputes between broadcasters and the public, and draws up rules on licensing, programming, and technology standards. The FCC was created, and is overseen, by the United States Congress, which justifies the regulatory role of the FCC on the principle of scarcity. The airwaves, or electromagnetic spectrum, are a scarce commodity, and regulation is necessary to prevent airwave chaos. Although cable television delivery systems do not face a technical scarcity of bandwidth, the FCC has interpreted its role in broadcasting regulation to extend to cable.

The government also regulates media that falls into the category of common carriers. Common carriers are conduits of communication; they do not compose or publish the content they communicate. Examples of common carriers include the post office, telephone service providers, and Internet service providers. These media providers are considered to be public utilities, akin to electricity and garbage providers. Generally, one company has a contract to provide these services to a geographic area and holds a monopoly on that area. In exchange for allowing this lack of competition to customers, local and state public utilities commissions have oversight over many of their activities.

Under the principle of open access, common carriers must provide "universal access" in their coverage areas, meaning they must allow everyone in their service area to use the service and they must make it available to all. The regulatory structure of common carriers also ensures smooth provision of service; for example, under one universal postal service, everyone needs only one mailbox, the price of postage is set, and local delivery must be efficient and regular. In this system, everyone gets his or her mail. Media sent through the mail is the responsibility of the sender or the receiver, but not the carrier.

In recent years, the development of technology has blurred the lines of this regulatory system. As technologies converge, the need for, and justification of, regulation is less clear. Digital media has changed the way content is prepared, packaged, and distributed. The Internet, for example, is a limitless resource—it faces no natural scarcity challenges. Its content—text, music, video, graphics, and telephony—is delivered to computers through wires. No one owns the Internet and no one controls its reach. Not since the radio has a new medium introduced such a profoundly new experience for the public. Likewise, not since the radio has a mass medium so challenged the established regulatory structure in the United States.

Economic and Political Theories

The United States is a capitalist democracy, which means that government does not interfere more than necessary in the marketplace. Providers of goods and services compete for customers in a public marketplace, and the public (the market) decides which ones survive. The marketplace model also applies to media law and regulation. United

States Supreme Court Justice Oliver Wendell Holmes placed media law squarely in the public marketplace in his opinions on court cases involving the First Amendment. He believed that truth is best guaranteed in the open marketplace of ideas. "Any government restraint that tends to distort or chill the free play of ideas, and thus the quest for truth, should not be permitted."[2] It is under the marketplace model that the government determines national media regulatory policies.

The "marketplace of ideas"—that from many viewpoints the truth can emerge—serves the public well, assuming that the market contains enough voices to include the truth. If the many ideas duel in a battle for truth, truth best arm itself for battle. The marketplace theory also assumes that every person who wants access to the media shall have it, and often this is not the case. The mass media is thus not a perfect market; some intervention is necessary to correct its failures. The media regulatory policies of the United States are the result of many balancing acts—attempts to intervene where necessary and appropriate, without preventing the market from existing and running smoothly.

When radio emerged as a popular form of mass media, the marketplace of ideas theory was challenged. The limited amount of spectrum space in the airwaves limited the number of voices that could speak, and people drowned each other out in their quest to communicate The regulatory policy of the press did not work in this environment, and the broadcasting media was soon in need of intervention. The same thing happened with the emergence of the Internet. Although not bound by the same constraints as radio, the Internet nonetheless posed many challenges to the existing regulatory schemes. Again,

the system was in need of intervention. In both situations, the government had to balance its desire to promote the marketplace with its desire to maintain fairness and promote the truth.

Urge to Regulate

Regulators intervene when new media technologies challenge the existing regulatory structure. Not surprisingly, the two landmark pieces of mass-media legislation, the Communications Act of 1934 and the Telecommunications Act of 1996, were signed into law largely in response to the regulatory dilemmas presented by the radio and the Internet. Media scholar Roger Fidler sums up the ongoing nature of the regulatory process:

> "When President Clinton signed into law the Telecommunications Act of 1996, pundits claimed that this first major overhaul of U.S. communication regulatory policies since 1934 would radically change the communications business in the United States and speed the way for new media development. Although this law eliminates many of the regulatory barriers that had existed between different forms of communication and allows for somewhat more competition, a great many questions remain unanswered."[3]

These questions will continue to mount in the upcoming decades as more technologies combine traits from the old, further blurring lines of the three regulatory practices. As we will see, technology continues to evolve, creating new opportunities to bypass existing regulations, and policy makers must constantly evaluate the interests of their constituents. "Frequently, technical issues disguise what are actually economic interests vying for control of some segment of the broadcasting market."[4] A thorough

understanding of the novel dilemmas posed by two new mass media technologies—radio and the Internet—will build a foundation for understanding the balancing acts of the future of media regulation. Many aspects of radio and the Internet, including their development, adoption, rationale, pioneers, corporate and public interest supporters, their technological aspects, and regulatory outcomes were similar. Many were different. This paper presents a comprehensive comparison, which can be used as a blueprint for likely regulatory processes of the media of the future.

This paper also explores the government rationale for intervening in the public marketplace and its evolving interpretations of the First Amendment and the notion of the public interest.

Research Questions

Using the radio and the Internet as examples, why do different media have different regulatory policies? Specifically, this paper seeks to address the technological, societal, and political influences on the policy-making processes.

1. What is the rationale for the policies as they exist now, and will that rationale apply to future media technologies?
2. What is the relationship between the corporate interests and the rate at which media are adopted? What about the government?
3. How has the public-interest definition evolved and what does that indicate about the role of media in the future?

4. Finally, how do the regulatory approaches affect the commercial potential of particular media forms? Can government regulation stifle technological development or does it act as an enabler?

The paper anticipates finding that adoption and development of the technology, its evolution into a mass medium, and the perception of the medium by the regulators all contribute to the regulatory policies of the medium.

---

[1] U. S. Constitution, amend. 1, sec. 1.

[2] Donald Gillmor, Jerome Barron, and Todd Simon, *Mass Communication Law: Cases and Comment*, 6th ed. (Belmont, Calif.: Wadsworth Publishing Company, 1998), 5.

[3] Roger Fidler, *Mediamorphosis* (Thousand Oaks, Calif.: Pine Forge Press, 1998), 126.

[4] Erwin G. Krasnow and Lawrence D. Longley, *The Politics of Broadcast Regulation* (New York: St. Martin's Press, 1973), 20.

CHAPTER 2

METHODOLOGY

> *"In historical research, as in all other kinds of research, the data to be used depend upon the question the researcher wishes to answer and the information the researcher can find to answer the question."*[1]

This paper was approached from the social science point of view and employed historical research methods. The historical approach is qualitative in nature, meaning that the research relies on interpretation more than on statistics.

Qualitative Research

Qualitative research indicates an emphasis was placed on processes and meanings that cannot be mathematically examined or measured. Often with qualitative research, as was the case of this paper, no measurement of data was conducted whatsoever. (Measurement refers to such scientific variables as quantities, amounts, intensities, or frequencies.) "Qualitative researchers stress the socially constructed nature of reality, the intimate relationship between the researcher and what is being studied, and the situational constraints that shape inquiry."[2] In contrast, *quantitative* research assigns values to variables and seeks to prove causal relationships between them.

Qualitative research is a component of social science. Social science plays an important role in understanding the influences on change that originate outside the

rational explanations traceable through mere observation. Social science can reveal answers to some of the world's major problems[3] and these methods are particularly useful in analyzing the role of technology in society.

Throughout history, technological advances have both addressed and subsequently created problems. Most of the time, problems caused by technology are solved with social solutions. "We cannot solve our social problems until we understand how they come about and persist. Social science offers a way to examine and understand the operation of human social affairs. It provides a point of view and technical procedure that uncovers things that would otherwise escape our awareness. "[4]

Inquiries of Social Science

Social science is comprised of two activities: measurement and interpretation. In this case, the events of history were collected and verified, then interpreted from social, economic, and political viewpoints. This study sought a general understanding of historical patterns—specifically, the patterns of technology invention, adoption, and regulation.

The inquiry was mostly unstructured; that is to say, the researcher did not begin with a general theory and then test it through observation. Instead, the researcher took the observations and looked for patterns within. This approach is known as the *inductive method* model. It began with specific concrete examples (radio and the Internet; the Communications Act of 1934 and the Telecommunications Act of 1996) and aimed to identify general principles regarding mass media regulation in the United States.

Often, a particular paradigm informs historical/comparative research. A paradigm is a model or frame of reference that directs attention to specific concepts and shapes the theories we develop of purposes of general understanding. Thus, comparisons between two particular media—radio and the Internet—help determine whether media can be understood through theory. In understanding the similarities between the two media, it is important to understand the essentials of media technology development, evolution, and regulatory evaluation.

Measurement: Analytic Techniques

Measurement is the collection of information and can be performed in a variety of ways. Often, social science research will include observation, content analysis, surveys, or immersion. Often, *what* is measured is as important as *how* it is measured. Because historical/comparative research is qualitative in nature, no textbook approach exists for analyzing historical data.[5] Often, the researcher must be able to identify important elements of data solely based on the researcher's understanding of the topic.

A major problem for historical researchers is that one cannot fully understand one's question without having some background in the relevant historical period. Unfortunately, it is impossible to gain actual first-hand knowledge of different eras, or for that matter, first-hand insight into the rationales and motivations of contemporary actors. Researchers can overcome this obstacle by understanding that history is more than a series of events and that the past has continued relevance for the present.[6]

A researcher can learn about a specific topic through self-instruction—locating and reading relevant books, articles, and reading lists on the topic. Most history books focus on facts rather than on theories, and they often frame their research questions differently than do social scientists. For example, historical researchers might focus on the dates of events, but specific dates are not always as important to social scientists as the *effect* of the event. This is where the compilation and evaluation of data are important.

For information on the regulation of media, sources of data must come from many points of view: communications scholars, economists, legal experts, and social historians. When evaluating texts from these fields, corroborating facts is crucial.[7] This can be done through cross-references with other texts and by evaluating the authority of one text versus another. For example, Erik Barnouw is highly respected as a media historian—his works are the most frequently cited on the topic. "In theory, the more an article or book is cited, the greater its contribution to the literature, and so the greater its utility."[8]

Finding and assessing primary historical data is an exercise in detective work, involving logic, intuition, persistence, and common sense. In historical research, the amount of data available is endless.[9] Countless historians have already reported on the events this paper sought to examine and have provided a wealth of information on the subject (particularly that of radio and the historic events leading up to the 1934 legislation); this body of information forms the basis of this research. It is important to note that the goals of the prior research varied—no study existed that covered the topic of this paper in entirety. Thus, conclusions were drawn based on the raw data provided by others, but the conclusions were original.

Sources of Data

Historical research methods encourage researchers to examine the documents of relevant organizations, as many organizations maintain records of their activities—in this case, policy papers, editorial letters, speeches by leaders, and transcripts of public conversations provided insight into the rationales of groups involved in media regulation. Of equal import were documents from official proceedings of the government—these included transcripts from the Congressional floor; statistics from executive-branch divisions; White House policy statements; and legislative proceedings of the U.S. Supreme Court. Each of these organizations has an agenda in presenting ideas to the public; these agendas must be weighed in evaluating the documents.

It is important for historical researchers to be wary of bias in their data sources.[10] To guard against bias, this research sought data from a diverse number of sources that represent different points of view. When they examine historical documents, researchers must ask themselves about to intended audience of the discourse, whether the document was intended to be public,[11] and if so, why; and what role did custom, etiquette, and convention play in the presentation of the material presented?

For instance, in examining transcripts from Congressional floor activity, it is important to keep in mind that legislators are fully aware that their actions, statements, and votes are public record; in fact, they are broadcast live and meticulously recorded. The actors involved in this data are acting under long-established procedures and conventions. Thus, what the legislators say on the floor must be evaluated closely.

Often, only an in-depth understanding of the issue under discussion reveals the true agenda of the speaker. Along these lines, researchers should try to incorporate first-hand accounts of the proceedings by witnesses. Newspaper and magazine articles often provide the much-needed context for the actions of particular legislators. Such factors as the demographics of the politician's home state, the length of time remaining in a politician's term, and of course, the amount of money donated to the politician's campaign help flush out the motivations of politicians, which helps the researcher weigh the meanings behind legislative proceedings.

The research questions of this paper are best answered through the historical method of inductive inquiry. The researcher is looking for patterns that will help explain how regulatory processes work. The research relied on copious amounts of reading, with on-going analysis of data. Surely, relevant data exists that was not consulted, and as with all historical research, the researcher must sort through the data until she is convinced she has the clues to her research questions.

Methodology is an important component of all research; the historical method provided the researcher the information to assemble a logical approach to the progression of mass-media evolutions in the United States. The paper follows the general approach the researcher took—it begins with the history, interprets events and developments from a theoretical grounding, and provides analysis of relevant patterns along the way.

[1] Gaye Tuchman, "Historical Social Science: Methodologies, Methods, and Meanings," in *Handbook of Qualitative Research*, eds. Norman Denzin and Yvonna Lincoln (Thousand Oaks, Calif.: Sage Publications, 1994), 312.

[2] Norman Denzin and Yvonna Lincoln "Introduction: Entering the Field of Qualitative Research," in *Handbook of Qualitative Research*, eds. Norman Denzin and Yvonna Lincoln (Thousand Oaks, Calif.: Sage Publications, 1994), 4.

[3] Earl Babbie, "Prologue," *The Practice of Social Research*, 8th ed. (Belmont, Calif.: Wadsworth Publishing Company, 1998), xxi.

[4] Ibid., xxii.

[5] Tuchman, 314-315.

[6] Ibid.

[7] Babbie, 329.

[8] Tuchman, 318.

[9] Babbie, 328.

[10] Ibid., 329.

[11] Babbie, 331.

CHAPTER 3

DEVELOPING NEW MEDIA TECHNOLOGIES

> *"Computer engineers and marketers were caught off guard by a public demand for applications they'd scarcely considered for their products... the same thing happened with the telephone and radio."*[1]

The history of the development of the radio and the Internet are very similar. Both media followed three main phases of development: idea (the concept of the final technology, combined with the purpose or need for the technology, and the scientific understanding as to how to build the technology); the series of inventions that would build upon each other; and the societal adoption of the technology as a form of mass media. Following the progression of inventions and innovations, a clear connection exists between radio and the Internet.

First, it is important to note that neither technology arrived out of the blue. "Radio is the clearest example of a machine already in existence before it was 'invented.'"[2] Despite its apparent lack of unoriginality, the impact of radio was huge. The development of the Internet did not develop so much as converge several existing technologies—it did not replace an older medium. Purely as an invention, the Internet is nothing radical, although its impact equals that of radio.

Introduction of Radio

The Idea: Carrying Sound over Electromagnetic Waves

The scientific concept behind the radio—the electromagnetic spectrum, or the "ether"—dates back as far as the 1860s and the research of James Clerk Maxwell, who discovered the presence of electromagnetic waves. German scientist Heinrich Hertz carried the first transmission over the waves. In the years 1886-1889, he demonstrated how to set waves in motion and how to detect them. Following that demonstration, research into "Hertzian waves" was intense.[3] By this time, the use of telegraphy was already widespread. Sound was first transmitted over the spectrum in 1880, although this use of the spectrum was not widely hyped because people didn't see much use for it, as they already used the telegraph to transmit information.

The term "ether" is used synonymously with the term "airwaves," although they are technically not the same things. Scientists in the nineteenth century assumed that a tangible material, such as water, air, or wood, was required to carry sound waves, and they named this material "ether."[4] Although electromagnetic waves actually require no air to travel, the term became established in the lexicon of radio as a description of the material over which sound travels.[5]

Sir Oliver Lodge built a device to detect radio waves. Although his agenda was purely scientific, the tuner he designed, called the coherer, would be the first invention upon which the others would build in inventing radio. Sir William Crookes first published the idea of a radiotelegraph as a way to communicate in an 1892 issue of

Fortnightly Review: "Here, then, is revealed the bewildering possibility of telegraph without wires, posts, cables or any of our present costly appliances."[6] Crookes's vision of communication without "appliances" put into words the goal of Hertzian waves.

Many scientists were working on Hertzian waves around Europe and in North America; however, the British navy would provide the clearest need for the radio. The navy's ironclad ships were so large and heavy that they had to travel at least 800 yards apart, which created a major communication problem. Signaling with flags (the common method at the time) was difficult with the distance between the ships.[7] Thus, there was a need for radio. Mahlory Loomis proposed in 1872 that electrical signaling would be possible over long distances if one used very tall aerials.

Guglielmo Marconi, a youth in Italy, took an avid interest in Hertzian waves and spent countless hours developing a Morse code key for his wave device and experimenting with an antenna.[8] In doing so, Marconi contributed a crucial element to radio development. He recognized the potential of radio to solve the problem of communication over distance. He took his invention, the "black box" to England, where scientists, naval officers, and enthusiasts soon appreciated it. He did not "invent" radio as it came to be known, so much as he "discovered" a useful purpose for communicating information over Hertzian waves—the need for a signaling function aboard ships. Marconi patented his invention in 1897[9] and formed what would become the Marconi Wireless Telegraph and Signal Company, Ltd., which he brought to the United States in 1899.[10]

"Now, with wireless a center of attention, there would be experimenters by hundreds and by thousands. . . . With them a new era began, associated with the terms *wireless telephone . . . radio telephone . . . radiophone . . . radio.*"[11]

Inventions and Patents

Marconi's "black box" was not the radio that people would come to have in their homes. Radio would need the important scientific additions of other inventors. In addition, other uses for communication over the air would transform wireless telegraphy into radio. The series of inventions both before and after Marconi's "black box" would result in many patent disputes throughout the radio industry.

The use of the radio waves as a medium for communication generated several physical problems. Wireless communication was public, which was a problem for military officials, who were generally concerned with keeping their operations secret. Also, other companies in addition to Marconi were sending and receiving wireless communications, and naval officers were concerned about the interference resulting from different senders using the ether. Contributing to both these problems were amateurs, whose signals often interfered with those of commercial senders.[12] These problems slowed the growth of radio.

One of the major turning points in radio development was the scientific research of Thomas Edison, who was working on the electrical light bulb.[13] He discovered that heat measurement could light glass in a vacuum, an occurrence that became known as the "Edison Effect." The vacuum tube would ultimately allow radio to realize its true

potential by allowing long-distance telephony and would birth the possibilities of data processing and the digital computer.[14] Edison was also an important figure in radio development because his business would ultimately become General Electric,[15] a company focused on encouraging research and development into radio and highly influential in the development of broadcast networks.

In 1904, John Ambrose Fleming, while working for the Marconi Company, adapted Edison's discovery by turning the vacuum tube into a device for alternating radio signals into direct currents. Lee de Forest added to Fleming's invention a third electrode in the form of a "grid" to the vacuum tube. De Forest's three-element valve, called the audion, could detect and amplify weak signals and was patented in 1906. The audion would be the most important invention of radio development and would form the foundation of all electronics until the development of the transistor.[16] By 1906, de Forest had made a name for himself in radio with several public demonstrations of wireless, and his company was already competing with American Marconi stations for ship-to-shore communication.[17]

Wireless radio was pervasive in the sea and served some dramatic purposes, mainly because it enabled distress signaling. By 1912, American Marconi had a virtual monopoly on marine communication in the United States.[18] Radio operators communicating with boats in trouble saved lives. For their heroism, they were "astronauts of their day."[19] That same year, the *Titanic* disaster would have indirect influences on the future of radio. The radio operator of a ship nearby *Titanic* could have assisted in the rescue mission but was asleep with the radio off; international regulations

henceforth required all ships to have 24-hour on-duty radio operators. Afterwards, "Marconi stock shot up from £55 to £225 on the London stock exchange...and Americans went on a speculative binge that would not be repeated until the days of Apple and Intel, Yahoo and Netscape."[20] The business value of radio was apparent.

More dramatically, a Marconi operator in New York City, David Sarnoff, reported the radio accounts of the *Titanic* disaster. Sarnoff would rise to prominence as one of the first broadcast executives and the head of the future RCA.

Edwin H. Armstrong added yet another element to the radio-wave detection abilities of the de Forest audion—the feedback circuit, which made radio reception effective. Armstrong received his patent in 1914.[21] Armstrong later improved on his feedback circuit and patented the superheterodyne circuit, which he sold to Westinghouse in 1920.[22]

Armstrong would also later introduce a new system of frequency modulation (FM) while working at RCA in the twenties. FM was very clear and eliminated much of the noise of radio. Although initially encouraged by RCA head Sarnoff, FM was then viewed as a threat to AM radio, which had by then become very popular. FM would also challenge early developments in television, so Armstrong had discouragement from both sectors.[23]

Full development of radio was hindered by patent disputes, the subject of many arduous and severe legal battles. Sir Oliver Lodge, who thought his coherer was built before Marconi's black box, filed one of the first patent disputes. Marconi also fought several battles with de Forest. Fleming's valve was developed while Fleming worked for

Marconi, so Marconi challenged de Forest's audion patent. Initial court rulings found that both these devices functioned as detectors, so de Forest's audion did infringe on the Marconi patent. However, de Forest's "grid" element was protected as a true innovation. Fleming's device and de Forest's device were very similar, so much so that one could not use one without infringing upon the patent rights of the other. "Each company was thus the owner of something it could not use in its own right."[24]

Armstrong was involved in the patent dispute over radio reception as well. de Forest's arduous battle with Fleming/Marconi and with Armstrong over the audion as a detector continued long after Fleming's original patent expired in the mid-twenties. The controversy over patents continued until 1943, when the United States Supreme Court ruled in favor of de Forest.

American Telegraph & Telephone Company (AT&T) established its Bell Labs in 1925 as a way to protect telephony from radio's potential to usurp purchasers. Within the labs, Bell would develop ideas and use the patents as bargaining chips[25] in its quest to monopolize broadcasting. Patent disputes threatened to slow or halt development of the radio. Just as things were heating up in the patent battles, however, the war in Europe was also heating up. Military needs for great quantities of vacuum tubes meant that patent disputes were set aside, and all companies were allowed to assemble the tubes in entirety.

Vacuum tubes were mass-produced for the first time and all were made to exact government specifications, so that different companies could make them. It was a very lucrative deal for manufacturers. War was enormously important to the development of

radio. Not only did radio assist war-related communications, war assisted radio development. [The navy] "with few restrictions as to funds, became the inspirer and guiding patron."[26] The war would also help the transformation of radio from signaling device to mass medium. Hundreds of servicemen operated radios during the war, learning how to use the tuners and gaining an appreciation for communication through the airwaves. After the war, these radio operators returned home with their equipment and started tinkering with radio, looking for something to do with it.[27] With the introduction of simplified receivers coming on the market, many of these servicemen became amateur—or professional—radio broadcasters after the war.

Radio Adopted as a Mass Medium

Radio would not reach critical mass as a form of wireless telegraphy. First, it would transform into a source of entertainment and information, not so much as a result of technology but as a result of developments in radio *programming*. This concept was broadcasting.

Reginald Fessenden, a Canadian scientist who worked for Edison and for Westinghouse, had the idea to transmit sound in continuous waves instead of transmitting in the wireless-telegraphy standard of interrupted series of bursts. The continuous waves allowed him to transmit voice on waves, which would become the key transformation of radio into a mass medium. In 1906, Fessenden transmitted music and speech from the coast of Massachusetts across the Atlantic on Christmas Eve.[28] This transmission was the

first real voice-based broadcast. Fessenden also coined the term "broadcasting" from the farming method of spreading seeds over a wide area.

Fessenden "invented" radio as a broadcast medium, but it would be another 14 years before broadcasting would really attain critical mass. As of 1906, there existed no social necessity for broadcasting, and most radio research and development was in enhancing distance communication.[29]

Lee de Forest would spend much of his energy developing broadcasting. His broadcast from the Eiffel Tower in 1908 made him a mini-celebrity, and his interest in broadcasting "became a grand obsession."[30] The roles of both de Forest and Fessenden would help transform radio from a point-to-point medium to a mass medium.

KDKA, the broadcast station operated by Frank Conrad, war veteran and Westinghouse engineer, is considered the first radio broadcast station. It went on the air in 1920.

The privacy issues that initially concerned naval officers and threatened widespread adoption of radio would eventually be seen not as a flaw, but as a benefit. Sarnoff, the Marconi operator at the time of *Titanic* and later chairman of RCA, had imagined a "music box" in every home, an appliance that could bring public entertainment into the house.

Changes in American society would also enable the possibility of broadcasting. Post-war America witnessed the rise of the middle class. Large corporations started manufacturing and selling radio receivers, which were inexpensive and very popular. Corporations also started efforts to join together in order to stabilize the radio market and

enhance profitability. The companies manufacturing the radios were the original investors in radio broadcasting, as they wanted to create the desire, or need, for their radios.

One of the principle contributions to technology adoption throughout history is the need of industrialized society. Mass distribution of the same product results in homogenization, and homogenization results in greater demand for perceived needs. For example, the telephone grew in tangent with the growth of corporations and large office buildings. The growth of the nuclear family (compared to the extended family of the 19th century), in concert with the rise of leisure activity, contributed to the success of radio. As the working class developed a need for comfortable environs to house their nuclear families, they developed a simultaneous need for homogenized entertainment within the home.[31]

In this sense, radio developed in an unusual social climate. Never again in the twentieth century would leisure time increase and create a need for entertainment. Subsequent new media would have to compete for public leisure time and attention, which would remain flat or actually decrease. Time people spent enjoying or exploring new media technologies would be less time spent with the old technologies. It follows that the owners, and others with financial incentives deriving from existing media would not greet new technologies kindly. Individuals have little to say about which technologies get developed or introduced,[32] but because of their importance as consumers, they do play an important role in determining which technologies reach

critical mass. People demonstrated their acceptance of broadcasting in the twenties by purchasing thousands of radios.

Consumers—the listening audience—fueled the growth of the radio industry, as did amateur broadcasters and the growing broadcast networks. Radio stations grew at such a rapid pace that chaos in the ether became a problem. This problem would result in media regulation.

Introduction of the Internet

> *"Understanding radio and its history is the key to a comprehension of the major social and technological issues surrounding the Internet."*[33]

The Idea: Carrying Data over Networked Systems

The Internet was built on the concept of networks. First introduced with the telephone, then popularized with radio and television, networks connect regional services in different areas of the country under one operation. Thus, telephone networks literally link people over the phone lines. Broadcast networks metaphorically link people by making possible a shared popular culture based on the same programming reaching the entire nation. The Internet is combination of these two types of networks—an interconnection of networks[34] that connects and communicates information to computers through telephone lines.[35]

As with radio, the development of the Internet was made possible by military need, funding, and research, although the military at this time had a more direct role in seeking a solution to its communication problem. The Internet is truly a product of the Cold War. The military, in the midst of the standoff with communism abroad, needed a

communications system that could withstand attack from an atomic bomb.[36] The system needed to be decentralized and redundant so as to avoid mutilation in the event of nuclear attack. This way, communications can continue even after attack wipes out one section of the system because there is no single command center is at risk.

The most innovative feature of the Internet is the concept of packet switching, a method for transferring data that had been discussed by academics for many years as an alternative to circuit-switching data, the system used by telephones. Packet switching breaks messages into small bits of binary code, called packets. These packets are compressed and encrypted, sent out, and routed through the network independently, then reassembled upon reception at the other end.[37]

Paul Baran, while working on a system for military communications for the RAND corporation[38] in 1964, conceived of "message blocks." Baran's idea was markedly similar to that of Donald Watt Davies' "packets."[39] Davies's prototype in the mid-1960s proved that the idea of packet switching could work. Both researchers published their ideas right around the same time.

Another contributor to the key invention of packet switching was Len Kleinrock, an Internet pioneer who became interested in science after assembling a crystal radio as a young child.[40] His Ph.D. on packet switching laid a foundation for data networking.

President Dwight Eisenhower requested the initial funding for the Advanced Research Projects Agency (ARPA) from Congress in early 1958.[41] ARPA was designed to be the single government defense-research agency for space and missile research,[42] streamlining the four-branch military bureaucracy. Within ARPA, the Information

Processing Techniques Office (IPTO) would build the basis of the Internet's backbone and the foundations for information processing that exists today.[43]

Inventions and Killer Apps

Transforming the concept of packet switching into the Internet would require a series of inventions and innovations. The first innovation was interactive, real-time computer networking, which was proposed by J.C.R. Licklider, head of the IPTO, in 1960.

The idea for this network was a single computer, linked to a telephone wire, which could be operated remotely. This prototype of the first computer was the 1940 IBM model 1, which was not a modern computer exactly but a calculating machine.[44] In 1960, computers were enormous mainframes—they had no keyboards or screens and filled entire rooms. They were expensive, and access to them was highly restricted.

Universities saw the computing and research potential of these supercomputers and applied to the IPTO for funds to install on-site mainframes of their own.[45] ARPA could not afford to give a mainframe to everyone who requested one—each installation cost more than $500 thousand, so the IPTO was motivated to find cheaper alternatives. The expense of mainframes and their applications encouraged development of the Internet.

The ARPA team came up with the idea of time sharing—connecting the machines to a network so they could share applications. The idea of networking computers was not new, but now there was a motivating need for it. An ARPA network was proposed "to provide interactive access between ARPA-funded computer resources... and to save

money that ARPA would otherwise have to spend on buying more time and more computers."[46] Through a network, computer costs could be amortized by time-sharing. Lower costs, in turn, allowed more people to access the computers.

The final invention in Internet development was a smaller computer that would sit in front of the mainframe host and act as its translator. The mini-computer would act as the interface messaging protocol (IMP) to the huge supercomputers and would run the software that "packetizes" the outgoing data and reassembles the incoming packets into messages that the mainframe could understand. These IMPs had to be built before the computers could be networked. The IMP—an early version of the "router" which later Cisco Systems designed and sold to great fortune—was a spin-off invention.

After ten years of existence, ARPA prepared to build its network in 1969. "It was on the brink of creating a new technology that would have profound and lasting consequences for technology, society, culture, employment, even the global economy."[47] The year 1969 was significant. As ARPA was created in the wake of Sputnik and at the height of the Cold War, so too was NASA. Both organizations accelerated their efforts to meet an end-of-the-decade deadline for landing on the moon, and both organizations would succeed in the summer of 1969. "Oddly, the moon landing would come to seem the end of an exciting era of adventure, while the ARPA effort would be just the beginning of a massive technological and economic boom."[48] The connection of the first two "nodes" of the ARPAnet—from UCLA's mainframe to its IMP, and from the UCLA IMP to the Stanford IMP to the Stanford mainframe in October of 1969—was the first

time two remote computers communicated. This event marked the official "invention" of the Internet.

Through its military involvement, the U.S. government played an enormous role in aiding the development of the Internet. The federal government funded computer development between the years 1958 to 1974 to the extent of $1 billion.[49] ARPA commissioned and funded huge computers for various government and research-oriented programs, and it had "an unprecedented and unrivaled freedom in the defense and research community to select and fund experimental projects with almost no red tape."[50]

Consider this comparison from *Scientific American* in 1982: "If the aircraft industry had evolved as spectacularly as the computer industry over the past 25 years, a Boeing 767 would cost $500 today and circle the globe in 20 minutes on 5 gallons of fuel."[51]

The Internet Becomes a Mass Medium

The transformation of the Internet from communication tool to mass media relied on technological advances: the Personal Computer (PC), the semiconductor, the World Wide Web, and the network browser. While scientists in one sector were working on the realities of networking mainframe computers, scientists in another sector were miniaturizing these mainframes into PCs. For these sectors to intersect, the computer industry had to grow in many directions.

As part of the broader, all-encompassing telecommunications industry, the Internet "may be the technology that changes the fastest of all and with the greatest

impact on society."[52] Like radio, the development of the Internet seemed to many to have happened rapidly—it arrived and changed the world within a few years. This thinking resulted from a misconception as to what the Internet really was. Those with this perspective confused the Internet with the World Wide Web, which is a small portion of the entire Internet infrastructure. While the Internet had been under development for about 30 years, the decade that brought the arrival of the Web also brought an explosion of the Internet onto the consciousness of the public, the media, and the government. "The explosion of the Web is strongly reminiscent of the great radio gold rush of the twenties."[53]

The concept of a "web" of data can be traced to Vannevar Bush in 1945.[54] Bush, however, did not consider the computer as the "gadget" to hold the web of information. Consequently, his idea of the "web" would not arrive for nearly half a century.

The year of Sputnik, 1957, was also the year the semiconductor was invented. The semiconductor was a crucial element in developing the modern Internet. The vacuum tube, invented as the receiving device for radio, was the mechanism for carrying radio waves up until 1948, when the transistor replaced the vacuum tube. Transistors worked remarkably well, and demand for transistor radios boomed[55]—thus creating a societal push for development in transistor technology. This research led to the development of the semiconductor, which used melted and altered silicon to transfer currents across a resistor. Semiconductors spawned a huge industry, largely based in California's Santa Clara Valley, or "Silicon Valley," headquarters of Fairfield semiconductor.

Robert Noyce, one of 50 "fairchildren," employees of Fairfield Semiconductor who left to form their own companies, and his partner Gordon Moore formed Intel Corporation to develop microchips that could hold an entire computer on a chip. Semiconductors would enable microchips, which would make possible the small-sized PC. The size and accessibility of PCs could bring computers to the desks of every office worker. Once the PC became a common office tool, the need to connect PCs arose, and hundreds of private companies developed the products to link PCs to printers, to each other, and to the Internet. At this point, the Internet truly starts to live up to its potential to change the world.

A "killer app" [application] is a feature of the technology that makes people think they must have the technology. In the evolution of the Internet, e-mail was the first killer app.[56] Invented in 1972 by Ray Tomlinson, e-mail was soon the majority of traffic on the ARPA network. In fact, after e-mail was introduced, 75 percent of the ARPAnet traffic was e-mail.[57]

After one year in use, e-mail carried mainly news and personal communication, not computing. Although the telephone was an adequate device for person-to-person communication, e-mail had tremendous benefits: it could overcome time-zone obstacles and could support messages to multiple recipients.

At the same time, the PC had made computers affordable, so the need for time-sharing applications became less important. The Internet's usage would shift from the largely academic and military users to the mainstream.

People who were using the Internet in the 1970s started to form newsgroups. Usenet, a network of newsgroups, was a method for university students and faculty to discuss issues and information. Usenet soon sprouted nonacademic forums, and by 1986, the Internet was so chaotic that oversight became necessary.

Unlike radio, initial oversight, or management, of the Internet was not the role of government. Internet administrators, mainly volunteer users, restructured the Usenet forums into seven hierarchies as a way to alleviate the chaos. Even this nominal management upset many users, who wanted to retain the newsgroups as community property.[58] In reaction to the imposed hierarchy, users introduced separate Usenet routings for topics not governed by administrators. These "alt" [alternative] use groups, hosting topics such as drugs, sex, and music, became very popular. This example demonstrates the great influence amateurs had in determining regulatory policies. Early radio pioneers lacked either the organization or the foresight to self-regulate the chaos of the airwaves in such a way, which might have opened the door to governmental regulation. If the industry had a self-appointed regulatory body, it might have prevented FCC oversight.

By 1974, commercial enterprises began to take an interest in the Internet as a business opportunity. Compuserve, a private, hosted network was very successful and drew many people who were neither technological nor computer-savvy. Other subscriber-based services would also form dedicated consumers. These included Prodigy and America Online, which would eventually become the RCA of the Internet.

The most important invention concerning the Internet's transformation from communications tool to mass medium was the World Wide Web (WWW; Web). Tim Berners-Lee developed and published a system with standards for posting and retrieving data on the network. The system was based on graphical catalogs of the shared content on the Internet, although it went beyond traditional cataloging or alphabetizing. The WWW introduced the concept of hypertext, which would allow people searching for something to link directly to another data source. Hypertext was nonlinear; it provided lateral and vertical exploration of information. Following various hypertext links, "surfing, the Web," soon became a popular hobby.

The network browser, introduced soon after the Web, was the tool people used to surf the Web. The introduction of the first widely-used browser, Netscape, was "every bit as powerful and intuitively exciting as had been the first public demonstrations of the telegraph or the motion picture ... it was, in a word, thrilling," said Netscape inventor Marc Andreeson.[59]

The Web and the browser made the Internet available to anyone with a computer and a telephone connection.

Regulating the New Media Technology

Though the Internet began as a means of point-to-point or many-to-many communication, it soon morphed into point-to-mass communication, providing news, culture, and entertainment. A virtual encyclopedia, the Internet included countless Web pages on every imaginable topic. Anyone could become a publisher and have his or her

ideas sent into cyberspace, creating a medium of self-expression. Included in this entertainment was pornography, an industry that boomed on the Internet.

Problems with content on the Internet first occurred in the Usenet postings. Some people expressed negative reactions to the "problems of unlimited expression."[60] While the existing media profoundly hyped the possibilities of the Internet's communication potential, it also exposed some of the perceived problems.

By the beginning of 1995, the big news in the mainstream media was the commercial aspects of the technology and the social evils to be found on the Web. Media coverage of the Internet showed "a technological devil in a very appealing disguise."[61] Soon after millions of Americans realized the extent to which the Internet was filled with content they considered undesirable, these teachers, parents, and others concerned about the easy access to pornography and other inappropriate content looked to the government to do something.

Internet Business Models

While the Web attained critical mass and drew millions to the Internet, the government was facing a crisis in its telecommunications policy. The Internet created enormous market possibilities, and every industry player wanted a piece of the action. Because people could surf for any information they wanted free of charge (most Internet subscriptions charged cn flat-fee, rather than usage-based, system), the paid-subscriber services, such as Prodigy and CompuServe, were struggling to compete.

Pioneer businesses in the Internet era had no more idea how to make money than did early pioneers of the radio. Many business models were introduced, most with problems. Telephone service companies like AT&T were providing the access lines to the data networks; cable companies saw that they too could offer access over their networks; mass media outlets saw an increased audience online; and people were upset about pornography.

At this point, neither the U.S. military nor any of its offshoots specifically "ran" the Internet. After spinning off to various networks, ARPAnet officially closed in 1989—the year the Cold War ended. The U.S. government came up with its plan to turn the upkeep of the Internet over—not to the public, and not to the academics, but to private industry. Many academics were not surprised. "From the late 1980s on, and despite the illusion of independence which had summoned the enterprise almost from the outset, it was inevitable that this tax-funded and government-managed asset would be handed over to the private sector."[62] In 1995, the National Science Foundation handed over the backbone and management of the Internet to Sprint, Ameritech, and Pacific Bell—the new gatekeepers of access.[63]

In the hands of private industry, the Internet, just like radio, was highly prized. The laws governing who could serve this market were outdated. The government needed to rewrite the Communications Act of 1934.

---

[1] Wade Rowland, *Spirit of the Web: The Age of Information from Telegraph to Internet* (Toronto: Key Porter Books, Ltd., 1999), 16.

[2] Brian Winston, *Media Technology & Society. A History From the Telegraph to the Internet* (London: Routledge, 1998), 67.

[3] Erik Barnouw, *A Tower in Babel: A History of Broadcasting in the United States,* vol. 1 (New York: Oxford University Press, 1966), 9.

[4] Charles Meadow, *Ink Into Bits* (Lanham, Md.: The Scarecrow Press, Inc., 1998), 112.

[5] The misconception regarding the "ether" also became the basis for one of the fundamental components of network computing. Bob Metcalfe, founder of networking company 3COM, named his critical invention the "Ethernet" as a referential joke, as described in Stephen Segaller, *Nerds 2.0.1: A Brief History of the Internet* (New York: TV Books, L.L.C.; Oregon Public Broadcasting, 1998), 164.

[6] Barnouw, 9.

[7] Winston, 67.

[8] Barnouw, 10-11.

[9] Ibid., 12.

[10] Ibid., 15.

[11] Ibid., 18-19.

[12] Wade Rowland, 125.

[13] Winston, 74; Barnouw, 25.

[14] Wade Rowland, 133.

[15] Barnouw, 48.

[16] Wade Rowland, 136.

[17] Barnouw, 22-25.

[18] Ibid., 42.

[19] Wade Rowland, 131.

[20] Ibid., 132.

[21] Barnouw, 47.

[22] Ibid., 66.

[23] Ibid.

[24] Ibid., 47.

[25] Winston, 80.

[26] Barnouw, 48.

[27] Ibid., 56.

[28] Ibid., 20; Wade Rowland, 142.

[29] Barnouw, 20.

[30] Ibid., 26.

[31] Winston, 77.

[32] Meadow, 40.

[33] Wade Rowland, 118.

[34] The term "Internet" originated in 1973 and was short for "internetworking of networks." Segaller, 111.

[35] Originally, the Internet was connected via telephone line. Now, connections are also over other kinds of lines, including DSL, cable, and fiber-optic. Wireless connections are also gaining in popularity.

[36] Wade Rowland, 290; Winston, 327.

[37] Wade Rowland, 290-292.

[38] The RAND Corporation is a private arm of the U.S. Military.

[39] Winston, 324.

[40] Segaller, 32.

[41] Ibid., 35.

[42] Ibid.

[43] Ibid.

[44] Winston, 323.

[45] Segaller, 49.

[46] Ibid., 95.

[47] Ibid., 69.

[48] Ibid.

[49] Wade Rowland, 274.

[50] Segaller, 43.

[51] Wade Rowland, 272.

[52] Meadow, 110.

[53] Wade Rowland, 316.

[54] Ibid., 324.

[55] Ibid., 260.

[56] Segaller, 104.

[57] Winston, 329.

[58] Wade Rowland, 296-297.

[59] Ibid., 340, quoting Marc Andreeson, Netscape inventor, August 1993.

[60] Neil Randall, *The Soul of the Internet: Net Gods, Netizens and the Wiring of the World* (Milford, Conn.: International Thomson Computer Press, 1997), 270.

[61] Ibid., 271.

[62] Winston, 333.

[63] Ibid.

CHAPTER 4

STUDYING NEW MEDIA TECHNOLOGIES: THEORY

> *"Theory is both useful and necessary to organize data and information concerning the regulatory process—it provides meaningful generalizations instead of episodic descriptions."*[1]

To understand how policy makers view new mass media, it is necessary to look at how society views, and comes to adopt, new media. Theory on the subject provides grounding principles for this purpose. Links in development patterns then can be used establish links in the technological development and adoption of the radio and the Internet as forms of mass media. These links help us see how relative policy-making approaches might also be linked.

Mediamorphosis

One framework for understanding new media is *mediamorphosis,* a term and concept developed by Roger Fidler.[2] Mediamorphosis is a valuable way of looking at communications media, as it focuses on similarities and relationships among past, present, and emerging forms. This framework incorporates the theoretical ideas of media scholars with an understanding of the factors that shape how people accept and adopt new communication technology. The mediamorphosis framework helps us predict the societal, and regulatory, implications of new media technologies as they evolve.

Mediamorphosis is defined as "the transformation of communication media, usually brought about by the complex interplay of perceived needs, competitive and political pressures, and social and technological innovations."[3] Media communication technologies are constantly evolving; they are not exactly separate forms so much as parts of an entire interdependent system. To examine the evolution of one medium, research must incorporate understanding of this interdependent system and of historic patterns of change.

These attributes include cultural, societal, and economic forces that contribute to media development and adoption. By combining a historical perspective with an understanding of these attributes, we can gain valuable insights into the new forms that may emerge in the years to come as well as insights into future governing policies that may emerge in response to evolving media forms.

In attempting to study new media technologies, researchers[4] acknowledge the difficulties of forming a strong theoretical foundation in an ever-changing environment. Gaining just an understanding of the technology is in itself a challenge; explaining, understanding, and analyzing new technology's social aspects requires the integration of existing theories with new applications.

In understanding how technological change affects people, Fidler suggests we first must change our assumptions regarding the rate of change. Whereas many people would view the adoption of radio and the Internet as rapid, he agrees with media forecaster Paul Saffo, who poses a more realistic perspective. He posits that the rate for media acceptance is 30 years, which he coins the *30-Year Rule.*[5]

Through his analysis of media development in the past five centuries, Saffo has found that three decades is the amount of time required for new ideas to saturate a culture[6] or attain critical mass.

The complete transformation of a media technology, from pure scientific inquiry to production and diffusion, takes time. This is true in all communication technology, despite the "profound tendency to historical amnesia behind... the oft-repeated assertion that the pace of change is now so fast as to be uncontrollable..."[7]

Saffo identifies three stages within the 30-Year Rule. "First decade: lots of excitement... not a lot of penetration. Second decade: lots of flux, penetration of the product into society of beginning. Third decade:...just a standard technology and everyone has it."[8]

A brief history review of commercial radio supports Saffo's rule. If we date radio invention to the Marconi wireless telegraphy patent in 1897,[9] we see the first decade including the Fleming and de Forest contributions. This first decade was decidedly exciting, as inventers and amateurs experimented heavily with radio and began communicating to each other via the ether. As radio grew in importance for oceanic communications, and as businessmen like Sarnoff began pushing radio for commercial applications, the second decade saw the penetration of the medium, as well as flux, as radio was developing in two directions—technological improvement and broadcasting. Patent issues also added to the flux. By the end of the second decade, KDKA became the first licensed radio station. By the tail end of the next decade, in 1931, 608 radio stations broadcast nationally.[10] By then, it did indeed seem as though everyone had radio.

The Internet also falls within the 30-Year Rule. Dating the invention to the first interaction between remote computers in 1969, the first decade included the additional nodes of the ARPAnet, as well as exciting development into PCs and silicon chips. In the second decade, the Internet was in flux in the sense that its original purpose in the Cold War was no longer relevant, as threats from communism had collapsed. Also, the network, for the most part, remained the domain of science and academia. By the third decade, the Internet reached the general public in large numbers, and by 1999, the Internet was a mainstream communications and media tool.

The common misconception concerning rapid development centers on the fact that people view new media as developing when they have it (which falls into the third decade) and not at the point at which the media was first conceived. "Technologies that appear to have suddenly emerged as successful new products and services have been under development for much longer than anyone admits."[11]

Adoption

The era when everyone has the new medium, or the third decade of development, is when the technology has reached the *critical mass.*[12] Critical mass refers to the number of people who must be involved in a movement before it "explodes" into the social consciousness.[13] Meadow outlines the three reasons that people adopt new technologies as social—personal ego satisfaction, "keeping up with the Joneses"—cost, and performance.[14]

Diffusion theory states that how society perceives an innovation will determine its adoption rate.[15] Several factors define an innovation: its relative advantage, compatibility, complexity, reliability, and observability.[16] Fidler adds a sixth factor to this process, that of familiarity.[17] By this, he infers that the more familiar a new technology appears, the sooner it will get adopted.

A crucial component of observability is the view of the *early adopters,* who provide the initial impetus for the technology's adoption rate throughout society by evangelizing the innovation and convincing opinion leaders of its value.[18] Markus supports the importance of early adopters in her study on the critical mass of interactive technologies.[19] She concludes that early adoption by influential individuals is key to a medium attaining critical mass.[20] Early adopters, are "respectable," not radical, like the true *innovators*, who can be seen by outsiders as too adventurous for their opinion to hold much weight.[21] Most of the decision to adopt a new technology comes from the *early majority*, which forms the center of control. The *late majority* are those who are extra-deliberate and somewhat skeptical. *Laggards*, the final classification of adopters, tend to stick with the traditional technology until no choice remains.[22]

All these types of people are encouraged to adopt new technologies through either overt or subtle salesmanship and advertising, which attempts to show the technology's benefits through the appeals to the three social motivators of ego, cost, and performance.[23] Meadow points out that adopting a new technology is much different than simply buying a product. Adoption appeals to people focus not on variations between brands, but on entirely new products and uses.[24]

New communication media generally fall within a recognizable structure, incorporating some existing formats with which society is already comfortable. Society acceptance is more likely if the medium is seen as an evolution of something that already exists, so they figure out how to fit it into their lives. Radio, for example, initially broadcast familiar works of music and theater, so society did not have to adopt both the medium and the message.[25] E-mail extended commonly accepted personal correspondence to computer screens.

Idea to Prototype to Invention to Adoption

Winston' s model of media development and adoption[26] was developed after studying diverse technologies over two centuries of development and finding repetitive and regular patters of innovations. His model places great emphasis on the balance of forces that push technology into the social sphere and accounts for the frequency with which two or more inventors will lay claim to the same idea. The cycle occurs in four stages of development—from idea to prototype to invention to adoption—and relies on the understanding that society will not adopt a new technology merely because of the technology itself. New media technologies cannot develop without a motivating social, political, and economic necessity.

Operating within this social sphere, technology and science are connected in a structural relationship. Technology is the physical result of a scientific understanding. Hertzian waves and packet switching were the scientific competencies, and wireless telegraphy and distributed computing were the technological realities of those

competencies. The first transformation, ideation, activates the scientist from inquiry to action. He sees the idea, the possible problems solved by it, and develops a solution. He will build a device to test this hypothesis. This device, a prototype, might become an invention. It might also get discarded. History is replete with examples of prototypes that become inventions years after they were first rejected. The determining factor is the second transformation, the *supervening social necessity*.

These supervening social necessities accelerate adoption rate and can move a prototype into the world. They can range from changes in the social sphere to perceived needs. One invention might create a need for another, so as to bring it into the social sphere, while another prototype might be perceived as performing the same function as another, so as to delay or eliminate its introduction. Winston classifies prototypes into the following four categories:[27]

- Rejected prototypes. No supervening social necessity acted because no possible use for the device is seen.
- Accepted prototypes. Supervening social necessity created partial needs that prototype fulfills.
- Parallel prototypes. An existing device is realized to have a second use after the operation of the supervening social necessity.
- Partial prototypes. A device is designed to perform in one area but does not.

The degree to which a prototype diffuses into society depends far more on its supervening social necessity than it does on its efficiency,[28] which explains why some media technologies, such as the laser movie disk or the Apple Newton, fail to sufficiently

diffuse, while its progeny, such as the DVD or the Palm Pilot, do diffuse. Radio and the Internet both needed social necessities to turn the scientific competencies into prototypes—in the case of both technologies, the social necessity was military need.

Supervening Social Necessities / Brakes and Accelerators

Several forces act as supervening social necessities. The easiest to recognize are the needs created by another technological invention. For example, the invention of the railway created a need for instant signaling to prevent collisions, so visual signaling systems were invented. Ships at sea also had a need for instant signaling, but the visual systems developed for the railways were insufficient for adoption to the sea. Hence, another technological invention needed to grow out of the instant-signaling system. This supervening social necessity is what separates Marconi from his contemporary scientists who were also harnessing sound waves. Marconi's prototype fulfilled a need, while the prototypes demonstrating radio's usefulness in transmitting light, heat, or sound met with indifference. The need to connect mainframes created the need for the mini-computer to act as the IMP for mainframe. The mini-computer then evolved into the router, which makes Internet connections between independent networks possible. The invention gives rise to another need, which is fulfilled by another invention.

A second class of supervening social necessity is the needs of a concentration of social forces. Growing urban centers created the needs for newsprint and mass transit systems, while the subsequent growth of the suburbs created an "anti-need" for the afternoon newspaper. Prototypes that fulfill strictly commercial needs make up the third class of supervening social necessities. These prototypes, such as the audio CD, are less

significant as innovations, as they are merely fulfilling the same needs in a re-packaged format. They are less guaranteed to diffuse, as the "social" necessity is not authentic, but derives from the need of commercial developers to generate profits.

By altering or transforming social circumstances, the operation of the supervening social necessity creates the fifth type of prototype—the invention. Inventions appear only in response to these altered circumstances; they respond to the problems created in the new environment. Nuclear families and the growth of single-family homes and PC-driven work environments gave rise to perceived societal needs for new inventions.

As new inventions move into the marketplace, they often threaten existing inventions, and when they do, it is extremely difficult for them to diffuse. The bigger the threat to existing business, the greater the challenge the supporters of the new technologies face. Fernand Braudel refers to "brakes" and "accelerators" when discussing technology introduction.[29] The accelerators are the supervening social necessities, which encourage the diffusion of the technology, and the brakes are the social constraints that try to limit the potential of the new invention to disrupt the status quo. Winston refers to this stage, the third transformation, as "the 'law' of suppression of radical potential."[30]

In line with Saffo's 30-Year Rule, "the law of suppression ensures that any new communications technology takes decades to be diffused."[31] The same forces that generally support technology adoption—the needs of companies, the requirements of other technologies, regulatory or legal actions, and general social forces—can also slow the adoption rate of media technologies. The brakes can also be the accelerators.

Constraints operate to slow diffusion, so that society can adjust to the new concept, and so threatened providers can prepare for the new competition and protect and preserve their businesses.

The 30-year time period can be useful for the established, threatened companies, as they can use it to develop their own, nonthreatening versions of the invention that fulfill the same societal needs. An example of this interaction occurred in the late nineties and early in the first decade of the twenty-first century in the music industry. Accustomed to complete, oligarchic domination over music distribution, the six main recording companies filed multiple lawsuits to suppress Napster, on online music file-swapping technology (the prototype). Although few doubt that online distribution of music is inevitable, the recording industry is unwilling to simply hand over its main business to the new technology. It is likely that, by the time the legality of the issue is sorted out in court, the music industry will introduce its own version of the technology, which will already have societal acceptance and demand.

The struggle between brakes and accelerators dictates the nature and pace of technology diffusion. Supervening social necessity guarantees that an invention will be produced. The law of suppression of radical potential acts as a constraint. The outcome of this struggle, as alluded to in the above example, will also result in related inventions—both spin-offs, successful adaptations of invention, and redundancies, or partial prototypes. Examining technology inventions in light of the interaction between the two is crucial to understanding how communications technologies develop. Winston's model "offers an understanding of the history and current position of

communications in our culture dependent on an examination of accelerators and brakes, or social necessities and constraints, rather than on performance of technology considered *in vacuo*."[32]

The theories on new media technology adoption focus on the technological aspects: early adopters, social information factors, and technology acceptance. A thorough analysis of media adoption into society also requires an understanding of a second set of external structural variables, which include competition, general economics, regulatory factors, and policy issues.[33]

Financial Support

After critical mass has been attained, another step is necessary for the mass media to succeed: financial support. Companies must need the technology or see its value as a moneymaking entity in order for society to be able to adopt it. Financial support falls into both Winston's category of "general social force" and into the external variables defined by economic, regulatory, and legal action.

> In a capitalist society like the United States, the fact that most mass media are advertiser supported provides a further barrier to the diffusion of a new mass medium. Because there are so many media channels for the dissemination of advertising messages, a new medium is at an extreme disadvantage. The medium must prove that it has an audience before earning substantial advertiser support, but, without income, the programming provided by the new medium is likely to be inferior to that provided by existing media... the attainment of a large enough audience to sustain the medium through advertising revenues may be considered yet another element of critical mass.[34]

This assumption rests on the fact that mass media in the United States is commercially funded and advertiser-supported. New media must provide revenue for societal adoption to occur.

Noam describes the electronic media in three stages: limited media (the past), multichannel media (the present), and cybermedia (the future).[35] The multichannel stage saw many restrictions lifted by the Telecommunications Act of 1996 and is focused on ensuring that competing providers are meeting their abilities. Noam predicts the cybermedia stage will see even fewer restrictions, as the systems of delivery and content continue to blur, eliminating the ability of regulation to place different functions into discrete regulatory boxes.[36]

As historical analysis of radio and the Internet demonstrate, policy makers have the urge to regulate new media, so the cybermedia stage might see less restriction, but it will probably not see fewer *attempts* at regulation. Even if continued convergence does make it difficult for regulators to differentiate media forms, Congress is unlikely to view that as a deterrent. What is possible, however, is an increasing ineffectiveness of these attempts. The cyberstage might see different outcomes, but not different motivations.

---

[1] Krasnow and Longley, 73.

[2] Fidler, passim.

[3] Ibid., 23.

[4] Frederick Williams, Sharon Strover, and August E. Grant, "Social Aspects of New Media Technologies," in *Media Effects*, eds. Jennings Bryant and Dolf Zillman (Hillsdale, N.J.: Lawrence Erlbaum Associates, Inc. 1994) 463-482.

[5] "Paul Saffo and the 30-Year Rule," *Design World* 24 (1992): 18.

[6] Fidler, 8.

[7] Winston, 15.

[8] Saffo, quoted by Fidler, 9.

[9] Michael Nolan, "Canada's Broadcasting Pioneers: 1918-1932," *Canadian Journal of Communication* 10, no. 3 (1984): 1-36.

[10] Rich Brown, "From Marconi to HDTV," *Broadcasting*, 9 December 1991, S6-S14.

[11] Fidler, 10.

[12] P. Oliver, G. Marwell, & R. Tiexeira, "A Theory of Critical Mass: I. Interdependence, Group Heterogeneity, and the Production of Collective Action," *American Journal of Sociology*, 91 no. 3 (1985): 522-556.

[13] Williams, Strover, & Grant, 468.

[14] Meadow, 155.

[15] Everett M. Rogers, *Communication Technology: The New Media in Society* (New York: Free Press, 1986), passim.

[16] Fidler, 12-13.

[17] Ibid., 14.

[18] Ibid.

[19] M.L. Markus, "Toward a 'Critical Mass' Theory of Interactive Media: Universal Access, Interdependence, and Diffusion," *Communication Research* 14, no. 5 (1987): 491-511.

[20] Ibid.

[21] Meadow, 155.

[22] Meadow, 155.

[23] Ibid.

[24] Ibid.

[25] Fidler, 16.

[26] Winston, passim.

[27] Ibid., 8.

[28] Ibid.

[29] Winston, 11.

[30] Ibid. Winston uses the term "law" lightly, as it is not really a scientific law in the sense that it does not conform to scientific definition as "always occurring with equal force." Nonetheless, he continues to call it a "law" as it does apply to all known media technologies. Likewise, with the word "suppression," Winston does not intend to imply that an authoritarian conspiracy is at play. He refers to the more scientific usage of the term, "hindering from passage or discharge."

[31] Ibid., 13.

[32] Ibid., 15. His italics.

[33] Williams, Strover & Grant, 471.

[34] Ibid.

[35] Eli M. Noam, "Media Regulation—New Rules for New Times," *Media Studies Journal* 10, no. 23 (1996): 39-48.

[36] Ibid., 44.

CHAPTER 5

THE INVENTORS: HAMS AND HACKERS

> *The scientists, engineers, corporate strategists, and military procurement experts failed to get beyond the idea of the digital computer as a replacement for platoons of human computers working with calculating machines. It would take a generation of undisciplined student hackers, incorrigible phone phreaks [sic], inveterate video game players, and barely prepubescent entrepreneurs to begin to realize the true potential of the do-everything machine... By simply playing (author's) with what was after all the most incredulous toy of all time, they uncovered its hidden cultural dimensions. It was this anarchic mob of unkempt misfits that conceived of the personal computer and brought it into being.*[1]*—Media historian Wade Rowland.*

Hams: The Role of Amateurs in Radio Development

Amateurs played an enormous role in radio development. Radio amateurs shared many traits: they tended to be young males with avid interests in technology. Encouraged by Marconi, experimenters assembled radios from accessible and fairly inexpensive parts.[2] Many were drawn to the technological aspects of radio, others by the excitement of strange noises from the ether. The initial radio developers and entrepreneurs (with the exception of de Forest and Fessenden) were more concerned with the technical aspects of broadcasting than with programming.[3] Amateurs collected radio distress signals and strived to catch fragments of speech over their headphones.[4]

"These experimenters, in city and country, were not only the beginning of what became the radio audience; they were also the cadre from which many broadcasters were to spring."[5] Some notable experimenters included Doc Herrold, who built the first broadcast radio station in San Jose, California in 1909 and encouraged a faithful following in the area. From his 20 dedicated amateurs, local students and listeners, many would go on to study radio in college, and many would choose radio as a career.[6] Other clubs formed around the United States, from which broadcasting would emerge. Although this era predated the networks, "almost everything that became 'broadcasting' was being done or had been done."[7]

These amateurs would be in big demand when the war began in 1917, although this year would also mark the beginning of the end of amateur broadcasting in the United States. The 1912 radio law had a clause that said all radio apparatus would become the property of government in the event of war, and that is exactly what occurred. Although amateurs held 8,562 licenses in 1917,[8] all stations in operation at that time were the property of the navy or the army. After the war ended, corporations would control almost all the radio patents and therefore the control of the radio industry. Many of the amateurs who served in the war would find careers in broadcasting.

Hackers: The Role of Amateurs in Internet Development

Just as the amateur radio hams contributed immensely to the transformation of radio from a point-to-point communication device to a broadcasting medium, so too did

the computer hackers transform the Internet from a medium of academic research into a mass medium.

Hackers were partly motivated by political ideas about liberating information and partly by a ". . .desire to flip toggle switches until lightbulbs danced before their eyes."[9] In the technology sense, these hackers were like radio amateurs and hams. In their cultural motivations, they were different. The developers of the technologies of the digital age had dramatically different agendas than their predecessors: their future was one in which technology could advance humanist goals.[10]

Hobbyists of the computer industry were able to maintain control over the medium. They self-regulated themselves and in the process, kept government out of the business. They also collaborated with each other.

"The pioneers of the ARPAnet were people with little interest in, or expectation of, either fame or fortune.... their ambitions focused on interesting problems, tenure, and an agreeable lifestyle."[11]

Unlike the development of the radio, the pioneers of ARPAnet were not motivated by personal profit and they did not argue over patents. "They were academics, even those who had wandered into the private sector, and their ambitions focused on interesting problems..."[12]

The computer industry of the late 20th century was largely developed in the spirit of Robert Noyce, cofounder of Intel. Noyce introduced a new corporate climate and culture. This culture became emblematic of Silicon Valley—nonhierarchical, bilateral, cooperative, and democratic—and of the networking computer industry in general.

Founded mainly by middle-class Protestants, the pioneers of the technology industry were studious, hard working, and modest. They eschewed signs of wealth and valued achievement through hard work. This culture appealed to the computer hackers of the late 20th century, who were turned off by the hierarchy of IBM and its "white-coated priests,"[13] the technicians who serviced the leases on the IBM mainframes.

The hackers of the late 1960s and 1970s were part of a unique American generation. The development of the PC was part of the culture of collaboration and sharing; "the idea was *power to the people*, straight sixties doctrine."[14] The notion of collaborative sharing was unique to the Internet.

The Benefactors

The developers of the radio found financial backing in the research arms of large corporations: AT&T, Bell Labs, and Edison labs. Most Internet-related advances were funded by federal government grants and developed in academic research centers, where future entrepreneurs were given financial and technological support to develop solutions.

In addition to the research departments in the military of the U.S. government, the developers of the Internet had great support from universities. Stanford University, for example, was considered to have a "hothouse atmosphere of constant problem solving, innovation, and regular infusions of research grants and venture capital."[15] Stanford was the second node on the ARPAnet, and had a reputation for encouraging students to get into business. Stanford believed that fostering successful business efforts of alumni would eventually benefit the school in the form of endowments, donations, and future

research. Some of the biggest technology and Internet companies were founded on the intellectual property of Stanford students. These companies include Cisco Systems, Hewlett-Packard, SUN Microsystems, and Yahoo.

The role of the corporation was another key differentiation between the pioneers of radio and the pioneers of the Internet. While most of the advances of the radio were made by employees of competing corporate research arms, as evidenced by the patent brawls, sketchy claims of ownership by de Forest, Fleming, Marconi, and Armstrong, the "narrow corporate interests were effectively subverted by massive government financing of early Internet development, along with the anarchic behavior of the early software hackers who. . . made their most revolutionary products available to the world free of charge."[16]

The Industry Titan

> *[Bill] Gates was the Richard Nixon of the computer industry, the ambitious overachiever whom people love to hate. Some have compared him to David Sarnoff, another man whose overwhelming ambition and cutthroat competitiveness often put him on the wrong side of U.S federal antitrust regulators bent on keeping the industry competitive. Gates, like Sarnoff, had the brilliance to see that the real money to be made in his industry was not in hardware but in software. Sarnoff's networks were the software of radio broadcasting and Gates's computer applications were the software of the computer industry.*[17]

Gates's role in the Internet was not in developing it, but in trying to exploit it. His company, Microsoft, challenged Netscape for the network browser market soon after Netscape was introduced. Microsoft would eventually be taken to federal court on charges of antitrust violations, largely in response to its unsavory tactics in the browser

war. Microsoft activity marked the turning point in technology development the moment it sold its first piece of code and charged people to use it. At that time, it was unheard of for someone not to share. "The idea of selling software for profit was unheard of and *not right.*"[18]

Pioneer businesses of the Internet had no more idea how to make money than did early radio entrepreneurs. The industry titans of these industries steered the course for profit making in novel ways. Access charges were not feasible, as no one really owned the Internet. Subscriber fees were initially unsuccessful because so much other content was available for free. Commercial sponsorship, which worked so profitably for radio, is the business model of choice for the Internet. Advertising on the Internet has faced many challenges, which are still being worked out today.

---

[1] Wade Rowland, 266.

[2] Barnouw, 29.

[3] Nolan, 12.

[4] Barnouw, 33.

[5] Ibid., 28.

[6] Ibid.

[7] Ibid., 37.

[8] Ibid., 33.

[9] Segaller,137.

[10] Wade Rowland, 19.

[11] Ibid., 102.

[12] Ibid.

[13] Ibid., 274.

[14] Segaller,124.

[15] Ibid., 229.

[16] Wade Rowland, 94.

[17] Ibid., 279.

[18] Ibid.

CHAPTER 6

UPDATING THE 1934 COMMUNICATIONS ACT

The Telecommunications Act of 1996 is a very lengthy and very detailed bill. Formally, the bill is an updated version of the 1934 Act written through a series of amendments and additions to the original bill. The text of the law is organized in the same format as the original act, which permitted clauses to be merged into the same overall framework.

Overview of the 1996 Legislation

The scope of the 1996 Act is broader, encompassing as it does the additional technologies introduced since 1934. It first covers telecommunications issues, then mass media issues, then introduces new features regarding content regulation in the media.[1] This expanded scope includes regulations on radio, television, cable, telephony, satellite, and the Internet. One major difference in the two acts is the treatment of the FCC.

The FCC was chartered in the 1934 Act as an industry-specific federal-oversight body. When Congress created the FCC to oversee communications, it granted that the communications industry required special provisions outside the scope of other business-oversight bodies, such as the Federal Trade Commission, that applied to business issues including antitrust, labor and securities laws. The 1996 Act enhanced the powers of the

FCC but does nothing to either justify its jurisdiction nor refine the definition of "public interest." The powers of the FCC were enhanced partly because legislators were unable to resolve conflicts themselves.[2]

"The 1996 Act not only failed to address these questions, but created an even larger Federal Communications Commission, charged with even more responsibilities."[3] The Act does address the public interest through the following areas: consumer choice, universal service, public trusteeship, and content restriction and regulation of broadcasting and the Internet.

Defining the Public Interest: Consumer Choice

The issue of technical convergence was one of the major motivations for rewriting the 1934 Act. Congress wanted to introduce and encourage competition into the communications marketplace. Since it was now feasible for telephone providers to offer cable and Internet service, the barriers to entry that existed should be removed, so that the consumer would be able to select service providers based on cost, service, and convenience. Legislators believed "the issue of technological convergence should be answered more commonly by marketplace forces, less frequently by regulatory fiat."[4] The 1996 Act intended to make more choices for consumers, which would also make more revenue-generating opportunities available for service providers.

To do so, the role of the FCC would not be to prevent providers from entering new markets but to establish guidelines for doing so. For example, telephone companies were prohibited from providing cable television service unless the telephone company

operated its cable operation on a common-carrier basis, meaning it had no impact on the programming offered via cable. Under the 1996 Act, anyone, including telephone service providers, could offer cable service with the aim of eliminating the cable monopolies. In exchange for the competition, existing cable operators would no longer be subject to rate regulation once "effective competition" for the consumer existed.[5]

Economic theory suggests that competition results in greater choice for consumers and consequently, lower rates. The final legislation "boldly equated the public interest with a competitive economic environment, in which consumer and producer desires and needs can be matched efficiently in the marketplace, not structured by regulators."[6]

In 1934, the main problem facing potential radio providers was the lack of spectrum space. Communications were, by nature, natural monopolies and were regulated by the FCC as common carriers. Broadcast licenses were granted to the most "worthy" applicants,[7] and those stations had to then compete for the listener's attention. The programming practices of the FCC determined the acceptable definitions of the public interest, which had evolved since 1934 based on the political ideologies of the commissioners and the legislative and executive branches to which it answered.

The 1934 Act also covered the telephone industry, and so it included regulatory oversight for communication over the wire and for communication over the ether. Telephone service was already considered a natural monopoly, due to the technical aspects of wiring the nation for service.

Universal Service

Like "public interest, the concept of "universal service" has never been defined,[8] but it has been included in both the radio and Internet legislation. Universal service subsidies equalize the costs of service across geographic and demographic lines. Long-distance phone providers contribute funds to local phone service providers so they can offer lower rates to the underserved and needy populations.[9] Basically, long distance telephone calls are charged higher rates so that local residential rates can be lower. Although the amount of money included in universal service subsidies is constantly in dispute, it does account for billions of dollars every year.[10]

Universal service was written into the 1934 Communications Act, and the concept dates back to the development of the country. The Founding Fathers understood the power of communications. They created the post office system and postal roads; they wrote the First Amendment; they offered reduced postal rates to newspapers and magazines. "In the case of the telephone, because community building was important to our society, we accepted the social responsibility of making basic communication services by telephone available to all citizens, trading economic efficiency for social benefit,"[11] According to an industry economist.

This model of universal service at all costs guided communications policy making, which has consistently advocated that everyone should have access to a telephone. In the years preceding the 1996 Act, 94 percent of households had telephone service.[12] The private markets offer these services in exchange for their monopolistic

control as part of their public service obligation. Taxes and tariffs on each telephone bills fill in the funding gaps in situations where markets cannot afford to offer service.

To develop the new concept of universal service, which would expand on its definition, the Clinton administration, through its commerce department, established the National Telecommunications and Information Administration (NTIA). The NTIA held a series of public hearings on universal service, the Internet, and the NII around the country (many of which were attended by Vice President Al Gore) to solicit opinions on public-interest issues. The FCC was also active in soliciting advice from the nonprofit sector.[13]

Universal service had many supporters for both political and social reasons. "Public interest advocates argued persuasively that universal service made excellent . . . sense, building inclusion into growth that made the service more economically attractive and limiting the dangers of a social divide along informational lines."[14] Expanding this coverage was one of the main goals of the Clinton administration (see section on political climates). Ensuring access to the information infrastructure from every classroom and library was a deal-breaker for the administration, which considered it a successful public-service initiative.

The administration enlisted the FCC chair Reed Hundt to lobby support for the initiative,[15] which culminated in the Snowe-Rockefeller-Exon-Kerrey amendment to the 1996 Act. Senators Jay Rockefeller of West Virginia and Olympia Snowe of Maine introduced an amendment that stipulated lower rates and access to advanced services for libraries, K-12 schools, and rural health care facilities. Both senators saw the potential for the information superhighway to bypass the constituents of their rural states.

Universal service became an explicitly articulated goal of the public interest coalition involved in telecommunications regulation in 1996—serving the public interest had evolved to ensuring *access to services*, rather than ensuring *access to the airwaves*, as was the intention of the early radio public-service interest groups. The 1996 Act codified the universal service concept and expanded it to include telecommunications and information services. For example, in the amended Act of 1996, phrases such as "telephone service" were replaced with "electronic communication device." The inclusion of universal service in the final Act was a significant victory for the public interest and "was a policy innovation, which created a small but significant precedent for the notion of public domains and spaces in the telecommunications future."[16]

Content Restrictions

The Communications Decency Act (CDA), section 502 of the 1996 Telecommunications Act, was probably the most publicized portion of the legislation. Also known as the Exon amendment, named for its sponsor, Senator James Exon of Nebraska, this section attempted to regulate the content of the Internet. Specifically, section 502 prohibited the use of "any interactive computer service to display . . . indecent information whether or not the user of such service placed the call or initiated the communication."[17] The law made it a crime to knowingly permit any computer system under one's control to transmit indecent information and indicated that the FCC could regulate Internet content.

In proposing the amendment, Senator Exon acknowledged the need to update the 1934 provisions and update "public protections" against "obscene, lewd, or indecent messages."[18]

---

[1] Patricia M. Aufderheide, *Communications Policy and the Public Interest* (New York: The Guilford Press, 1999), 62-79.

[2] Ibid., 62.

[3] Thomas G. Krattenmaker, "The Telecommunications Act of 1996," *Connecticut Law Review* 29 (1996): 173.

[4] Ibid., 129.

[5] Ibid., 136.

[6] Aufderheide, 61.

[7] Krattenmaker, 126.

[8] Ibid., 143.

[9] Aufderheide, 57-59.

[10] Ibid., 57.

[11] Herbert S. Dordick "The Social Consequences of Liberalization and Corporate Control in Telecommunications" Chapter 6, in ed. William J. Drake *The New Information Infrastructure: Strategies for U.S. Policy* (New York: Twentieth Century Fund Press 1995), 158.

[12] Ibid.,158.

[13] William J. Drake "The National Information Infrastructure Debate: Issues, Interests, and the Congressional Process: Policies for the National and Global Information Infrastructures" in *The New Information Infrastructure: Strategies for U.S. Policy*, ed. William J. Drake (New York: Twentieth Century Fund Press 1995), 312.

[14] Aufderheide, 58.

[15] Reed Hundt, *You Say You Want A Revolution: A Story of Information Age Politics* (New Haven, Conn.: Yale University Press, 2000), passim.

[16] Aufderheide, 59.

[17] *The Telecommunications Act of 1996. U.S. Code*, Public Law No. 104-104, Stat. 86.

[18] *Congressional Record*, 103-140 Cong Rec S. 9745, vol. 140 no. 99.

CHAPTER 7

MODELS AND METAPHORS

"Axioms, puns, specific facts, and common terms are good... abstractions and acronyms are bad."[1]

New media technologies are often put into the context of their technological predecessors in both usage and in regulatory action. Since a new medium is understood in known terms, it is generally discussed in recognizable terms or metaphors. Those discussing the relative merits or roles of a new medium rely on metaphor for clearer understanding. The models used to identify radio as people tried to figure out where is fit into the regulatory structure in the twenties provide insight into the rationale of the subsequent policy making.

The rapidly changing nature of radio contributed to reliance on metaphor in discussions pertaining to its regulatory status. Whereas radio was initially understood throughout its early days and through World War I as an extension of telegraphy, it soon realized its potential as a mass medium. "When... the experience of radio broadcasting was rapidly capturing public attention and transforming even the industry's understanding of what it had created, there was little popular imagery and language for public discourse of its realities."[2]

Some of the metaphors result from confusion as to radio's social application, with the diversity of its suggested scientific applications (likely grounded in the early adoption by physicists), its educational potential, and its eventual application to entertainment. Radio was even viewed as a possible replacement for power lines and as a form of medical treatment.[3]

Mander's analysis of the public debate surrounding broadcasting up to the passage of the 1927 Radio Act[4] identifies three models and metaphors used by those involved in the policy making to describe radio. Her analysis of the rhetoric, discourse, and documentation reveals that as radio permeated society, the metaphors used in the policy discussions tended to place radio into three specific contexts: transportation, newspaper press, and public utilities. By the nineties, metaphors continue to be prevalent in political debate; however, in discussions concerning the Internet, the metaphors would center on the transportation model introduced in the radio debate.

The Transportation Model

The connection between the railroad legislation and the radio formed the basis of the transportation metaphor. Broadcasting thus has been characterized since the emergence of radio in terms of transportation, and not in terms of a "symbol-producing, culture-maintaining" medium.[5] The transportation model for communication makes sense historically, as communication was tied to the method by which it was transported (the marathon, the pony express) until the invention of the telegraph made the physical transportation of messages unnecessary.

The transportation model was invoked as decision makers tried to make sense of the chaos of the airwaves. They spoke of "congested paths" and "vessels in the waters." Representative Wallace H. White of Maine sponsored early legislation to authorize Hoover to act as "a traffic cop of the air."[6] The airwaves, an intangible commodity, were described in terms of thoroughfare: "it had boundaries, rights of way and its user were bound to follow the rules of the road. Rules of the road were necessary partly because spectrum space was scarce."[7] Legislators spoke of there being "too few tracks to accommodate the trains, not enough streets for the automobiles, or too little ocean for the ships."[8] Secretary Hoover likened the airwaves to channels of navigation.[9]

The legislative precedent for radio regulation also originated from existing laws governing the waterways. Since radio originated as communication between ships, it was logical for marine laws to set the precedent for radio legislation. It was the Marine Act of 1912 that granted licensing of radios spectrum space under the auspices of the Commerce Department. Further legislative precedents for radio originated within the commerce clause of the Constitution, as had the regulations of the rails, the telegraph, and the telephone.[10]

The 1934 Communications Act was largely based on 1890 legislation devised to regulate transportation via the railroad—the concept of common carriage, which stated that carriers must provide access to all who desired it—at a fair price.[11]

Congress viewed radio from a market perspective—in terms of trade, economics, and commodities. It did not see radio in terms of art, culture, or education. The transportation model of examining radio in the early stages of its development could

logically have led to the subsequent development of radio broadcasting as a noncommercial, advertising-supported service, rather than as an academic or cultural service.

Similarities abound in the Internet discourse. Legislators and the media rarely mentioned the Internet without describing it as the "information superhighway." The vast networks were the highways; access charges to the Internet were "tolls," date moving across the network was "traffic," problems with the Internet were "bumps, potholes, and stop signs." Media coverage referred to the "pornographic ditches" along the route. Although Al Gore coined the term to describe the entire national information infrastructure, the "information superhighway" soon became synonymous with the Internet itself.

The Newspaper Model

The second model for framing the regulatory debate was the newspaper model. Radio was referred to as "the magazine of the air"[12] and as having the same ability to spread information of intelligence and public interest as newspapers.

Freedom of the press was a critical component of this model of rhetoric, as Congress used the press as a metaphor for freedom. Regulating radio with economic measures, according to Senator Clarence Dill in 1924, "would be tantamount to taxing the nation's newspapers... radio ought to be kept free, because... it will eventually be a greater blessing than the free press."[13] Federal Trade Commissioner Anning Smith Prall,

instrumental in early FCC action, conceived the radio as a combination of "journalism, entertainment and opinion"[14] similar to a newspaper.

Ownership of the airwaves was thus framed in terms of liberty and intellectualism, similar to the concepts surrounding a free press. Radio executives certainly encouraged this model of thinking, defending themselves as patriotic institutions operating within the democratic, and journalistic, notions of the "marketplace of ideas." RCA chairman David Sarnoff believed the same principles of freedom guiding the press applied to broadcasting as well. The marketplace metaphors in the First Amendment doctrine are partly responsible for disparate legal interpretations of who is protected as a speaker by the First Amendment, and have served to muddy the distinctions between media protections.[15] McChesney says the muddied rhetoric was responsible for the elimination of the general public and the noncommercial from the regulatory debate.[16]

In analyzing rhetoric in telecommunications industry legal fights for autonomy, Dente Ross suggests susceptibility on the part of the courts "to the power and influence of First Amendment rhetoric protection mouthed by businesses seeking to advance their rational economic interests."[17] The telecommunications industry has been perceptive in framing its arguments in these terms in the courts because it recognizes the trifurcated regulatory media policy of the United States affords the greatest autonomy to the press. These findings also apply to the legislative branch of the government and indicate the importance of presenting new media technologies in terms of older media with First Amendment protection.

Other metaphors drew on legal precedents. Some drew parallels between the priority rights of broadcasting and the priority rights of trademarks, saying that the time and money invested in developing and owning recognizable words or phrases is similar to investment in developing broadcast stations.[18] Radio broadcasters were compared to "homesteaders;" those who got there first owned the frequency.[19] In the Internet era, controversy over "cybersquatting" continued this line of discourse. Cybersquatters were people who registered Web URL names belonging to the brand or identity of others in the hope that the URLs would fetch a high price. Early on, this strategy worked; fast-food chain McDonalds' paid a lot of money to buy the URL mcdonalds.com; however, later courts would view such URLs as juliaroberts.com as the intellectual property of the person who made that name famous.

Legally, landowners with water running through the property may use the water on their land, but they may not interfere with the water on the property of others. This water-rights metaphor was used to liken the airwaves to the property issues of landowners.[20] Property, and issues about who owned it, would continue to follow media policy.

The Public Utilities Model

The public utilities model is tied to the concepts of the common carrier and the public utility. In the early discourse, many supported the declaration of the airwaves as a public utility, similar to the railroads, the telephone, and the telegraph. Public utilities were regulated in the "public interest, convenience or necessity," a phrase that was

incorporated into the original Radio Act of 1927 and has since become standard rhetoric in subsequent discussions of media technology regulation. Public interest was connected in the rhetoric to controlling oceanic traffic, controlling the airwaves, and to political democracy.[21] Bureau of Standard's chief under Secretary Hoover, J.H. Dellinger, saw radio as a private utility, much like "electricity generating companies."[22]

The concept of public convenience was twofold. The first was, not surprisingly, attached to the movement of ships at sea. Ships communicating via the airwaves used whatever channel was convenient. By the mid-1920's, as the debate focused more on the broadcast elements of radio, convenience was connected to the concepts we recognize now: the comforts and happiness of the audience.

Those describing radio as a public utility pointed to the granting of licenses, the notion that information is just as valuable as roads, and the possible extinction of radio once the market for radio receivers reached its saturation point. Since the original commercial broadcasters existed merely to sell receivers, people were concerned they would simply close down, a legitimate concern in light of the fact that advertising was not the predominant model for financing radio until 1928.[23]

The link between radio and public utility emphasizes the technical and economic aspects of broadcasting. Rowland cites this linkage as key to the development of the "public interest" standard as a doctrine designed to ensure the economic well being of the radio industries.[24]

Public interest focused the debate on the interests of the radio audience, rather than on the broadcast providers. Whereas the original legislation of 1912 ordered

dispensation of licenses to anyone who wanted them, the granting of licenses was later determined by who would best serve the needs of the listeners. "The test was not whether an individual businessman desired to get into broadcasting for profit, but whether the public would be served by his doing so.".[25]

The public utility model placed the discussion around both economic and political arguments. Congress and the courts were reluctant to regulate rates at which broadcasters could charge for usage; they were also reluctant to force open access to the airwaves.[26]

The scarcity principle meant that broadcasters were monopoly editors over spectrum that was, at the same time, owned by the people, yet limited the number of people who could speak.[27] Under common-carrier provisions in public utility legislation, carriers could not restrict access to interested parties. Fear of propaganda led regulators away from this model.

The fact that people on both sides of the debate as to whether or not to regulate radio broadcasting saw it as a public utility highlights a fundamental problem facing Congress at the time. They did not have enough personal experience with radio to know its role in society at that time or its future potential. Thus, the influence of radio operators, business, and executives in the fledging radio networks were able to influence Congress and guide it towards its desired outcome.

That outcome, the highly favorable Radio Act of 1927, went into effect with little discourse on the overarching meaning of the legislation in the scheme of media control.[28] The legislators of the 104th Congress would rely heavily on the notion of the public utility model in discussing Internet regulation. In fact, most of the legislation centered on the

descriptions of the Internet as a public utility, most similar to telephone and cable systems, than to the Internet as a mass medium.

When describing the "evils" of the Internet—the pornography—the metaphors of the Internet were more colorful. Senator Exon compared it to "a red-light district."[29] Ultimately, the transportation model, the public utilities model, and the newspaper model were used to conceptualize the new media technology of radio. The underlying model of each of these was that of the market. The market model allowed Congress and the courts to see the new medium within the framework of capitalist economic factors favorable to the commercial broadcast interests. Higgins and Moss relate that this victory by powerful manufacturing interests, followed by the broadcast network interests, "impregnated broadcasting with the spirit of commerce and the ethos of consumption."[30]

The way radio was perceived and presented is crucial in understanding how it evolved into a commercial medium. In the United States, rhetoric for understanding radio highlighted its use as a mass communication tool, provided by profit-seeking industrialists for public consumption. In Canada, where radio evolved into a public, noncommercial medium, it was perceived a community builder, similar to the town hall meeting.[31] Government regulators in Canada (the Department of Marine and Fisheries had governing authority) saw broadcasting as a public service, rather than as a public utility. To this end, it enacted strict regulations on radio, which basically prohibited the industry from making profits at the public's expense.[32] Likewise, the British system of broadcasting, considered by many to be the "paragon of public service broadcasting,"[33]

has been noncommercial since the establishment of the British Broadcast Corporation (BBC) in the early 1920's.

Like the United States, Canada had no specific policy defining the media; however, the Canadian approach fully "endorsed broadcasting as a noncommercial venture,"[34] whereas the American approach clearly endorsed the opposite view. The difference in approach might rest with the fact that the Canadian government held extensive public hearings on the issue[35] and the United States held several private radio conferences with radio industry leaders.[36] In each case, the nature of radio, and consequently, mass media to follow, was solidified in the debates of the 1920's and 1930's. The end result in each case stems from the initial perception of nature of radio.

---

[1] Hundt, passim.

[2] Willard D. Rowland, Jr., "The Meaning of 'The Public Interest' in Communications Policy—Part II: Its Implementation in Early Broadcast Law and Regulation," *Communication Law and Policy*, 2 no. 4 (1997), 375.

[3] Ibid.

[4] Mary Mander, "The Public Debate about Broadcasting in the Twenties: An Interpretive History," *Journal of Broadcasting* 28 (1984): 167-185.

[5] Ibid, 169.

[6] Krasnow and Longley, 19.

[7] Mander, 171.

[8] Ibid.

[9] Louise M. Benjamin, "Working it out Together: Radio Policy from Hoover to the Radio Act of 1927," *Journal of Broadcasting and Electronic Media* 42 (1998): 221-236.

[10] Mander, 172.

[11] John V. Pavlik, *New Media Technology: Cultural and Commercial Perspectives*, 2d ed. (Needham Heights, Mass.: Allyn and Bacon, 1998), 244.

[12] Mander, 179.

[13] Ibid., 180.

[14] Leslie Smith, "Quelling Radio's Quacks: The FCC's First Public-Interest Programming Campaign," *Journalism Quarterly* 71 (1994): 594-608.

[15] Susan Dente Ross, "The 'Strange Power of Speech': The Unprecedented but Limited Success of Telephone Company First Amendment Arguments," *Communication Law and Policy* 3 (1998): 99-131.

[16] Robert McChesney, "Conflict, Not Consensus: The Debate over Broadcast Communication Policy, 1930-1935," in *Ruthless Criticism* eds. William S. Solomon and Robert McChesney (Minneapolis, Minn.: Regents of the University of Minnesota 1993), 222-258.

[17] Dente Ross, 101.

[18] Louise Benjamin, "The Precedent that Almost Was: A 1926 Court Effort to Regulate Radio," *Journalism and Mass Communication Quarterly 67* no. 3 (Autumn 1990): 583-584.

[19] Donald G. Godfrey and Val E. Limburg, "The Rogue Elephant of Radio Legislation: Senator William E. Borah," *Journalism and Mass Communication Quarterly 67* no.1 (Spring 1990): 214-224.

[20] Benjamin, "Precedent," 583.

[21] Mander, 175.

[22] Benjamin, "Working it out," 222.

[23] McChesney, "Conflict not Consensus," 225.

[24] Willard D. Rowland, 364.

[25] Ibid.

[26] Ibid.

[27] Aufderheide, 15.

[28] McChesney, "Conflict not Consensus," 225.

[29] Congress, Senate, Senator Exon of Nebraska speaking for the Communications Decency Act. S.J. Res. 652, 104th Cong., 2d. sess., *Congressional Record* 140, pt. 99 (26 July 1994).

[30] C.S. Higgins and P.D. Moss, *Sounds Real: Radio in Everyday Life*, (St. Lucia and New York: University of Queensland Press, 1982), 80.

[31] Nolan, 6.

[32] Ibid., 8.

[33] Robert McChesney, "Graham Spry and the Future of Public Broadcasting," *Canadian Journal of Communication* 24 (1999): 27.

[34] Nolan, 11.

[35] McChesney, "Graham Spry," 29.

[36] Benjamin, "Working it out," 221-236.

CHAPTER 8

POLITICAL CLIMATES IN DRAFTING LEGISLATION

The decades leading up to the Communication Act of 1934 and the Telecommunications Act of 1996 were similar in their political and economic climates. The guiding political parties were redefining themselves and seeking new models for regulatory policies. Legislators endeavored to create a balance between free-market industry desires and policies that would best serve the public interest, and the final legislation reflects compromises. The push for regulation in the radio and the Internet eras came from interested individuals in the executive branch who recognized the importance of the new media technologies and sought to create new paradigms for policy. In both eras, industry leaders exerted great influence on legislators, while public-interest groups fought for access to the decision-making process.

As legislators developed an Internet regulatory policy for the twenty-first century, the political process was remarkably familiar to that of radio. Just as they were in the debate over radio regulation in the twenties, power and money were the preeminent forces shaping a policy model for a new mode of electronic communication and information. Technology underwent amazing development and change, but the American political system changed little.

Radio as Scarce Commodity

The governing political and economic philosophies of the times influenced Congress. Radio provided Congress with a novel dilemma, as it first introduced the notion of *scarce commodity*, which means that a limited amount of spectrum space is available for communication use. It is largely upon the notion of scarcity that Congress enacted, and the courts then justified, regulation of broadcast media.

Initially, radio communication was generally a form of message transactions, such as signaling distress. Several years before broadcasting became popular, the military complained that private radio signals interfered with their signals aboard ships. In response, the U.S. Government passed the Marine Act of 1912, which mandated that all ships leaving U.S. ports had radios and that all radio operators had licenses, and established a division within the Commerce department to enforce these laws. This act became the first general law regulating radio in the United States.[1]

The Marine Act and the authority of the Commerce Division to regulate radio licenses stresses the Congressional view of radio transmissions as a means of communication. This view is not surprising, considering that the telegraph, telephone, and cable companies were focusing their development of radio along these lines. As people began experimenting with broadcasting throughout the next decade of radio development, the number of operator licenses increased.

Just as the number of licenses was increasing, the courts decided that the Secretary of Commerce lacked the authority under the 1912 Act to limit radio licensing. The Commerce department could not deny licenses or govern radio wavelengths.

Consequently, the airwaves became chaotic, with radio transmitters jumping over each other and crowding each other out of the spectrum. Congress recognized the need to address this dilemma and began evaluating how best to regulate the airwaves.

Herbert Hoover, Secretary of Commerce and later President, believed spectrum allocation was necessary to prevent chaos in the frequencies. He also believed that the burgeoning broadcast networks were beginning to show signs of monopolistic control over the airwaves.[2] Hoover was actively involved in developing radio policy.

The Radio Act of 1927 created the Federal Radio Commission (FRC) as an emergency measure to deal with the airwave chaos. The FRC, made up of five independent members, was to have control over broadcasting and other radio-related activities for one year. In 1928, Congress extended the term of the FRC and soon made it a permanent regulatory body.

The Communications Act of 1934 changed the FRC to the FCC, granting it regulatory authority over radio, cable, telegraph, and telephone systems. The Act also formally declared radio to be a national communication medium and a form of interstate commerce, meaning federal regulators would have authority over local or state regulations. The FCC, a bipartisan organization of seven members, continues to exist in this role today. The 1934 Act legitimized the U.S. government's interest actively overseeing in the growing political and economic influence of broadcast media and set the stage for permitting, or at least, evaluating media from a regulatory perspective.

Politics and Economics

Although the Communications Act of 1934 was passed in the Franklin Roosevelt administration, whose liberal political principles differed greatly from those of the Coolidge-Harding-Hoover administrations, little changed in the content of the 1934 Act regarding mass media regulation from the Radio Act of 1927.[3] Thus, the politics of the twenties determined the governing model of the American broadcast system.

The twenties saw a boom in the economy, as well as a focus on American industry. Post-war America was smug in its place in the world; the Great War had demonstrated the success of the American economic and political models and the strength of American forces and materials. The mythologies of the American twenties—the melting pot, the Horatio Alger success stories, the open access of democracy, the dawning of a new era—demonstrate the pro-industry attitudes of the country.

The United States at this time became a creditor nation, lending money and financing people's desires for goods, especially durable goods.[4] Americans at this time were consumers, with money to spend and attitudes of optimism. The burgeoning consumer wealth contributed to the appearance of a radio in every living room. The images of the Roaring Twenties show people out to have a good time, enjoy life and play. The social concern of the Industrial Age was replaced by social activity.

In contrast to the Progressive movement at the beginning of the century, the twenties was dominated by the ideologies of Adam Smith and Charles Darwin, a sense of *laissez faire* government response to the industrial growth. The landslide 1920 election of Warren Harding as President was "a rejection of the progressive spirit as much as a

rejection of Wilsonian liberalism at home an abroad"[5] Government leadership was remarkably pro-business. President Calvin Coolidge remarked: "The business of America is business."[6] The Coolidge administration was very popular with business—"never before had confidence in the world of business been so high, or had business been so surely in control."[7] Herbert Hoover, Secretary of Commerce under Presidents Harding and Coolidge, and later President himself, was influential in moving the country away from regulation, away from the antitrust sentiment of the past. "The greatest ally of business at the courts of Harding and...Coolidge was . . . Herbert Hoover, a constructive critic of business practices."[8] Under these administrations, America's ultrarich got richer with favorable tax laws introduced by Secretary of the Treasury Andrew Mellon.[9]

Hoover, a former engineer, was very interested in radio. He recognized that radio was evolving from a communication tool for naval and military purposes into a broadcasting medium. "'We have witnessed in the last four or five months,' said ... Hoover early in 1922, 'one of the most astonishing things that have come under my observation of American life.'"[10] Presidents Harding and Coolidge gave Secretary Hoover authority to work things out with industry. Hoover worked closely with industry leaders. Through a series of information-gathering summits over the course of several years, he adopted a paternalistic relationship with the radio executives. He cautioned them to avoid monopolistic practices and offending the public. As long as they did, he was amenable to industry self-regulation.

This climate has been called "corporate liberalism,"[11] a term that describes a set of regulatory and legal arrangements that permit stable, large-scale businesses and complex markets. Under this theory, monopolies and sectors typified by substantial market power could have powerful benefits. This ideology is a remarkable departure from the antitrust sentiments of the turn of the century. Hoover's doctrine was "progressive individualism:" a belief in business, "a quasi-religious faith in the private corporate association and in a free, but responsible, industrial leadership with whom government should closely cooperate."[12] A third philosophy was at work in the twenties: Ellis Hawley's "associative state."[13] This term describes a cooperation between private entities and government agencies.

This philosophy, marked by joint undertakings to address societal needs for reform and economic expansion, was the blueprint for Hoover's approach to regulation, who actively promoted cooperation between government and industry.[14]

The cooperative efforts of the associative state guided government policy in the twenties.[15] Government's role was to work with private organizations, lend support to business, and encourage development. It was neither hands-on nor hands-off, and it was under this arrangement that the radio industry and the government developed the foundation of broadcast policy in the United States.

The Digital Age

The Internet emerged under a similar paradigm. Clinton's role as a "New Democrat" would influence his administration's views on information technologies.

Clinton often publicly promoted a "new partnership for a new country."[16] As head of the Democratic Leadership Council, Clinton was a key member of the group that tried to wean the Democratic Party off big-government liberalism. In doing so, Clinton's administration changed the Democratic Party.[17] Just as Hoover *cooperated* with industry to expand the American economy in the twenties, Clinton *partnered* with it to promote the global Internet economy.

The Internet was unregulated as a form of mass media when the Telecommunications Act of 1996 was drafted and no model existed for regulating digital communication. The Clinton administration was very active in encouraging the development of technology and emphasized competition, private investment, open access, and universal service.[18]

The administration had to balance its socially oriented agenda, which included equal opportunity for access to the new information infrastructure, with its desire for a seamless, secure network, which required the assistance of the commercial enterprises that would build it. Clinton's team was a prominent advocate of an activist government, one that works as a partner with business to increase national competitiveness. It also believed advanced communication and information technology were keys to this effort.

As in the twenties, the economic policies of the Clinton administration were largely influenced by global conditions. Communism had recently collapsed, and market capitalism and aggressive economic liberalization policies dominated the global markets. Simultaneously, the information revolution created a global information economy in

which computerized networks and information resources were central to wealth and power.[19]

Clinton pointed the United States firmly toward the global economy. His administration signaled a willingness to grant greater monopolistic freedoms to business (such as approving mergers and acquisitions) as long as business was working to promote American workers in the global economy by giving them the tools they would need. He recognized the power of economic markets, and his policy approach helped spur an era of great American prosperity.[20]

When Clinton took office in 1993, there was no World Wide Web to speak of; when he left in 2001, the majority of Americans' work was somehow related to the computer technology industry. Clinton repeatedly compared the social change resulting from the Internet revolution to be on a scale matching the Industrial Revolution a century ago.[21]

Job Creation and Revenue Opportunity

As Harding and Coolidge relied on Hoover for media policy, so to did Clinton rely on Vice President Al Gore. Gore was already known for his forward-thinking leadership on telecommunications issues, and he understood early on how the Internet worked, which was unusual for public officials at that time. As a senator, Gore sponsored the High-Performance Computing Act of 1991, which established the National Research and Education Network (NREN), a fiber-optic network connecting research sites at universities. The NREN became a big portion of the Internet backbone.[22]

This legislation was a precursor to the 1996 Act, and it was when he was promoting it that Gore coined the term "information superhighway." Gore understood both the possibilities of and the problems inherent in the new information infrastructure. In its campaign for office, the Clinton-Gore ticket used Gore's technology background wisely, courting the votes, and money, of big technology companies and executives. They saw the possibility to sell the message of job creation and revenue opportunity while also selling the message of education enhancement through networked services.

> "Gore undoubtedly would be the most technology-literate person ever to hold national office; that he actually used the Internet in itself distinguished him from most top policy makers at the time, both here and abroad, who were making decisions about telecommunications and information issues."[23]

Reed Hundt, Clinton-appointed commissioner of the FCC, strongly believed that encouraging entrepreneurship to stimulate competition was the purpose of government. Once competition emerged fully in the monopoly markets—telephone, cable, and video—the government would "happily" deregulate those markets. If competition reduced profits, it could discourage investment, and there would be no incentive to build up the networks.

Although the Telecommunications Act was many years in the making, the Clinton administration took an active role in promoting a regulatory policy for the Internet. In doing so, it had to perform a delicate balancing act with the market interests of deregulation and competition on one side and the public's interest on the other.

The 1927 Radio Act: Conservation and Censorship

Throughout the twenties and into the thirties, government took steps to preserve America's natural resources. The Teapot Dome and Elk Hills scandals, in which the Secretary of the Interior had secretly leased federal oil reserves to personal acquaintances in private corporations, had outraged the public. Private industry had benefited at the expense of their public. As a result, American' confidence in its leaders was shaken and debate on the use of public lands was at the forefront. In response, the Coolidge administration had to improve the watchdog role of government over public property.[24]

Public attention focused on the endangerment of other natural resources, especially water sources. Another threatened public resource was the airwaves, according to Hoover, whose language advocating the protection for the airwaves was incorporated into the 1927 radio act.[25] Comparing the airwaves to public resources would have a great impact on the future of broadcast legislation. Hoover believed that public utilities entailed common interests that differed from other industries and carried public responsibility. Therefore, heavy regulation by government acting on behalf of the people was justified whereas other industries could operate in the free market without government intrusion.[26] Radio was a natural resource, therefore a form of a public utility. Hence, government guidance was appropriate. The creation of the FRC in 1927 would ensure that the airwaves remained public property.

President Roosevelt's concern with conservation issues would help strengthen the power of the future FCC. He had created his Depression-fighting works programs to both conserve natural resources and to employ impoverished men. One of his first

actions as President was to examine the role of government in radio broadcasting,[27] and the result was that the nation needed an independent, permanent watchdog agency to oversee public, private, and governmental use of radio, telephone, and telegraph communications. Roosevelt's federalist approach to regulation codified the metaphoric link between radio and public utility.

The link between radio and public utility emphasizes the technical and economic aspects of broadcasting. This link is key to the development of the "public interest" standard as a doctrine designed to ensure the economic well being of the radio industries.[28] As with the telephone, and later, cable utilities, and ultimately, the Internet, serving the public interest meant providing the infrastructure, capital investments and technology necessary to bring the medium to the public. Thus, the public interest cannot be served without an economically healthy provider, whose fiscal profitability provides incentives to invest in new technologies for the benefit of consumers. This *instrumental perspective*[29] of the public interest relies on the model of the public utility, which had its roots in the conservation efforts of the Depression.

The public-utility model centered on both economic and political arguments. Congress and the courts were reluctant to regulate rates at which broadcasters could charge for usage; they were also reluctant to force open access to the airwaves. The scarcity of the airwaves principle meant that broadcasters had monopoly control over spectrum space that was, at the same time, owned by the people.[30] The 1934 Communications Act assumed the presence of natural monopoly conditions, based on the logic of scarcity. The government supported a few dominant carriers believing that was

the best way to regulate chaos over airwaves. The government also wanted to separate carriage from content.

This interpretation is important because it will shift over the course of the twentieth century. The U.S. Supreme Court has invoked the common carrier principle to distinguish a publisher from a distributor in libel cases. It defined a distributor as a third party, not responsible for the creation of editorial content, but responsible for its dissemination. The most common distributors are booksellers, newsstands, and broadcast affiliates carrying statements of their networks. The U.S. Supreme Court held that a proprietor of a bookstore, as a common carrier, is protected by the First Amendment protection of freedom of the press.[31] Courts in nonlibel cases have sometimes granted First Amendment protection to common carriers, but it is less absolute than that afforded to private speakers.[32]

Freedom of the press was also a concern in the twenties. The *Gitlow v. United States* ruling by the U.S. Supreme Court in 1925 upheld the notions of freedom of speech and the press and granted them fourteenth amendment immunity from state prosecution.[33] *Gitlow* was highly influential. Accordingly, the Radio Act emphasized that government authority over radio licenses did not extend to censorship.

Private ownership would guarantee that radio news be truthfully edited free from government control and would disseminate American news values, or "propaganda-free news." In the twenties, propaganda was associated with social and economic groups, including those that operated without profit-making intentions,[34] and was feared for its potential to be subversive. This fear of propaganda encouraged the belief that only a

commercial broadcaster would provide unbiased information. Labor unions, religious organizations, and academics were seen as potential propagandists, while market-driven, profit-making organizations were encouraged.[35]

General Order 40, a mandate by the newly created FRC in 1928, reallocated spectrum space based on industry recommendations to the FRC. General Order 40 "established the framework for modern U.S. broadcasting"[36] wherein the networks staked out the most favorable allotments of the spectrum space and their dominance grew from there. Due to industry influence, the FRC at this time would "recognize and crystallize the dominant trends within broadcasting over the previous two years and make no effort to counteract these trends through public policy."[37]

The broadcast model gave away the radio spectrum—a public resource—with minimal enforcement. Radio regulation pushed aside public interest. Radio as an advertising medium barely existed before 1928, and absolutely no one was discussing it in those terms in the debates prior to 1927.[38] The word was not even mentioned in the original 1927 version of the broadcast policy. As a result, the legislation was "already obsolete when it was passed."[39]

The 1996 Telecommunications Act: Infrastructure and Universal Service

The Clinton administration outlined an agenda for the new national information infrastructure (NII) that would guide the administration's efforts. Clinton's 1993 vision statement on the NII named nine administration principles and goals. Included in the nine were the following:

> 1) Promote private sector investment, through tax and regulatory policies that encourage innovation and promote long-term investment. . .
>
> 2) Extend the "universal service" concept to ensure that information resources are available to all at affordable prices. Because information means empowerment, the government has a duty to ensure that all Americans have access to the resources of the Information Age.[40]

The NII is a collection of mostly private networks, which could be any "computerized networks, intelligent terminals, and accompanying applications and services people use to access, create, disseminate, and utilize digital[41] information."[42] While the Internet is not the same as the NII, it would be the first technology to offer a tangible example of what the NII would eventually become.[43] Regulatory policy regarding the Internet would create the blueprint for future new mass media and telecommunications technologies. Clinton's goals for the NII were to establish the national information infrastructure as a cornerstone of the U.S. economy in the global marketplace and to promote education and lifelong learning by providing the very best resources.

President Clinton promised legislation to "increase competition and ensure universal access in communications markets—particularly those, such as the cable television and local telephone markets, that have been dominated by monopolies. Such legislation will explicitly promote private sector infrastructure investment—both by companies already in the market and those seeking entry."[44] The administration was willing to listen to private industry in developing regulatory policies for the Internet.

President Clinton also revealed his social agenda: "The Administration is committed to developing a broad, modern concept of Universal Service—one that would emphasize giving all Americans who desire it easy, affordable access to advanced communications and information services, regardless of income, disability, or location."

Nonprofit input was encouraged by the Clinton administration, a marked change in attitude after 12 years of Republican pro-business control. The administration reached out to nonprofit sectors and put together a public interest conference on the information infrastructure, sponsored by the Benton Foundation. The summit gathered over 700 participants in a discussion on a new policy platform. "For the first time in more than a decade, advocates for nonprofits, disadvantaged social groups, consumers, labor, and education interests could share rhetoric with corporate forces whose commitment would eventually be crucial to any real-world business activity." [45]

The public interest coalition was a diverse body of interested parties composed of a combination of grassroots organizers and Washington insiders. Three kinds of groups were involved in the debate: those with expertise in electronic media (these include Computer Professionals for Social Responsibility, the Electronic Frontier Foundation, and the Taxpayer Assets Project); others with more general social concerns (these include the ACLU and Library associations); and individuals (these include writers, teachers, Internet personalities, and entrepreneurs).

The Telecommunications Policy Roundtable was very active. It mobilized electronic letter campaigns and held monthly policy meetings. Its goal was to foster a democratic dialogue outside the mainstream power. "Not since the unsuccessful

broadcast reform movement of the twenties and early thirties has the communication policy process witnessed this sort of involvement by citizens' groups committed to the pubic interest."[46] This group saw the NII as a vital civic center—a place providing "electronic commons" or public arenas. It wanted to redefine the concept of universal access, saying the old system wouldn't work because the definition of services available was too narrow. The goal of this group most mirrored the public-interest goals of the administration: access.

The public interest coalition's ideas about the NII are "influenced by the contrast between the Internet and traditional electronic media."[47] They were interested in freedom of speech and in open source development of the technology. They advanced the empowerment of citizens and the concept of letting anyone be a publisher. "The pursuit of profits in the early days of broadcast radio and television squeezed out all other uses of the scarce spectrum, and that is precisely what this group wants to avoid."[48] "Like the coalition that fought unsuccessfully for some noncommercial broadcast space in the radio spectrum...they support private sector development of the NII."[49]

In the years 1993-1994, the administration also met with industry leaders. The business community was well prepared and was able to unite with the following broad objectives: to expand their businesses into broader industries, to gain market position and market share, and to make more money. The business community went on the offensive, with full-scale public relations and lobbying efforts. Hired representatives of the interested industries flooded Capitol Hill. Their message: government is "a roadblock to the information superhighway."[50] They sought incentives and revenue opportunities in

exchange for their investments in building up the infrastructure of the superhighway. The model they viewed as most ideal was the cable model, wherein one entity controls both the pipes and the content going through the pipes into the homes of millions of Americans.

The broadcast industry was an active participant in the lobby dance. Concerned they would soon become extinct once competition relaxed their hold on "eyeballs," they sought expanded ownership (the previous maximum of ownership was 25 percent of all national audience; the bill ultimately relaxed that percentage to 35 percent). They also fought to maintain "must carry" laws, which protect broadcasters from cable operators by forcing them to offer local broadcast channels on their systems. Broadcasters also wanted to be able to sell off excess high-definition television (HDTV) spectrum space to providers of other services. The fundamental vision of the traditional service providers was that of entertainment. The excess spectrum space enabled by HDTV would be capable of delivering thousands more signals into the homes; to those involved with the Internet society, that same bandwidth offered potential to deliver noncommercial programming and services that could enrich and empower individuals.

The broadcasters said they would send a digital and an analog signal so that people could see what they were missing and buy digital TV sets. Once this changeover was complete, they said they would give back the spectrum. The free giveaway of the digital spectrum to the broadcasters was

> "the largest grant of government largess since the 19th-century donation of 10 percent of the public land in the West to three dozen railroad companies in order to persuade them to build transcontinental

> railroads. Yet unlike the railroads, the recipients had no plausible business plans for using the boon from Washington."[51]

The stakes were high, and legislators undertaking the rewriting of the 1934 act were met with intense lobbying efforts by potentially affected industry groups from public utility, technology, and media companies. These groups increased their soft-money, or political action campaign, donations by nearly 20 percent, with more than half the money coming from the telephone industry. AT&T was the largest corporate political action committee (PAC) contributor, and local phone companies were the largest group.[52] Consumer rights groups with the potential to be affected by telecommunications were barred from raising PAC money by campaign finance laws, which are very strict regarding industry-specific contributions. A group representing minorities, for example, would have a hard time defending contributions on telecommunications, even though the outcome of those policies would have profound effects on the minority populations of urban and rural areas.[53]

The situation for the public interest groups was not as unfair as it might appear, however. The diverse and many corporate interests that fought each other often canceled each other out. For example, the AT&T money supporting access to local phone service was countered by the enormous sums spent by local utilities fighting for access to long-distance markets.

The Clinton administration has taken an active role in promoting new information infrastructures, emphasizing both commercial and public-sector benefits. Its goal was to make the United States stronger in the global marketplace and enhance education.[54] In a 1994 Speech, Al Gore defined the agenda for American trade advocacy, which

culminated in a 1997 agreement among 69 countries to eliminate monopolies, open all markets to competition under transparent regimes, and guarantee interconnection between new and existing networks. The administration's international advocacy was very successful, and the United States was clearly a leader in global telecommunications policy making.[55]

The social goals of the administration would be harder to obtain, as balancing the interests of the private sector with those of the public-interest coalition proved difficult.

> "The Democrats had an opportunity during 1993 and 1994 to establish a new policy architecture balancing corporate and noncommercial interests, but they lost it. . . the overwhelming majority of the population was disengaged entirely from the debate. . . . The process was thus dominated by a heated contest between powerful corporations and their lobbyists on one hand and a hardworking but heavily outgunned public interest movement on the other. And once pre-election partisan politics entered the mix, all deals were off."[56]

Government Attitudes

Throughout the twentieth century, the sentiments of the government in terms of industry regulation continued to evolve. The progressive movement had a revival in the mid-twenties when the many factions organized themselves into three main political groups largely in response to the division in Democratic party over the presence of the Ku Klux Klan in the party, prohibition, and religion. The twenties marks the split between Northern and Southern Democrats. The progressive plank was opposition to private monopolies that "crushed competition and stifled private initiative and independent enterprise in pursuit of extortionate profits."[57]

The period between the creation of the FRC in 1927 and the Communications Act of 1934 witnessed a tumultuous debate on radio's future.[58] Between 1927 and 1934 much would change in America. The economic boom, fueled by a craze for personal prosperity and heavy investment in the stock market—"the ecstasy of speculation"[59]—crashed and sent the country into the Great Depression. The worst period was the notorious "Years of the Locust" of 1929-1932. One-quarter of Americans were unemployed.[60] Shantytowns housing the millions of homeless sprang up around the country. The name of these squalid camps, "Hoovervilles," belies whom Americans blamed for their plight. When he left office in 1933, "he was condemned as inefficient and inhumane."[61]

However, the Great Depression actually contributed to the growth and success of broadcasting.[62] For many Americans, radio was the only entertainment they could afford. It was during this period that commercial advertising revenues grew by "leaps and bounds."[63] Some of the increase in advertising growth was due to the investigations of fraudulent magazine and newspaper ads. As the Federal Trade Commission (FTC) cracked down on print ads, those advertisers turned to radio stations, which were badly in need of money to support their adolescent industry and which were exempt from the investigation.[64] Audiences appreciated corporations for sponsoring radio so that they could receive it free.[65]

Broadcasters had seen that advertising was less conspicuous on popular programming than when it interrupted cultural programming. Virtually none of the serious initial programs would last past the depression, when broadcasters started programming to "the lowest common denominator."[66]

Broadcasters saw their revenues soar in the era between 1927 and 1934.[67] This era also saw the crusade of the Broadcast Reform Movement, made up of academics, labor organizations, and populists to return the airwaves to the public. Roosevelt knew firsthand the power of radio. His well planned campaign to promote his relief efforts as Governor of New York over the radio helped him gain national prominence. Radio was very important to Roosevelt's Presidential campaign[68] and would continue to play an important role with the public. His 28 radio addresses "fireside chats" made himself accessible to Americans.

The "New Dealers" of Roosevelt's administration were committed to reform. They followed the ideology of the Progressives. On economic policy, Roosevelt's advisers advocated careful intervention by the federal government in the economy with more business regulation.[69] The Congress of 1934 was overwhelmingly democratic.[70] Encouraged by Roosevelt's election and sentiments of reform, The National Committee on Education by Radio formed in 1930 and became very active. Educators were excited about the chance to reverse the trends established in 1927. "A flourishing rhetoric of 'public service' had developed, but to the FRC, this had been synonymous with service to advertisers."[71]

This opposition movement could not match the influence of the commercial broadcasters, who "did everything within their (substantial) powers to keep people, and even Congress, ignorant of their right and ability to determine broadcast policy."[72]

Commercialization of radio took a shared public resource and made it a tool for the furtherance of the interests of one group—business—and one social paradigm—a consumer society.[73]

---

[1] "Evolution of Federal Regulation Policy," *Congressional Digest*, April 1984, v6, 100.

[2] Ibid.

[3] Barnouw, 26.

[4] Jean Folkerts and Dwight L. Tweeter, eds. *Voices of a Nation* (New York: Macmillan Publishing Company, 1989).

[5] Sean Dennis Cashman, *America in the 20's and 30's: The Olympian Age of Franklin Delano Roosevelt* (New York: New York University Press, 1989), 3.

[6] Willard D. Rowland, 366; Godfrey and Limburg attribute the same quote to President Harding, 215.

[7] Barnouw, 202.

[8] Cashman, 90.

[9] Ibid., 102.

[10] Barnouw, 4.

[11] Aufderheide, 13.

[12] Willard D. Rowland, 367.

[13] Benjamin, "Working it out," 221.

[14] Barnouw, 178.

[15] Benjamin, "Working it out," 221-236.

[16] Carl Mollins, *McLean's* (16 November 1992): 52.

[17] Michael Waldman, "The Clinton Legacy," *The New Democrat*, November/December 2001, 8.

[18] Pavlik, 241.

[19] Drake, "National Information Infrastructure," 306.

[20] Waldman, "The Clinton Legacy," 8.

[21] Ibid.

[22] Pavlik, 280

[23] Drake, "National Information Infrastructure," 307.

[24] Barnouw, 178; Cashman, 97.

[25] Barnouw, 195-196.

[26] Cashman, 123.

[27] Ibid.

[28] Willard D.Rowland, 372.

[29] Ibid., 365.

[30] Aufderheide, 15.

[31] Smith, 153.

[32] Dente Ross, 99-131.

[33] Gillmor, Barron, and Simon, 16-18.

[34] McChesney, Robert, "The Battle for U.S. Airwaves," *The Journal of Communication* 40, no. 4 (Autumn 1990): 34.

[35] Ibid.

[36] Ibid, 226.

[37] Ibid, 227.

[38] Ibid, 224.

[39] Barnouw, 200.

[40] Department of Commerce, National Information Infrastructure, *The National Information Infrastructure: The Administration's Agenda for Action*, (Washington D.C., 1993, accessed 10 March 10, 2002); available from http://www.ibiblio.org/nii/NII-Agenda-for-Action.html; Internet.

[41] Information must be digital—digital information is the defining aspect of the NII.

[42] Drake, "The Turning Point," introduction to *The New Information Infrastructure: Strategies for U.S. Policy* ed. William J. Drake (New York: Twentieth Century Fund Press 1995), 5.

[43] Ibid.

[44] Agenda for Action.

[45] Aufderheide, 46.

[46] Drake, "National Information Infrastructure," 322.

[47] Ibid., 324.

[48] Ibid.

[49] Drake, "Introduction," 18.

[50] Drake, "National Information Infrastructure," 314.

[51] Dordick, 65.

[52] Aufderheide, 42.

[53] Ibid.

[54] Pavlik, 246

[55] Hundt, passim.

[56] Drake, "National Information Infrastructure," 343.

[57] Cashman, 100-101.

[58] McChesney, "Conflict not Consensus," 223.

[59] Cashman,112.

[60] Dieter Franck, prod., *America in the Thirties: Depression and Optimism* (Princeton N.J., Films for the Humanities, 1990), videorecording; Cashman, 118.

[61] Cashman, 123.

[62] Smith, 596.

[63] McChesney, "Conflict not Consensus," 228.

[64] Smith, 596.

[65] Wade Rowland, 168.

[66] Ibid.

[67] Smith, 598.

[68] Cashman, 137.

[69] Ibid., 156.

[70] Ibid.

[71] Barnouw, 23

[72] McChesney, "Conflict not Consensus," 247.

[73] Wade Rowland, 170.

CHAPTER 9

THE PUBLIC INTEREST

> *"In order for a policy to be accepted by politically influential groups, it must be relevant and must not conflict unacceptably with their expectations and desires."*[1]

Although the "New Dealers" would ultimately pass the 1934 Act, their influence in communications policy was more administrative (combining telephone with broadcasting) than guiding. The notion of a true "public interest" was largely ignored in the debate on broadcast regulation, even though the phrase "public interest" phrase remained not only in the language of the Communications Act of 1934, but appeared in subsequent rhetoric surrounding mass media in the United States.

Stronger industry regulation, with the inclusion of public input, was a popular crusade in the mid-to-late 1960s, when civil rights and President Johnson's Great Society dominated public discourse. The shift to deregulation occurred in the 1980s under the administration of Ronald Reagan. The Reagan and subsequent George Bush administrations promoted a hands-off approach with a heavy emphasis on deregulation, which gave little attention to the shift in the information economy. They were active in promoting the cable industry by endorsing competition, but other than with cable, they created no foundation for an overarching information infrastructure.[2]

Public as Consumers

In the 1980s, communications policy was the domain of the courts and the FCC, although the FCC's power was severely limited.[3] The FCC, chartered to operate in "the public interest" by the 1934 Communication Act, was up against a crusade by the industry against government involvement. Under the Reagan Administration, "Public Interest"[4] simply meant that broadcasters had to televise programs that the "public" was "interested" in watching. Mark Fowler, chair of the FCC under the Reagan administration, said "the public's interest, then, defines the public interest."[5]

"This word game was meant to convey that the market, and not the government, should determine what broadcasters would transmit. By 'the market' was meant the advertisers who paid for free over-the-air television."[6]

This free-market ideology climaxed with the end of the Cold War, and the public interest seemed to break apart like the bricks on the Berlin Wall. "Deregulation became a turbulent political issue. By the end of the 1980s, the public interest as measured by deregulation, competition, or both became an established fact both in mass media and telecommunications."[7] The Reagan administration set the tone for a deregulatory ideology. "Deregulation was at the center of a kind of holy war in policy."[8] The FCC, faced with a regulatory backlash, couldn't fulfill its mandate to guide telecommunications industry development.[9] Instead, the FCC, especially under the Bush administration, was more pragmatic, dealing with licensing, rather than content or access, issues.

Privatization and deregulation were dominating policy debates, and the notion of public interest was becoming more and more the notion of a market of consumers free to choose their content and services without government intervention.

The public-interest forces lacked a cohesive movement and any significant funding. Their traditional guarantee of protections, the scarcity of the airwaves principle, was no longer valid, and their agenda as protectors of the people was usurped by the seeming ability of true market forces to offer freedom from government intrusion. The debate on telecommunications policy threatened to exclude them. The media at this time was a moneymaking venture, and access to the airwaves was getting very expensive, as stations had to compete for audience share with each other, with cable, with VCRs, and with computers.

In the years directly preceding the legislation of 1996, the distinctions between media became more blurred. The Internet was about to burst on the public consciousness. The Internet offered a delivery system of data, voice, and video, challenging all notions of the existing regulatory scheme. Over heavily regulated phone lines into the home, the Internet delivered First-Amendment protected journalism and regulated video signals over one pipe. "Convergence of modes is upsetting the trifurcated system developed over the past two hundred years..."[10]

"The absence of high-level government leadership [prior to the Clinton administration] and disagreements within the industry combined to slow the development of a forward-looking national strategy . . . the emerging technologies would soon

revolutionize electronic media and along with it, the economy and society, but the outmoded federal policy framework impeded significant movement down that path."[11]

Internal Struggles

Although the Clinton administration promoted its "new" economic approach to Internet regulation, Congress had other ideas. The struggle between the executive and legislative branches was intense. Congress in the nineties was less willing to follow guidance from the administration than the Congress that followed Hoover and Roosevelt. Led by Speaker of the House Newt Gingrich, the Republican party was more inclined to follow the free-market model hailed by technologists like Alvin Toffler and George Gilder, who worked on public policy through the Progress and Freedom foundation, a libertarian think tank associated with Gingrich.[12] This faction believed media regulation was an outdated notion and delineated its cause in a "Magna Carta for the Information Age"—a "veritable call to arms for telecommunications deregulation."[13]

The republican legislators started blocking all legislation as the 1994 election approached—they wanted to deprive Democrats of any victory as they sensed a switch in congressional majority.[14] Congress held closed door meetings with industry "chieftans" who had helped the Republicans through money donations to campaigns and free airtime. Congress summoned the leading executives of the information sector to the Hill to discuss the Telecom bill. "No small companies; no entrepreneurs; no software or hardware companies; no consumer groups were invited."[15] The session was closed door.

No debates were televised, and the only witnesses were staffers and lobbyists.[16] The "Democrats and public interest groups were not invited."[17]

"Lobbyists have seldom met more receptive lawmakers. Committee Republicans have held numerous meeting with industry executives since January, at which they implored companies to offer suggestions about the ways the Congress could help them."[18] Gingrich wanted to abandon any notion of public service programming.

"Losing the House in '94 was without question a seminal moment in the political history of the media."[19]

When drafting regulation at public hearing, it is the "regulated" who appear and offer arguments—regularly, forcefully, and with a show of massed strength. . . groups that represent listeners are rare, and those that do arise have become impotent with impressive regularity."[20]

The Senate included an updated version of the infamous failed Wagner-Hatfield amendment in 1934, which would have set aside 25 percent of the Internet to noncommercial use. Initial proposals called for 20 percent of the network capacity to be set aside for noncommercial information suppliers. Industry pressure scaled the capacity back to 5 percent and narrowed the qualifications of eligible entities. This 5 percent was nonetheless an important victory for the public interest groups.

Although the public interest coalition had an unprecedented degree of influence on the policy process, their issues were watered down in the final version of the legislation. Nonetheless, they remained on the agenda, which is more progress than the noncommercial radio industry made more than 60 years ago.[21]

Regulating New Media Technologies

In both eras, the structures of the past did not serve the realities of the day. Government could not continue to regulate media as it had either because it was reluctant to impose regulation in pro-competitive political climates or because doing so was impossible with evolving media technologies. The public discussion centered on what exactly was the government's role in the business of communication technology.

Members of Congress solicited the views of major corporations and nonprofit and public interest groups. However, corporate lobbying and the politics of money eventually took over.[22] Multiple striking parallels with the radio broadcast struggle were evident—power and money are preeminent forces shaping selection of a policy model for a new mode of electronic communication and information.

The 1996 Telecommunications law gave almost no guidance to the FCC on how to treat the Internet, access charges, data networks, or affordable telephone service (universal service). Most strikingly, the 1996 Act was also practically obsolete upon passage.

---

[1] Krasnow and Longley, 17.

[2] Drake, "National Information Infrastructure," 306.

[3] Ibid.

[4] For more on the public interest, see pages 60-66 above.

[5] Hundt, 124.

[6] Ibid., 36.

[7] Aufderheide, 26.

[8] Ibid., 27.

[9] Drake, "National Information Infrastructure," 306.

[10] Ithiel de Sola Pool, *Technologies of Freedom,* (Cambridge, Mass.: Belknap Press) 1983, 7.

[11] Drake, "National Information Infrastructure," 307.

[12] Ibid., 338.

[13] Hundt, 81.

[14] Drake, "National Information Infrastructure," 338.

[15] Hundt, 83.

[16] Ibid.

[17] Drake, "National Information Infrastructure," 339.

[18] Hundt, 86.

[19] Ibid.

[20] Krasnow and Longley, 24.

[21] Drake, "National Information Infrastructure," 335.

[22] Drake, "The Turning Point," 20.

CHAPTER 10

CONCLUSIONS: MOVING TOWARD POLICY?

"'Public interest' vagueness hampered development of coherent public policy."[1]

A comparison of radio and the Internet, from development to regulation, reveals clear historical patterns in new media development, adoption, and regulation. A historical perspective allows researchers to recognize and appreciate social tendencies that push innovation in certain directions. While history won't repeat itself, the tendencies—or supervening social necessities—are always essential to technology innovation and will repeatedly shape the future.

As media continues to converge and change, the distinctions between media will blur. The purpose of this research was to explore media policy making in the past, evaluate where it stands today, and attempt to understand the likely developments of future media technologies.

The United States will continue to evaluate the regulatory policies of new media based on two main factors: which existing media technology does it most resemble? and what potential revenue opportunities exist to make the technology an attractive investment for the private sector? Radio and the Internet are regulated differently *not* because the content they contain is different but because the underlying technology

systems upon which information travels are significantly different enough that lawmakers were unable to apply one policy to both.

Rationale for Existing Policies

The Courts have upheld media regulation since the 1934 legislation in specific circumstances and based on specific aspects of the medium. Radio, and subsequently television, is an appropriate medium to legislate because of the scarcity of the airwaves. Oversight is necessary to prevent chaos. On this principle, the FCC has wide latitude to regulate in the public interest. The Internet, on the other hand, has no such technological restrictions. It can support limitless numbers of content providers. It is also decentralized, thereby making it almost impossible to police the producers of the content.

An analysis of the historical pattern reveals an ongoing interplay between government and commerce, with the public's role an ever-changing one. Radio and the Internet both developed in response to military need; both media took about the same length of time to permeate society; and both evolved from technologies designed for communication to mass media.

However, two significant differences, the point in development at which the media was regulated and the role of the technology developers, led to different regulatory outcomes. In both the 1934 Communications Act and the 1996 Telecommunications Act, Congress attempted to impose governmental oversight on the content of the media; however, it was not successful at regulating the Internet in 1996.

Several factors led to the drafting of the portion of the 1996 legislation that was soon thereafter deemed unconstitutional by the United States Supreme Court. Congress

demonstrated an overall misunderstanding of the technology. This tendency is nothing new, as described by a researcher on radio policy-making in 1934:

> *"Even a cursory study of Congressional debates or hearings reveals the inadequacies of Congress in handling matters of technical complexity. Actually, Congress has always been a step behind technical progress in the radio field, following new developments with legislation only when these have grown big and important enough..."*[2]

However, the legislation in 1996 was enacted mainly in reaction to economic market forces and to public outrage over Internet pornography, rather than in an attempt to draft policy that would address the evolution and convergence of future technologies. Whereas the 1934 Act attempted to build an overarching agenda, with oversight by a newly created governing body, the 1996 Act failed to achieve such lofty goals. It was adopted as an update to the 1934 legislation, and its attempt to regulate content on the Internet reflects that backwards-facing approach.

In both cases, legislation was enacted before the implication of the medium was fully realized. Thus, the 1934 Act made no mention of how radio would be funded—advertising—and how that model may or may not serve the public interest. The 1996 made no mention of how the Internet would most intrude upon the public interest—privacy. Had Congress either imposed policy *prior* to the point at which the medium reached critical mass or waited a few years more before doing so, it might have faced fewer problems meeting changing technology. In each case, the legislation was both overdue and premature, as well as obsolete upon passage.

In the future, we can learn from the experiences of radio and the Internet. We can expect the technology to develop largely outside the public eye, then gain the attention of the public and the lawmakers at roughly the same time. We should expect Congress to leave ownership of the media to corporate interests and to attempt to regulate undesirable content.

However, the Internet continues to evolve, and as it does so, regulatory approaches to it will also evolve. Congress is likely to focus on the narrow problems presented by the technology rather than focus on the possibilities of the medium in the future. Media policy making for digital technologies is likely to be adopted piece by piece; as a new concern is raised by a technology, a new law or judicial interpretation will address that specific problem.

The rationale that created the FCC and birthed media regulation—scarcity—will not apply specifically to media technologies of the future, but as history has demonstrated, the rationales behind policy can be adapted. The FCC is unlikely to disappear with the end of the scarcity dilemma. Rather, its focus will shift to meet the future.

Corporate Interests

The economic and political ideology in the United States leads to more control by the private sector. In the era of Hoover, the United States was recognizing the power and influence of communism; in the Clinton era, it was recovering from the threat of this influence. In both eras, the capitalist reaction to communism and the implied elevation of the entrepreneur guided media policy making.

The government in the United States does not own or control the mass media. It does however, have an interest in ensuring that the media operates as a source of information and entertainment to the public. Since it cannot control the media, it must provide incentives for the commercial sector to do so.

Technological progress demands some guarantee of revenue, and that is the role of the government in media policy making. New communications technologies will not develop unless the people who invest in them receive a return on their investment and are rewarded for taking risks.

The interested parties involved in the development of the Internet had an advantage that most members of Congress did not. The Internet entrepreneurs shared a culture in which computers and technology were open and accessible to everyone. They believed that an open approach to the Internet would benefit greater society by making it possible to build on the ideas of others; in their culture, information was a public right. They were not as interested in creating a system wherein anyone, particularly the government, could out the brakes on technological development.

The technology involved in the Internet was much more complicated for the user than were the mediums of the past. More was involved than simply plugging in an electrical source. Because the legislators failed to fully grasp the technological aspects of the medium, they were more persuaded by those who did, and those who did wanted no hand of government in the medium.

That is not to say that the pioneers of radio sought, or desired, regulation. They certainly wished for independence, but for slightly different reasons. They were mainly

driven by independent, rather than collective, motives. Broadcasting offered exciting profit-making opportunity, and the patent fights and corporate rivalries were more naturally the scope of trade and commerce oversight. The scarcity principle provided the government with justification to serve as a watchdog over these corporate interests—licenses to broadcast were given to those who served the public interest.

The FCC under the current administration of George W. Bush is the most sympathetic to corporate interests of any commission since its inception.[3] Reflecting a new regulatory climate in Washington, the FCC of today is skeptical of the role of government in promoting public-interest agendas such as diversity. The FCC is gradually rolling back many of the restrictions on media ownership, relaxing the rules that had previously prevented cable companies and other media outlets from growing and dominating new markets. The FCC is also considering plans to auction off excess radio spectrum space for cellular telephone service, an occurrence that would closely connect radio and the Internet in one governing policy.

It is unlikely that the framers of the Constitution would consider the press to be a major source of revenue and wealth for corporate interests. Their concern was in protecting the public from government, not from protecting the public from profiteers. The financial aspects of the mass media will undoubtedly continue to form the basis for media development and adoption. If no viable source of revenue accompanies a new technology, the corporate interests are highly unlikely to develop or promote it. While commercial funding of radio broadcasting was an afterthought—once it was evident that radios had saturated the market, the industry needed a reason to program the

broadcasts—media of the present and the future will never view advertising, or revenue, as an afterthought.

Taking copyright infringement as an example, the laws governing the rights of ownership are complicated and dense. The public is not going to fully comprehend these laws and is unlikely to control and technology that could potentially face copyright infringement. In this case, the existing laws act as a "brake" on innovation.

Public Interest

The public-interest standard had never been defined and has continually evolved since the original phrase was incorporated into the 1934 Act. The FCC has had authority to determine which broadcasters, and which policies, best serve the public interest, and the Courts have interpreted the decisions of the FCC based on the same vague guidance from the law. The 1996 Act attempts to clarify what actions best serve the public interest.

The wording in the Act indicates that the public interest is best served when the public has both choice and access. The public refers to the society of consumers. Their interests are assumed to be their choice. The public should have choice and it should have access to all media. Pro-competitive policies encourage more consumer choices. The law was an attempt to stimulate competition and stifle monopolization of the media. The law also required universal service by imposing financial obligations on those benefiting from monopoly service areas. Thus, the public interest is the public's ability to get information and at competitive prices.

Although public-interest groups involved in the regulatory debates of both the twenties and the nineties believed the public interest would best be served by setting aside portions of the resources to educational and noncommercial purpose, regulators in each situation determined that the marketplace is the best safeguard of the public interest.

We should expect the public interest to be further protected by the marketplace but not expect that the educational or noncommercial interests will have access to the medium as providers. We should expect Congress to implement measures to ensure that the underserved populations will be able to receive, or consume, the medium, but not necessarily to present messages of their own.

Had Congress either enacted Internet policy prior to the point at which it reached critical mass or waited a few years before doing so, it might have had greater success at regulation. As it is, the public interest will likely continue to be associated with the consumer's ability to choose, the accessibility of service, and the continuation of the economic marketplace.

Role of Government

Congress understood media through the use of metaphors in the debate. They consistently view media in terms of another industry they can equate it with, then regulate accordingly. As a result, the radio airwaves became roads, requiring traffic cops and order, and the Internet became a superhighway that required the resources of industry to build. Neither media was debated on the merits of the information and news it could provide. Particularly in 1996, the debate lacked reference to the special role communications play in society. Had they not overlooked the Internet's potential as a

mass medium, they might have been able to draft legislation that would not have violated the First Amendment.

The government largely funded the research necessary for these technologies to develop. Within the cycle of media invention and adoption, the government plays the largest role. The government not only can encourage development and innovation, it can suppress it through policy and lawmaking. Despite the international nature of both radio and the Internet, the U.S. federal government determines its fate in the United States.

Expectations and Predictions

Communications policy will continue to be drafted in response to corporate interests and will continue to be reactionary rather than visionary. As the Internet becomes more dominated by commerce, we should expect much more regulation. Congress and the courts are starting to understand the true applications of the Internet and they are grappling with the issues posed by the new (digital) face of media. The ideology of the corporation is slowly supplanting the hacker mentality, which was one of open-source and free access to information. The on-going debate about digital music sharing over the Internet reveals that once a profit or revenue is threatened, the rule-makers quickly hear about it.

Radio regulation set several precedents. Regulators will view new media technologies with an eye toward regulation. The instinct is to implement oversight, or at the very least, implement restrictions. Communications merit special considerations outside the standards of general commercial oversight. Regulators will weigh the input of industry leaders in determining policy. Regulators will react to specific considerations

presented by new media technologies rather than rely on overarching policy. Regulators will view new media in terms of an older one and attempt to conform the technology to existing regulatory models. This could act as a "brake" on new media development, if regulators see all new content-delivery systems as illegal infringements on copyright regulations, for example. We can expect that future technologies will be more controlled.

Finally, regulators will assume that the commercial interests will continue to support new media technologies and that the logical scheme for media funding will be profit-driven.

Suggestions for Future Research

Media continues to play a larger role in our lives, and people face a multitude of choices for their entertainment and information. Media technologies are converging and content-delivery methods are rapidly erasing any constraints of geography. With advanced video-on-demand, music MP3 formats, and downloadable books challenging the traditional in-store methods, how are the challenged industries reacting? We are seeing huge debates over music, with the recording industry fighting to eliminate the music-swapping sites through legislative and judicial tactics. Many comparisons are made between this situation and that of the VCR in the 1980s.

A thorough comparison of those two technologies would delve deeper into the specific strategies that incumbent industries employ when warding off the entrepreneurs. As this issue will most likely affect every form of media, from telephone service to Hollywood movies, research in this area would be valuable as policymakers approach an era sure to introduce media technologies with as great an impact as radio and the Internet.

[1] Krasnow and Longley, 16.

[2] Carl J. Friedrich and Evelyn Sternberg, "Congress and the Control of Radio—Broadcasting, I," *The American Political Science Review* 37 (1943): 798.

[3] Stephen Labaton, "Media Companies Succeed in Easing Ownership Limits," the *New York Times*, 16 April 2001, Section A, 1. Column 6.

Works Cited

Aufderheide, Patricia M. *Communications Policy and the Public Interest.* New York: The Guilford Press, 1999.

Babbie, Earl. *The Practice of Social Research,* 8th ed. Belmont, Calif.: Wadsworth Publishing Company, 1998.

Barnouw, Erik. *A Tower in Babel: A History of Broadcasting in the United States,* vol. 1 New York: Oxford University Press, 1966.

Benjamin, Louise M. "The Precedent that Almost Never Was: A 1926 Court Effort to Regulate Radio." *Journalism and Mass Communication Quarterly* 67, no. 3 (Autumn 1990): 528-585.

_____. "Working it out together: Radio Policy from Hoover to the Radio Act of 1927." *Journal of Broadcasting and Electronic Media* 42 (1998): 221-236.

Brown, Rich. "From Marconi to HDTV." *Broadcasting* 121 (9 December 1991): S6-S14.

Cashman, Sean Dennis. *America in the 20's and 30's: The Olympian Age of Franklin Delano Roosevelt.* New York: New York University Press, 1989.

Congressional Record, 103-140 Cong Rec S 9745, vol. 140 no. 99.

Dente Ross, Susan. "The 'Strange Power of Speech': The Unprecedented but Limited Success of Telephone Company First Amendment Arguments. *Communication Law and Policy* 3 (1998): 99-131.

Denzin, Norman, and Yvonna Lincoln. "Introduction: Entering the Field of Qualitative Research." In *Handbook of Qualitative Research,* eds. Norman Denzin and Yvonna Lincoln, 1-17. Thousand Oaks, Calif.: Sage Publications, 1994.

de Sola Pool, Ithiel. *Technologies of Freedom.* Cambridge, Mass.: Belknap Press, 1983.

Dordick, Herbert S. "The Social Consequences of Liberalization and Corporate Control in Telecommunications." In *The New Information Infrastructure: Strategies for U.S. Policy,* ed. William J. Drake, Chapter 6. New York: Twentieth Century Fund Press, 1995.

Drake, William J. "The National Information Infrastructure Debate: Issues, Interests, and the Congressional Process: Policies for the National and Global Information Infrastructures" In *The New Information Infrastructure: Strategies for U.S. Policy,* ed. William J. Drake, Chapter 10. New York: Twentieth Century Fund Press, 1995.

_____. "The Turning Point" In *The New Information Infrastructure: Strategies for U.S. Policy,* ed. William J. Drake, introduction. New York: Twentieth Century Fund Press 1995.

"Evolution of Federal Regulation Policy." *Congressional Digest* 63 (April 1984): 100-101.

Fidler, Roger. *Mediamorphosis.* Thousand Oaks, Calif.: Pine Forge Press, 1997.

Folkerts, Jean, and Dwight L. Tweeter. *Voices of a Nation.* New York: Macmillan Publishing Company, 1989.

Franck, Dieter. *America in the Thirties: Depression and Optimism.* Produced by Films for the Humanities, 1990, videorecording.

Friedrich, Carl J., and Evelyn Sternberg. "Congress and the Control of Radio—Broadcasting, I." *The American Political Science Review* 37 (1943): 797-818.

Gillmor, Donald, Jerome Barron, and Todd Simon. *Mass Communication Law: Cases and Comment,* 6th ed. Belmont, Calif.: Wadsworth Publishing Company, 1998.

Godfrey, Donald G., and Val E. Limburg. "The Rogue Elephant of Radio Legislation: Senator William E. Borah." *Journalism and Mass Communication Quarterly* 67, no. 1 (Spring 1990): 214-224.

Goffman, Erving. *Frame Analysis: An Essay on the Organization of Experience.* Cambridge, Mass: Harvard University Press, 1974.

Higgins, C.S., and P.D. Moss. *Sounds Real: Radio in Everyday Life.* St. Lucia and New York: University of Queensland Press, 1982.

Hundt, Reed. *You Say You Want A Revolution: A Story of Information Age Politics.* New Haven, Conn: Yale University Press, 2000.

Krasnow, Erwin G., and Lawrence D. Longley. *The Politics of Broadcast Regulation.* New York: St. Martin's Press, 1973.

Krattenmaker, Thomas G. "The Telecommunications Act of 1996." *Connecticut Law Review* 29 (1996): 100-185.

Labaton, Stephan. "Media Companies Succeed in Easing Ownership Limits." *The New York Times*, 16 April 2001, Section A, 1.

Mander, Mary. "The Public Debate About Broadcasting in the Twenties: An Interpretive History." *Journal of Broadcasting* 28 (1984): 167-185.

Markus, M.L. "Toward a 'Critical Mass' Theory of Interactive Media: Universal Access, Interdependence and Diffusion." *Communication Research* 14 no. 5, (1987): 491-511.

McChesney, Robert. "Battle for U.S. Airwaves." *The Journal of Communication* 40, no. 4 (Autumn 1990): 29-57.

_____. "Conflict, Not Consensus: The Debate Over Broadcast Communication Policy, 1930-1935." In *Ruthless Criticism*, eds. William S. Solomon, and Robert W. McChesney, 222-258. Minneapolis, Minn.: Regents of the University of Minnesota, 1993.

_____. "Graham Spry and the Future of Public Broadcasting." *Canadian Journal of Communication* 24 (1999): 25-47.

Meadow, Charles. *Ink Into Bits.* Lanham, Md.: The Scarecrow Press, Inc., 1998.

Mollins, Carl. *McLean's* (16 November 1992): 52.

Noam, Eli M. "Media Regulation—New Rules for New Times." *Media Studies Journal* 10 (1996): 39-48.

Nolan, Michael. "Canada's Broadcasting Pioneers: 1918-1932." *Canadian Journal of Communication*, 10 no. 3, (1984): 1-26.

Oliver, P., G., Marwell, and R. Teixeira, "A Theory of Critical Mass: I. Interdependence, Group Heterogeneity, and the Production of Collective Action." *American Journal of Sociology* 91 no. 3, (1985): 522-556.

Pavlik, John V. *New Media Technology: Cultural and Commercial Perspectives*, 2d ed. Needham Heights, Mass.: Allyn and Bacon, 1998.

Randall, Neil. *The Soul of the Internet: Net Gods, Netizens and the Wiring of the World.* Milford, Conn.: International Thomson Computer Press, 1997.

Rogers, Everett M. *Communication Technology: The New Media in Society.* New York: Free Press, 1986.

Rowland, Wade. *Spirit of the Web: The Age of Information from Telegraph to Internet.* Toronto, Ontario: Key Porter Books, Ltd., 1999.

Rowland, D. Willard., Jr. "The Meaning of 'The Public Interest' in Communications Policy—Part II: Its Implementation in Early Broadcast Law and Regulation." *Communication Law and Policy* 2 no. 4, (1997): 363-396.

Segaller, Stephen. *Nerds 2.0.1: A Brief History of the Internet.* New York: TV Books, L.L.C.; Oregon Public Broadcasting, 1998.

Smith, Leslie F. "Quelling Radio's Quacks: The FCC's First Public-Interest Programming Campaign." *Journalism Quarterly* 71 (1994): 594-608.

The Telecommunications Act of 1996. U.S. Code, Public Law No. 104-104, Stat. 86 (1996).

Tuchman, Gaye. "Historical Social Science: Methodologies, Methods, and Meanings." In *Handbook of Qualitative Research,* eds. Norman Denzin and Yvonna Lincoln, 306-322. Thousand Oaks, Calif.: Sage Publications, 1994.

U.S. Congress. Senate. Senator Exon of Nebraska speaking for the Communications Decency Act. S.J. Res. 652. 104th Cong., 2d. sess. *Congressional Record* 140, pt. 99 (26 July 1994).

U. S. Constitution, amend. 1, sec. 1.

Waldman, Michael. "The Clinton Legacy," *The New Democrat* (November/December 2001):

Williams, Frederick, Strover, Sharon and August E. Grant, "Social Aspects of New Media Technologies," in *Media Effects,* ed. Jennings Bryant and Dolf Zillman, 463-482. Hillsdale, N.J.: Lawrence Erlbaum Associates, Inc. 1994.

Winston, Brian, "How are Media Born and Developed?" in *Questioning the Media: A Critical Introduction,* eds. John Downing, Ali Mohammadi, and Sreberny-Mohammadi, 54-74). Thousand Oaks, Calif.: Sage Publications. 1995.

_____. *Media Technology & Society. A History From the Telegraph to the Internet.* London: Routledge, 1998.