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THE INFORMATION HIGHWAY IN PUBLIC DISCOURSE:
STORIES IN THE MAKING

DISSERTATION

Presented in Partial Fulfillment of the Requirements for
the Degree Doctor of Philosophy in the Graduate
School of The Ohio State University

By

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*****

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ABSTRACT

This study investigates whether widely-distributed written public discourse about the information highway describes an infrastructure that generates positive social outcomes. A narrative method was used to analyze depictions of access, function, funding, and control of the information highway in eighteen magazine articles oriented to diverse segments of the population. These depictions were compared to themes from scholarly literature as to how access, funding, function, and control should be configured to be socially beneficial.

Seven research questions guided the comparison: (1) what type of power relationships are constructed; (2) who are the experts; (3) what actions and responsibilities are attributed to the government; (4) what characteristics are associated with the setting; (5) is universal access evident; (6) what functions are depicted; and (7) is the information highway depicted as centralized or decentralized, and how does this affect function, and access.

Relatively homogenous depictions of access, funding, and function were portrayed in the articles, but there was
wide divergence as to what the function should be, and whether people's lives will be enhanced by implementing an "information highway". Evident in this discourse is an awareness of the economic imperative driving the planning of the information highway. Articles cluster around four responses to this imperative: (1) be happy, good consumers; (2) try to capture a piece of the profits; (3) succumb to despair; (4) hope the government will intervene.

The conclusion is that public discourse that refutes the economic imperative of the information highway must develop stories that present logical, competent, realistic alternatives and address areas of ambiguity. Nonstories and vague references to universal access must become more detailed stories that catch the imagination of the reading public and policy makers. Academicians should integrate their research into public discourse to provide concrete alternatives to the dominant consumer-based model.
Dedicated to my husband, Vicente Berdayes
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CHAPTER 1
INTRODUCTION

...Human beings as storytellers, at once immersed in linguistic webs that they did not spin, and busily weaving webs in which to immerse others. W. Barnett Pearce, Communication and the Human Condition, pg. 68.

The "linguistic webs" spun about access, funding, function, and control of the future communication infrastructure are the focus of research in this dissertation. I apply a narrative analysis to a sample of magazine articles to gain insight into what purposes and practices are privileged, and conversely marginalized, as a result of action, setting, and character depictions. I chose this research focus because of the influence our public discourse has on the way we think about, and eventually use, new communication technologies in day to day life practices.

The impact of technology on day to day life practices is not a trivial issue. Technology practices encourage some kinds of interactions and discourage others (Kramarae 1988); they constitute gender relations (Frissen, 1992; Rakow,
1988); and centralize or decentralize power relationships (Innis, 1951). Technology "posits a subject, has an epistemology, and structures value choices" (Deetz, 1990).

Given the impact of technology on day to day life practices, I also focus attention on criteria that should guide infrastructure planning to generate positive social outcomes. I compare the depictions in my sample to these criteria. Thus, this dissertation is not only an effort to gain insight into what are all too often easily glossed over linguistic constructions that influence how we use technological systems; but, I also assess whether this discourse suggests a future infrastructure that generates positive social outcomes.

I review scholarly literature that addresses two general issues of concern in this dissertation in the following section: first, the role of public discourse in coordinating social opinion and influencing policy makers; and second, criteria that should be established to insure the creation of a communication infrastructure that generates positive social outcomes.

General Issue: Public Discourse and Life Practices

Introduction

Access, funding, function and control of our future communication infrastructure are currently being configured. Just as our nation faced critical junctures when railroad
lines were built and telegraph and telephone wires were
strung coast to coast, a communication infrastructure will be
implemented that has the potential to dramatically change day
to day life practices. Instead of talking about dots and
dashes or long and short waves, the buzz words are digital
signal compression, video on demand, interactive multimedia,
fiber-optics, and satellites.

Designers and vendors are testing aspects of this new
infrastructure in various locations. Fiber-optic pipes are
being laid in the ground to speedily transmit signals. Major
companies are merging what were previously distinct services
into a single service. People are experimenting at home with
personal computers and interacting over a mega-network,
Internet, to access information, purchase goods, and interact
with others in novel and experimental ways. Last, but not
least, popular magazines and newspapers are disseminating
tremendous amounts of information about the possibilities the
new infrastructure will afford the general population.

The focus in this dissertation is on this latter
phenomenon, widely-distributed public discourse1 about the
future communication infrastructure. In particular, I

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1 When I refer to public discourse in this dissertation
I am describing discourse that is publicly available and
circulated to segments of the population, such as: news
reporting, advertising, popular magazine articles,
organizational position papers, and the like.
explore the assumptions embedded in a selected sample of magazine articles about the information highway.

I begin this study with background thoughts on public discourse and technology practices. First, I review scholarly literature that discuss the influence of public discourse on power relationships, social structure, and policy formation. I pay special attention to whether the current use of an information highway metaphor in widely-distributed popular discourse predisposes us to think in specific ways as to how communication technologies should be implemented in day to day life.

Berger and Luckmann (1966) describe how reality is socially constructed through language. Language is a "repository of vast accumulations of meaning" (P.35); meanings which force us into patterns of behavior and typify life experiences into easy to understand categories. Thus, through written public discourse--implied by Berger and Luckmann to be language that is detached from face to face experience--there is the "capacity to communicate meanings that are not direct expressions of subjectivity 'here and now' (P. 35) but rather: "immense edifices of symbolic representations that appear to tower over the reality of everyday life, like gigantic presences from another world" (P. 38).

A well researched theme in scholarly literature is the influence of written public discourse on the creation and
perpetuation of power relationships. Paul Bove (1990) argues that discourse emanates from a point of view with an identity to be discovered, defined, and understood. He suggests that by analyzing public discourse one can describe "linkages between power, knowledge, institutions, intellectuals, the control of populations, and the modern state as these intersect in the functions of systems of thought" (P. 54). According to Bove, "Discourses and their related disciplines and institutions are functions of power; they distribute the effects of power" (P. 58). As power is distributed throughout culture, various "fields of possibility" are opened up. Public discourse to Bove is "one of the most empowered ways in modern and postmodern societies for the forming and shaping of humans as 'subjects'" (P. 58).

Altman (1990) also investigates the role public discourse fulfills in structuring day to day social relationships. She focuses attention on how public discourse "construct ways of seeing, imagining, or valuing technology in the home" (P. 97).

Other research is focused on how consensus is manufactured through public discourse, thereby limiting the way the population thinks about an event or object. For example, Deetz (1990) claims scientific reasoning dominates public discourse and marginalizes other competing but less powerful discourses. He describes how this "instrumental" discourse manufactures consensus and consent throughout the
population, but this is consensus and consent built on unawareness:

Systems of thought, expression, and communication medium may contain embedded values that are at odds with the person's own values, if such a person could openly assess them...Yet, the embedded values can be reproduced in expression without awareness...If people could work back through the concepts they utilize, they would often find a gap between what they reflectively think and feel and what they unwittingly express (P. 47).

He urges scholars to focus communication research on "'whose' and 'what' ends are being advanced" in the discourse instead of the efficiency and effectiveness of new technologies.

Lindblom (1990) is also concerned with how consensus is built through distribution of public discourse. He argues that audiences are moved toward conformity through mass media systems in which commonly accepted ideas narrow the way they think about an issue.

Influence on Policy Makers

This discourse also may influence policy makers to attend to some policy issues and not others; after all, they reside within a culture permeated by this discourse. We know that policy makers place limitations on policy debates due to their own subjectivity. Their tacit or explicit values determine the scope and nature of the policy issue under discussion. The problem definition stage of the policy process is not a neutral process:
Politics motivated by simple self-interest, shared ideals, values, or whatever, still matters in propelling problems through and past the obstacles that keep the agenda for action from getting overloaded (Bosso, P. 100).

Policy makers define problems by "imposing certain frames of reference on reality" (Dery, 1984, P. 4) in the context of a shared community. This notion of a shared community of values is further extended by McCain, et. al. (1995) who describes how shared perceptions of problems by policy makers influence what policy options are considered. Policy makers tend to rely on tacit knowledge that is acquired haphazardly and informally, rather than on more objective social science research (Weiss & Bucuvalas, 1980).

Given the subjective nature of the policy process, it stands to reason that widely-disseminated written public discourse can influence the problem definition and agenda setting stages of the policy process, let alone the actual promulgation of rules. Some examples in the literature of this influence are documented by Mander (1984) relative to regulation of broadcasting in the 1920s; Streeter (1987) describes the influence of public discourse on regulating cable television between 1966 - 1970; and, Baker & Meyer (1994) discusses how public discourse places pressure on policy makers to respond to increasing levels of criminal activities. Sterling (1994) describes three ways in which the general and trade press influence the policy process: they help define the policy agenda by pressuring policy
makers to attend to certain issues; they inform the larger policy community of specific developments; and, "...their pages are common sources for lobbying advertising efforts, especially that are aimed at Congress" (P. 467).

Thus, there are indications that policy makers are influenced by written public discourse. Commonly accepted assumptions in public discourse subtly establish the parameters of policy considerations (Samarajiva, 1994). Insight into these commonly accepted assumptions may permit a would be intervener to expand the parameters of policy discussion and thereby expand the policy potential. Such a heightened awareness of the symbolic realm can allow one to more effectively encourage the asking of "...different questions and look at the problem from different perspectives..." (Samarajiva, 1994).

In this project, I focus on popular magazine articles. They are a subtle form of storytelling and an important source of social information in our culture. Social relations are produced and reproduced in these articles (Altman, 1990; Burke, 1936; Deetz 1990, Kramarae, 1988; Marvin, 1988; Williams, 1958). But what type of stories are being told? In particular, what are the stories that are being told about how communication technologies should be integrated into daily practices?

The future communication infrastructure is referred to by different names in popular magazine articles. Some of
these discourses refer to: The Intelligent Network, described as "a variety of types of networks that support software-related services" (Mansell, 1989, P. 8); The National Research and Education Network, which refers to a high-speed network whose purpose is to link academic, industry, and government agencies throughout the United States (Cerf, 1991, P. 29; Habegger, 1991); The National Information Infrastructure, a web of communications networks and consumer electronics that will make vast amounts of information available to the public (Bakhshi, 1994; McCain, et. al., 1995; "National Information Infrastructure: Agenda for Change," 1993); and, most recently, The Global Information Infrastructure, described by Al Gore as "highways-or, more accurately, networks of distributed intelligence--will allow us to share information, to connect, and to communicate as a global community."2 These names, The Intelligent Network (IN), The National Research and Education Network (NREN), The National Information Infrastructure (NII), and the Global Information Infrastructure (GII) are known by those who are technically aware and follow policy discussions about the configuration of the future communication infrastructure.

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2 On March 21, 1994 in a speech delivered at the first development conference of the International Telecommunication Union.
The most common referral to the future communication infrastructure—the referral that appears to have caught the imagination of the general population—is the information highway. Even the phrase information highway is referred to in various ways in the literature: digital thruways, electronic pathways, superhighways, interstate highways of information, highways of the 21st century, telecommunication highways, and electronic highways (Sawhney, 1992). The biases inherent in this metaphor are the focus of research in this dissertation.

**Information Highway Metaphor**

Mary Mander (1984) argues that widespread use of metaphors in public discourse should not be ignored. They deeply affect the way we conceptualize the subject of the metaphor. They "establish categories of what is possible or what is impossible" (P. 169). Lest one think that the information highway metaphor is unique to the 1980's and 1990's, Mander claims that transportation metaphors were dominant in debates about early radio. In magazine articles in the 1920s, President Hoover was a "'traffic cop' who's main job it was to police the air waves and to relieve the 'congested lanes of ether'" (P. 170). Images of the thoroughfare were used to describe the ether: "it had boundaries, rights of way and its users were bound to follow the rules of the road" (P. 171).
Discussion in the literature about the implications of using an information highway metaphor to envision how communication technologies will be implemented in day to day life practices reveal agreement among scholars around certain issues and disagreement around other issues. There is agreement that the information highway metaphor assumes there should be a communication infrastructure built that resembles the transportation infrastructure, therefore, with a primary goal of facilitating commercial interests. There is disagreement if this metaphor implies an inclusive or exclusive infrastructure, and greater or lesser government regulation.

Gandy (1992) and Sawhney (1992) argue that use of the metaphor associate the communication infrastructure with economic growth and therefore provide a rationale for the federal government to commit public resources to build it. Gandy somewhat contradicts this notion of strong government involvement when he also argues that this metaphor encourages deregulation based on the same economic imperative arguments. Mander (1984) argues that transportation and public utility metaphors used in early radio debates of the 1920s supported federal involvement and oversight, but with two different goals in mind. The transportation metaphor coupled communication to a marketplace approach; the role of the federal government was to insure orderly transmission of communication from point to point to facilitate commercial
interests. In contrast, comparing early radio to public utilities coupled communication with public interest; the purpose was broader than facilitating "commercial interests. Rather, the future development of broadcasting ought to be done with a view to the social and economic good of the people" (P. 176).

Beside differing notions as to whether use of an information highway metaphor assumes government oversight, and if so, toward what policy goals, there is also confusion as to whether discriminatory practices against segments of the population are encouraged. Dordick & Lehman (1994) argue that the transportation infrastructure was a boom to manufacturing but overall harmful to many sectors of the population:

in the wider sense of transportation infrastructure, the interstate has been a costly failure. Car ownership is almost universal, but the importance of the interstate for different groups has been far from neutral. The role of the interstate in facilitating suburbanization is well documented. The neglect of mass transit alternatives and the subsequent impacts on residential and industrial location patterns is also well documented. The results may have been detrimental for the urban poor. Urban America's problems are inextricably linked to the interstate. The interstate also facilitated the transition from small, heterogeneous, owner-managed shops to national homogeneous, corporate chain stores. Mass transit alternatives would have been more sympathetic to the former than the latter. The short term interests of suburbanites have been advanced by the interstate, but it is unclear that these are lasting benefits. Avoiding the costs of urban blight to everyone, suburbanites included, seems to be elusive over the long term (1994, P.174).
Solomon & Walker (1995) claim that while the information highway metaphor implies easily accessible highways for all, in fact, this is illusionary relative to current telecommunication infrastructure building:

"so far telecommunications operators have maintained exclusive control of their networks and have used them as tools to expand their influence and even control over their customers' communication habits. The customer has no free access to the network and the terms and conditions of such access are strictly regulated by the carrier" (P. 84).

The potential gaps in how the communication infrastructure is being developed compared to the assumptions implied by use of an information highway metaphor are recognized by Sawhney (1992) as well; but he, unlike Solomon & Walker, suggest that:

"the transportation analogy when properly employed can serve as a heuristic device for thinking about, if not understanding, the development pattern of the emerging telecommunications technologies...There is the potential for using the previous experience with transportation technologies to build an analogy-based model which enhances our understanding of emerging telecommunications changes" (P. 539).

To Sawhney, the information highway metaphor provides positive direction for thinking about the emerging communication infrastructure, namely, that it will be an infrastructure that requires government support.

The theme that use of the information highway metaphor implies the necessity of building an infrastructure is discussed by others as well, but without the optimism expressed by Sawhney. Oscar Gandy (1992), unlike Sawhney,
thinks this will generate harmful rather than helpful effects. Gandy writes that an infrastructure predisposes us to think about the future telecommunication network as a system, first and foremost, to benefit private sector firms:

The use of infrastructure as the term to describe the social and technological system through which information flows has come into its own rather recently, and it seems to have emerged through a process that several critical observers have identified as self-serving and instrumental...may be seen as serving...telecommunication firms that would benefit from direct investment, from expanded demand through the provision of subsidies or tax credits to identifiable user communities, or for specified uses such as education and health care delivery (P. xx).

Bruce Egan and Steven Wildman (1992) also claim that the focus on infrastructure building in public discourse reflects subtle shifts in our perceptions about the purpose of communication technologies: "An infrastructure consists of facilities and the collection of people and skills required to utilize them that are commonly available to further the activities of both private and public parties" (P. 22).

Keeping in mind Gandy's, as well as Egan and Wildman's, Mander's, and Sawhney's claims about the biases built into the use of an information highway metaphor to describe this future technological configuration, we need to reflect on what purposes we want communication technologies to fulfill in day to day life; not unconsciously succumb to implicit
assumptions. In addition, a concern not explored significantly in the literature, but important nonetheless, is whether the equating of communication systems to transportation systems, and consequently the marketplace, privilege the transmission of information over a more ritualistic view of communication. Is the efficient and fast transmission of information tantamount to excellence in communication in this worldview, and, if so, what are the implications of this?

This type of serious reflection is critical because as Jacque Ellul (1990) discusses, technological progress can bring unforeseen consequences with disastrous results. He

3 Throughout this document the word infrastructure is used to denote the configuration of communication technologies that transmit messages point to point and point to multipoint. This is a convenient denotation but done with full awareness of biases implied with usage of this term.

4 James Carey argues that: "two conceptions of communication have been 'alive' in American culture since the nineteenth century: a transmission and ritual view of communication. The transmission view is the commonest in our culture, and is defined by terms such as 'sending,' 'transmitting,' or 'giving information to others.' The ritual view links communication to 'association,' 'fellowship,' and "is directed not toward the extension of messages in space but toward the maintenance of society in time..." Sandra Braman extends Carey's argument and claims that there are three stages to the information society: during the first stage (pre-information) the ritual model of communication was dominant; during the first two stages, "the community was transformed into an audience of consumers of commoditized information," and characterized by Carey's transmission model of communication; in the third stage (current times) people are transformed into a network, and "we are still trying to understand what this means" (1993, P. 133).
describes that whenever new techniques are introduced there are always some risks. Some of these risks are known and considered reasonable tradeoffs for the benefits that result from the new technique(s). But there are also results that are totally unforeseen and unexpected. When we become aware of a danger we usually find a solution, but

"each time the problem raised is more difficult and the remedy more costly. The constant feature is that we never know what we are starting. We cannot even imagine it. This fact sets at once a very strict limit to our ability to predict" (P. 71).

Written public discourse that centers on the information highway metaphor is a window to the assumptions that influence the way the general public, as well as policy makers, conceive of how to integrate communication technologies into day to day life. This is an important time for us to be insightful about the assumptions that guide the planning of this future communication infrastructure. Thus, in this dissertation, I explore assumptions about access, funding, function, and control of the information highway in widely-distributed magazine articles about the information highway in the hope that such a study will make some potential unforeseen effects more visible.

Making these assumptions more obvious is only worthwhile if there is a context for evaluation. My interest in gaining insight into these assumptions is guided by a desire to assess whether this written public discourse contributes or
harms efforts to create a communication infrastructure that enhances the quality of life for all its citizens. The following is a review of scholarly literature about infrastructure implementation strategies to facilitate positive social outcomes.

Specific Issue: Information Highway Discourse

A well-established argument in scholarly literature is that communication infrastructures in the United States have traditionally been implemented to expand economic development and increase economic efficiency; social applications were more often than not secondary afterthoughts. The railroad was primarily a distribution system for products to get to market and to get raw materials to manufacturers. The telegraph and telephone were designed and encouraged to be business apparatuses to expedite transactions over distances (Bruce, 1973; Fischer, 1992; Lindley, 1975; Marvin, 1988; Schwarzlose, 1990). The wireless radio facilitated

5 Alfred Chandler (1977) describes how: "The railroad's fundamental advantage [over canals or roadways] however, was not in the speed it carried passengers and mail but its ability to provide a shipper with dependable, precisely scheduled, all-weather transportation of goods...The steam locomotive...lowered the unit cost of moving goods by permitting a more intensive use of available transportation facilities. A railroad car could make several trips over a route in the same period of time it took a canal boat to complete one" (P. 86).

6 Claude S. Fischer describes how both the history of electrification and the development of the telephone demonstrate that home markets were ignored in favor of

Given the propensity of technology innovators to focus attention in early stages of technology diffusion on economic efficiency and development, possibly at the expense of other social goals, a key concern in this dissertation is whether this is evident in current discourse about the information highway. In addition, what would be attended to in these articles if one were to pay attention to social goals other than economic efficiency and expansion? This issue is explored more fully in the next section.

Criteria for Positive Social Outcomes

What would the discourse about the information highway focus on if the intent were to create an infrastructure that generates positive social effects? Logan (1994) argues that people need to have access and be taught the necessary skills to fully participate on the future technological infrastructure. He criticizes current implementation strategies for increasing the amount of impersonal communication at the expense of interpersonal communication.

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industrial customers in the beginning and then eventually, once the lucrative nature of the home markets was realized, the general population was serviced. According to Fischer, "early telephone men often fought their residential customers over social conversations, labeling such calls as frivolous and unnecessary." By the 1920's the "Bell executives told their salesmen to sell telephone service as a "comfort and convenience,'including as a conversational tool" (P. 79).
and creating a more solitaire and passive existence for much of the population. The natural outcome of such tendencies is social alienation; the rich are favored and the poor are undermined.

Logan lists six policy responses he considers essential to ensure a national communication infrastructure that will generate positive social outcomes: (1) access to the infrastructure should be a right not a privilege; (2) access to information should not depend on ability to pay; therefore, (3) subsidization programs need to be in place to facilitate access to the infrastructure for all segments of the population; (4) skills that enable effective use of the infrastructure should be taught in easily available ways to the population; (5) the infrastructure should be decentralized to maximize autonomous, creative, practical uses; and (6) people should be guaranteed privacy on the infrastructure.

The call for an electronic information service that is available to all citizens at affordable costs is echoed by Frederick Williams (1994). In addition, Williams and Fischer

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7 Ronald Adler and George Rodman (1994) describe that quality, not quantity is what distinguishes interpersonal communication from impersonal communication: "In a qualitative sense, interpersonal communication occurs when people treat one another as unique individuals, regardless of the context in which the interaction occurs or the number of people involved. When quality of interaction is the criterion, the opposite of interpersonal communication is impersonal interaction, not group, public, or mass communication" (P. 196).
(1992) claim that the function of such a system should be to offer vital information that is essential to the well-being of many citizens who are often left out of infrastructure planning. Williams suggests services should be offered to less advantaged sectors of the population to help them in accomplishing routine daily tasks, such as: receiving pertinent information about local services and accessing medical and police resources.

The federal government needs to insure universal access to the future communication infrastructure (Cronin & Hebert, 1994; Fischer, 1992; Noam, Ferris, Parker, 1994; Williams, 1994). Concern is expressed that if access is left up to the private sector there will be segments of the population, those that do not return an acceptable rate of profitability, that will be denied services on the communication infrastructure (Fortner, 1995). Noam (1993) highlights the implications of discriminatory access to the infrastructure. He describes the information world as a tele-society with enormous potential but one with significant pitfalls depending on access to services:

Imagine a Tele-society as I've described it, yet with some people not able to connect into it. They will be physically there, but socially or economically not. They'll be like aborigines living in territorial reservations in the larger society (1993, P. 1233).

Real access to the infrastructure means more than simply having a point of access. Genuine access requires that
people have the ability to acquire the equipment, be trained to use the information, that the information be in accessible formats, and that the technology be user-friendly enough to support technically unskilled segments of the population (Fischer, 1992; Williams, 1994). In addition, the access points need to be available in public-housing as well as suburban homes, in schools, post-offices, libraries, and other publicly-available sites. Some scholars argue that the infrastructure should favor central control and intelligent switching rather than a decentralized system to facilitate universal access (Fischer, 1992; Pavlik, 1994; Williams, 1994).

Thus, the communication infrastructure should strengthen and empower the weakest segments of the population to fulfill a positive social outcome in day to day life practices. Policy makers should focus attention on equity concerns and implement infrastructures that strengthen social life. Equity policy refers to policies that are focused on a "concern for fairness and for the protection of the diverse interests of all affected individuals," as compared to economic efficiency policy, which is focused on the "overall growth in the national economy" (McCraw, 1984, Pg 302).

**Trickle-Down and Weak-Link Approaches**

Dordick and Lehman (1994) claim that the transportation infrastructure is an example of the outcome of trickle-down approaches to infrastructure planning. In a trickle-down
approach the most successful firms, industries, and households are the primary beneficiaries of the new infrastructure; it is assumed that: "the benefits will trickle-down to all through enhanced economic growth" (P. 176). To Dordick and Lehman, the flaws in a trickle-down approach are evident when one considers the legacy of inequality that was enhanced by the transportation infrastructure:

A complete cost-benefit analysis of the interstate is probably impossible, and is not our intent. Rather we wish to explore the underlying infrastructure which justifies the interstate as good infrastructure. We call this the 'trickle-down' infrastructure theory. The most successful firms, industries and households were the primary beneficiaries of the interstate. At least part of their success must be accounted for by the availability and relatively easy access to the interstate. While poorer households, firms and industries did not benefit to the same extent, some of the benefits of the interstate trickled down to these groups as well. The postwar economic growth of the U.S. was, thus, shared by almost all groups. That the seeds for today's problems were also sown is only now becoming clear. The facilitation of inequities and the geographic isolation of certain socioeconomic groups now imposes a cost on us all (P. 176).

They propose a weak-link perspective to guide communication infrastructure planning as a way to achieve both equity and economic efficiency goals. A weak-link perspective prescribes that "infrastructure investment be focused on improving the efficiency of the weakest link in the economic structure rather than enabling the most able segments" (Dordeck & Lehman, 1994, P. 176). Although both weak-link and trickle-down perspectives place an emphasis on
economic development and efficiency, they differ as to how such development and efficiency can be achieved.

Dordick and Lehman claim that trickle-down approaches result in expanding corporate profitability through downsizing; a strategy whereby less people are employed and high-paid jobs convert to low paid ones. This leads to an increasingly divided workforce, as depicted in the following scenario:

...an educated elite, with brainy and computer-connected lawyers, investment bankers, consultants and scientists and technicians on one side; and vastly more people without college degrees toiling at the only other jobs - ringing up groceries, cleaning office buildings, part-time fast food jockeys and making deliveries (P. 180).

A weak-link approach to planning the telecommunication infrastructure focuses attention on easing access and use of the information infrastructure for weaker segments of the population, not the immediate increase of corporate profits:

The importance of the weak-link theory is that it produces markedly different infrastructure policies. The telecommunications infrastructure cannot be divorced from the larger information infrastructure. What does the weakest link in the information age need? The goal becomes ease of access and use for consumers and ease of entry for information providers in the form of their personal computers. Infrastructure aimed at these criteria cannot avoid dealing with the issues of education and training (or retraining), terminals and user interface standards (P. 180).

To summarize, we can surmise from the above discussion that for public discourse about the information highway to be suggestive of an infrastructure that would generate positive
social outcomes, the focus should be on access and function portrayals that strengthen and empower the weakest segments of the population. Funding and control depictions should support ease of access, autonomous innovative uses, and useful practical information. To be more specific, of particular interest in this study is whether articles in public discourse suggest a communication infrastructure that has the potential to generate positive social outcomes; If so, then access, funding, function, and control should be portrayed in the following ways:

**Access.** Access to the infrastructure should be a right, not a privilege. The federal government should ensure universal access and not leave it to private industry. The technology should be easy to use and access points need to be in the homes, schools, post-offices, libraries, and other publicly available sites.

**Funding.** Subsidy programs need to be in place to facilitate access for all segments of the population. Policies should focus on encouraging the acquisition of equipment by all segments of the population, as well as training people to use available equipment and services.

**Function.** The highway should offer services that are centered around vital information that is essential to the citizen's well-being. Services should help in completing routine daily tasks, such as: receiving pertinent information about local services and accessing medical and police
resources. Communication infrastructures should increase interactions and contacts between people, and enable people to experience and be involved in more of the world around them.

**Control.** There are conflicting notions of whether a centralized or decentralized infrastructure generate positive social outcomes, however, a centralized switching system is viewed as most amenable to universal access.

I provide background on the specific issues of access, funding, function, and control of the communication infrastructure as they are being dealt with in policy forums in the following section. I focus attention on the challenges policy makers face in trying to integrate social policy goals, such as universal access, in a market-driven, extremely competitive climate. I demonstrate how trickle-down implementation strategies guide policy decisions, thereby marginalizing equity issues.

**Access, Funding, Function, and Control**

A trickle-down theoretical approach dominates current policy debates. This point is elaborated on in the following section, in which I review current issues relative to access, funding, function and control of the communication infrastructure.
Access

Market access. Most current policy attempts address the issue of business access to markets (interconnection issues), not the general population's access to the resources of the communication infrastructure (universal service). Typical of a trickle-down approach, it is presumed in the recently passed Telecommunications Act of 1996 (S 652 - PL 104-104) that competition will lower rates and stimulate consumer access; and therefore, the thrust of the law is aimed at generating a "competitive" marketplace environment. This is evident by the attention Congress placed on interconnection and market entry issues and the lack of attention on universal access issues.

Some industries provide the massive infrastructures that are the conduits for commercial exchanges. They are considered common carriers and are responsible to operate in the public's interest:

Transportation, energy, and telecommunication industries provide the services upon which all economic action (beyond the level of self-sufficiency) depends...These services are 'connective' institutions. They are the channels for trade and discourse which bind together a community, society, or nation (Horwitz, 1989, P. 11-12).

Common carriage regulation is based on the "guarantee [that] no customer seeking service upon reasonable demand, willing and able to pay the established price--however set--would be denied lawful use of the service or would otherwise be discriminated against" (Noam, 1994). Common carrier
regulatory requirements limit the ability of infrastructure monopolists to restrict free trade or the diversity of information available through the infrastructure by being required to interconnect competitive businesses to their infrastructures.

Noam suggests that common carriage is a policy doomed in this new telecommunication environment because traditional common carriers have difficulty competing with private carriers who do not have to adhere to common carriage regulation:

The juxtaposition of positives and negatives may give the impression that a policy choice exists. But...once the basic choice has been made, correctly, and unavoidably, in favor of competitive and non-compartmentalized transmission media and upper-level services, the eventual unraveling of common carriage is also inevitable (1994, P. 452).8

He advocates replacing common carriage with a new principle of neutral interconnection:

A carrier can elect to be private by running its own self-contained infrastructure and having full control over its content, use, and access. But if it interconnects into other networks and accepts transmission traffic from them, it cannot pick some bits over other bits. This means that while a private carrier can be selective in its direct customers, whether they are end users or content providers, it cannot be selective, in what it accepts from another interconnected carrier (1994, P. 452).

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8 Private networks, also referred to as contract carriers: "serve communication needs utilizing carriers transmission facilities by leasing dedicated lines...that in effect create segments of the networks that are not 'public' but private in the sense of access" (Noam, 1994, P. 445).
This focus on interconnection and market access issues evident in the Telecommunications Act of 1996 emphasizes economic efficiency/trickle-down thinking rather than equity and weak-link thinking. Thus, there is little indication that equity concerns, beyond market equity, influence the Congressional policy agenda. A key question is whether articles in public discourse about the information highway also reflect an emphasis on interconnection/market access.

9 S652 - PL 104-104 require telephone companies to share their networks with competitors. They must have competition in the local telephone market before they can enter the long-distance telephone market. A Bell company has to pass a series of test before it can be allowed by the FCC to offer long-distance telephone service: there has to be competition in the local telephone marketplace, a separate affiliate for offering long-distance service has to be set up, and the FCC has to consult with state regulators to verify the Bell's compliance with interconnection requirements.

Ownership limits on radio stations were lifted, although in communities with fourteen or fewer commercial stations, no party can own more than half of them. TV networks and ownerships groups were permitted to own an unlimited number of commercial stations in the United States, provided their signals do not reach more than 35 percent of all U.S. households. TV stations in local markets can join forces with other broadcasters. Companies are allowed to own more than one TV network, although the big four (CBS, NBC, ABC, and Fox) are not permitted to merge with each other or Time Warner Inc's WB Network and the United Paramount Network (UPN). The statutory ban is lifted that prevented cable company's from owning TV stations in its service area, but the FCC regulations against cross-ownership are still in place; the FCC was ordered to review its cross-ownership rules every two years and do away with those that are deemed no longer working in the public interest.

The law ended price controls on cable programming, although price controls on the basic tier had to remain in place until a cable operator faced effective competition, that is, until the local telephone company begins offering comparable services, then, price controls can be lifted ("Telecommunications Highlights," Congressional Quarterly, February 19th, 1996).
issues. How are settings portrayed in these articles? Who are the main characters? What are the central actions? Do actions focus on reconfiguring the marketplace and the bitter battles between companies to gain entry to markets for competitive advantage? If so, is this focus challenged and another scenario depicted?

Universal service. Universal service is a regulatory requirement that common carriers provide services to all segments of the population at fair and reasonable rates (Horwitz, 1984). A key question in current policy debates is whether publicly-switched common carrier networks should be required to provide universal service in this changing telecommunication environment. Noam argues that publicly-switched networks are at an unfair disadvantage in their competition with private networks because of this regulatory requirement. Private network providers have greater flexibility than common carriers to adjust to changing market conditions: "...contract carriers will be economically more profitable than a common carrier, essentially because it has more flexibility in setting prices, service conditions, and choice of customer" (Noam, 1994, P. 445). Thus, private networks with less obligation to balance business decisions with policy goals have a competitive advantage over common carriers. A dilemma is how to maintain viable publicly-switched networks and still require them to meet common carriage and universal access obligations. This is not a
trivial issue. A weakened public network could result in reduced services to marginal customers.10

The Telecommunications Act of 1996 does not address this issue in any detail. Congress required the FCC to convene a federal-state joint board and to make recommendations on universal service by November 8, 1996. The FCC has until May 8, 1997 to implement the rules recommended by the board ("Telecommunications Highlights," Congressional Quarterly, February 17, 1996).11

10 Marginal customers are those that do not guarantee a profitable return on investment, the impoverished, those that will not invest in advanced services, and those in physically remote locations that require large investment in infrastructure building.

11 "The law defined universal service as an evolving array of telecommunication services. The FCC was instructed periodically to decide which specific services to include in the definition and, thus, make eligible for subsidies...The law ordered all companies providing interstate telecommunications services to contribute to whatever financing arrangement the FCC established to pay for universal-service subsidies." There are six "Universal service principles" that are spelled out in the law: (1) quality services should be provided at just, reasonable and affordable rates, (2) all providers of telecommunications services should contribute to the cost of universal service on an equitable and nondiscriminatory basis; (3) universal service should be supported by specific and predictable financing mechanisms; (4) all regions should have access to advanced telecommunications and information services; (5) telecommunication and information services and prices in all regions should be reasonably comparable to services and prices in urban areas; and (6) elementary and secondary schools and classrooms, libraries and health-care providers should have access to advanced services for educational and medical purposes ("Telecommunications Highlights," Congressional Quarterly, February 17, 1996).
To summarize, access issues are complex in that universal access issues are complicated by market access issues. Universal service and common carriage regulatory principles are at risk in the new telecommunication environment. Federal and state regulators need to determine how to insure access in such a changing time, but most of their attention is focused on market access issues at the detriment of universal service issues. Universal access receives little attention in comparison to market access issues in the recently passed telecommunication act.

The call in scholarly literature for an emphasis on easy to use and accessible home equipment in public housing projects as well as suburban homes is not attended to in this legislation. There is equally no mention of training people to use equipment. A key question in this dissertation is whether the public discourse analyzed in my sample is equally as vague relative to universal service issues. Who are portrayed as accessing the information highway in these articles and where are the points of access? Do these depictions portray an information highway that provides universal access for all segments of the population?

**Funding**

Services and access equipment must be affordable to the general population to meet the criteria discussed previously for a socially responsible infrastructure. Policy forums are grappling with the issue of how to keep prices low while at
the same time provide services that do not generate returns on investments. As with access issues, a trickle-down theoretical approach dominates much of this discussion. Competition and short term corporate profits are encouraged in the hope that this will lower prices for the general population.

A key question is whether a national fiber-optic network, one wired to all homes equally, should be constructed; if so, who should pay for such a network. Connecting every home to a fiber-optic network is a very expensive proposition. Estimates differ as to how expensive, but according to Jonathan Aronson (1992) the cost will likely be between two hundred and four hundred billion dollars over twenty to thirty years. George Heilmeier, president of Bellcore Company, claims that there is a direct connection between the level of required access and cost:

Given the diverse populations that will have to use this, the lower you go on the education scale, the more sophisticated the technology's going to have to be...so there is a flip here. When we talk about ease of access and simplicity, we have to understand that it's going to cost more to make information access easy (Pavlik & Thalhimer, 1994, P. 82).

As mentioned previously, those who argue for universal access claim that easy access from the home is important. Conversely, Charles Ferris argues that the expense of wiring each home outweighs the potential benefits of a national fiber-optic network:
Can you really justify the capital cost of putting fiber into the home-to every home-when a twisted pair can do the job with the services that the home presently desires? I don't know if you can. I think that adds unnecessary capital costs. It throws things in the rate base which increases, probably only a small amount, but it does raise rates. Is that efficient use of capital expenditures for your telecommunications infrastructure? I don't think it is, at this point (Noam, et al, 1994, P. 82).

One alternative to a fiber-optic network wired to each home is fiber to the curb: Fiber optics deliver signals close to a home and coaxial cable or copper wires bring the signals into the home (Jacobi, 1993, P. 271).

There are numerous options to fund fiber to the curb or home. Different segments of the population bear the cost of fiber deployment depending on which option is selected. Some options place greater onus on the general population and others on private industries. Some options favor cost-sharing between consumers and private industries while others advocate government funding to alleviate the costs on both consumers and private industry investors. The following is a review of the various options for funding the communication infrastructure as discussed in policy and scholarly literature.

One choice facing policy makers is whether communication services offered through this infrastructure should be considered part of normal telephone service. Public Utility Commissions decide what property of the telephone company can be properly included in the rate base that determines the
allowable rate of return in profit. The higher the rate base, the higher the allowable rate of return of profit. The primary standard used by state commissioners in allowing property into the rate base is "used and useful." If the deployment of fiber optic is considered "used and useful" than the expense of this deployment can be used by state commissioners to establish the rate base; thus, the telephone industry can recoup their investment costs in upgrading the local network to a fiber-optic network through higher rates. Traditionally, materials or supplies for new construction are not allowed in the rate base. O'Lessker, Dupagne, and McGregor (1993) argue that common carriers are hesitant to upgrade the public network when the deployment of fiber-optics is not considered part of the rate base. The dilemma of including the cost of fiber deployment into the rate base is that all ratepayers will have to pay for an upgraded network that they may not use, and depending on how practical the services that are offered, they may not need. Many could lose access to basic telephone service as rates may increase.

An alternative to rate of return regulation that is advocated by telephone industry lobbyists is price cap regulation:

an agreement between the regulator and the telephone company to freeze the overall level of prices for captive customers (e.g., basic residential and small business services) in return for a profit incentive
provided by a relaxation of the strict rate of return on the net investment (rate base)" (Egan & Wildman, 1992, P. 54).

Price caps provide incentives for common carriers to invest in fiber-optic deployment but they do not resolve the tension of keeping prices low and providing services that "cannot pay for themselves" (Egan & Wildman, 1992). The likelihood is that service providers will offer enhanced services to communities that promise to return a higher rate of profit eventually on the enhanced infrastructure while excluding others; thus, leading to uneven and discriminatory infrastructure building and access.

Another option is that subscribers pay for services in a competitive market environment. In this scenario, advanced communication services are unregulated and provided by private contractors or common carriers permitted by state regulators to provide "competitive" services. If a service is typified as "competitive," then deployment of fiber-optics would not be considered part of the rate-base and service providers would not have their profits regulated. Critics of this scenario argue that common carriers would cross-subsidize "competitive" services from regulated services with the following results: common carriers would have an unfair competitive advantage over private service providers; all ratepayers would pay for advances that only a select few would enjoy; and uneven development of the infrastructure would widen access gaps between segments of the population.
Still others claim that the federal government has a responsibility to ensure that the communication infrastructure gets built and that access to this infrastructure is affordable to all (Cronin & Hebert, 1994; Dordick & Lehman, 1994; Egan & Wildman, 1992; Fisher, 1994; Noam, 1994). However, direct federal and state funding has been restricted to "specialized networks for assistance of education & research, and specialized activities of government agencies" (Egan & Wildman, 1992, P. 39).

A major focus of attention by the government is on how to encourage private industry to invest in upgrading the present communication infrastructure (Egan & Wildman, 1992). One suggestion is that state governments designate "free trade zones." In these zones, "unregulated private carriers are able to openly compete with the current local exchange carriers in the provision of local services" (Egan & Wildman, 1992, P. 44). Critics of this plan claim that it will only work in large metropolitan areas. Egan and Wildman suggest that regulators modify regulations that limit local telephone company investments to the infrastructure, allow these companies to supply equipment to the home, relax information service restrictions, and allow local telephone companies to provide long-distance telephone services. ¹² Other suggestions

¹² Egan and Wildman made these suggestions in 1992. Interestingly, most of these suggestions have come to pass the Telecommunications Act of 1996.
are that the federal government offer tax incentives in the form of investment tax credits, accelerated depreciation deductions, value-added taxes,\textsuperscript{13} and income tax credits for terminal acquisition (Dordeck & Lehman, 1994; Egan & Wildman, 1992; Noam, 1994).

Under considerable debate is the question of how much the federal government should subsidize local access to the communication infrastructure. Traditionally, the federal government has established various subsidy programs (some but not all are funded through federal monies) that serve two main purposes: (1) to bring services to those who couldn't have it; and (2) to increase the value of the network to all users (Cronin & Hebert, 1994). Subsidy programs that facilitate telephone access are: \textbf{Lifeline}, \textbf{Linkup}, \textbf{Carrier Line Charges}, and \textbf{Universal Service Fund}. \textbf{Lifeline} was introduced in 1984. This program offers reductions in subscriber line charges to household that meet state-defined criteria for assistance. \textbf{Linkup} was offered by the FCC in 1987 and provides funds to offset the connection charge to low-income users. In 1949 the Rural Electrification Administration began to fund telephone service in rural areas. This program has funded over nine billion dollars in subsidized loans towards rural telephone development. Small

\textsuperscript{13} Noam (1994) claims that a universal service fund could be established for subsidizing certain functions and users. The money for this fund could come from a value-added tax.
telephone providers receive these loans to upgrade their systems. The Universal Service Fund is a mechanism by which long distance customers subsidize local users in high cost areas. Long-distance carriers pay into a common pool of funds administered by the National Exchange Carriers Association (NECA). This fund provides support to companies with excessive costs to provide local services. These costs are then passed on to the consumers (Cronin & Hebert, 1994).

Cronin and Hebert argue that subsidy programs are justified as a disproportionate amount of the expense of advanced services fall on the low-income and elderly segments of the population. They found in a recent study that the wealthiest twenty percent of the population have enjoyed the greatest increase in spending power as a result of telecommunication advances. The low-income and elderly have less spending power as they spend a greater proportion of their income on housing, food, and utilities. The average consumer spends 2.1 percent of his/her total expenditures on telephone services while the low-income person spends 3.1% of total income on telephone services (Cronin & Hebert, 1994).

Another form of subsidy discussed by Fortner (1995) is advertising. He describes how advertisers spend eighty billion dollars subsidizing media operations to have access to consumers in the United States:
Altogether in 1991 advertisers spent $126.4 billion to reach U.S. consumers, including expenditures for electronic and print media, outdoor advertising, direct mail, telephone yellow pages, and so forth...This is in addition to the $20 billion annual subsidy provided to achieve current levels of telephone penetration" (P. 144).

Fortner envisions a future communication infrastructure supported by increased subscription costs and the domination of lucrative commercial services.

Thus, there are numerous options for funding the future communication infrastructure. These options range from rate-regulated services, to competitive unregulated services, as well as various intermediate steps aided by government intervention to advance cost-sharing techniques. In a study in which nineteen utility Commissioners were interviewed in the Ameritech region, O'Lessker, Dupagne, McGregor (1993) found that the majority called for cost-sharing remedies to fund the communication infrastructure; the "shareholder" participates in paying for the costs. There was little sentiment in favor of full rate-basing of the costs of fiber deployment. The dominant paradigm appears to be the encouragement of private sector investment with the hope of a trickle-down effect.

Functions

Functions should assist people with everyday tasks that enhance their life experiences to meet the criteria discussed previously for a socially responsible infrastructure. This is problematized in that equity and economic efficiency
policies can be in conflict. Economic efficiency and expansion are not inherently opposite to democratic ideals, but can overshadow other positive social functions simply by virtue of what is attended to. Noam (1989) argues that equity concerns are being subsumed under economic efficiency concerns as increasingly equity is thought of as equal market access. My findings in a case study I conducted of a state utility commission hearing on the Caller ID debate support this claim. The Commission advocated equity concerns relative to the consumer but this was overshadowed by industry participants who advocated equity concerns relative to the marketplace (Cooper, 1990).

Designing the functions of the infrastructure from a weak-link perspective is not an easy task as equity concerns often become second priority to economic development and expansion concerns. Brenda Dervin (1989) describes how communication systems are often designed in ways that "reify systems that create disparities between the haves and the have-nots" (P. 217). She argues that new communication technologies end up serving existing design functions: "thus, the new technologies are allowed to do only what the old technologies did - but at greater speed, with greater search capacity, and at greater distance" (P. 217). She

14 In fact many would claim that democracy is dependent on a strong, efficient economy.
recommends functions that serve more than "entrepreneurial ends."

These entrepreneurial ends described by Dervin dominate the implementation of the communication infrastructure, according to Nicholas Garnham (1985). He claims that the identification of the electronic sector by governments as the key to economic growth and international competitiveness had adverse effects on communication type functions. He argues that new communication technologies tend to be used to expand markets for domestic consumer goods and promote economic efficiency and productivity in the service sector as well as office work.

Competing visions of the functions communication infrastructures should serve result from the tug between economic efficiency and equity concerns. Some see the primary purpose to be empowering people through access to educational resources, increased interactive capabilities between people, and access to useful practical information that provides a safety net for the population (Cronin & Hebert, 1994; Deetz, 1990; Dordeck & Lehman, 1994; Fischer, 1994; Greenberger & Puffer, 1989; Pavlik, 1994; Stedman & Branford, 1993; Williams, 1994). Rather than waiting for trickle-down effects to perform these functions, advocates for this vision argue that the government should intervene to ensure that the primary function of the communication
infrastructure is to empower and enlighten the general population.

Others focus on profit making functions such as increased access to services such as home shopping, video games, and movies on demand. These services are incentives for private industries to build the communication infrastructure—an integral part of the national economy and key to international competition. Economic efficiency and expansion priorities permeate the Congressional bills recently passed, as well as state utility commissions' move to deregulate local telephone companies and institute competitive services in the local loop.15 Garnham (1989) argues that it is essential to consider the importance of communication technologies to economic efficiency and expansion to understand infrastructure implementation.

Tied very much to the function issue is whether the information highway should be centralized or decentralized. This is a complicated issue because two criteria for generating positive social outcomes are pitted against each other: universal access and autonomous functions. An argument is made by some (Fischer 1992, Williams, 1994) that universal access is dependent on the maintenance of public networks with intelligence embedded in the central switch to

15 There are some who question the assumption that the communication infrastructure enhances productivity (Jonathan Aronson, 1992; Egan and Wildman, 1992).
ease access for the many. Arguments are also made that people will have greater autonomy to use the infrastructure for what they want by putting greater computing intelligence in equipment in the home (Logan, 1989). In this dissertation I explore this conundrum in greater depth.

**Control**

There are two aspects of the control issue that are discussed in scholarly and policy literature. These aspects overlap with each other. The first aspect is, should the control function traditionally handled by sophisticated control switches in public telecommunication networks (telephone switching) be separated from transmission functions and distributed to remote nodes? The second aspect is, if so, should functions be centralized through a public network or dispersed through independent service providers with interconnective capability (Downs, 1994; Mansell, 1989; Sirbu, 1992; Soloman & Walker, 1995; Williams, 1994)?

Strong trends indicate that the control function usually handled by sophisticated switches in a central switching office is being separated and distributed to remote network resources. The control function determines the path the message travels through the network and translates the users request to switching mechanisms (Downs, 1994). The concept of distributed control functions derives from the advent, in the 1960's, of Local Area Networks (LANs): "In early LANs, the transmission medium is configured as a bus or ring and
its capacity is shared by all of the users as they transmit their data in high speed bursts" (Sirbu, 1992, P. 168). Many companies developed LANs: They bypassed public network switching technology, leased transmission lines from common carriers, and installed "premises-based switches ("routers") to link LANs at their various locations" (Sirbu, 1992, P. 168). Consequently, the telecommunication infrastructure has become "a heterogeneous and complex system of publicly and privately operated components" (Mansell, 1992, P. 5), and business users have increasingly more control and flexibility over network functions.

The key question being faced in the 1990's is how much this distributed control should be carried over into the home networking market, and to what extent should the network be centralized or decentralized. While there are clear signs that the control function will be embedded in remote nodes rather than central control switches, there are still questions as to how much intelligence should be left in the central switches, consequently, how centralized network services should be within the domain of a public network.

Competing standards centralize and decentralize network services in varying degrees. The most dominant standard is the Asynchronous Transfer Mode (ATM) standard. This standard is the most extreme in extracting intelligence away from the central switch: It removes "the control function to such an extent that it almost seems to have been abstracted away"
(Downs, P. 124). In 1988, the International Telegraph and Telephone Consultative Committee (CCITT) of the International Telecommunication Union (ITU) chose ATM as the standard for building the future broadband digital telephone network. According to Downs, (1994) this was a significant decision:

By selecting ATM as the solution for broadband networks, the CCITT chose not to optimize the performance of the network around the needs of any one communication service. Instead it opted for flexibility, choosing a solution that could accommodate virtually all communication services (P. 115).

ATM was chosen to be the "ultimate extension of the telephone network...one universal supernetwork," but ATM is independent from the telephone infrastructure (Downs, P. 119). In fact, the adoption of ATM technology shifts the traditional role of network providers from delivering vertically integrated specialized services to providing

building blocks [that] can be used by end users or independent service providers to create new services or to support emerging communications applications. The unbundling of the traditional network functions into these basic building blocks offers a new role for traditional carriers - the role of network wholesaler, supplying basic, service-independent communications capacity to service providers, applications developers and systems integrators (Downs, P. 121).

Not surprisingly, public telephone networks are not the first to implement ATM standards:

Although the CCITT, by choosing ATM for its B-ISDN vision, may have been an early promoter of ATM, it is the data communications equipment manufacturers who are developing the first wave of ATM products. Indeed, the first implementations of ATM switching are being found in customer premises, not in public networks (Downs, P. 119).
Since this adoption, ATM is "the most likely candidate for the corporate data network backbone of the future" (Downs, P. 115): TimeWarner, Inc has adopted this standard for its planned future interactive network; "Nearly all telecommunication equipment manufacturers, carriers, and other services providers have announced either ATM products, ATM services or at least ATM strategies" (Downs, P. 115).

A competing network architecture offered by Bell Operating Companies is Bellcore's Advanced Intelligent Network (AIN). This architecture is supported by those who wish to see a very centrally controlled network. As in ATM, the telephone network would develop "service-independent building blocks" (Pavlik and Thalhimer, 1994, P. 98). These building blocks are "linked together by service logic that exchanges information with the switch" (Pavlik and Thalhimer, P. 99). This implies greater dependency on public network switches as more intelligence is embedded in the central switch than with ATM. The Coalition of Open Network Architecture Parties (CONAP) has expressed concern that "the AIN envisaged by the BOCs will perpetuate the closed nature of today's networks" (Downs, P. 132).

It appears that customer premises equipment may contain greater intelligence and subsequently greater access to services; but, it is still very unclear as to how centralized or decentralized the future infrastructure will be. And, even with greater control possibilities for the person in the
home, will they have the resources to avail themselves of an array of interactive services. If provision of services is market-driven, and we have increasingly more segmented and targeted services, will people become more isolated, separated, and only interact with the most familiar? Will service providers bombard most homes with consumer-based services and only a technical elite will avail themselves of more communication-based interactive services? Will the public-network be doomed in this new era of competitive services and doom universal access with it? Decentralizing the network may be a step in the right direction, but it is not enough to assure an infrastructure that serves positive social goals beyond economic efficiency and expansion; in fact, weakening the public network may have serious implications on access and function.

To summarize, a review of policy and scholarly literature demonstrates gaps between current policy efforts and addressing the criteria necessary to ensure that a communication infrastructure generates positive social outcomes. These gaps are (1) an emphasis on trickle-down effects and market access issues in policy forums, little attention to universal access or weak-link strategies; and, (2) an emphasis in policy forums on economic development functions with little attention to practical and interactive functions that build community and strengthen weaker segments of the population. The emphasis in policy forums is on
short-term profitability and economic growth. While there are some who call for universal service, subsidized funding, decentralized systems and practical useful functions, most policies are focused on competition between large transnational corporations, entertainment and consumer services that generate high return on profit, and uneven market-driven access. In addition, those advocating decentralized systems may unintentionally be undermining universal access by weakening the publicly-switched national network.

Research Questions

This dissertation is organized around one central issue: how public discourse influences the way we implement communication technologies into day to day life practices. Specifically, in this dissertation I explore whether widely-distributed written public discourse centered around an information highway metaphor suggests an infrastructure that generates positive social outcomes as discussed in the previous section. The following is a brief review of key concerns associated with these issues and a description of the specific research questions I address in this study.

There are claims in scholarly literature that power and social relationships are created, sustained, and recreated in widely-distributed public discourse. There is some consensus among scholars that use of an information highway metaphor assumes that the communication infrastructure should resemble
the transportation infrastructure, but there is disagreement as to whether this generates an infrastructure that facilitates universal or discriminatory access, and whether the use of this metaphor implies heavy government involvement in building and controlling the infrastructure. There is widespread agreement among scholars that this metaphor links the communication infrastructure to commercial interests, but little discussion as to whether this linkage privileges a transmission model of communication and marginalizes a more "ritualized" notion of communication.

To address these concerns, I first examine the power relationships, the role of government, and the overall setting that is constructed in widely-distributed magazine articles about the information highway. The following are specific research questions that address these issues:

**RQ1:** What type of power relationships are constructed in the depiction of characters and their actions?

**RQ2:** Who are the experts in the discourse?

**RQ3:** What actions and responsibilities are attributed to the government character?

**RQ4:** What characteristics are associated with the overall setting of the information highway?

In addition, relatively consistent themes emerge from a review of scholarly literature as to how access, funding, and function of the communication infrastructure should be configured. Access should be universal and the technology
should be easy to use and available in homes, schools, post-offices, libraries, and other publicly available sites. Subsidy programs should be in place to facilitate access and policies should focus on the acquisition of equipment by all segments of the population, as well as training people to use available equipment and services. The highway should offer services that are centered around vital information that is essential to the citizen's well-being. Services should help in completing routine daily tasks, such as: receiving pertinent information about local services and accessing medical and police resources. Interactions between people should increase and enable all segments of the population to experience and be more involved in more of the world around them. There is inconsistency in the scholarly literature whether the control of network services should reside in distributed systems or a central switch.

It is beyond the scope of this dissertation to definitively assess this criteria, but I can assess whether the depictions of access, funding, function, and control of the information highway in popular magazine articles are aligned or divergent to these criteria. To provide insight into these specific issues, I addressed the following research questions:

RQ5: To what extent is universal access evident by depictions of points of access and funding support?
RQ6: What functions are served by the information highway?

RQ7: Is the information highway centralized or decentralized, and how does this effect function and access?

A narrative method of analysis was used to gain insight into the deeply embedded assumptions about access, funding, function, and control of the communication infrastructure in articles about the information highway. The reason I chose this research method is my conviction that our understanding of implementation issues and the type of communication infrastructure we are constituting is deepened by analyzing the various stories (possibly conflicting) that have wide circulation throughout our culture about the information highway. By creating a "metastory" that includes the various "smaller stories" about the issue, we gain an overall perspective that is inclusive of multiple perspectives, thereby expanding the possibilities and range of debate (Roe, 1992). This point will be elaborated on in the following section.

Narrative Method and Policy Analysis

Most people associate narratives with fictional stories, but narratives are also factual stories that have a beginning, middle, and end (Bruner, 1991; Foss, 1989; Kaplan, 1993; Roe, 1992; Rowland, 1987). A narrative is distinct from other modes of discourse in that there are developed
scenarios centered around an event that hold some possibility of change (Rowland 1987). Narrative analysis takes as its object of research the story itself. The methodological approach is to examine the story and analyze how it is put together by looking at the linguistic and cultural resources it draws on and the way in which these resources persuade the reader to accept the authenticity of the story (Riessman 1993). Narratives have common features that can be compared, such as: settings, characters, narrator, actions, temporal relations, causal relations, assumed audience, and themes (Foss, 1989).

Human beings create coherence and share meaning with each other through storytelling (Bruner, 1991; Fisher, 1985; Lucartes & Condit, 1990; Miller, 1993; Mumby, 1993; Pearce, 1989). Narrative structure is a "universal medium of human consciousness" (Lucartes & Condit, 1990). Our experiences and memories of human events are organized in the form of stories (Bruner, P. 4). The world "is a set of stories which must be chosen among to live the good life in a process of continual recreation" (Fisher, 1993, P. 75). The narrative form generates a coherency of thought often quite subtle but powerful:

The narrative...has a plot with a beginning...a middle...and a proposed end...In the process, the narrative 'grasps together,' in Ricoeur's phrase, a variety of disparate information and thoughts and weaves them into a plot. The end flows naturally from the beginning and middle, so much so that it is possible to
imagine our analyst not knowing or only loosely knowing at the beginning of the story how it will turn out and, as is often the case for novelists, being swept along to a particular conclusion by the force of beginning and middle" (Kaplan, 1993, P. 176).

Applying a narrative method to analyzing discourse about policy issues expand our insight about these issues and their potential effects (Bruner, 1991; Kaplan, 1993; Roe, 1992). Through this method we gain insight into how concerned parties (policy makers and others) simplify or complexify policy issues. If one considers the different stories together into a larger story (a metastory) a more inclusive perspective is generated.

Roe provides several examples of how such an analysis contributes to deepening our understanding of policy issues. In the following section I will review two of his examples: the Cuban missile crisis and the 1980/1982 Medfly crisis in California and show how this relates to my analysis of information highway discourse. Roe demonstrates how analyzing and then integrating "little" stories into an inclusive metastory provides unique and powerful insight into the issue.

**Examples of Narrative Analysis**

*Cuban Missile Crisis.* This crisis is still a topic that generates a great deal of uncertainty; "each new story becomes a candidate for another conflicting model or perspective on the emergency" (P. 564). Transcripts of secret tapes of several key White House Meetings, in 1962, on
this crisis have recently been published. What becomes apparent after analyzing these transcripts is the "relative dearth of stories used by the meetings' participants as a way of articulating the high uncertainty of the events around them" (P. 564). Roe labels these stories as "nonstories:" scenarios are never finished, arguments are interrupted or dropped, few alternative scenarios are suggested. He concludes that

this paucity of stories illustrates a crisis that was one precisely because few people present in those meetings knew what the 'rules of engagement' they and the Soviets were playing by. In contrast, the multitude of stories told after these meetings frequently differ over just what these rules really were (P. 565).

Roe argues that the metastory can be summarized succinctly:

Telling stories about the crisis in the past tense becomes our way of concealing that the crisis is still very much in the present tense: by being always preoccupied with determining which story 'was' correct, we evade the more urgent exercise of having to deal with there still being no 'story' to tell, or at least one with a beginning, middle, and end that we do not dread (P. 565).

The 1980/82 Medfly Crisis in California. The Mediterranean fruitfly infested California in 1980 and led to marketplace rejection of Californian fruit. Two conflicting narratives dominated the discourse over how to handle the infestation: government bureaucrats and California agribusiness interests advocated aerial spraying with malathion, and a loose coalition of urban residents and
environmental activists critiqued this scenario. Roe argues that from a narrative policy analysis, the opponents' critique of aerial spraying is of interest less for its substantive thrust than for its narrative status as a nonstory: critiques are not stories, having their own beginnings, middles, or ends (P. 566).

The resulting metastory is about how the critique heightened people's sense of risk and uncertainty associated with the medfly infestation: the critique called into doubt the aerial spraying scenario without offering an equivalent alternative or counterproposal to that spraying (P. 566).

Given this metastory the responsibility of the policy analyst is clearer: "trying to ensure that the opponents of aerial spraying were provided the financial and informational resources they lacked in coming up with this counterestimate of risk" (P. 566).

Although Roe does not describe in enough detail how he systematically carries through his study--his criteria for sample selection, procedural steps in analysis, and more specific detail on what constitutes a nonstory--he does demonstrate the capacity through narrative method to shed light on policy issues. There is the capacity through a narrative method to gain insight on how those involved in the description of the information highway order and present this new world. A focus on narrative is appropriate as a means to understand the vision of the information highway that is created in public discourse, and point to new needed directions in policy analysis. Narrative analysis allows us
to see the metastory that emerges, and therefore, also the smaller stories. Through a narrative approach we gain an overall perspective that is inclusive of multiple perspectives; thereby expand the possibilities and range of debate.

To conduct a narrative analysis a researcher must select a body of discourse to study and must develop procedural steps to guide that analysis. In the following section I elaborate on the method of sample selection and procedural steps in analysis used in this study.

**Sample Selection**

I analyzed a selected sample of articles about the information highway distributed in 1993-1994. This is an interesting time because the Clinton Administration was advocating a national information infrastructure. Cable was reregulated in 1994. I focused on how access, funding, function, and control of the information highway was portrayed, and whether these portrayals signified an information highway that would generate positive social outcomes.

The selection of articles was based on theoretical sampling as suggested by Glaser and Strauss (1967). The selection of groups or subgroups that construct the data collection is based on theoretical purpose and relevance. The sample was selected to maximize the possibility for diverse assumptions, therefore, the goal of this
sample selection was to select magazines oriented to as many diverse segments of the population as possible.

There were many steps in the process of sample selection. First, I initiated an electronic search of the Nexis database for articles about the information highway published for the entire year of 1993. This was a keyword search in which I requested articles that contained the words information (super)highway. This search yielded 834 articles; 83% of these articles were in business or trade oriented magazines, 22% were in magazines oriented toward the general population, and less than 1% were in magazines oriented toward a female or ethnic minority audience.16

Another search was initiated six months later in the Infotrac Database for articles about the information highway that were published in 1993 and the first seven months of 1994. This search yielded 559 articles: 84% of these articles were in business/trade magazines, 14% were in magazines oriented toward the general population, and again, 1% were in female or ethnic minority-oriented magazines.

It became obvious that business and trade oriented magazines dominated the type of magazines indexed in major electronic indexes, and therefore, I could not rely on electronic indexes to generate my entire sample. The Uhlrich

16 Trade/business magazines are defined as magazines oriented toward specific trades or industries. Computer-oriented magazines are collapsed into this category.
Periodical Index was used to locate titles of periodicals that may be oriented to minority and female audiences that might not be cited in electronic indexes. I identified these magazines and manually searched each issue published in 1993-August 1994 to locate articles about the information highway.

Despite these efforts there were no articles located in African American oriented journals that focused on the information highway.\(^{17}\) I searched the Ethnic Newswatch database and located newspaper articles about the information highway that were oriented to African American audiences.

The subsequent selected sample consists of magazines that fall within one or several of the categories of business/trade, general interest, and ethnic minority or women. There is an emphasis in this sample on magazines oriented to different segments of the population. Rolling Stone appeals to people interested in music (and mostly young or middle-aged) and Modern Maturity to the senior citizen population. Technology Review appeals to science and technology-oriented audience members and The National Forum to the nation's intelligentsia. Tikkun appeals to the Jewish population and Christian Century to the Christian population. Time Magazine has broad circulation throughout much of the population.

\(^{17}\) There were two articles that were indexed, however, these articles only briefly mentioned the information highway and were considered inappropriate as units of my sample.
Business Week, Byte, Scientific American, and Wired are classified in this study as trade/business magazines. Byte and Wired are classified as trade magazines because of their focus on computer technology, although arguably they also could be considered magazines oriented to the general public that are interested in computer technology. Business Week distributed a large amount of articles about the information highway since January 1993. 32% of articles in business magazines, a total of 47 were Business Week articles in the "Mags" file of the Nexis database. 29% of articles in business magazines, a total of 56, were Business Week articles in the InfoTrac index. Scientific American is oriented to the professional and technical managers across a wide range of trades and businesses.

Two magazines oriented to ethnic, minority, or women readers overlapped with the business/trade category of articles. Working Woman is oriented to women in the business world and Hispanic Business is obviously oriented to the Hispanic business community. This is despite great efforts undertaken to find non-business women or ethnic oriented magazine articles. Four articles, one in the Call and Post (Cleveland), one in Hispanic Magazine, one in Mademoiselle, and one in the Oakland Post are not business or trade oriented. Please see Table 1 for an overview of the magazines that construct this sample ordered by size of circulation.
### Table 1: Selected Sample of Articles.

<table>
<thead>
<tr>
<th>Source of Article</th>
<th>Focus</th>
<th>Circulation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modern Maturity</td>
<td>Retirement issues</td>
<td>22,140,586</td>
</tr>
<tr>
<td>Time Magazine</td>
<td>News</td>
<td>4,183,303</td>
</tr>
<tr>
<td>Rolling Stone</td>
<td>Music</td>
<td>1,275,087</td>
</tr>
<tr>
<td>Mademoiselle</td>
<td>Fashion and beauty</td>
<td>1,268,700</td>
</tr>
<tr>
<td>Business Week</td>
<td>Business news</td>
<td>886,229</td>
</tr>
<tr>
<td>Working Woman</td>
<td>Women in business</td>
<td>883,060</td>
</tr>
<tr>
<td>Scientific American</td>
<td>Technical issues</td>
<td>629,563</td>
</tr>
<tr>
<td>Byte</td>
<td>Computers</td>
<td>511,400</td>
</tr>
<tr>
<td>Hispanic Magazine</td>
<td>Hispanic community</td>
<td>233,289</td>
</tr>
<tr>
<td>Wired</td>
<td>Digital technology</td>
<td>175,000</td>
</tr>
<tr>
<td>Hispanic Business</td>
<td>Upscale business people</td>
<td>166,173</td>
</tr>
<tr>
<td>National Forum</td>
<td>General interest</td>
<td>121,000</td>
</tr>
<tr>
<td>The Nation</td>
<td>Management Information</td>
<td>95,757</td>
</tr>
<tr>
<td>Technology Review</td>
<td>Science &amp; engineering</td>
<td>85,821</td>
</tr>
<tr>
<td>Oakland Post</td>
<td>African-Americans</td>
<td>62,496</td>
</tr>
<tr>
<td>Call and Post</td>
<td>African-Americans</td>
<td>42,000</td>
</tr>
<tr>
<td>Tikkun Magazine</td>
<td>Politics, culture and</td>
<td>40,000</td>
</tr>
<tr>
<td></td>
<td>society (Jewish critique)</td>
<td></td>
</tr>
<tr>
<td>Christian Century</td>
<td>Social concerns</td>
<td>35,000</td>
</tr>
</tbody>
</table>


**Analysis: Procedural Steps**

The method of narrative analysis used in this project is based on a chapter on narrative criticism in Sonja Foss's book, *Rhetorical Criticism: Exploration & Practice,* with slight modification. Both the content and form of the articles are analyzed in this method. I began my analysis by explicating many features of the narrative, including the settings, characters, narrator, actions, temporal relations, causal relations, audience, and themes. Of the many features of the narrative I studied, the setting, actions, and
characters proved to be most relevant given my research focus; consequently, the analyses focus on these elements. Information from the other elements are integrated into a general introduction to the analysis of each article. At the conclusion of each analysis is a description of the worldview presented in the article.

In-depth knowledge of narrative emerges. The analysis is prompted by the asking of questions designed to allow as many possibilities for an in-depth knowledge of the narrative to emerge. Questions that contribute to this analysis are the following: what are the major settings in the narrative; who are the main characters and what traits are associated with them; what are the key events; who and what are the causal agents, and what are the effects; what function does the author/narrator fulfill in the narrative and what is his/her attitude as expressed through illustrations, examples, and the language used in the telling of the story.

Focus on access, funding, function, and control. Once an indepth knowledge of the narrative emerges, I focused attention on how access, funding, function, and control of the information highway were portrayed. This analysis was aided by answering several questions, such as: which of the characters are accessing the information highway; where are the characters accessing the information highway; does anyone control the information highway, if so, who; what technologies are mentioned in the narrative and how are they
portrayed; what actions are portrayed as being conducted on the information highway; what degree of interactivity is described relative to the information highway; who is building the information highway; what type of services are described in the events or examples given; who is providing services over the information highway, and what overall function does the information highway serve.

Comparison among narratives. Narratives were compared on the basis of the questions described above and clusters of commonality and difference were identified.

Emergence of metastory. A metastory based on analyzing the clusters of commonality and difference was generated and analyzed relative to the research question.

Ground Rules

Unless specifically mentioned in the analysis, the narrator is assumed to be the author. Settings are the physical locations in which the action of the story takes place. Events are defined as "actions, happenings, or changes of state" (Foss, 1989, P. 231). Characters in the narrative are defined as people, figures, or creatures who think, communicate, or act in the article.18 Often characters are people, but given this definition, it is possible for characters to be non-human or inanimate actions.

18 Foss defines character as "the people, figures, creatures who think and communicate in the narrative" (P. 231). I have expanded this definition to include act.
In summary, narrative analysis was the chosen method of inquiry in this dissertation. A variety of narrative elements were analyzed and compared in eighteen articles about the information highway relative to four issues: access, locus of control, funding, and functions.

Conclusion

This project adds to a greater understanding of how language as a communication practice contributes to the construction of technological systems; a communicative system that, as Kenneth Burke (1936) argues, serves as a tool for common action. The purpose of this chapter was to familiarize the reader with the problem and ultimately the research questions that guided this dissertation. The research method, findings, limitations and contributions of the study were explicated.

The narrative analyses are presented in the next four chapters: chapters 2-5. Each chapter contains articles that were found to cluster around a common theme. The four themes that emerged are as follows: Chapter 2, "Trickle-down;" Chapter 3, "New Rules;" Chapter 4, "Social Good;" and Chapter 5, "Trickle-up." Articles in each of these clusters tend to share common depictions of access, funding, function, and control of the information highway. The following is an overview of the four chapters in which I present the narrative analyses of the sample.
Chapter 2: Trickle-Down

Six articles clustered around an unquestioning stance that the primary purpose of the information highway is to generate profit for private industry firms. These articles were from: (1) *Time Magazine*; (2) *Technology Review*; (3) *Business Week*; (4) *Mademoiselle*; (5) *Call and Post* (Cleveland); and (6) *Byte*, with a combined circulation of 6,977,453. Assumed in these articles is that benefits of the information highway will trickle-down to the general population from private industry sources.

Chapter 3: New Rules

There are four articles that cluster around the notion that the information highway may provide opportunities for success to those who have traditionally been left out of powerful positions in the business world. These articles are from: (1) *Oakland Post*; (2) *Hispanic Magazine*; (3) *Hispanic Business*; and (4) *Working Woman*, with a combined circulation of 1,345,018. These articles focus on what specific segments of the population can do to gain access to opportunities on a future information highway that will, first and foremost, focus on the needs of transnational corporations to be competitive in a global marketplace.

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19 There may be overlap in circulation numbers in that the same person may subscribe to more than one of these sources, nonetheless, this is a ballpark figure that indicates some degree of circulation of this discourse throughout the population.
Chapter 4: Social Good

Four articles cluster around the notion that the information highway can either strengthen or weaken democratic principles depending on whether the government protects the interests of the general public on the information highway. These articles were from: (1) Rolling Stone; (2) Christian Century; (3) Tikkun; and (4) Modern Maturity, with a combined circulation of 23,490,673. Assumed in these articles is that benefits will not trickle-down to the general population unless the federal government enacts protective policies that restrain private industries from monopolizing the information highway for their own selfish and profit-oriented ends.

Chapter 5: Trickle-Up

Four articles cluster around the notion that the information highway will be controlled by private industry to exploit the population. These articles are from: (1) Wired; (2) Scientific American; (3) The Nation; and (4) National Forum, with a combined circulation of 1,021,320. Benefits will not trickle down to the general population; rather, the last bit of resources left to the general population will trickle-up to greedy private industry characters whose only

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20 Modern Maturity accounts for 22,140,586 of this circulation rate, leaving only a combined circulation rate of 1,350,087 from the other three magazines.
concern is the expansion of capital on the information highway.

Chapters 6 & 7

The last two chapters are where I conclude this project. In Chapter 6, I compare the articles across clusters and apply these findings to my research questions. I end chapter 7 with a metastory that emerged through consideration of all the articles in the sample. I conclude in chapter 7 by reviewing my findings and discussing these findings in the context of the broader issues that are informed by the research questions.
CHAPTER 2
TRICKLE-DOWN

Six narratives in my sample cluster around an unquestioning stance that consumer benefits from the information highway will trickle-down to the population from profitable private industry firms. They are from the following sources: Time Magazine, Technology Review, Business Week, Mademoiselle, Call and Post (Cleveland), and Byte. The focus in these articles is on market access issues, private industry control of the infrastructure, and subscription services. Entertainment and consumer services are dominant. The infrastructure is depicted as both centralized and decentralized.

Overview

Technology is accessible in homes through easy to use sophisticated equipment, but there is little to account for how this happens; thus, universal service is a vague concept never fully developed. In one article (Call and Post), Ameritech promises to provide non-discriminatory access if they are deregulated. The only other characters who argue for universal access are weak government characters, and they
are in only half of the articles. There is much more attention on market access issues. The majority of actions center around private industries competing to gain access to the market place. It is assumed that people will subscribe to services on the information highway that are delivered to the home by private industry characters. Absent are any actions that indicate subsidizing access, equipment purchases, or training programs; thus, a weak-link perspective to infrastructure building is not evident.

The general population is passively waiting to receive the services provided by private industry. There is a reliance on private industry experts to provide most of the information in these articles which is consistent with depictions of their actions. Interactivity on the information highway is primarily limited to home subscribers reacting to prescribed menus of choices. There is some mention of traveling to different sites on the information highway via Internet, but these actions receive less attention than interactive services that are "commercially proven," and provide more passive entertainment.

The primary purpose of the information highway is to generate profits to private industry characters. Lucrative commercial services such as home shopping, movies on demand, business services, and electronic game playing are emphasized. Little attention is paid to functions that build community, promote interpersonal communication, or involve
people more directly in day to day life experiences. Thus, there is an emphasis on economic efficiency, but not equity. The only possible exception to this is in the article from the Call and Post. In this article, the information highway enhances life experiences of African Americans and others, but this is defined primarily as providing a non-discriminatory environment in which African Americans can compete on equal footing with others, or through the consumption of products; not exactly the life-affirming activities suggested by Logan or Williams.

A detailed analysis of these articles is presented in this chapter. I conclude with reflections on whether the depictions of access, funding, function, and control are aligned with building a socially responsible infrastructure as described in Chapter 1.

Narrative Analyses
"Take a Trip into the Future of the Electronic Superhighway"

Time Magazine, April 12, 1993 (Elmer-Dewitt).

Narrator Elmer-Dewitt refers to the coming information highway as a "communicopia" brought to neighborhoods by "major cable operators and telephone companies." Featured are the competing visions of the information highway advanced by private industry and government characters. A racehorse metaphor is used extensively, thus, emphasizing speed, expansion of energy, and competition. The future is one in
which "more and more of what one wants to see will be delivered on demand" and "channels and nightly schedules will begin to fade away."

**Description of Narrative**

The narrative begins in the partially-constructed present setting of the information highway. There are five main characters: "You;" the private sector referred to as the telephone, cable, and computer industries; the federal government; technology; and experts. You request services through an interactive television/computer information system which enable you to "select any item from an encyclopedic menu of offerings" and "have it routed directly to your television set or computer screen." You encounter obstacles if venturing on local access roads by yourself, but you needn't worry because private industry characters will bring the information highway to your home.

Most of the actions focus on how private industry companies are competing and collaborating to build and control the future information highway; therefore, market access issues are emphasized. They have competing visions of the future information highway: telephone companies want services that will "rack up message units;" the cable industry want to offer entertainment programs on demand to the home; the computer industry want to be the "data highway's traffic cops" by controlling the flow of information. Long-distance telephone companies control the
"interstate turnpikes." Some local access roads are controlled by local telephone companies, others by local cable systems. Telephone and cable companies are converting the "bumpy" local roads to smooth and efficient access routes to the home.

The government character, primarily the Clinton Administration, is "scrambling to see how to join in the fun." The Clinton campaign expressed interest in building the information highway prior to the presidential election of 1992, but now is intent on not using taxpayer dollars to construct the information highway; consequently, this administration is providing incentives to encourage private industries to build the information highway. As a result, the government has difficulty keeping up with the changes brought by private industry investment and are a "dark horse" in the "race" to build the information highway. The government consistently argues for a populist vision of the information highway. They advocate low rates to insure universal service for the general population, but are in a weak position to be heard.

The home is the central access point in the future information highway setting. In this future "brave new world of video phones and smart TVs...channels and nightly schedules...fade away and could eventually disappear...more and more of what one wants to see...delivered on demand by a local supplier..." The emphasis on profitable consumer
services is evident in this future setting. The distinctions between entertainment and advertisements blur. One has entertaining experiences at the same time that products are bought and sold: home shopping networks "blossom into video malls" as "armchair shoppers browse with their remote controls;" a "press of a button" allows these "shoppers" to charge an item that interests them on a credit card; all done without ever leaving their home. People receive movies on demand, play electronic games, and purchase goods by subscribing to services provided through large centralized switching systems administered by cable and/or telephone industries. Benefits will trickle-down to the population, but the emphasis is on the trickling-down of consumer services throughout the nation, a rather restricted notion of trickle-down benefits.

Technologies are ubiquitous and imbued with human attributes: they act as "file servers;" are "unreliable and noisy;" "handle transmissions;" and are companions. Fiber-optics provide a "virtually limitless transmission pipeline" and are key to interactivity. Telephone switching centers bring new services to neighborhoods "without wiring to every home." Cable decoders (television interfaces) will deliver as many as 540 channels to the public. Synchronous digital subscriber line (ADSL) squeeze video signals through copper telephone wires.
There is some mention of Internet as the prototype for many information exchange functions that will be available on the information highway, such as: sending gossip and research results electronically; searching for information in hard-to-reach libraries; playing digital games with opponents in cyberspace; and exchanging digitalized sounds, photographs, and movie clips electronically; but information exchange functions receive far less attention than entertainment and consumer functions.

Five experts give advice and information: Vice-President Al Gore and FCC chairman James Quello are experts from government; TCI chairman John Malone and Apple Computer chairman John Sculley are private industry experts; and Mitch Kapor, co-founder of the Electronic Frontier Foundation (and former computer industry whiz), is a citizen/activist. The government experts and Mitch Kapor advocate universal access, distance-education projects, and the provision of free television to the general population. Private industry experts present a more profit-oriented vision of the information highway. Sculley points out how lucrative the information highway will be. Malone warns that if people do not pay their cable bills, their television will be turned off. None of the experts question the need for the information highway.
Worldview

Several assumptions about the information highway are visible in this article. The information highway is characterized by people ordering entertainment and service products conveniently from their home. These services are transmitted from a central hub constructed by the telephone or cable industries who are competing with each other or working collaboratively. Consumption and leisure activities are emphasized. The needs and concerns of private industry characters dominate. The information highway is used as a conduit for entertainment and consumer services to be brought to the consumer in the home; a key to commercial success for private industry. The participant is primarily passive in the home, interacting with services controlled by private industry. A "bumpy road" is encountered if the participant at home attempts to travel on the information highway by him/herself. Once private industry characters bring the information highway to subscriber's homes, the home participant will "vote" with his/her remote control. But this "consumer" will vote on services predetermined by the private sector.

In this article the information highway is depicted as a "tidal wave" that is about to converge on the home. Brody describes how technical innovations, market forces, and regulatory initiatives enable new services in the home to become a reality. The telephone industry with its massively interconnected network is foreseen by Brody as the main provider of information highway services to the home.

Brody uses a poetic style of narration in this article. He relies on a water metaphor to describe the creation of the information highway: "A tidal wave of pictures and sound is about to crash into our living room;" and, "...through the fog of confusing claims and breathless promises, the outline of a nascent medium are becoming visible."

He is a realist and even though his realism causes him to refer to the information highway as a "strip mall" rather than a highway, he is hopeful that eventually the information highway will fulfill loftier goals, evident in the following excerpt: "If the first offerings of the grand information highway fall short of inspirational, take comfort that most media need years-sometimes decades-to begin fulfilling their potential." To Brody, the real potential of the information highway is the ability to access vast databases.
Description of Narrative

There are three main characters: the general population made up of "You," "People," "Viewers," or "Consumers;" the private sector referred to as the telephone companies, cable companies, and computer companies; and experts.

Dictated by market forces, the information highway is more like a "strip mall focused on services with proven consumer demand" than an information highway. People tend to want to experiment with media systems, but are inconsistent about what they say "they would buy and what they actually buy." Viewers control what comes on the television screen. They pause, rewind visual images, request customized software, and use their remote controls to "navigate through a sea of information." They place orders through 800 numbers and transmit responses to local switching centers. Consumers are at home and "navigate through the array of offerings." They prefer to be passive and would "pay a premium if they could choose from a large selection of movies without having to leave their homes."

You initiate actions on the information highway as well as passively receive information. You are adept with technology and use it to facilitate day to day practical activities, such as: "inspecting real estate;" "furnishing rooms;" "electronically snipping photographs from on-line catalogs;" and "sampling software at home." You also interact with media for entertainment purposes such as
playing video games and watching movies: You view "thousands of movies," wander to video rental stores, and watch television. You are cynical about the propositions circulating in the media about what the information highway will provide. You ask yourself: "why should I believe it this time? Haven't technologies been making these kinds of promises since the 1970's and hasn't it all turned out to be so much vaporware-grand ideas that have failed either because of technological infeasibility, the nonexistence of a market, or regulatory barriers?" Brody suggests that there is reason to believe some of what you are hearing.

Most of the action in this article is centered on the competition between private industry characters to control the information highway. Industries "competing and sometimes flowing together to create the new wave of home information services" are conducting "field trials" to ascertain "what [services] people want and how much they are willing to pay..." The telephone industry is building the information highway: they "have laid tens of thousands of miles of optical fiber..." More capable than the cable industry to offer a broad choice of information highway services to the home, the telephone industry can provide one-way video service in the near future; that is, if regulators continue to lift restrictions against them offering such services.

The cable industry is more deceitful and in a less competitive position to provide information highway services
than the telephone industry. They claim that reregulation is limiting their ability to develop advanced services, "but their activity suggests no such limitation." Rather, the reregulation of cable services encourages the cable industry to "exploit hundreds of additional channels and the "lush, unregulated territory of enhanced services." They claim to want to provide distance-education services on the information highway, but in actuality, "entertainment offerings will fill most of the bill." Unlike the massively interconnected telephone network, the cable industry has infrastructures that are "telecommunication islands serving a particular community." Despite having "a time-tested technology for delivering video into the home," the cable industry is a "poor cousin" in their efforts to offer movies on demand.

Computer companies are the "maven of user-friendliness." These companies are developing multimedia products and joining with telephone companies to develop home information services. They are marketing software that gives television sets the look and feel of a personal computer. All of their activities seem to be based on making it easier for people to use whatever television services are available. Computer companies are benevolent, helpful, friendly, and above the fracas between telephone and cable companies.

On the future information highway, the television set occupies "center stage as it does now," and consumer services
trickle-down to viewers at home who "control what comes on the screen...:" they select movies from an option of choices; interact with "animated shopping catalogs;" and engage in "multiple-player video games." This emphasis on entertainment and consumer services means that: "People who consider themselves true information junkies...will have to continue using a personal computer and modem to tap online databases."

Technologies have Godlike power as they "bestow fiber-like capability...on copper wire and coaxial cable that reach into the home;" but this is Godlike power used to enrich our access to entertainment and consumer services. High-capacity transmission lines "multiply manyfold" the amount of information piped into a home. Fiber-optics "carry" programming and "transmit" dozens of video channels. Switching offices "retrieve" movies, software or games from any computer in the world and use ADSL to transmit video images through copper wires and/or coaxial cables to "transmit" the last mile of video signals into the home. Television interfaces combine the capabilities of a computer, fax, calculator, and telephone, and "gives" a television the look and feel of a personal computer.

Just as the actions in the article privilege private industry characters as powerful, so to, most of the expert information provided in these articles are provided by private industry experts. Of the nine experts referred to,
six are from private industry and three are university professors. Narrator Brody adds information to enhance or detract from the expert's message; thus, for the most part he mediates the expert's information to the reader.

**Worldview**

There are several assumptions about the information highway evident in this article. The world of the information highway is one in which people access information as well as receive consumer goods and leisure activities in the home. Services that generate private profit prevail since private industry and natural market forces determine the functions the information highway fulfill in day to day life.

A trickle-down approach to infrastructure building is assumed, but this too is the trickling-down of consumer and entertainment services to the general population. There is a glimmer of hope that eventually services that broaden and expand life experiences beyond consumption will trickle-down as well, but this is in the far off future. In the meantime, the information highway is a "strip mall."

What clearly trickles-down to the population is convenience, but the price of the convenience may be too high to pay. Many activities that people heretofore had to leave home to enjoy are experienced from home. The living room and the television set become the main form of contact with the world outside the home. Each activity is heavily mediated by
technological systems that are constructed and controlled by private industry. The convenience of access to consumer and entertainment services may expand life experiences in some ways, but clearly, it is at the expense of shrinkage of our unmediated, experiential domain.

"Calling All Channels." Business Week, September 27, 1993.

(Bart Ziegler)

Competition between the cable and telephone companies to control the information highway is featured in this article. It is presumed that one of these two industries, or both industries converged into one will build the information highway. The telephone industry is heavily favored in this competition. The general population is only referred to in passing, indicating their powerlessness and irrelevant position in controlling the information highway.

Ziegler shares narration with Mark Landler, narrator of a sidebar entitled: "Bell Atlantic Reaches for the Stars In Hollywood." Bell Atlantic's efforts to build an interactive television system are described in this sidebar. Both Ziegler and Landler unquestionably favor the construction and control of the information highway by private industry. Ziegler argues that the telephone industry could bring "the Information Age into American living rooms sooner than anyone expected." Policy makers are encouraged to deregulate the
telephone industry to hasten the arrival of the information highway.

**Description of Narrative**

There are four main characters: private industry companies referred to as telephone and cable companies; the federal government; technology; and experts. Actions occur for the most part in the present on the partially-constructed information highway. Two sites are featured in this present setting: telephone industry research centers and the "regulatory arena."

The narrative begins with a tour of the Chesapeake & Potomac Telephone Company office in Arlington Virginia to see "where the information superhighway or at least a small stretch of it is being laid." At this site, the old is combined with the new. Old buildings are filled with "shiny new IBM computers, upgraded 'backbone networks," and "strong balance sheets." This site is just one example of the efforts the telephone industry is making to build the information highway.

Telephone companies use various strategies to build the information highway. Some compete with cable companies to provide video into the home. These companies are "quietly working to deliver information to PC's and TV sets in homes and offices." Other telephone companies collaborate with cable companies, and in some instances, actually buy existing cable companies.
Entertainment and consumer services will trickle-down to the general population in the future. Bell Atlantic Corporation is developing an interactive television system called Stargazer. This system "turns your TV set into a shopping mall for video services." In this interactive mall, "Programs and shopping options are arranged up and down hallways, with an elevator to transport the view from floor to floor." A "rudimentary" version of Stargazer is being tested in fifty Bell Atlantic employees' homes. The company is planning to extend the test to one thousand households and to ask the Federal Communications Commission (FCC) "for permission to test the system with outside customers." Bell Atlantic will eventually sell Stargazer in a six-state region and license the system to rival services. Arthur Bushkin, the president of information services at Bell Atlantic, hopes that Stargazer will become "an industry standard for navigating interactive TV." Bushkin hopes to "charge retailers rent for space in this electronic mall. He envisions one or two anchor tenants, plus an array of specialty stores." Time Warner cable executives claim they pose stiff competition to Bushkin's quest as "Bell Atlantic...can't draw on the savvy of Home Box Office and Warner Brothers Inc."

Most of the actions are centered on market access issues and the competition to control the information highway. Despite some disadvantages in their "race" against the cable
industry, the telephone industry has "momentum" on their side to build and control the information highway. With "liberating" regulatory rulings "in hand," telephone companies plan to become a "programming powerhouse" that could challenge some of the "giants" from the cable industry. Investors are viewing the telephone industry optimistically, but wondering if they can handle the "technical hurdles" that will most certainly occur in the near future. The cable industry has a tradition of having "hogged the spotlight," and "shrewdly" timing announcements to business strategies. The cable companies are "crying foul at the possibility that the "Bells" will use profits from their local phone-service monopolies to fund the replacement of copper wires."

There are "violent clashes" between the cable and telephone industries in the "regulatory arena." They are battling over regulations that determine what their competitive position will be relative to building the information highway. The government, in deregulating the telephone industry, is facilitating it to build and control the information highway. The deregulation of the telephone industry is supported by the federal courts as Judges protect the telephone industry's "First Amendment rights" in judicial rulings. A recent court decision allows the telephone industry to deliver information to the home and "heats up the race," giving the telephone industry "momentum" in their quest to build and control the information highway. The
Congress is under pressure by Federal Courts to "reshape communications policy" to make the marketplace more competitive.

Little attention is focused on the future information highway. It is assumed that the highway will "pull up to U.S. homes sooner than many experts expected." The home is the central access point to the future information highway. Although there is some mention of "interactive town meetings," most services offered in the home to the general population will focus on entertainment and consumer services. People will receive movies on demand and purchase products through sophisticated forms of home shopping. Technology reaches nearly everyone in this future scenario, although again, there is no mention of how this will happen. IBM computers are not "ordinary machines." These computers "hold dozen of movies, TV shows, and educational programs that have been turned into computer code." Advanced networks bring "telephone and cable-TV service" into homes. Advanced switches "keep track of whom to bill for what" and "store and send digitized video programs." ADSL uses existing copper telephone wires to "shoot" digital bits into living rooms.

Private industries are powerful characters consistently throughout the article. There are only references to private industry experts, eight in total: four are from the telephone industry, one from the cable industry, and three are industry analysts working in the private sector.
Narrator Ziegler referred to anonymous sources, calling them: "industry experts," "industry analysts," and the "industry grapevine," and paraphrased their views for the reader. In these instances, Ziegler would make a general statement that either privileges the position of the telephone industry in the "race" to the information highway, or at the least, claims the telephone industry to be a serious contender to control the future infrastructure of the information highway.

**Worldview**

There are several assumptions about the information highway visible in this article. This information highway world is characterized by deregulation to allow private industry characters to compete for success in the marketplace and to provide conveniences to consumers in the home. Trickle-down benefits are assumed, but again, the focus is on the trickling-down of consumer services and conveniences that are profitable to private industry. Consumption, leisure activities, and competition are emphasized, not uplifting the weakest-links in the population or expanding and enhancing life experiences in any but consumerist ways.

Technology facilitates services and is key to commercial success therefore privileging economic efficiency but not necessarily equity. The participant is passive and reactive to powerful companies, deregulatory policies, and sophisticated speedy technology. Just as the audience and public disappear in the telling of the narrative, so to the
participant on the information highway has little say in determining the function, access, or control of the information highway.


Narrator Dibbell is eagerly anticipating the services we can expect to encounter in the future on the information highway. In this article, the overriding agent of change is technology and the services that result from technologies. We never have to leave the comfort of our armchairs to experience these services; a scenario portrayed as a great advantage by Dibbell. Public and private worlds are collapsed and many of the functions that are now performed in the public realm are performed in private from the home. The participant is a consumer of information and products on the information highway; not a constructor, developer, or controller of the highway.

Dibbell expresses no doubts or reservations about the effects of the information highway. He does not reflect on the types of policies needed to ensure beneficial outcomes of the information highway, nor does he seem concerned about who controls the highway relative to the types of services that will be made available. He refers to the highway as a communications system that will "blanket the nation;" therefore, suggesting a highway that covers everyone, keeps
everyone warm, shelters and protects from outside elements.
Speed and efficiency are important in this narrative based on
the descriptive terms used throughout: "...electronic
superhighway...;" "...high-speed...;" "...instant access..."
The information highway, according to Dibbell "will mean
working, playing and living at the speed of electricity."

Description of Narrative

The dominant setting in this article is the future
information highway. The information highway is described as
a "fast-lane communications systems" which will "blanket the
nation" within a few years. The highway gives instant access
to entertainment, information, and a variety of services to
people in the home. It is composed of new technological
devices--"super machines"--that combine the functions of the
telephone, personal computer, and television.

The setting of the information highway is elaborated in
detail as a setting constructed of many sites. The home is
transformed into a place of high technology with multiple
outlets; a central access point to the information highway.
One primary event characterizes the narrative--the women
character's/reader's "move" from her home to one or more of
the other sites as a result of her connection to the
information highway. She is able to enjoy the benefits the
other sites offer from her home.

The other sites are oriented toward specific types of
activities. Four of the sites depicted concern professional
activities. In the **school** setting, people are studying "with professors across thousands of miles" and accessing "library resources;" in the **media** center, creative materials are being produced and distributed without the need for film or music studios. The **office** is where "every office activity--from passing out memos to taking meetings to gossiping by the coffee maker--will be easily conducted from home." At the site of the **voting booth** is a voting network based in the home.

Four of the sites presented have to do with leisure and pleasure. One is the **mall**, where the individual can "order whatever you fancy." At the **hangout**, "people will feel closer to their digital 'communities' than to their geographic ones," and at the **multiplex**, movies are available on demand and video games can be played by people who are miles apart. The **sex club** is the site of "steamy get-togethers" and is "a couple of steps beyond phone sex." The final site suggested is the **highway horizon**, the far future of the highway where individuals can teleport themselves to other locations and "literally become digital information, our minds traveling down the electronic superhighway from one fabulous robot body to the next."

There are three main characters in this narrative: "You;" technology; and experts. You are visually depicted as female. This character is busy juggling multiple tasks simultaneously, talking on the phone while using a lap-top
computer and a remote control. This woman is physically situated at home throughout the article. You are a passenger on the information highway, told to "fasten seat belts" and unable to "drive" a car on the highway. You never have to leave your armchair, but can choose a wide-range of services in the home. You are slow to adjust to changing times and prefer to react to circumstances rather than to affect or influence them, evidenced in the author's admonition to you that the information highway is coming "sooner than you think" and you had "better adjust."

Technologies allow information to travel quickly and are "all purpose." New technological devices combine the functions of the telephone, personal computer, and television. These devices are "super machines" and will be available in a few years. Other specific technologies that are mentioned in the narrative are: fiber-optics, digitalization, computers and modems, and Internet.

Fiber-optics are "hair-thin glass strands" that carry 65,000 times more information than copper phone lines. Scientists located at the research branch of the telephone companies (Bellcore) predict that "...by the year 2015 every American home will be hooked up with fiber-optic cable." Digitalization "allows" information to travel far and fast. Through the process of digitalization, sounds and images are translated into l's and 0's "...the 'digits' in digital-that can move through the fiber-optic cables." If a person has
access to a computer and modem she can send electronic files over phone lines, and "dial onto the Internet, a global network of computers...." Internet "...provides an electronic space where people can search and find information...."

The third major character in the article is the expert. The expert enters the narrative when the author of the article cites the testimony of authorities to explain or support his claims about the information highway. One such expert is an unnamed scientist at Bellcore, who estimates that every American home will be hooked up to fiber-optic technology by the year 2015. Another is an administrator at the National Institute of Standards and Technologies, Roy G. Saltman, who expresses concern that electronic voting will facilitate undemocratic principles by denying technologically deprived citizens the right to vote. The third expert is Howard Rheingold, author of the book, Virtual Reality, who speculates that in the future, bodysuits that "transmit...appropriate tingling sensations to erogenous zones by special projecting and vibrating gear, activated by phone lines" will be available to those participating in sex clubs on the superhighway.

**Worldview**

An ideal world is one characterized by a very fast pace, lots of action, and efficiency. Meandering; slowly taking in and appreciating one's environment; and enjoying long, slow,
lazy afternoons have no place in this world. The world is a frenetic, fast-paced, constantly changing one, and everyone must scramble to keep up and to take advantage of all that it offers. Life will be superior when lived via the information highway, this narrative suggests. Life is superior if it is speeded up, overloaded, and provides infinite numbers of options in all areas of our lives. The public and private spheres are collapsed in this world, and many of the functions that now are performed in the public realm--going to work and going to school, for example--are performed in private on the information highway. Home is not a place of refuge from an outside world but is the center of that outside world.

This is a world in which women are portrayed as powerful in the home but only passengers on the information highway. In the home, women are manipulating technology, working, creating, producing, and seemingly satisfying social needs, but once readers step outside the home, this power diminishes. The information highway that comes into the home can provide "a professor teaching oceanography in Australia on your desktop," "publish text to an international audience of millions," and sophisticated home shopping experiences. The important policy decisions are being decided by others. The women in the home must adapt or acquiesce to these decisions, and within prescribed perimeters, she will
experience professional and leisure activities that will alter her day-to-day life.

More telling than what is included in the article is what is missing. There is no discussion about what should be offered over the information highway, who should access it, what type of funding mechanism should be employed, or who should be allowed to control the traffic on the information highway. There is a presumption of the inevitability of the eventual arrival of the information highway and the role it will play in readers' lives.

"The Superhighway is Coming." Call and Post (Cleveland) February 10, 1994: 4-A. (Editorial)

The narrator in this article is not identified with an individual, rather, with the Call and Post newspaper. The increased access to information and economic benefits brought by the information highway to the African American community are eagerly anticipated by the Call and Post. The Ameritech Corporation is heralded as working feverishly to provide universal access to the information highway. Ameritech is moving America into "a new age of communications and information technology." The actions of Ameritech will insure "that new technology is evenly distributed," and that the information highway is an infrastructure that gives "the Black community an equal opportunity to compete;" thus equity
as well as economic efficiency will trickle-down to the African American community through Ameritech.

No doubt or reservation is expressed about the effects of the information highway; only positive benefits are envisioned. The Call and Post's appreciation for what Ameritech is doing for the African American community suggests an open mind to the role of business in advancing the interests of the African American community. The Call and Post advocates greater control for Ameritech by urging the government regulatory community to deregulate Ameritech. There is also no expressed concern about the types of services that should be offered. The only expressed concern is that African Americans have as equal an opportunity as others to access the opportunities available through the information highway. The language used in the article is for the most part straightforward and very basic. Simple causal relationships are advanced with little reliance on metaphorical or abstract reasoning.

Description of Narrative

There are two dominant settings in this article, the present setting in which the information highway is being constructed and the future information highway. Three characters dominate the actions in the present setting: the Ameritech company, the African American community, and an expert, the Rev. E.T. Caviness. The African American community is also referred to as "Black" and "We" in the
narrative. The African American community is dependent on private industry characters to provide resources. Often ignored by the business community, African Americans are "miles" behind where they should be. They are usually the last to receive new technologies and "never utilized as test markets." Proud and hardworking, this community is "not asking for a handout, only a level playing field."

The construction of the information highway by Ameritech is a bright hope for altering these inequities in the future. Ameritech is an "enlightened" private sector company and through it, equal access and opportunities will trickle-down to the African American community. Ameritech pressures policy bodies to deregulate the telephone industry in order to facilitate access to the future information highway. As the constructor of the "on and off ramps" to the information highway, Ameritech is trying to "insure" fair distribution of technology to predominately African American and rural communities; communities generally overlooked by other Ohio utility companies. Ameritech petitions the Ohio Public Utilities Commission to permit them to wire "schools, homes, businesses, libraries and other entities with the new fiber optic telephone technology." Interestingly, in this article there is some mention of weak-link strategies (making sure there is access to the information highway in publicly-available sites) but rather than the government providing this access, the government character is asked to step aside
and let private industry (Ameritech) provide universal access.

The Ameritech company is an excellent role model for other private sector firms that are less benevolently motivated. Not only is Ameritech trying to provide access to potential participants in all communities, but Ameritech is also trying to provide business opportunities specifically to African American and other minority vendors. Ameritech pledges to "utilize minority vendors as much as possible during the $1.6 Billion dollar wiring and installation phase of the project in Ohio."

The future setting is one in which "all of America's homes" are connected by "interactive fiber optics." The Ameritech company offers economic and information resources to the African American community on the information highway, but little else is stipulated. This is a setting in which African Americans compete equally with other members of society.

The only expert cited in the article is the Rev. E.T. Caviness, Chairman of the Ohio Civil Rights Commission and pastor of the Greater Abyssinia Baptist Church. Rev. Caviness advocates support for Ameritech in their efforts to remove regulations that impede their ability to widely distribute technologies to various sites. According to Rev. Caviness, "This is something we absolutely must support. It
is clear that we are in a new age of information and African Americans must be in the forefront of this movement."

**Worldview**

The information highway world is one in which the African American community is given opportunities by private industry to "compete" on a "level playing field" with others. Large centralized electronic networks interconnect various sites and provide access to heretofore inaccessible regions to the African American community. As a consequence, the information highway offers the potential for greater equality; not increased discrimination.

This is a worldview in which the African American community does not initiate actions to obtain opportunities independent from what Ameritech deems willing to provide. Notably absent is any discussion of what services should be provided on the information highway. Nondiscriminatory access is focused on in this article, but access to what (beyond market opportunities) is not clear, and actions to insure access (training, subsidy programs) beyond Ameritech promising to put computers in certain publicly available sites (schools and libraries), is absent.

A passivity and sense of powerlessness underlay the African American community in this worldview; although, this community can be very competitive once given a "level playing field" by private industry characters. It is assumed that great benefits will trickle-down to the African American
community if Ameritech is deregulated and permitted to build and control the information highway; but just what these benefits are beyond nondiscriminatory access to information and opportunities remain unclear. Perhaps having nondiscriminatory access to information and opportunities is enough.


(Andy Reinhardt)

Reinhardt is interested primarily in how the information highway can facilitate connecting with customers and suppliers, improving employee communication, gathering competitive data, document sharing, reducing travel spending, encouraging telecommuting, reducing health care costs, and providing wider choices for consumers. Non-business applications are given scant attention in the article. The type, access, and control of services will be determined on the basis of how technical issues are resolved.

"value-added services," "trunk lines," "telco," and "formatted data handling."

**Description of Narrative**

There are four main characters: private sector companies, also referred to as cable, computer, and telephone companies; the government; technology; and experts. Actions occur in the present and future information highway. The present information highway is a "vast web of fiber-optic strands, coaxial cables, radio waves, satellites, and lowly copper wires now spanning the globe." This setting is dominated by competition between private industries vying for control over the information highway; thus, an emphasis on market access issues.

Most actions center on various "players" and their strategies for gaining dominance on the future information highway. Every technology company defines the highway based on "whatever the company plans to sell." Both the telephone and cable industries are "forging links with on-line services" to be in a position to offer "meaningful data content" in the future. The telephone industry is "strong where cable is weak." Described as the "largest switched distributed network," the telephone industry "handles millions of phone calls simultaneously...billing customers precisely for their usage." Reinhardt claims that telephone companies are more reliable and open than cable companies. This character, while very powerful and strong "suffers
bandwidth shortage." The telephone industry is "racing" ahead of the government and wishes to "invade cable territory."

Long-distance telephone companies form the "backbone of the Internet," and "aspire" for a big role in the information highway. They enjoy an advantageous position in the marketplace due to government policy and are beginning to offer local telephone access. Local access telephone companies (RBOC's-Regional Bell Operating Companies) are the "vanguard of data highway construction." These local companies provide the "access ramps to the backbone." These local telephone companies are buying cable companies and retrofitting existing local communication infrastructures to accommodate the transmission of video signals.

Cable companies favor one-way over two-way transmission on the information highway. They are dependent on telephone companies since they have to "lease backbone capacity from long-distance [telephone] carriers, or spend big money to lay their own digital fiber trunk lines." Cable companies are not as open or reliable as telephone companies, but they could "unseat RBOC's by providing access to long-distance carriers" and make important contributions to the information highway because of their ability to offer expanded bandwidth into many American homes. They also are "racing" far ahead of the government.
The computer industry is not discussed as explicitly as the cable and telephone industries. They are working to provide the tools necessary for greater access and convergence of already existing systems and "pride themselves on user-interface design skills."

This present highway setting has a long way to go before it is a site of efficient, speedy and ubiquitous access to information. There need to be "better on-and off ramps," "new vehicles, more destinations, better guidebooks on how to get there;" schools and businesses need to be interconnected, and information infrastructure providers need to have access to "meaningful data content."

Policy makers need to figure out how to keep prices low enough to facilitate access. Even now "cable and telco businesses are racing so far ahead of regulators, judges and legislators that their wish to invade each other's territories may be granted before proper protections are in place for the public."

Technologies need "greater computational power," "careful maintenance," capability to transmit signals in "real-time," and the ability to multicast to enable efficient video broadcast. There are several computer interfaces that hold promise to solve some of these technical problems. Homeworks promotes cable-based access to Internet and is intended to "act as living libraries on the data superhighway." Channel Works permits interconnection of
Ethernet LANs over Cable systems and can only be used with cable systems that can support two-way transmission. Hybrid Networks uses cable and phone lines and plans to provide interfaces to "millions of users lacking advanced cables services. Mosaic acts as "a client-side browser."

Interactive TV data servers that emphasize entertainment functions are described as a "new breed of computers." These data servers "feed data downstream to millions of users" and need to "store full-motion video, stereo sound, and other rich data types." Such capable servers are in the development stages and should be ready in a year.

There is dispute among different manufacturers as to the amount of computational power these servers need. Some argue that they need great computational power and others argue that they are input/output devices and do not require such power. Interactive technology is still being invented, "won't come easy," "won't come quickly," but is "definitely coming," and "will store [the] world's entire movie library."

ATM "spans the gap between packet-switch and circuit-switched technologies, and therefore is a "vital backbone technology for [the] data highway." This transmission standard also allocates needed bandwidth on demand guaranteeing real-time delivery of digital video data. Some claim however that ATM is "overhyped," "drops bits," and because it doesn't support multicasting "inefficient for broadcasting."
TCP/IP is the currently used transmission protocol for Internet and supports "public domain networking." A "connectionless" system, TCP/IP was not designed "for real-time data delivery." This protocol is different from ATM in that it is non-sequential and supports multicasting. Although ATM offers great competition, TCP/IP is "unmatched in universality and reliability." ADSL lets conventional copper wires carry more information. It is portrayed in the narrative as a "quick-and-dirty way to pump digital video over the existing copper plant;" however, ADSL is considered "no match for 50 channels of cable."

Internet "rides on shoulders of the phone system and is portrayed as a "remarkable, worldwide computer cooperative." Not owned by anyone, Internet is subsidized by the government and is growing; it may provide the "language, culture, and customs" to the data highway. A weakness of Internet is its inaccessible "arcane interface." The "backbone" and "on-ramps" of Internet are changing, and consequently, it is accessible to a "new class of users." Some of the old time users are afraid that Internet will "lose its communal spirit."

The future setting of the information highway is an environment in which "information is a commodity" and people are either providers or consumers of information. "Enormous opportunities will be unleashed for all providers and consumers of information...everyone will have access to the
information...those with the experience will profit from the information." There is a "ubiquitous internetwork that allows them [business users] easily and inexpensively to connect with customers and suppliers, improve communications among employees, and gather competitive data."

This future setting is also characterized by "fierce competition over services and prices" between competitors. While no one standard will dominate the technology that constructs this future highway, all components will be interchangeable, resulting in very accessible "interfaces" that permit a participant to access information located in different parts of the world with ease. "You could click on an icon to learn about northwestern conifers, and get connected to a server in Vancouver, and then hop a link in pursuit of details on pine cones and be transparently logged into a server in Oslo." Some portray this future setting as a very insecure place and others emphasize how "citizens [will have] access to a vast wealth of information." Despite these different portrayals, all the experts seem to agree that this future setting will be controlled by private industry characters. Reinhardt argues that the "...data highway will profoundly alter society..." He maintains that "when the hurdles are surmounted, enormous opportunities will be unleashed for all providers and consumers of information."

Just as private industry characters dominate the present and future settings of the information highway, they also
dominate the information provided in this article. Of the twenty-six experts referred to, nineteen are from private industry, three from the government, one from a university, and two are citizen/activists. Reinhardt's authority is tempered by the inclusion of sidebars narrated by others.

Worldview

The worldview presented in this article is one in which access to information and business concerns dominate the information infrastructure. Access to information is good business and profitable for those who have the expertise to either provide or consume the information. Information is a commodity and the information highway is a source of great monetary profit. An ideal world, in this discourse, is one in which every one has access to the information highway and the gaps are closed between the information haves and have nots. But the future is hardly ideal in this narrative. The world is divided between the producers and the consumers. The producers are large-scale corporations who control services and access to the information highway. The consumers are corporate users and people interested in accessing information. There is little place for one who is not technically interested and literate.

Information, profit, business strategies, and ubiquitous access to information resources are featured, but featured for the technical elite who can maneuver on the information highway. There is mention of the development of easy to use...
computer interfaces that allow a would-be consumer of information to easily travel to various sites on the information highway. The implication is that intelligence is embedded in sophisticated home computer systems, thus the information highway is decentralized and distributed through interconnected private networks. But there is no mention of training or subsidy programs to help all segments of society acquire the equipment. There is concern expressed in this article that the non-corporate participant on the information highway can only be protected through the actions of the federal government, but government institutions lag behind the competition to control the highway. Those without access to sophisticated technologies are clearly left out.

Conclusion

The story that emerges from this cluster of articles is one that begins in a very uncertain present setting. The cable and telephone industries are competing to build and control an information highway that will be easily accessed from the home. The telephone industry is massively connected, wealthy, and most probably will control the information highway in the future. A weaker cable industry tends toward deception to try to gain advantage. The computer industry collaborates with primarily the telephone industry to make devices easy to use on the information highway.
The general population is hardly visible in the present setting. They are "non-drivers" that are dependent on private industry characters to bring the information highway to their home. The government is weaker than private industry and is involved in much less action; when active, it scrambles to keep up with private industry. The importance of the government character is the extent that it provides incentives to private industry to build the information highway. Barely visible and most improbable is its power to regulate nondiscriminatory access to the information highway.

Some depicted technologies favor centralized switching, others favor decentralized networks. The articles in Byte and Mademoiselle portray distributed networks similar to Internet, but ADSL (a method of transmitting video signals unidirectional via telephone copper wires) is also featured in some articles.

Eventually the information highway is accessed from the home and technology is ubiquitous, although little is said as to how this ubiquity occurs. Ameritech promises if they are deregulated to provide non-discriminatory access in one article. The only others who argue for universal access are weak government characters; they are in only half the articles. There is more attention on market access issues. The majority of actions center around private industries competing to gain access to the marketplace. It is implied that the information highway is funded through subscription
rates and advertising revenues. A deregulated telephone industry offers competitive services filled with advertising to home subscribers.

Life experiences are technologically mediated from the comfort, safety, and security of living rooms. People spend their time viewing movies, buying products, and playing electronic games. When they engage in information sharing activities it is usually connected to business endeavors: gathering research data, facilitating office activities from home, testing software, and creating media products.

The primary purpose of the information highway is to generate profits to private industry characters. Lucrative commercial services such as home shopping, movies on demand, business services, and electronic game playing are emphasized. Little attention is paid to functions that build community, promote interpersonal communication, or involve people more directly in day to day life experiences. The information highway will enhance life experiences of African Americans and others, but this is defined primarily as providing a non-discriminatory environment in which African Americans can compete on equal footing with others, or through the consumption of products; not exactly the life-affirming activities suggested by Logan or Williams.

One might conclude that the trickle-down theoretical approach generates good social outcomes based on these articles, but I propose that conclusion is only partially
correct. The emphasis is on the trickling-down of consumer services throughout the nation; a rather restricted notion of positive social outcomes. The general population figures little in these stories of the information highway. These articles tell the reader how to function on the information highway as consumers and occasional producers, but always within prescribed limits established by private industry.
CHAPTER 3
NEW RULES

Four articles in this sample cluster around the notion that those who have traditionally been left out of powerful positions in the business world can achieve success through opportunities available on the information highway. They are from the following sources: *Oakland Post, Hispanic Magazine, Hispanic Business*, and *Working Woman*. Benefits will not trickle-down to certain segments of the population unless they take action to insure their future. The focus, in this cluster of articles, is on what specific segments of the population can do to have opportunities on the information highway. There is less reliance on experts than in Chapter 2; however, 96% of experts are from private industry.

**Overview**

These stories take place in an uncertain present setting. Actions that occur in the present determine who will be part of the fast-paced future environment. There is an emphasis on market access and economic efficiency. The rules of business are changing as technological innovation and a competitive global marketplace force large and small businesses to adapt to new challenges.
All types of private industry characters are in processes of great change. The telephone industry is building the information highway but is vulnerable to control by local regulators and must contend with cable and broadcasters merging into a single operating system (Oakland Post). Large transnational service industries are having to be competitive on a global level and are diversifying their workforce (Hispanic Magazine, Working Woman). Small businesses need to keep up with changes initiated by government initiatives. Such an unsettling time in the private sector suggests new opportunities for those who have the wherewithal to avail themselves of them. Segments of the population are at risk of being ignored on the information highway if they do not prepare now for the future.

African Americans, Hispanics, and Women are complex characters in that they are portrayed as powerful and powerless. African Americans are aware, but also distracted and foolish; they have with blinders on (Oakland Post). Hispanic professionals are disposable workers and prized employees. Women are entrepreneurial and in control of their lives; but they are also victims, oppressed and passive.

Government efforts do not resolve ambiguity for the population or protect their interests on the information highway. The government is in only half of the articles and their priorities are not oriented toward protecting the interest of African Americans, Hispanics, small businesses,
or Women. For example, the Clinton administration is building an information highway that will stimulate the national economy, and local politicians lag behind large corporate interests. Equity is clearly not a priority in the vision of the information highway that emerges in these articles. Economic efficiency and the expansion of wealth is the function of the information highway.

Technology is ubiquitous and the world is dominated by high-speed data transmission in the future: news, information, and entertainment products are distributed to a world of consumers (Oakland Post). Transmission of programs pervade all sectors of life. Business affairs are conducted via electronically mediated special interest groups and video conferencing (Hispanic Business). Practical services help women conduct family and business responsibilities easily from home, the office, or the automobile (Working Woman). The message is clear. Segments of the population who want to have the benefits of the information highway trickle-down to them need to position themselves to receive benefits.

A detailed analysis of each of these articles is presented in this chapter. I conclude with reflections on how access, funding, function, and control are represented and whether this representation is aligned with building a socially responsible infrastructure as described in Chapter 1.
Narrative Analyses

"African Americans Better Get Aboard Communications Highway."

Narrator Reed portrays the coming information highway as a "once-in-a-lifetime reconfiguration of the telecommunications infrastructure." African Americans must "demand a stake in" this reconfiguration or be left "on the outside looking in, begging for jobs that should have been ours to give." He advocates establishing "telecommunications districts" that give local communities ownership and control over local access to the information highway. If African Americans organized into local coalitions they could gain influence and power on the information highway, according to Reed.

If they do not take the "blinders" off of their eyes, they will be left on the "outside looking in and begging for jobs." Reed does not question the value of the information highway, rather, he encourages African Americans to organize into power blocs to reap the power and profit possible through control of the information highway. He is extremely pragmatic and puts responsibility on the African American community to create their own opportunities on the information highway.

Some of the descriptive terms Reed uses indicate a bias toward an urban fast-paced existence in which one competes to succeed. He uses a racehorse metaphor at different points in
the article, evident in the following excerpts: the information highway offers a "window of opportunity" if only African Americans would realize the "stakes" involved; companies are "jockeying to influence;" African Americans need to take their "blinders off;" the information highway is "up and running." Interestingly, racehorses have blinders placed by their owners on their eyes to not be distracted by the crowd, but Reed reverses this and describes blinders as distracting.

Description of Narrative

There are two dominant settings: the present setting in which the information highway is being constructed and the completed future information highway. There are five main characters: "We;" the private sector; government; "blacks;" and experts. The present setting is one in which the integration and consolidation of telecommunication/media systems into a "mighty single operating network is almost complete." This consolidation is dominated by strategic alliances among "corporate giants." Also characteristic of this present setting is a "struggle" between "broadcasters, cable operators, government agencies and allied media interests" trying to gain influence over the "development, expansion, use and control of our cities' cable systems." According to Reed, these cable systems will be the "on ramps" to the information highway.
The telephone industry is building the information highway. Bell Atlantic will have eight million "interactive customers before the year 2,000." The cable, computer, and television industries are also speeding the development of the information highway by consolidating their systems. African Americans are being left out of these current struggles and are in danger of being denied opportunities on the future information highway.

We are African Americans and aware that private industries are consolidating to form the information highway. Involved in "petty rivalries," we are distracted from taking actions that need to be taken to insure access to opportunities on the future information highway. We have the political power necessary to gain opportunities but need to assert pressure by forming "alliances with politicians, established organizations, media companies, and local civic groups." Through such alliances we could "carve out our own piece of the information highway action." We must take action now or be left out and "begging for jobs" in the future.

The government is "jockeying" with private industry to "influence the development, expansion and use of cities' cable systems." Local government commissions regulate the telephone and cable industries and can be subject to political pressure by organized black constituents. Many "career politicians" placed in their position by the black
community are lagging behind private industry in creating the "interactive network." These politicians struggle to "arrive at any definition of how to help the public that elected them." If held accountable, they would tell the black community "...that the cable television systems and telephone companies where we live are regulated by our local governments." Government characters have power but are uncertain how to use it and unaccountable to the African American community that elected them.

The character "blacks" receive the most attention in the narrative. They are "foolish" not to see the meaning of the current struggle between interested parties to consolidate telecommunication and media systems; they need to take "blinders" off of their eyes. Now is the time to "get on board" the information highway. Blacks "...need to see the nature of the stakes and move to realize the great profit and power potential in ownership and control of local facilities ...which could give us control and more than 10 million potential interactive customers." They must act quickly "before the window of opportunity" closes on the "vital economic opportunities."

Reed refers to one expert, Charles Tate, described as a business leader. Tate supports an argument advanced by Reed that the establishment of telecommunication districts could "generate economic benefits through local ownership and control." Tate is portrayed as a role model in that he forms
"alliances to gain more black carriers and influence" on the information highway.

The setting of the future information highway is characterized by two different scenarios; each scenario is dependent on actions taken by the African American community. In one scenario, the African American community does not assert pressure on local political organizations and is consequently left out and "begging" for jobs and opportunities on the future information highway. In the other scenario, the one in which most of the action in the narrative occurs, the African American community asserts pressure to establish "telecommunications districts" and consequently control local access to the future information highway. These districts ". . . issue special purpose bonds to raise capital. . . hire businesses owned and operated by people of color, community development organizations and black telecommunications experts. . . [and] have the power to negotiate strategic alliances, joint ventures." The "production, distribution, and presentation of news, information and entertainment products and services to the worlds consumers, on demand" occur in both settings, regardless of which set of actions the African American community adopts in the present.

**Worldview**

Competition and struggle dominate this worldview. The information highway is coming. Certain aspects of this highway are inevitable: the consolidation of media systems
into a giant centralized system; a bias toward consumer services in which large revenues will be amassed; and a bitter struggle to control local access points to the information highway. If African Americans do not assert their political power quickly they will be left out of the opportunities available in the future and forced into a dependency position. An ideal world is one in which African Americans control local access to the information highway and enjoy economic advancement in the future.

This worldview is dominated by fast paced action and competition. Passivity in commerce and community activities is unacceptable. There is little faith in business or government characters to act benevolently toward others, rather one must protect their own interest against the mighty and pressure political bodies to act responsibly. No one is going to protect the interests of the African American community except the African American community.


The focus in this article is on strategies that Hispanic and other minority employees can use to gain jobs on the information highway. Narrator Heller refers to many private industry experts who describe the need for prospective job
applicants to be flexible and willing to adapt their life styles to specific market demands. One may find employment on the information highway if he/she is willing to be adaptable, relocate, and be educated to excel in business, communication, and technical skills.

Heller does not question the value of the information highway, nor does she attempt to intervene in policy formation. To Heller, the information highway is a foregone conclusion and the "writing is on the wall." Her role is to advise Hispanic and other minority prospective employees on tactics to gain access to jobs on the information highway. She does not concern herself with questions about the purpose of, or access to, the information highway. Heller values professional career, stable jobs, and material success. There are only two possible scenarios for the future in this article: "The changes ushered in by the 90s give professionals new, exciting career possibilities or terrifying, unstable futures. It all depends how you look at it and how flexible you can be."

Heller uses little metaphorical language, rather a pragmatic, non-poetic use of language prevails. She functions in the world of practicality. The only exception to this is her occasional attribution of human qualities to the job market and various industries. She refers to the job market as having a "pulse," companies as "growing" and having
needs, and the communications industry as having a "technical nature."

Description of Narrative

The primary setting in which most of the action occurs is the "corporate culture" of the information highway. This is a setting in which social relations are being reconstituted. Those who were assured a position in previous corporate cultures may or may not retain positions on the information highway.

The central action is the transition of the traditional corporate job market to the job market of the information highway. The narrative begins with an assertion by job recruiter Rowena Yates that "the 90s [is] the decade of change." She "tracks newspaper classified advertising across the country" and notes that: "Hiring is up in almost every region of the country except Southern California...With major mergers and corporate restructuring, there are a lot of changes. And you have to keep up with them to be hired."

Many "professionals" are being laid off and "their line of work will soon be obsolete." Some may not be flexible enough to adjust to the changes brought about by the information highway and will be excluded; others, previously denied opportunities in many pre-information highway corporate cultures, have increased access to new jobs and services. No longer can one leave the "nurturing arms of
college" and enter "those of a giant corporation for a lifelong career."

The rest of the action in the narrative are elaborations of the hiring practices on the information highway. There are three main characters: people employed on the information highway; information highway industries that employ people; and experts. Many of the people employed on the information highway are bilingual, derive from Hispanic or other minority groups, have a technical skill and/or communication skill, and are "business savvy." Highly educated, these employees recently graduated from college or have both education and extensive experience. They adapt their lives to the needs of private industry, "obtain new skills," and "reconsider what kind of work or position" they are willing to take based on company requirements. If the job requires them to move they are willing to. Even "seasoned professionals" start over again in their "move up the ladder."

Companies on the information highway are referred to as computer, software, or cellular communication companies. Specific companies referred to also include insurance, financial, and telecommunication companies, such as: AT&T, Nynex Mobile Communications Company, American Express, GTE, and the Chubb Company. The "corporate cultures" of these companies are changing through mergers and restructuring. Hiring and retention decisions are based on the need to stay competitive in a global marketplace. Values such as
competition, efficiency, and productivity are emphasized, and providing security for employees are devalued. Employees must adapt to the needs of these companies if they want to work on the information highway.

Many companies are hiring Hispanics and members of other minority groups. There is a greater demand for employees who have "second-language skills...." A high percentage of the client base of the Nynex company is composed of "Hispanic and other minorities, so [the hiring of minorities] is going to speed up in the coming years." Even though American Express does not "set out looking for people with bilingual skills," the company is "making a concerted effort to hire Hispanics and other minorities to diversify its domestic offices."

The five experts referred to are all in management positions. Four have job titles that indicate responsibility for job recruitment. Two of these titles refer specifically to minority recruitment. Rowena Yates, a branch manager at a recruitment and advertising agency for Kidd, Schneider, and Dersh; and Pete Medrano, staff manager for university relations and college recruiting for AT&T, discuss employee traits sought by employers on the information highway. Lisa Durant, staffing manager and diversity coordinator for the Chubb Co., and Jeffrey Robinson, senior manager of campus recruitment and minority imaging for American Express, focus many of their comments on minority recruiting. The fifth expert cited, James Gerace, is associated with the Nynex
Mobile Communications Co., and does not have a job title mentioned in the article. All of these experts are directly quoted by Heller and give advice to prospective employees on traits/skills that if possessed make one a more desirable job applicant on the information highway. They provide information that Heller uses to support her arguments that the information highway offers job opportunities to Hispanic and other ethnic minorities, if one is flexible and willing to adapt his/her life to the needs of private industry.

**Worldview**

An ideal world, in this discourse, is one characterized by Hispanic and other minority employees gaining access to opportunities on the information highway by adapting to changing corporate cultures. This is a world in which efficiency, professionalism, practicality, commercial success, and competition are dominant. Other values, such as community relations, intact family life, and non-practical pursuits are secondary.

Segments of the population either adapt to the changes brought about by the private sector through the use of new technologies, or live a "terrifying, unstable" future. Private Industries dominate and control all aspects of life. The employee has no negotiating power to determine their own future except by adapting to changes enacted by private industry characters. The uneducated, working poor, senior citizen, and disabled do not appear in this worldview.
The arrival and purpose of the information highway is a foregone conclusion in this narrative; the information highway will stimulate the economy. Future economic expansion depend on the ability to provide "telephone-like connectability between users and services, and between users and other users." This connective capability is referred to as "telepower" by the narrators. "Telepower" is "made possible by digitalization and digital compression," rendering technology the chief causal agent in the narrative. Through technological means "global commerce, technological innovation, and intellectual leadership" will be joined.

Two individuals wrote this article, but they speak with a single voice. The credentials of the narrators appear in a small note at the bottom of the article. Lynda Y. de la Vina, first author, is an academic. She is the associate dean for graduate studies and research at the University of Texas at San Antonio and co-founder of Operational Technologies Corporation. John D. Fernandez is a senior vice-president of Operational Technologies Corporation. They establish a strong authoritative voice in the article, and perform the roles of advisor and teacher. They advise the reader as to where "commercial potential lies," what is "cost-effective, and how small businesses may profit in the future on the information highway. No experts other than
themselves are referred to in the narrative. There is a pragmatic tone to the narrative. The thoughts, feelings, and motives of the characters are immaterial; actions are what is most important.

Description of Narrative

The dominant setting is the information highway; however, this setting changes depending on the stages of information highway development. People are eagerly anticipating a future telecommunication infrastructure that will have as comparable an impact on future world economies as railroads and airplanes have had on contemporary economies. There are three main characters in this article: the government; technology; and the private sector, symbolized by small businesses.

The government character refers to the Clinton Administration; a powerful character who is initiating actions and creating the information highway. Vice-President Al Gore formulated plans for the National Information Infrastructure (NII), a "keystone of the Clinton Administration's economic policy," after gaining favor from the electorate to create an information highway that would "stimulate the economy" during the Presidential campaign of 1992.

Companies that want to be in a position to profit on the economic and market changes brought about by the information highway need to take certain actions in the present formative
stage of information highway development. These companies need to set up electronic networking systems and keep up with what the federal government is doing to establish the National Information Infrastructure (NII). They also need to gain expertise in relevant future network applications.

Technology is the conduit to "economic growth" in the narrative. Economic expansion is dependent on infrastructure technologies such as the information highway: "In the 21st century the information superhighway will be the network that joins global commerce, technological innovation, and intellectual leadership." Internet is discussed extensively in the narrative. "Growing" by 15% every month, Internet "incorporates more than 3,000 interactive discussion groups." The Internet has "enormous commercial potential," is very "cost-effective," and "creates temporary working relationships" to optimize the resources of participants. Internet is the foundation of the National Information Infrastructure.

Once in place the information highway is a setting dominated by high-speed data transmission. The simultaneous transmission of "diverse programs via television and electronic services with telephone-like connectability between users and services, and between users and other users" pervades all sectors of life. Small businesses with technical expertise provide support services to many information highway "users." Efficient and speedy business
transactions are facilitated by "E-Mail." Electronically mediated special-interest group discussions and video conferencing prevail.

Worldview

An ideal world, in this discourse, is one in which economic stability and expansion prevails. Business transactions are expeditiously handled electronically, and new market opportunities are exploited by small businesses. The information highway provides integrated connectivity worldwide, and thus, enables new and improved markets and services. This information infrastructure is the central hub around which a homogenous world economy rotates. Speed, efficiency, competition, and material acquisition prevail in this worldview. Those who can adapt and change to a technology-driven capitalist marketplace will succeed; but anonymous market and technological forces generated through government initiatives predetermine the environment in which people respond.


The information highway is portrayed in this article as a conduit to economic and professional advancement for women in the "high-tech" field. This "superhighway" is expected to generate $3.5 trillion dollars by the end of the century. Narrator Fryer is concerned that women will be left out of
these immense profits: "In story after story, deal after deal, the major players are the same white males who already run the leading cable, communications, and computer companies." She asks the question, "where are the women drivers on the information superhighway" and examines the site of the computer industry (past, present, and future) to take a "closer look at how women have fared..."

She concludes that the domination of the computer industry by "white men" may slow advancements women experience on the information highway, but eventually new opportunities will occur.

Fryer's narrator responsibilities are shared by a narrator of a sidebar story in which the future information highway is envisioned. Narrator Francine Hermelin describes a day in the life of "You." Women are "drivers" on the information highway and not "in the slow lane" or having to "take detours..." They use technology to facilitate family and professional responsibilities.

Both narrators assume a reading audience that is female and share a desire for women to achieve success in corporate America. They use language and metaphors that speak to the experiences of women: the superhighway is suppose to "knit our computers, televisions, and telephones into networks;" there is a "forbidding, no-girls-allowed atmosphere of tree houses;" at the "birth of the PC;" "fill your dance card with a variety of experiences;" in a "testosterone-tinged
atmosphere." In all of these examples, one senses an awareness on the part of the narrators of the traditional roles associated with men and women, as well as a feeling of being left out of activities on the basis of gender bias.

Description of Narrative

Actions occur on either the current or future information highway. The current information highway is a setting in which men are the "drivers," and the "major players" are "white males." Computer companies are "jockeying for a place in the fast lane" with telephone and cable companies. Women make up a small part of the workforce in the computer industry; only 2.9% of the CEO's are women. Only 5% of senior-management positions belong to women. Women have traditionally been oppressed in the corporate culture of the computer industry. For example, the expectation that employees will work around the clock poses a greater hardship to women than men because of additional responsibilities in the home. In addition, a lack of available mentoring programs limit women from attaining powerful positions.

Although women have little influence in the current setting, everything is likely to change in the future. Technology, which has kept women out of powerful professional positions, will be controlled and used by women to advance themselves. The personal computer "born in the 1970's" was predicted to "provide a level playing field for women" but
women "didn't swarm to Silicon Valley..." The association of computer technology with mathematical applications limited women's involvement. The computer is being looked at as a creative tool beyond mathematical applications, consequently, women are more involved with computer technology. Multimedia creates new opportunities for women. For example, currently, one third of the managers of multimedia companies are women. Electronic mail is a "flattener of organizations" and encourages non-hierarchial communication patterns; thus, easing the conflict many women face in balancing work and family. Internet "links many networks in a huge communications web...perceived by many as the forerunner of the information superhighway," although relatively few women participate on Internet.

Many companies are starting to hire women for leadership roles. Bill Gates hopes to appoint women to the board of Microsoft within the next couple of years. He is hampered by a job applicant pool dominated by men. Guided by marketplace considerations, the computer industry changes their "minds and hearts" about the value of women in the workplace when they recognize women's buying power.

Women receive the most attention in the article and are portrayed differently depending on the setting. In the current setting of the information highway, they are victims of self-doubt, lack technical training, have to face the bigotry of men, and are "shut out of real power and presence
in the computer industry." "Many "girls" buy into the common perception that a "technical female is an oxymoron." Some have an "iron determination to succeed, but many "lose heart in the testosterone-tinged atmosphere." Women find their technical capability questioned at work and seldom feel encouraged. Some women are entrepreneurial while others do not take advantage of available opportunities. They tend to cluster in "less powerful staff jobs." Women at work meetings wear "red dresses" and "brighten up a room." The few women who achieve power in the present setting are profiled in sidebars. These few role models "enjoy visibility and respect-not to mention impressive fees."

Overall, women are passive on the present information highway. They react to stimulus from technology, men, or general circumstances. Discouragement causes women to "lose heart" in trying to succeed. An inhospitable climate causes "self-doubt among high-tech women." One of the few instances when women are portrayed as initiating action is when they wear "red dresses" and thereby "draw attention" in a room, or as consumers, they change the "hearts and minds" of the computer industry.

This passivity and victimization disappears in the future. Women control technology and are in high positions of authority at home and in the workplace. Technology is in place, ubiquitous, and facilitates professional, family, and social activities. Information is easily accessed from home,
the office, and the automobile. Women communicate with their children's school nurse from their office; send voice mail to a colleague in another part of the country; use E-Mail to communicate with colleagues at work, as well as order lunch; check for available parking spaces on a computer in their automobile; and video phone family members and friends.

Women are not dominated by technology as often they decide to not mediate their activities through technology: At night "with both kids asleep, you relax on the couch and flip through nearly 500 channels, but there's nothing to watch. So you curl up with a book, of all things, and fall asleep." Even though home-shopping is available you decide to shop at the mall. Women install blocks on their television sets so that their children cannot order products without their knowledge. Women choose to read a paper copy of the newspaper rather than scanning an electronic version. In a prophetic stance, Fryer ends the article by claiming that: "sooner rather than later, a lot more women are going to be brightening up those rooms [business conference rooms controlling the information highway]."

Men, on the other hand, are "Boy Wonders" who started some of the biggest computer companies and have played with electronics for years. Unlike women, men in the present setting, are willing and able to work through the night. They are competitive, oppressive, and challenge women's technical knowledge, although their technical expertise is
taken for granted. Men are reluctant to enter into mentorship relationships with women for fear of being charged with sexual harassment by female mentees. Men are confident and are change agents in that they "run computer, communications, and cable companies," "shut women out of executive positions," "start computer companies," and discourage women from pursuing careers in computer technology.

Fryer relies on expert testimony to depict a current information highway that is oppressive to women and yet a possible source of opportunity. Out of sixteen experts, fourteen are women. All but one expert work within private industry in high management positions. The one exception is Pat Schroeder, a Congresswoman and chairperson of the House Subcommittee on Defense Technology Conversion. Fifteen of the seventeen experts are directly quoted, thereby strengthening their authority in the article.

**Worldview**

This narrative contributes several assumptions to perceptions about the information highway. An ideal world, in this discourse, is one in which women are in powerful corporate positions on the information highway and have authority in the home. The information highway is an avenue for women to achieve this power and influence, but women need to seize the initiative.
Traditional communication industries are dominated by men and oppressive to women. But despite this oppression, the information highway offers hope to women. Technologies available on the information highway facilitate social, family, and professional responsibilities for women and equalize the differences between men and women in the workplace. Technology is mastered by women; women are not subservient to technology. Women are active in the world and maintain social practices independent of electronic mediation.

This is a worldview in which women are oppressed in the current setting and there are no men in positions of authority in the future envisioned setting (although there is no mention of male oppression in the future setting). There is little sharing of power between the two in either setting. Business concerns and professional careers are emphasized. Women who develop business and technical expertise are successful. There is no mention of women who choose to stay at home and raise children. Women are portrayed as career women and mothers, not wives. Efficiency, control, and professional advancement reign in this worldview. There is little room for chaos, insecurity, or feelings of inadequacy in the present or future settings of the information highway.

Conclusion

Competition and struggle dominate the settings of these articles. The information highway is coming and certain
aspects of it are inevitable. Technology is ubiquitous but the central access point is in the place of business; there is relatively little discussion of the information highway in the home. Little attention is paid to the general population's access to the services of the information highway. The focus is on how specific segments of the population can access business opportunities on the information highway.

The funding mechanism for the information highway is a blind spot in these articles. There is no discussion of the expense of building the information highway, or who should pay for it. We can imply, based on the actions of characters in two articles (Oakland Post, Hispanic Business), that people and/or businesses subscribe to services from vendors; but otherwise, there are no indications of who pays for the information highway.

The function of the information highway in these articles is first and foremost to expedite business transactions and the making of profit. Networking practices are emphasized, but always in the context of business transactions. Access to local resources through electronic means help women to satisfy both social, family, and work responsibilities in the article from Working Woman, but this is a minority view in this cluster.

There is little attention on central switching or the public network. One narrative focuses attention on
controlling local access routes, but it is unclear whether these are public or private roads. There is an emphasis on sophisticated software that facilitate computer networking in the actions and technologies discussed; thus, the reader is left to assume an emphasis on private networks and distributed control.

A cynicism underlies these articles as to whether benefits will trickle-down to specific segments of the population. Rather than waiting for trickle-down benefits, specific segments of the population (traditionally segments often left out of economically advantaged positions) are urged to get positioned to compete on the information highway.

The general population, beyond targeted segments, is not evident. There is little concern for those who cannot compete on the information highway. The overriding theme is everyone for themselves; get what you can. Speed, efficiency, competition, professionalism, and material acquisition are the dominant values. Social relations and non-economic pursuits are of secondary value. The uneducated, working poor, senior citizens, children, and disabled do not seem to have a place on the information highway.

Policy issues such as access, funding, function, and locus of control are tended to very little in these articles. Perhaps this is the result of a long standing tradition of
not having input into policy considerations, and a general assumption of the inevitability of a dog eat dog world; but, the only real ability to intervene expressed in these articles is to generate access to business opportunities. Strangely, a deep level of passivity undergird the actions advocated in these articles.
CHAPTER 4
SOCIAL GOOD

Four articles in this sample cluster around the notion that the information highway can strengthen or weaken democratic principles depending on whether the government protects the public's interest. They are from the following sources: (1) Rolling Stone, (2) Christian Century, (3) Tikkun, and (4) Modern Maturity.

Overview

A central theme is that benefits will not trickle-down to the general population unless the federal government enacts protective policies that restrain private industry monopolization of the information highway; thus, these articles focus on access and function concerns. There were references to ten experts and none were from private industry. Four experts were authors who wrote books on the information highway (40%), three were from academia (30%), Mitch Kapor was referred to in two different articles (20%), and only one expert was from government--Al Gore (10%).

The present information highway setting is crowded, primitive, and harsh. Traffic jams and confusion abound. Private industries compete and invade territories as they

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desperately try to seize control in this embattled environment. The general population consists of the "Civic Sector" (Tikkun), "People" (Rolling Stone, Christian Century), "We" (Tikkun, Modern Maturity), and "Everyone" (Christian Century). These characters live in a great deal of uncertainty. They depend on the federal government to protect them against private industry greed on the information highway, and seek to use the information highway to interact with each other and gain access to information.

Private industry characters are building the information highway. The cable industry is more deceptive and controlling than the telephone industry, but they are both fierce competitors who are excessively concerned with private profit at the expense of the public good. Information providers, broadcasters, and media companies are also greedy and unconcerned with the public good (Tikkun, Modern Maturity). The only contradiction to this one-dimensional portrayal of private industry characters is the computer industry, viewed in the article from Rolling Stone as aiding access to the information highway.

The government is mentioned explicitly in three of the four articles and briefly in the remaining narrative from Modern Maturity. This character has to insure that policies that protect the interest of the public on the information highway are enacted. The only source of power the government has is to provide incentives that enable private industry
characters to keep prices low and provide services that facilitate human interaction and political empowerment. It is uncertain if this can be accomplished as the government is dominated and distracted by private industry in half of the narratives (Tikkun, Rolling Stone).

There is confusion as to whether intelligence will be embedded in a central switch or in customer premises equipment (CPE); it could go either way. Digital networks are featured in all five articles. Internet is mentioned specifically in three of the four articles and Internet type functions are depicted throughout the cluster. Movies, games, home shopping, information, and television programs are piped into the home to a captive audience in three of the four articles (the exception is the narrative from Christian Century).

The future setting is not clearly established. Decisions in the present determine what the future will be. If the government protects the interest of the general public than the future setting of the information highway will be one in which people use networks for whatever they want, barriers are broken down between people, and the population is empowered through unfiltered access to information. If the government does not protect the public’s interest on the information highway, the future setting is one in which control over a vast wealth of information is given to private industry characters, and the dominant activity of the
population is consumerism (Rolling Stone, Tikkun), personal privacy is intruded upon by private industry characters (Modern Maturity), and passivity and social isolation spread throughout the population (Rolling Stone, Christian Century, Tikkun).

A detailed analysis of each of these articles is presented in this chapter. I conclude with a summary of how access, funding, function, and control are represented and whether this representation is aligned with building a socially responsible infrastructure as described in chapter 1.

Narrative Analyses

"Civilizing Cyberspace: The Rolling Stone Interview with Mitch Kapor." Rolling Stone, June 10th 1993

(Jeffrey Goodbell).

This article is centered around an interview Goodbell conducts with Mitch Kapor, noted computer expert and social activist. Goodbell provides information that is either substantiated or refuted by Kapor who is the real authority in the article. Kapor argues that the information highway (also referred to as "cyberspace") is still in its formative stages. Now is the time to decide what kind of communication services the information highway should support. Kapor urges the federal government to not be distracted from developing
an infrastructure that facilitates open access and the capacity for two way transmissions.

Kapor favors an integrated, flexible, decentralized infrastructure that is based on open network architecture. This infrastructure should empower the participant at home to be both a sender and a receiver of information on the information highway. Kapor argues that "the task at hand is the transformation of a whole bunch of frontier into a slot of space where a lot of people can live for a long time in a civilized society."

Description of Narrative

There are five central characters: the general population signified by "You," and "People;" the private sector, also referred to as the telephone, cable, and computer industries; the federal government; technology; and expert Mitch Kapor. In the beginning of the article, Kapor takes the reader to the present and future information highway. The present highway (cyberspace) is raw, primitive, crowded, and lacks defined boundaries: "...you have to churn your own butter...You can't go down to the 7-Eleven and buy a stick of butter because it's not that well developed. You have to do a lot of your own technical work or have someone do it for you, because things are not running smoothly."

People are brought together by the harshness of the environment into little communities. Many people work at home with their modems and talk to many others on Internet.
Most communication on the highway is a "bunch of people screaming at each other...nine hundred and ninety-nine times...one time in a thousand" an "on-going group conversation...reinforces democratic values..." and is "a very effective tool for political organizing and political discourse." Despite the penchant for interacting electronically with other people in "cyberspace," people are dependent on private industry. They are stymied from fully being able to telecommute, access unfiltered information, or distribute multimedia products electronically from their home until more sophisticated technologies are available.

The majority of actions occur in the story Kapor tells of the current struggles over control of the information highway. Most of the battles are fought in Congress and the marketplace. There are three main combatants: the telephone industry, the cable industry, and the computer industry. It is difficult to tell who is on what side as confusing battles ensue based on opposing visions of the information highway. To add to the confusion there are emerging alliances between various combatants. "Rebels" are trying to strengthen the computer industry's influence in Congress. The cable and telephone companies "each want a piece of the other guy's business, but there are legal restrictions on both sides."

Three "battle lines" are being drawn around key technical issues: bandwidth, openness and control. The "network that comes into your home and terminates in a little
box on top of your TV will allow for one-way or two-way communication" depending on how these issues are resolved.

Open Architecture, the public dissemination of standards which allow anyone to compete in furnishing interfaces, stimulates competition. Integrated Services Digital Network (ISDN) allows "the guy on the street to start messing around with a computer...software developers to start writing programs." The deployment of ISDN is held up by the "mind set" of engineers who argue that it is obsolete. Kapor argues that ISDN is not the most powerful tool but it is "good enough" to get started. By implementing ISDN, the telecommunication industry will allow people to work at home, and thereby permit people to seize "control of their economic destiny by going into business for themselves." Internet is a new medium which allows many-to-many communication. When it is functioning well it helps to develop ideas and is an effective tool for political organizing. At its worse, Internet can degenerate into people attacking each other as well as other (unspecified) problems.

The government is not willing to build the highway. This character is distracted from focusing on real policy issues by the telephone and cable companies: "So far, the debate has not been about infrastructure, and open networks, it's been about what should telephone companies be able to do, what should cable companies be able to do, cross-ownership issues. Those are legitimate issues, but those should not
define the debate about information and communications policy."

The cable and telephone companies are compared to the Union Pacific Railroad who bought up land rights cheap and seized control of large portions of the West. They are serious about "building the fiber-optic field of dreams to bring very large amounts of bandwidth to the home and workplace" and are battling each other. There are several inconsistencies in the way they are discussed in the article. They are communication companies but do not believe in "openness." They are incompetent and unable to compete and yet: they control Congress, control services offered into the home, and control the direction the technology will take in the future. The computer industry is unified in the vision that the future network should be based on open architecture and incrementally implemented. The voice of the computer industry is starting to be heard in Washington, but this industry will face serious problems if the cable industry controls the services that are available to subscribers in the home.

The future information highway envisioned by Kapor is a setting where "people are using networks for whatever they want" and are being empowered through unfiltered access to information. Kapor envisions "enormous applications" being made available through the information highway. "So it would be terrific if everything were televised. That's perfectly
possible and not that expensive. If there were forums for that, and people could talk back, then people would sort themselves into the issues they really cared about and talk about them, and the people in Washington and elsewhere would listen to it."

**Worldview**

This article contributes several assumptions to perceptions about the information highway. An ideal world, in this discourse, is one in which people are receiving unfiltered information and entering into meaningful discussions with each other to make the world a more civilized place. Two oppositional forces dominate this worldview. One force is based on competition and the other force is based on cooperation. Access to the marketplace and control of the information highway indicate tremendous competition; one must be able to defend and fight for the future he/she want on the information highway. But an equally strong force in this article is the potential for creating a more civilized and democratic way of life through the information highway. For example, people often act uncivilized on the Internet, but the potential for civility is always there, and occasionally it is even actualized.
"The Information Superhighway: Going on Line."

Christian Century, February 2-9, 1994 (James Wall).

The use of the information highway to facilitate community building and democratic ideals is featured in this article. Narrator Wall urges the federal government to monitor the activities of private industry characters to insure that "the common good" is served on the information highway. The construction of the information highway signifies a "media revolution" which could have entirely different outcomes depending on policies enacted at this time. Private investment must be balanced by public control to insure that the general population is served rather than exploited.

Wall's affiliation with Christianity and orientation toward community service is evident in the descriptive terms and illustrations he uses in the article. He testifies as to how he was "introduced to the spirit of community in the network." He emphasizes a "superhighway" that serves users rather than "merely" exploits them. He also describes how he accesses religious and church news through Internet.

He is interested in the use of technology to increase democratic ideals by expanding opportunities for participation in the political process to a wider array of the population. Suspicious of large companies motivated by profit, and not the "common good," Wall has confidence in the federal government to protect the interest of the population.
Through government policy that protects the "common good" rather than profit alone, "democratic interchanges" will prevail, and the information highway will facilitate new social connections, rather than social isolation.

Description of Narrative

There are five main characters: the general population referred to as "people," "everyone," "members of communities," "individuals," and "all of us;" the private sector referred to as information industries; the government; technology; and experts. Actions occur in the present and future information highway. The present information highway is composed of "numerous small highways that carry data and messages over a variety of systems." There are many "traffic jams and confusing intersections." But despite the confusion, there is a "deep sense of connection to people around the world." Various communities of people "gather around their individual computer screens and talk with another..." Often "strangers become friends...face to face meetings sometimes follow."


This populace is accessing information, interested in politics, quickly learning how to "drive" on the information highway, emotionally supporting each other, providing
information, protecting each other, and feeling a deep sense of connectedness to one another.

Wall recounts some of his own experiences on the information highway. He felt overwhelmed the first time he tried to communicate, but when he made a mistake he was "introduced to the spirit of community in the network." He inadvertently sent a message intended for one person to everyone participating in a network. When he realized his mistake, he "immediately" typed an apology. In response to his apology he got back two quick responses from strangers. One response was from the leader of the group who told him that he had "zapped" his first message so it was seen by only a handful of readers. The second response was from someone who said, "Don't worry, it happens to all of us."

There is a flurry of activities on the current information highway. Participants "look up topics in an encyclopedia, make airline reservations...chat at any hour of the day with potential pals..." Sometimes these chats become extended conversations focused on topics ranging from "sermon helps to the English language." One "troubling development" on the information highway is the sharing of "explicit sexual conversations and images...through the networks..." allowing easy access by children.

The information highway is a "media revolution that will expand our horizons," but if left unchecked could give a great deal of control to a "limited number of profit-oriented"
hands." The private sector, referred to as information industries, are the telephone, cable, and computer industries. These industries are equally depicted as "fierce" competitors, creators of "information bottlenecks," "concerned with profits" at the expense of "the common good," and in need of oversight by the government to "keep the competition fair." They are the builders of the information highway.

During the Reagan and Bush administrations, "marketplace forces" were allowed "to determine the direction of the media revolution, with little government input." The current Clinton administration "wants government to play a role." The administration will "rely on the private sector to build the information superhighway" and will "devise investment incentives, to insure affordable universal service, to keep the highway democratic, and to protect both privacy and intellectual-property rights." Only if the government protects "the common good" will increased democracy occur over the information highway.

Technology is a complex and unpredictable character relative to its effects on community building. Sometimes technical systems fragment communities, and at other times technical systems enhance community building. Communication media has traditionally been controlled by private industries; and its function determined by market forces. Digital networks allow one to "plug into information" and
gain access to information and conversations. The types of connections are determined by the balance between private and public sector control.

Wall refers to three experts: Al Gore, writer Howard Rheingold, and New York Times writer Peter Lewis. He refers the most to Gore. The article begins with Gore watching Congressional activities as a child and ends with a to a reminder by Gore of the importance of a balance between public control and private investment of the information highway. Wall often refers to illustrations of the use of the highway as described by Gore, as well as Gore's position on the role of the federal government to insure the information highway facilitates democratic ideals. Wall extends Gore's arguments, but the other experts add support to Wall's opinions. Rheingold describes the community-building activities presently occurring over the information highway, and Lewis describes how future interactive services will enable "anyone" to communicate with "the vice-president."

The setting of the future information highway is one in which there is "fierce competition" between "information industries-cable, local telephone, long-distance telephone, television, film and computer." This competition is driven by "enormous profits" that can potentially be earned on the information highway. People participate in interactive news conferences: "anyone with access...could sit at home and talk
with the vice-president by typing in messages that were transmitted by phone." In the not too distant future "these years will be remembered as the horse-and-buggy stage of the information-sharing era." Barriers are broken down between people and participants have equal access to information and decision makers.

**Worldview**

The ideal world in this article is one in which people are feeling connected to each other and are using technology to facilitate democratic ideals and interpersonal relationships. People are participating in political processes, communicating with each other, gaining information, and giving emotional and spiritual support to each other. Technology mediates communication processes to facilitate face to face interaction; not to take the place of such interaction. Homes are interconnected to libraries and doctor's offices, permitting even the most physically isolated household to have access to resources commonly enjoyed by urban dwellers. Barriers between different segments of the population are broken down as a person at home has the capacity to electronically interact directly with the vice-president of the United States. But the establishment of this ideal world is dependent on the willingness of the federal government to monitor the actions of the private sector to protect the interest of "the common good."
The values emphasized in this worldview are community, cooperation, and democratic ideals. Emphasis is placed on communication, education, medical, and information functions; entertainment and consumer services are not emphasized. Also emphasized is the need for a powerful central government to control the selfish and greedy impulses on the part of private industries. The population is incapable of defending itself against the mighty force of private sector search for profit on the information highway.

The Information Superhighway: Roadmap for Renewed Public Purpose, Tikkun, July-August 1993 (David Bollier).

The use of the information highway to address critical social needs is featured in this article. Bollier's attitude is that the federal government needs to protect the interest of the "civic sector" on the information highway from private industry domination. He assumes that a battle must be waged against the "corporate guardians who will fiercely resist." Both the Clinton administration and the reader are called to action: "We need a policy framework as visionary as the new electronic technology itself..." Bollier is very authoritative. He refers to four experts: two from the academic community and two co-authors of a book (non-designated affiliation). These experts are referred to sparingly and support propositions advanced by Bollier. His expertise is established to the reader upon first glance at
the article. Above the title is a notation, "Memos to Clinton," and at the bottom of the first page is a brief description of Bollier: Bollier "is a journalist and consultant with extensive expertise in electronic media, consumer advocacy, public policy, and law." The article "is based on a report written for the Center for Media Education, a public-interest organization in Washington, D.C."

The narrative is told with the assumption of an educated readership in mind. Abstract concepts and descriptors are used that contribute a dramatism to the narrative and signify narrator Bollier to be public-minded and somewhat idealistic. He speaks of a "public-spirited vision," an "electronic commons in the media landscape," a "vibrant telecommunications civic sector," a "public consciousness [that] will almost literally be rewired," and "a fresh public purpose." He prefers an information highway that first and foremost serves the development of community and family, rather than as primarily a source of profit for private industry.

Description of Narrative

There are six main characters: "We;" the private sector referred to as telephone companies, cable companies, broadcasters, and information providers; the federal government; the civic sector; technology; and experts.

Most actions occur in the present time as the information highway is being planned, or in the future when
the information highway is complete. In the present setting the television broadcast infrastructure does not honor or promote diversity. Excellent programming does not "survive the forces of marketplace competition." Media systems focus on the sensational, the immediate, and the superficial." We are active, creative, and knowledgeable participants in the world. We see that excellent television programming cannot survive in the competitive broadcast marketplace. Now is the time for us to "...introduce enlightened, long-term policy plans." We need to "create public arenas in the 'media landscape.'"1

Private industries (cable and telephone) are planning to build an information highway that would alter media services in the future: the "American media system stands on the threshold of a new era." They are aggressive, ruthless, and only concerned with business. Cable and telephone companies have little interest in maintaining "public forums." They want to "control the channels of communication for business purposes." The cable industry has "meddled" and blocked "fresh voices" from entering cable programming. They regard the "First Amendment as a business weapon." The cable

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1 It is difficult to ascertain whether "we" is symbolic of the audience and the narrator, the narrator and the public-interest organization he is affiliated with, Bollier and the editorial staff of the magazine in which the article appears in, or Bollier and the presidential administration.
industry "hyped services in the 1970's," and "fashioned a controlled marketplace."

Broadcasters, also referred to as "media industries," receive less attention than the cable and telephone companies, but are also portrayed as having "little enduring institutional interest in maintaining public forums," and are aggressive. These broadcasters gained the right to the air waves in return for providing a public service. They "have shown a greater interest in privatizing and controlling channels of communication for strictly business purposes."

Information providers such as Prodigy and interactive computer companies receive the least amount of attention among private industry characters. But they, like the others, suspend democratic principles to succeed in the marketplace. When Prodigy raised rates and subscribers protested the rate hikes, the protestors were banned from the discussion about the rate hike on an electronic bulletin board available through Prodigy.

Two possible scenarios for the future information highway are portrayed. One scenario is a future in which democratic ideals are emphasized and the other is one in which competition and marketplace concerns are emphasized. Through "aggressive federal supervision" of marketplace activities the federal government needs to insure a "truly open and competitive telecommunications marketplace." This would facilitate the nation's "civic-sector" to fully
participate over the information highway. The government must negotiate a new legal structure that serves "public needs that the market will not." This policy framework should emphasize universal service, national public networks, local and state information networks, multicultural programming, and new funding sources and mechanisms. Private industry characters will "give due consideration to the public" in exchange for "government subsidies, tax breaks, and legal privileges needed to build the new information highway." The federal government must challenge the private sector's tightened control over the channels of communication. This would result in the civic sector interacting over media systems.

The civic sector could "rejuvenate the democratic culture" in the United States through increased interactivity. Composed of educators, writers, artists, civic leaders, volunteers, citizen-advocates, religious organizations, self-help groups, and independent producers; this sector is a "portrait of American pluralism" and "needs a platform" on the information highway. The civic sector "counterbalances the commercial forces of the media marketplace," and could "address critical societal needs" through the information highway.

If the federal government does not take action now to protect the public's interest, the future information highway is a setting in which there is an intensification of the
"current deficiencies of television and other mass media." Information services provided by "corporate guardians" do not assist "community development" or give "sustenance to national political life." Even though fiber optics could facilitate electronic town meetings, interactive bulletin boards, and independent video publishers; commercial media companies will probably find these services not "lucrative enough to initiate." Segments of the population that demographically do not appeal to "advertisers and pay-per-view providers" are ignored.

Regardless of whether the federal government protects the common good or not, the information highway is a catalyst for new jobs and economic growth in the future. The "telephone, computer, television, and VCR" are converged into a "single medium, capable of transmitting and receiving enormous amounts of information." Business institutions and the way people work are altered: "...thousands of interactive programming and information services will be flowing into American homes and businesses." In this "brave new world" the "public consciousness will almost literally be rewired."

**Worldview**

In this worldview, the battles between public and private sector are accentuated. Corporate interests stand on the side of greed and competition and render media services to be based on the sensational and superficial aspects of
life. The civic sector stand on the side of enlightenment, public interest, cultural diversity, and democratic ideals. Corporate greed dominates current media systems, and therefore, sensationalist, superficial programming prevails at the expense of uplifting, educational, and culturally diverse programming. Private industry characters are attempting to dominate the future information highway as well; clearly at the expense of the "public good." The federal government can be a savior of the public interest if efforts are made now to pressure the private sector to consider public as well as private interest.

An ideal world, in this article, is one in which private sector domination is balanced by a strong civic sector composed of intellectuals, artists, and publicly-minded organizations. This civic sector uses the resources of the information highway to promote diversity, democratic ideals, and a more enriched cultural existence. Through enlightened policies, technological systems can be used to promote public good, enrich life, and address critical social needs.


The potential impact the information highway will have on privacy is featured in this article. Our lives are certain to change as a result of the coming information highway. Some positive effects may be convenience and
increased access to information, but a negative trade-off is
the loss of personal privacy. According to narrator
Dworetsky, there are many unanswered questions as to how the
information highway should be regulated: "The ways in which
society can or should regulate this force are still largely
undefined." At question is whether large companies will
control information coming into the home, or the participant
at home will have control over production, distribution and
exhibition of information. Dworetsky refers to two experts
in this article: Mitch Kapor, an activist, and Nicholas
Negroponte, an academic. Dworetsky relies on Kapor to
advocate for two-way transmission systems with the locus of
control residing with the individual "user."

The building of the information highway by private
industry firms is a natural force, beyond human capacity to
control, and moving with great ferocity: "...[a] surge of
mergers and deals among telephone, cable, computer and media
goliaths splash across the business pages of your newspaper;
"...the marriage of media, computers, cable and telephones
and cellular, satellite and microwave transmission technology
will shrink the world-with its bounty and intrusions-to the
palm of your hand; the hand in which rests your TV remote
control of your telephone handset. This is power—for good
and evil."
Description of Narrative

There are four main characters in this narrative: the general population signified by "We" and "You;" the private sector; technology; and experts. The government characters is only talked about in passing by Kapor.

Change is imminent and uncertainty dominates the present setting. It is clear to most that "something is happening along the edge" of the information highway's "societal and economic frontier." Magazine stories are "trumpeting the arrival of the new information age, the digital revolution, the electronic highway, whatever." Private industry characters are reconfiguring themselves to accommodate, as well as initiate, the changes that will occur as a result. There is a "surge of mergers and deals among telephone, cable, computer and media goliaths." While all of these industries are "merging" and "dealing," the cable and media industries receive the most attention. Both are "grappling for baron-like control," and trying to be "information ranchers" on the information highway (controlling intellectual property and channels of communication).

In the future setting, what are now distinct industries and information services are merged into a single service in the home. The telephone, television, and computer technologies are combined into a single "interactive television" unit. People "have access to shopping, movies, and other types of information on demand through interactive
TV..." from their homes. Those separated from friends and family, or homebound due to illness are enabled to more fully participate in life through virtual reality systems. These systems allow you to feel "like you're actually at the mall, in the middle of Tom Clancy's latest thriller, or visiting your son and his family half a world away..."

But, access to expanded information and new convenient services is a "two-edged sword." It will be possible to collect data about individuals. From this data, a "very accurate picture of your likes and dislikes and remarkably lifelike portraits of your very thoughts" emerge. Sometimes we "knowingly" sacrifice privacy for specific benefits, but at other times we unknowingly provide information to computer systems. Society has not determined how to regulate the "power" brought about by the coming arrival of the information highway. Future regulation may follow one of two courses of action, according to expert Kapor. Fashioned after the broadcast network model "consumerism, passivity, crassness, and mediocrity" dominate the information highway. Fashioned after the Internet model "critical thinking, activism, democracy, and quality" dominate. The narrative ends with the pronouncement that there are "promises and risks" along the information highway. Everyone is affected by the changes in technologies.
Worldview

Suspense and uncertainty dominate this worldview. The information highway is coming. "Something is happening" that may help or hinder our lives. Private industry characters are seeking to own and control the information highway in the midst of this uncertainty. It is unknown who will be instrumental in determining the future setting of the information highway.

The information highway could enhance participation in daily social activities by helping people to keep in touch with loved ones and to easily access information; but the price of this aid—loss of privacy—may be too high. The issues associated with the information highway are very complex and uncertainty prevails. Technology possesses Godlike power. Depending on how the information highway is implemented, a promising or frightening future awaits us. The ability of the individual to access and control information is emphasized. Family, leisure activities, and community involvement are heralded in this worldview. The power and promise of technology is highly respected. An ideal world is one where people use technology to extend individual power and control.

Conclusion

Concern about access is expressed in these articles. Some concern is focused on market access (Rolling Stone); but most of the concern is directed toward people having equal
access to information that contribute to more enlightened and involved life experiences. Gaps between segments of the community widen if private industry characters control information and develop a slew of consumer/entertainment services piped into the home (Rolling Stone, Christian Century, Tikkun). The individual must control personal information. (Modern Maturity). The government has the responsibility to insure universal access (Rolling Stone, Christian Century, Tikkun). The central access point to assumed to be in the home with easy to use equipment.

Private industry companies build the information highway and are encouraged by the federal government to keep prices low by tax and other incentives. Some mention is made of subsidy programs to encourage access (Christian Century, Tikkun), but in general, people subscribe to networking and entertainment services provided by private industry to the home.

There is acknowledgement that the information highway will generate great profits for private industry characters, and stimulate the economy; but this is of secondary interest. The primary function of the information highway should be to promote diversity, increase interactivity between people, politically empower people, and strengthen communities. The profit function is of interest in these articles only to the extent that the need for profit supersedes the capacity of
the information highway to fulfill important social functions.

Concern about control of the information highway is centered around control of physical movements of the information (central switching or home-based control), and control over content of information. There is confusion as to whether control of the movement of information should reside in central switches or home equipment. Both scenarios are presented, but preference is given to intelligent interfaces that allow the person at home to travel autonomously (similar to Internet) and with ease to the many diverse and interesting sites on the information highway. The ability to access unfiltered information is highly valued in these articles. There is concern that if large corporations control the flow of information they will also control (and homogenize) the content of the information. The potential for the information highway to strengthen community, expand understanding, and empower people in their day to day lives is focused on in these articles. Whether this potential is actualized is left ambiguous; it depends on how well the government protects the interest of the public against greedy private industries. Cooperation and competition are two dominant values that permeate these narratives; which is most dominant is left unanswered.

Irregardless of whether the information highway promotes competition or cooperation, there are aspects of the
information highway that are inevitable. The home is the central access site; the generation of profit for private industry is paramount; and an increased capacity to access information. What type of information one will access is left unresolved. Will it be filtered and targeted information that segments the population and pacifies us into mass consumerism; or unfiltered access to networking resources that strengthen community and enhance life experiences?

Technology will dramatically change our lives in the future. We can become empowered or disempowered depending on whether policy protects the interest of the general public to openly access and control information. Without this protection there is little hope that benefits will trickle down to the population. A proactive approach by federal government is encouraged to insure that all segments of the population benefit from the information highway, and not just in narrow economic terms.

What is also left unanswered is how this proactive approach can be undertaken when private industry controls the information highway. Suggestions are made that through tax incentives, subsidy programs, etc., the federal government can encourage universal access, but this seems to be a weak argument when in over half of the articles the federal government is manipulated by private industries to focus on deregulating markets.
CHAPTER 5
TRICKLE-UP

Four articles in this sample cluster around the notion that the information highway will be controlled by private industry to gain profits by exploiting the general population. They are from the following sources: (1) Wired; (2) Scientific American; (3) The Nation; and (4) National Forum.

Overview

Only discrimination, widening gaps between the population, and consumerism gone amok await us on the information highway. It is assumed that benefits will not trickle-down to the general population; instead, the last bit of resources of the general population will trickle-up to greedy private industry characters whose only concern is the expansion of capital on the information highway.

The narrators tend toward an authoritative stance in these articles, although, twenty one experts were referred to in three of the four articles (experts were not a character in the article from Wired magazine). Most experts were from academia (43%), secondly, from private industry (38%), thirdly, experts who had written books about the information
highway (14%) (affiliation not designated), and the fewest were from government (5%).

The present setting of the information highway is unsafe; deceit, exaggeration, and insecurity permeate the environment. Lawlessness prevails as the general population (referred to as the public, people, and anyone) are innocent, naive, and preyed upon by powerful technical elites. No one is able or willing to contain the ruthlessness and competition that dominate this setting.

There are battles between technical elites to control instruments of power--information technologies. Technology is an unstoppable force that is coupled with the maddening desire of private industry characters to extend their power over others. The government is manipulated by private industry, and in some instances is duplicitous with private industry in deceiving the general public. Technical elites, whether they are employed by private industry or self-serving "hackers" who enjoy victimizing unsuspecting travelers on the information highway, use technology to gain power, dominance, and profit. Private industry characters (usually referred to as telephone, cable, and computer industries) are greedy in three of the four articles (the exception is Scientific American) and deceptive in all.

There are widened gaps between technical elites and the general population in the future. Services are designed solely to benefit corporate or technical elites in their
quest to accumulate capital and/or to dominate others. The
general population is excluded and/or exploited on the
information highway. They are intruded upon and their homes
are invaded by marauders wishing to extract any resources
that are available (National Forum, The Nation, Scientific
American). A minority view is that the information highway
is used only for business purposes and never comes to the
home (Wired). Alienation ensues as gaps between the
population widen, and in the worst case scenario, people
become anaesthetized; they sleepwalk in a consumer nightmare
through day to day life.

A detailed analysis of each of these articles is
presented in this chapter. I conclude with reflections on
how access, funding, function, and control are represented
and whether this representation is aligned with building a
socially responsible infrastructure as described in
Chapter 1.

Narrative Analyses

"Backlash: The Infobahn is a Big Fat Joke." Wired,
March 1994. Pg. 73 (Mark Stahlman).

Stahlman proclaims that telephone and cable companies
are lying when they claim to be constructing an information
highway into the home. The reader is warned to see through
the hype to preserve his/her "digital future." Private
industry characters perpetuate the ruse of connecting the
home to the information highway to encourage the federal
government to deregulate their industries; thus, enabling
them to establish what they are really interested in: high-
speed digital networks for business services.

Stahlman reinforces the theme of the deceitful private
industry character by using metaphors centered on common
cultural experiences that are tinged with sensationalism and
deceit: the story of *The Wizard of Oz*, circuses, and
docudramas. He expresses disdain for the influence popular
media products have on the populace, evident in some of the
following phrases: "...all the wild Wall Street, through-the
roof, Crazy Eddie, cornucopia, shout-it-out-loud promo jobs
are pure greed;" and, "This primetime docudrama has been
breathtaking. Who will win? Who has the best
position/funding/technology/hairdo?" He emphasizes the need
of a digital infrastructure that is accessible to non-
business users.

**Description of Narrative**

There are four main characters: the audience signified by "You" or "Dorothy;" private industry; the federal
government; and technology. The dominant setting is the
present information highway. A "convergence circus"
dominates this setting. Newspaper and magazine headlines
depict a coming information highway that is: "digital,
interactive, 500-channel, multi-megamedia blow-your-socks-off
future" exaggerate what is going on and "are pure hype." The
audience is naive, innocent, and associated with the female gender. She is misled by what she has been reading: "There will be no infobahn. None of it - at least not the way you've been reading about it." She needs to see past the deception of the private industry to insure her place in the future digital world: "There really is a man behind the curtain, Dorothy. Pay no attention to the convergence pyrotechnics. There's alot at stake, and it just might be your digital future."

Private industry characters, often referred to as "they" in the article, denote the cable and telephone companies. Treated equally by Stahlman throughout the article, these companies are predictable in their greed and willingness to deceive to gain dominance in the marketplace. They are told what to do by the government, and they don't like this. They exaggerate their plans and the competitive threat they are under in efforts to be deregulated. These companies are referred to as "guys" indicating masculinity.

The government tells private industry characters what to do: they tell them "what rates they can charge...what businesses they can own...with whom they can associate," but is also manipulated by private industry. Naive to the tricks and deceit by cable and telecommunication companies, the government is vulnerable to private industry because of their lack of technical understanding. If "Dorothy" is waiting for
the federal government to protect her "digital future," she will have a long wait.

"Why has cable versus telecom become the center ring in the convergence circus? Mostly because cable and telecoms are regulated monopolies yearning to be free...Along comes Convergence and Digital Everything, and the cable and telecom folks step right up to take advantage. They tell the regulators: The technology wants to be free. It will save the nation, the economy, and the free world." The general public is being fooled by this deceit and wait in "breathless anticipation" for an information highway that will never be built.

In stark contrast to the site of the "convergence circus" is the site where high-speed digital networks are being built. Illusion does not reign here; rather, there are massive interconnections of high-speed digital networks to facilitate business services. The cable and telephone industries are not worried about "cross-competitive threat" from the other. Cable television "is not particularly suited to carry switched voice...the cable network is just not a good place to locate radio cells." Telephone companies cannot compete with cable companies to provide "entertainment video" into the home: "Fiber rebuilds are costly...all the attempts to put multiple compressed video streams on copper have met with well-deserved skepticism." The "real money is being spent on real markets: business-to-business
communications..." The article ends with a warning to the audience to see through the deceit.

**Worldview**

This article contributes several assumptions to perceptions about the information highway. The needs of private industry dominate the information highway at the expense of services coming into the home. An ideal world, in this discourse, is one in which people see through the hype and deceit promoted by private industry characters about the information highway and insure that they receive services; but little hope is depicted that the information highway will fulfill any function other than to facilitate business transactions.

Competition, deceit, cynicism, and hype are emphasized; there is little room for optimism or cooperation. The metaphors used throughout the article—the circus and the docudrama—emphasize illusion, exaggeration and deceit. The government is both authoritative and manipulated by private industries. The general public is naive and deceived by media and private industry characters. Idealism does not thrive well in this future scenario; not a good place for the faint at heart. But even in this dark cynical worldview, Stahlman hopes that "Dorothy" pulls open the curtain and safeguards her "digital future." The truth will set you free; a hope that seems beyond hope in this setting.
(Paul Wallich).

Wallich's main argument is that no one is safe on the present information highway (also referred to as Internet) due to an increase in criminal activity. Technical elites either restrain or facilitate access to information and therefore determine the extent of vulnerability one is exposed to in using the information highway. System administrators are devising techniques to block would-be criminals from accessing information, but these efforts may be inadequate. He suggests that perhaps the government may need to enact policies to protect the privacy rights of people on the future information highway, but even that may fail. According to Wallich, no one really "understands the idea of a national information infrastructure well enough to be put in charge." Wallich refers to twelve experts. Of these twelve, seven are from private industry, four are university professors, and one is a computer hacker. He paraphrases most of the information presented by the experts.

Description of Narrative

There are eight main characters: a general population signified by "People" or "Anyone;" the private sector referred to as telephone companies, computer companies, or small companies; technology; experts; attackers; engineers/designers; new settlers/comers; and system
administrators. The government character is mentioned in passing, but is not central to the narrative.

The setting is comprised of many access sites to the Internet system on the current information highway. This is an environment in which there are: "no laws, rapid growth and enterprise-its shoot first or be killed." Sometimes this setting is synonymous with the information highway; at other times Internet is equated to a "19th century railroad that passes through the badlands of the Old West" and "may become an information superhighway." This system is "open to as much traffic as it can bear," and "consumers and entrepreneurs crowd onto the information highway."

"New settlers" on the Internet "flock to cyberspace" in search of "free information or commercial opportunities." This comparison of settlers to sheep implies a passive innocence contradicted somewhat by the active searching for commercial opportunities. They "make easy marks..." and face many violations of trust. "Electronic impersonators...commit slander or solicit criminal acts in someone else's name." Through forgery a "sender" can gain access to other's files. Through file-transfer programs "an attacker can gain access to a networked computer."

At first the telephone industry was vulnerable to "phone phreaks," but in a "running war" they defended themselves against these "phreaks." The telephone industry's role as defender of electronic security has been changed by policy
regulators when the telephone industry was divested. Since the divestiture, AT&T is "no longer the global policeman of the telecommunications world." The cellular telephone industry "apparently ignored the lessons that their wire-bound predecessors so painfully learned." Cellular engineers underestimated the persistence of those who want to illegally access the system; wireless systems are vulnerable to attacks.

The computer industry ships software to "enable resource sharing," but they also "keep people in the dark as they are loath to talk about security problems..." Small companies are vulnerable to attacks. They "found themselves the targets of 'finger hackers,' but they had nothing like AT&Ts expertise in self-defense." Computerized organizations have an "idyllic little pocket of cyberspace," until they open "its digital doors to the Internet. Suddenly, 'world' really means the entire globe...What was once a private lane is now a highway open to as much traffic as it can bear."

"Computer hackers" receive the most attention in the article among the human characters. These hackers are referred to by many different names: "electronic impersonators," "sharpers," "attackers," "intruders," "computer crackers," and "phone phreaks." They "play a keyboard as deftly as Billy the Kid ever drew a gun," emphasizing their slyness, quickness, and aggressiveness. They are criminal, in that they "commit slander," and "elicit
criminal acts in someone else's name." They are untrustworthy and unethical, in that they "masquerade as a trusted companion." These hackers surreptitiously gain access to computers, and demonstrate extreme patience in figuring out how to illegally gain access. They enjoy challenging the systems. To many of them winning is a game.

Two characters that attempt to counteract the activities of the computer hackers are the system administrators and designers. The system administrators allow "safe" connections, attempt to protect their systems against computer hackers and are "kept in the dark by computer vendors." The designers of communication systems traditionally have made mistakes in the early designs of systems that permitted the hackers to gain entry into the networks. Sometimes these designers continue to make the same mistakes, but at other times they have successfully designed some monitoring tools to cut down on illegal entry. They often have failed to keep the vulnerabilities of their designed systems secret.

Worldview

An ideal world, in this discourse, is one in which people are safe and information is protected from would-be interlopers. But the reality is that people are vulnerable to attacks from others and battles are waged to protect against illegal intrusions. There is a gulf between the "knows" and the "know nots." Local systems are safe, but when
these systems interconnect to the Internet, the local systems become very vulnerable. The ability to control the flow of information is very important in this worldview, access is of secondary importance. Battles, criminal activities, the search for business opportunities, and naiveness are emphasized. You are powerless to protect yourself on the information highway unless you are a computer hacker, a system engineer, or a network administrator. The technical elite are the only ones who can protect the participant, and even they don't have a full grasp on all the issues affecting the Internet.

"Public Way or Private Road?" The Nation, July 22, 1993
( Herbert Schiller).

Private industry domination of the information highway is featured in this article. Working with the support of the federal government, private industry is taking control of public resources. Consequently, the information highway of the future is controlled by private industry and invades the home with consumer services that exploit and anesthetize the "viewing public." Only if the "public and the public interest" are brought "into the decision-making process" can this domination of private interests be stopped; although Schiller does not devote any time in the article as to how this could be accomplished, or what the information highway could become if this occurred.
Shiller's narrative style is very authoritative. His only expressed uncertainty is how to involve the public in policy decisions. He mediates all experts and information for the reader. His attitude is one of cynicism and despair. For example, he discusses how Joan Rivers calls television "today's talking catalogue." He asks whether "K Mart, Wal-Mart, Bloomingdale's, Sears, Merrill Lynch, Home Depot...can be far behind?" He asks the question: "can our living rooms much less our minds, handle such a crowd?" He is dismayed by the increasing power of private industry. He is cynical toward the government and expresses this cynicism through sarcasm, evident in the following excerpt: "The genesis and likely fate of the Internet represent a familiar sequence, repeated throughout U.S. industrial history. The corporate sector has invariably relied on the government to finance and develop new undertakings that are risky...Once the project is a profit-maker, it is appropriated by the self-styled 'risk takers.'" 

Shiller refers to six experts. Three references are made to articles in magazines or newspapers with wide public distribution: The New York Times, Time, and Broadcasting and Cable magazine. He uses experts to substantiate assertions that he makes, thereby, never losing his authority to the experts. Vice-president Gore and John Sculley, chairman of Apple Computer Company, are directly quoted. An executive of a consortium of colleges and universities is cited to support
his argument that the privatization of Internet poses a threat to educational uses.

Description of Narrative

Five characters are featured: a general population referred to as the "Public; the private sector, referred to as telephone companies, cable companies, computer companies, "megacorporate interests," and "high-tech electronic interests;" the government; technology; and experts. The current and future information highway are the two settings. A new "electronic environment...is being created at an astonishing speed" as information technologies penetrate the U.S. economy on the current information highway. "Construction scaffolding" is everywhere. Productivity in manufacturing, services, and retail activity is on the increase. A "social transformation of truly epic proportions is under way," and "being thrust, want it or not, need it or not, on the people and the economy." Individual, household, business, and work practices are being encompassed by this social transformation. "Giant" companies make deals with each other.

Private industry is creating the information highway into a lucrative marketplace and is at war within itself (telephone, cable, and computer industries) for control of the future information highway. The private sector excludes public participation from policy discussions and is making deals that result in thrusting "a social transformation" onto
the "people and the economy." Private sector companies are
taking over public resources and are involved in "frenzied
corporate wheeling and dealing to establish technological and
financial advantage." By inducing the public to "believe
that existing equipment is obsolete," the private sector will
invade the home in the future and extract "golden flows" from
"the viewing public;" thereby, creating "a distracted and
numbed viewer."

The "public interest" is excluded on the future
information highway. The "social landscape" is "almost
exclusively privatized." A "few communications
supercorporations" control the information "superhighway" and
make "enormous" profits. Viewers at home are "distracted and
numbed" by the consumer-based services coming into their
homes; services entertain and promote merchandize, such as,
consumer electronic sales, home shopping, and sports
programming. The home is invaded by marketing messages and
an "endless choice of sports channels owned by entertainment
superconglomerates." The information highway becomes
"exclusively privatized" in this future setting.

The government, duplicitous with corporate interests,
supports private sector control and commercial development of
the information highway. Government characters approve
mergers between major companies, sell parts of the national
radio spectrum to corporate interests, and support turning
Internet over to the private sector.
Technology is controlled by the private sector and a tool of domination in all aspects of American life; mesmerizing the public and generating "distracted and numb "consumers who are sources of rich revenues for the private sector." Electronic gadgets "feed" the information highway and are an "immediate profit making" source for manufacturers. Internet could be the "basis of free social information," but instead is being privatized by the National Science Foundation and appropriated by corporate interest.

**Worldview**

The worldview presented in this article is one in which people are vulnerable to private industries. They are easily duped and manipulated. The greed on the part of private industry characters dominate the information highway. Everything else is subservient to this greed. The home of the future is invaded by the private sector. "The public" are exploited, passive, and anesthetized by the consumer services that are delivered to the home. An ideal world would be one that can resist this greed, passiveness, and duplicity, but little hope for this is evident in this narrative. The information highway is determined by private industry interests. Interactive services that are limited to home-shopping and other proven consumer services are the main services available; thus, the main purpose of the information highway is to generate profits for the private sector.
"The Information Superhighway as the Yellow Brick Road."


The general theme featured in this article is that the "promises of the Information Age are at the very least substantially overdrawn, if not outright fabrications." Like the "yellow brick road" in The Wizard of Oz, the information highway is built on deceit and exaggeration. We are being fooled by private industry to believe the information highway will solve social problems, but instead, day to day life will be adversely affected for most of the population as "prevailing relations of power" will be better able to coordinate and segment the general population. Some segments of the population will be denied access to services and opportunities; those that receive information services will be exploited by corporate profit seekers. An "illusion of happiness" in a supposed well-ordered world will prevail.

Evident in this article, is narrator Gandy's assumption that the readership is well-educated; abstract language is used throughout the narrative. He mentions a "utopian vision" and describes how "allegory is in the eye of the beholder." He describes the "instrumental purposes in political economy," the "instrumental contrivance," and refers to a "public sphere."

He posits a theoretical conviction that the capitalist economy and the need to respond to competitive pressures create a dehumanized culture in which social problems become
exacerbated. He is cynical about the ability of the federal
government to intervene successfully. The need to expand
profit and stay competitive is the ultimate causal agent in
Gandy's worldview. There is little that can be done to
counteract those forces. Gandy refers to four experts; all
are from the academic sector.

Description of Narrative

There are five main characters: "We;" the private
sector; the federal government; technology; and experts. All
actions lead to a central event, the private sector
domination of all aspects of life. In the current setting,
private industry characters perpetuate images of the
information highway that are "deceitful fiction, an
instrumental contrivance developed with the assistance of
creative people in marketing and public relations
departments." People are deluded by these images and support
the construction of the information highway under false
pretenses. We want to "guarantee" the future and are
"influenced by illusion, deception and sleight of hand:
"Evil is destroyed, banished, contained, or transformed as if
by magic." These acts of illusion work because people living
in "impoverished communities of the United States" face
"economic, social, and political difficulties" driven by
"problems of communication" and are searching for solutions.

Dramatic changes in the present setting will effect
people's lives. Private companies invest substantial dollars
in "image advertising," in their quest to be "key players" in the information age. This advertising exaggerates the benefits of the information age. A Bell Operating Company produced a "fancy brochure" in which the "landscape of the future" information highway is portrayed as offering an "enormous range of benefits to consumers." AT&T promises "the marvelous wonders of communication that wait just around the corner," and the computer industry as well as the cable industry promise "five hundred channels of movies on demand." Private sector companies are greedy, only interested in profit, and create discrimination and segmentation among the population.

The government is somewhat deceitful. The "activist administration" is actually pursuing an industrial policy under the guise of supporting the information highway, thereby aiding the private sector in making the promises of the information superhighway "household words." The information highway "may just catch on" as a result. This character cannot control disparate access to the information highway despite efforts to support universal access to the information highway.

Social organizations once thought of as permanent are being changed by the use of advanced information technologies. In efforts to stay competitive, the private sector applies technologies to expand production potential. The advances made in the production process result in
"bottlenecks in distribution." These problems in distribution get resolved by advanced transportation systems; however, these systems lead to problems of underconsumption. Efforts are undertaken to resolve this problem by expanded marketing techniques that include more focused marketing on select segments of the population. Selective marketing requires detailed profiles of segments of the population to determine the most lucrative, profit-potential segment. This need to generate profiles of individuals requires sophisticated information handling techniques and is the impetus for private industries to construct the information highway.

Technology is controlled by private industry and is used to dominate all aspects of life on the future information highway. Technology imposes "its own laws" and is symbolic of a "point of view." Technology is also a "religion, in which "efficiency is God," "economists are priests," and "engineers are the faithful servants." Information technology, in particular, is "all-seeing," "discriminatory," and causes job loss through automation.

The information highway will cause increased unemployment, privacy invading pre-employment screening, and decreased productivity of workers due to increased surveillance and monitoring of activities. People will have unequal access to services on the information highway and will be left unemployed as information companies "downsize"
and use cheaper labor overseas. Information gathered on individuals will lead to discriminatory hiring practices. Those who belong to less desirable demographic groups (based on marketing data) "will be ignored or bypassed as they stand by the highway trying to hitch a ride to the good life."

"Teledemocracy" will be "ushered in by the Information Age." People will be able to participate in the political process electronically, but unless these networks "are organized as a public forum rather than a private, commercial communication service...free speech and robust debate" may be harmed.

Private sector domination becomes complete and totalizing once the information highway is completed. "Toll roads" constructed and controlled by the private sector will determine who accesses the information highway on the basis of race and class distinctions. The "production and distribution of information" is the primary labor activity. This future setting, referred to by Gandy as the "Information Age," is a setting where the "deepest instincts and our most secret passions will be analyzed, published, and exploited. We shall be rewarded with everything our hearts ever desired. But our happiness will be an illusion, artfully constructed for strategic ends."

**Worldview**

In this worldview, the private sector is driven by market forces to stay competitive and seeks to dominate all facets of life. Technology is used to maximize
profitability. Profiles of the population are assembled through sophisticated information gathering techniques. Segments of society with disposable income have access to services and information over the information highway, but in exchange they will be exploited, surveilled and intruded upon. The impoverished are left out of the information highway. The techniques of the information highway take over all facets of life and serve the interest of capital at the expense of social equity and democracy. This is a bleak worldview in which market forces, equipped with powerful information gathering techniques, dominate all facets of life; resistance is nonexistent.

Conclusion

Access to information highway resources are controlled by private industry or technical elites, thereby, the gaps between the information have's and have-nots are increased. Segments of the population that do not return a profit on investment are left out of the information highway. The government is either incapable or lacks the will to ensure universal access. If people were more involved in policy formation this course could be altered, but there is little actual hope held out that this will occur; thus, little alternative to this bleak future is envisioned in these articles.

Private industry companies are building the information highway and use the highway to generate profits through
consumer services brought to the home, as well as increased surveillance and work techniques to maximize efficiency. Subscription services and advertising subsidies are implied. There is no evidence of any other type of tax subsidy programs to counteract the domination of consumer driven services. The purpose of the information highway is to expedite business growth and expansion; no other functions are envisioned (much to the dismay of several narrators). It is assumed that control will be embedded in intelligent central switches that manage a limited interactive system oriented toward consumer and entertainment services. Intelligent interfaces and sophisticated electronics are embedded in customer premises equipment and enable networking capacity, but passage through the information highway will be heavily guarded and controlled by technical elites.

Thus, the information highway will lead to greater insecurity, isolation, and alienation in these articles. The confluence of technological innovation coupled with greed is too powerful a combination to protect the innocent from the marauding parasites who which to extract whatever resources they can. The home is invaded by these marauders in over half of these narratives; it becomes a central site of exploitation. There is no possibility of trickle-down benefits, only the trickling-up to technical elites (most often private industry) of whatever resources are still owned by the general population.
CHAPTER 6
RESEARCH FINDINGS

I discuss the seven research questions that guided this inquiry in this chapter. In general, I argue that the narrative analyses conducted in this study indicate that criteria discussed in scholarly literature for establishing an infrastructure that will generate positive social outcomes are not, for the most part, envisioned in portrayals of the information highway in widely-distributed popular articles.

Despite this claim, it would be an error to assume that this discourse wholeheartedly endorses an economic efficiency approach to infrastructure planning. While there are relative homogenous depictions of access, funding, and function on the information highway, there is wide divergence as to what the function of the information highway should be, and whether people's lives will be enhanced from its implementation. Evident in this discourse is an awareness of the overwhelming economic imperative driving the planning of the information highway; but, with very different responses.

Research findings to the seven questions that guided this study are briefly summarized as follows: (1) the general population is depicted as powerless, private industry is
powerful, and the power of the government is portrayed inconsistently; (2) private industry experts are used more in articles that support the economic imperative of the information highway and academic experts in articles that question this imperative; (3) there is divergence among the articles relative to the role of the government; (4) the type of access, the function of the information, and the control of information are key issues that need to be resolved before the information highway setting is assumed unilaterally to be a setting that empowers and enhances people's life experiences; (5) universal access is not depicted in these articles, rather, those who can subscribe to lucrative information services delivered to the home have access to the information highway; (6) practical useful functions that assist the person to connect to local resources such as medical, educational, or service organizations are not featured in the majority of articles, rather, the focus is on functions that expedite business transactions and aid economic growth; and (7) without an emphasis on universal access there is little difference as to whether systems are centralized or decentralized. These points are elaborated on in the following sections
Research Questions and Findings

RQ1: What Type of Power Relationships are Constructed in the Depiction of Characters and their Actions?

Powerless general population. The general population is portrayed as powerless in a majority of these articles. This portrayal is most apparent in the four articles analyzed in Chapter 5, centered around a "Trickle-Up" theme. In this cluster, the population is exploited, lags behind others, and must adapt to circumstances beyond their control. They are deceived into believing that the information highway is something that it is not through "pure hype" (Wired) and "deceitful fiction" (National Forum). The population is deluded by these images because they want to "guarantee" the future and are induced to "believe that existing equipment is obsolete" so they will invest in new unneeded equipment (Nation). This passivity is further evident in the various references to the population as: "Dorothy" from the Wizard of Oz (Wired); "New settlers" who "flock" to the Internet and are duped by technical elites (Scientific American); "the viewing public" who are "distracted and numbed" by the plethora of consumer services that come into the home (Nation); and, those who are "ignored or bypassed as they stand by the highway trying to hitch a ride to the good life" (National Forum).
This powerlessness is also evident in the analyses in Chapter 2, the "Trickle-Down" cluster, although a bit more complicated. A common theme in the "Trickle-Down" cluster is the notion that the information highway will come to the home and provide expanded interactive services that afford the population opportunities for increased information access, entertainment, and consumer purchasing. Thus, typical in these articles is a portrayal of a person accessing the world of information from the comfort and security of his/her living room. But also typical in these portrayals is that he/she is not a "driver" on the information highway. If venturing outside the home this person may "encounter obstacles" (Time Magazine), and as a passenger must "fasten seat belts" (Mademoiselle). People must adapt to outside forces that determine the information highway is a "strip mall," despite interacting with sophisticated software capabilities at home (Technology Review). Often this interaction is with a prescribed menu of choices "voted" on through one's remote control (Time Magazine). One must wait for private industry to bring the information highway to them, and once there, will be able to compete (Call and Post).

The most complex portrayals of the degree of power held by the general population are the analyses in Chapters 3 and 4, the "New Rules" and "Social Good" clusters. In the "New Rules" cluster, segments of the population that have
traditionally been left out of business opportunities can gain access to new resources and more powerful positions on the information highway. But this can only happen if they adapt to forces beyond their control and gain entrance into profitable endeavors that are bound to occur on the information highway. For example, the African American community is told to "demand a stake in" the information highway and try to control local "on-ramps" (Oakland Post), members of the Hispanic community need to be "flexible" to the needs of business and industry (Hispanic Magazine); small businesses need to set up electronic networking systems (Hispanic Business); and women need to become technically adept to accommodate the changes in the business environment brought by the information highway (Working Woman).

Significant in these articles is the absence of characters that do not adapt; they are left out and have no place on the information highway. Despite the goal of achieving power in these articles, this power is based on total submission to predetermined business expansion functions the information highway fulfills in day to day life. Similar to articles in the "Trickle-Up" and "Trickle-Down" clusters, the population is not a "driver;" but rather, a passenger on an already determined road, in a vehicle driven by someone else. If they act appropriately, maybe they can sit next to the driver.
The general population is portrayed as most powerful in the articles analyzed in Chapter 4, the "Social Good" cluster. This character is powerful in his/her own right: she is productive, insightful, capable of altering outside forces through organized efforts, and an initiator of change. But, there are strong outside forces of greed and opportunism that must be challenged and defeated in order for this character to be in a powerful position on the information highway. And more likely than not, the only way that this greed and opportunism can be controlled is through strong federal oversight of private industry actions on the information highway. So, this character's power is contingent on the federal government to counteract the greed and opportunism spawned by private industry. In the final analysis, the general population is powerless to effect what the information highway will become except for a brief hope that the federal government will protect their interest against greedy private industry characters (see Table 2).
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Table 2: Powerful/Powerless Actions and Population

<sup>Note.</sup> <sup>x</sup>=Condition is true only if certain actions are taken. M=Condition is only true for Males. F=Condition is only true for Females.

<sup>a</sup>Column headings: Ex=Exploits; Cont=Control; In=Initiates; Comp=Competes; Exd=Exploited; Lag=Lags behind; Pa=Passive (this includes dependence); Ad=Adapt (need to adapt to established forces); Ab=Absent (no depiction in article).
Table 2 (continued)

Each article is symbolized by an abbreviation of the source document. The abbreviations and their meaning are the following: Ti=Time Magazine, TR=Technology Review; BW=Business Week; M=Mademoiselle; C&P=Call and Post (Cleveland); BY=Byte; OP=Oakland Post; HM=Hispanic Magazine; HB=Hispanic Business; WW=Working Woman; RS=Rolling Stone; CC=Christian Century; T=Tikkun; MM=Modern Maturity; W=Wired; SA=Scientific American; N=The Nation; NF=National Forum. Articles are organized by clusters in Chapters 2-5: T-D=Trickle-down; NR=New Rules; SG=Social Good; and T-U=Trickle-up.

°refers to men and women but only if women take certain actions.

In summary, the general population is portrayed as powerless rather consistently throughout the discourse. This powerlessness is evident in the four possible courses of actions suggested for the population: (1) accept the economic imperative and be happy good consumers; (2) accept the economic imperative and try to capture a piece of the profits; (3) succumb to cynical despair at the complete domination of transnational corporate interests; or (4) hope that the federal government will protect the public's interest on the information highway.

Powerful private industry characters. Private industry characters are the most powerful in all the articles. They build and compete to control the information highway (exceptions are in Hispanic Business and Mademoiselle). More than just powerful, private industries are exploitive in the "Social Good" and "Trickle-Up" clusters. For example, they are described as: "profit-oriented hands" (Christian Century)
and "controlling channels of communication for strictly business purposes" (Tikkun). They are "grappling for baron-like control," (Modern Maturity) and involved in "frenzied corporate wheeling and dealing to establish technological and financial advantage" (The Nation).

An interesting twist in this portrayal of a dominant private industry character occurs in the "Trickle-Up" cluster. In these articles, private industries adapt to forces outside of themselves. They constantly adopt new techniques and methods to stay competitive in a world marketplace (National Forum, The Nation). They innovate to protect the integrity of their systems from would-be invaders (Scientific American); they gain a competitive edge by creating the ruse of an information highway to get regulators to deregulate (Wired). Consequently, the most powerful characters in these stories are themselves victims of outside forces beyond their control.

Private industry characters have some weaknesses that can be openings to gain power for other segments of the general population. For example, in the "New Rules" cluster, the business environment is changing and private industry must adapt to forces beyond its control. But, unlike in the "Trickle-Up" cluster, such a changing environment provides new opportunities to gain power for those previously denied access.
Another possible break in the shield of power maintained by private industry characters is suggested in the "Social Good" cluster. The federal government could regulate the actions of private industries and protect the interest of the public; but, this is contingent on whether the federal government chooses to fulfill this role; a substory that has two equally plausible endings (see Table 3).
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Table 3: Powerful/Powerless Actions and Private Industry

**Note.** \textsuperscript{*} = Condition is true only if certain actions are taken.

\textsuperscript{a}Column headings: Ex=Exploits; Cont=Control; In=Initiate; Comp=Compete; Exd=Exploited; Lag=Lagging behind; Reg=Regulated; Ad=Adapt (need to adapt to established forces); Ab=Absent (no depiction in article which is a sign of lack of power).
Table 3 (continued)

Articles symbolized by abbreviation of source document: TI=Time Magazine, TR=Technology Review; BW=Business Week; M=Mademoiselle; C&P=Call and Post (Cleveland); BY=Byte; OP=Oakland Post; HM=Hispanic Magazine; HB=Hispanic Business; WW=Working Woman; RS=Rolling Stone; CC=Christian Century; T=Tikkun; MM=Modern Maturity; W=Wired; SA=Scientific American; N=The Nation; NF=National Forum. Articles are organized by clusters in Chapters 2-5: T-D=Trickle-down; NR=New Rules; SG=Social Good; and T-U=Trickle-up.

In summary, the private industry character is the most powerful character in this discourse; although, even this character's power is constrained by outside forces that require it to adapt. A sobering thought in a third of the articles is that if private industry's power is not harnessed and controlled by the federal government, a bleak future awaits the general population on the information highway (Christian Century, Tikkun, Modern Maturity, Wired, The Nation, and National Forum).

Government: a hodgepodge of power relations. The government is portrayed inconsistently throughout the sample: a less powerful character in "Trickle-Down" and "New Rules" clusters, and more powerful in "Social Good" and "Trickle-Up" clusters. For example, the government is not a character in half of the articles in the "New Rules" cluster and a third of the articles in the "Trickle-Down" cluster. Of the articles in these two clusters that portray the government as a character, the government lags behind private industry in controlling the direction of the information highway. The
exceptions to this are in *Hispanic Business*, in which the Clinton Administration is building the information highway, and in *Business Week*, in which the government deregulates private industries, thereby, enabling them to build the information highway.

The range of power that the government has and will use is an uncertain dimension in the "Social Good" cluster. The government is not willing to build the information highway and has been distracted by private industry to focus only on market access issues, but is beginning to listen to other voices in Washington (*Rolling Stone*). During the Reagan and Bush eras the government allowed "marketplace forces" to "determine the direction of the media revolution, with little government input," but now the Clinton administration "wants government to play a role" (*Christian Century*). If the government does not take action to protect the information highway there will be an intensification of the "current deficiencies of television and other mass media" (*Tikkun*), but it is left as an unknown whether or not the government eventually protects the public. Clearly, this character has the potential to protect the public, but there is wonderment as to whether it has the will, and if it does, is it too late?

The government is the most powerful in the "Trickle-Up" cluster. In two thirds of these articles, the government is working in collusion with private industry against the
interests of the public; although in *Wired* magazine is also being deluded by private industry. The government may have to step in to protect the privacy of people on the *Internet* from invading marauders if the system administrators cannot handle it, but even in this eventuality, the government may not be able to control the thievery (*Scientific American*) (see Table 4).

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Table 4: Powerful/Powerless Actions and Government
Table 4 (continued)

**Note.** ^ = Condition is true only if certain actions are taken.

*a*Column headings: Ex=Exploits; Cont=Controls; In=Initiates; Comp=Competes; Contd=Controlled; Lag=Lagging behind; Ad=Adapt (need to adapt to established forces); Ab=Absent (no depiction in article).

*b*Articles are symbolized by abbreviation of the source: TI=Time Magazine; TR=Technology Review; BW=Business Week; M=Mademoiselle; C&P=Call and Post (Cleveland); BY=Byte; OP=Oakland Post; HM=Hispanic Magazine; HB=Hispanic Business; WW=Working Woman; RS=Rolling Stone; CC=Christian Century; T=Tikkun; MM=Modern Maturity; W=Wired; SA=Scientific American; N=The Nation; NF=National Forum. Articles are organized by clusters in Chapters 2-5: T-D=Trickle-down; NR=New Rules; SG=Social Good; and T-U=Trickle-up.

Thus, the power of the government is inconsistently portrayed in this discourse. Different portrayals of this character are evident; none of them dominate the discourse. Is the government the protector of the public or working in collusion with private industry? Is the government lagging behind private industry or leading the way?

**RQ2: Who are the attributed experts in the discourse?**

The majority of articles use expert testimony (the exceptions are Wired and Hispanic Business). In total, there were one hundred and six instances of expert testimony. The majority of these (62%) are experts affiliated with private industry, sixteen (15%) are affiliated to academia, nine (8%) are government employees, eight (8%) are authors/media writers, and eight (8%) are citizen activists. If we look at
the breakdown of expert affiliation within the specific clusters, definite patterns emerge.

First, in the "Trickle-Down" cluster there is at least twice as great a reliance on the use of experts than any other cluster (48% of all references), and seventy percent of the experts referred to are affiliated with private industry. Second, in the "New Rules" cluster, there is less reliance on expert testimony (only twenty two percent of total references) but, ninety six percent are affiliated with private industry. Third, in the "Trickle-Up" cluster, there is greater diversity relative to the affiliation of the experts cited: (a) academics (38%); (b) private industry (33%); (c) media writers (21%); and (d) an equal distribution between government and citizen/activists at four percent.

Lastly, in the "Social Good" cluster, there is the least dependence on expert testimony; only eight percent of total references appear in this cluster. Of the experts that are cited, none of them are from private industry. The majority are from academia (38%) and media and citizen/activist are equally represented at twenty five percent. There is one reference to an expert affiliated with the government (12%). Please see Table 5 for a specific breakdown of experts by constituency.
### Table 5: Number of Experts Referred to by Constituency

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<sup>a</sup>Each article is symbolized by an abbreviation of the source document. The abbreviations and their meaning are the following: TI=Time Magazine, TR=Technology Review; BW=Business Week; M=Mademoiselle; C&P=Call and Post (Cleveland); BY=Byte; OP=Oakland Post; HM=Hispanic Magazine; HB=Hispanic Business; WW=Working Woman; RS=Rolling Stone; CC=Christian Century; T=Tikkun; MM=Modern Maturity; W=Wired; SA=Scientific American; N=The Nation; NF=National Forum.

Articles are organized by the clusters in which they are situated in Chapters 2-5. The cluster abbreviations are the following: T-D=Trickle-down; NR=New Rules; SG=Social Good; and T-U=Trickle-up.

In summary, there are distinctions between thematic clusters of articles and the way in which experts are used.
Articles that support the role of private industry, and accept the economic imperative of the function of the information highway, rely more on expert testimony from private industry. Articles that are critical of this economic imperative rely less, if at all, on private industry experts, and more on academic expertise. In addition, if we reconsider the issue of construction of power, clearly, private industry sources are perceived as having the most expertise; citizen/activists and government characters have the least. Academicians are cited a bit more, but still pale in comparison to private industry experts.

RQ3: What Actions and Responsibilities are Attributed to the Government Character in the Discourse?

In the "Trickle-Down" and "New Rules" clusters, the government's actions (when it is a character) are consistent with what its role is expected to be: the government deregulates to facilitate market access. Exceptions are in the Oakland Post, in which the government is portrayed as lagging behind private industry, and in Byte, where concern is expressed for universal access.

The articles in the "Trickle-Up" cluster, in contrast, depict a discrepancy between government actions and what the government should be doing. The government should protect the public's interest through regulation. Instead, the government is deregulating to facilitate market access. The
government is expected to regulate private industry and facilitate universal access, but whether is occurs is left ambiguous in the "Social Good" cluster. Government actions are, for the most part unclear (see Table 6).

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Table 6: Government Actions and Attributed Responsibilities

**Note.** Access columns indicate whether the government facilitates market access, indicated by M, or universal access, indicated by U. Dereg=deregulation and Reg=regulation.
Table 6 (continued)

*Each article is symbolized by an abbreviation of the source document. The abbreviations and their meaning are the following: TI=Time Magazine, TR=Technology Review; BW=Business Week; M=Mademoiselle; C&P=Call and Post (Cleveland); BY=Byte; OP=Oakland Post; HM=Hispanic Magazine; HB=Hispanic Business; WW=Working Woman; RS=Rolling Stone; CC=Christian Century; T=Tikkun; MM=Modern Maturity; W=Wired; SA=Scientific American; N=The Nation; NF=National Forum. Articles are organized by the clusters in which they are situated in Chapters 2-5. The cluster abbreviations are the following: T-D=Trickle-down; NR=New Rules; SG=Social Good; and T-U=Trickle-up.

This claim is that the government may need to regulate but only as a last resort to protect the public against data thieves who intrude on privacy.

We can conclude that there are discordant views as to what the role of the government should be in this discourse. Some assume the government should deregulate telecommunication industries and facilitate market access, but an equally strong argument is that the government has the responsibility to facilitate universal access and regulate telecommunication industries.

RQ4: What Characteristics are Associated with the Overall Setting of the Information Highway?

Uncertainty prevails on the present information highway setting depicted in a majority of articles: uncertainty as to who will control the information highway; uncertainty as to who will be able to access the highway; and uncertainty as to what services will be available. In addition, there is a fast pace that adds a level of anxiety to many of the
narratives, as: "cable and teleco businesses are racing so far ahead..." (Byte) and the government lags behind. Typical depictions, in this sample, are fierce battles between competing forces to control the future setting of the information highway.

There are conflicting depictions as to whether the information highway is inclusive or exclusive to all segments of the population. Those who are technically adept (Scientific American, Byte) or oriented toward marketplace and professional activities (New Rules cluster) fare reasonably well. Those outside these circles have a more difficult time and risk increasing discrimination (National Forum, Tikkun and New Rules cluster); thus, the setting is a potentially dangerous one for many.

Conversely, the information highway presents opportunities to gain access to good jobs for many previously denied such opportunities (Working Women, Hispanic Magazine, Oakland Post, Call and Post). In addition, senior citizens have access to resources and activities otherwise denied (Modern Maturity); and people have increased access to decision makers (Rolling Stone, Christian Century) (see Table 7)
Table 7: Attributes of Present Information Highway Setting

<table>
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<tr>
<th>Article</th>
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Uncert=uncertainty.
Table 7 (continued)

c Speed includes fast moving, emphasis on competition, and references to a need to keep up.

d Dangerous includes hazardous and need to protect self.

• incl = inclusive and is defined as all segments of the community able to participate.

• discrim = discriminating and is defined as excluding or impeding access for segments of the community.

The future information highway is a setting where enormous profits are generated for private industry characters who provide services to people in their homes. Whereas the present setting is characterized by private industries competing to build and control the information highway, the general population's actions are emphasized in the future setting. People are: (1) shopping from home (Time Magazine, Technology Review, Working Women, Business Week, The Nation, Modern Maturity, Mademoiselle); (2) accessing opportunities (Time Magazine, Modern Maturity, Mademoiselle, Oakland Post, Call and Post, Hispanic Business); (3) ordering movies (Time Magazine, Technology Review, Business Week, Modern Maturity, Mademoiselle); (4) controlling television viewing (Time Magazine, Technology Review, Working Women, Mademoiselle); (5) participating in town meetings from home (Rolling Stone, Business Week, The Nation, Mademoiselle); (6) working from home (Rolling Stone, Working Women, Mademoiselle); (7) accessing education materials from home (Time Magazine, Byte, Mademoiselle), and...
Thus, the promise in many of these articles is expanded access to information resources in the future, and in some articles, simply the access to information and/or business opportunities indicate life enhancement; but, as was discussed previously, the general population is not a "driver" in most of these articles (Time Magazine, Call and Post, Byte, Oakland Post, Hispanic Magazine, Hispanic Business, Working Women). People are empowered or disempowered depending on if they have access to the information highway. Other articles do not concern themselves with whether people will be more or less empowered (Technology Review, Business Week).

Access to information is not enough to guarantee life enhancement in the "Social Good" cluster. The type of information (diverse, culturally enlightening, unfiltered) is important, as well as the freedom of privacy (Modern Maturity). Two of these articles take a leap of faith and foresee a future setting in which people are empowered because of networking capabilities that provides access to unfiltered information as well as opportunities for discussion and debate (Rolling Stone, Christian Century). In other articles, the future setting enhances life experiences if the federal government controls private industry greed.
In the "Trickle-Up" cluster, life is not enhanced in the future setting. Private industries and/or technical elites dominate a generally disempowered population, despite an increase in access to information, entertainment, and consumer services. Whatever resources can be extracted from this powerless population will be (see Table 8).

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Table 8: Attributes of Future Setting of the Information Highway

214
To summarize, the information highway setting is a confounding setting with conflicting notions as to what its effects will be on day to day life practices. The basis of the conflict is whether access to information and opportunities in and of itself is enough to enhance life experiences. The type of access, the function of the information, and the control of information are key issues.
that need to be resolved before the information highway setting is assumed unilaterally to be a setting that empowers and enhances people's life experiences.

**RQ5: To What Extent is Universal Access Evident by Depiction of Points of Access and Funding Support?**

Universal access is not evident by the depiction of points of access coupled with funding support. The central access point is in the home, but the office is also another key access point. There is little discussion in any articles about public access outside of the home, such as, schools or libraries. The "New Rules" cluster ignores the funding question entirely in half of the articles. In the "Trickle-Down" cluster there is explicit mention of lucrative information, consumer, and entertainment services. There is some mention in the "Social Good" cluster of government programs and strategies to insure universal access, but these are only mentioned in half of them, and for the most part, the funding issue is ignored. They too, seem to assume private industry will offer lucrative services and people will subscribe to them from their home. There is no question but that those who can afford to access the information highway will subscribe, and those who cannot will not have access in the "Trickle-Up" cluster of articles. We can
conclude that universal access is not depicted in these articles (see Tables 9-10).

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Table 9: Points of Access to the Information Highway

*Each article is symbolized by an abbreviation of the source document. The abbreviations and their meaning are the following: TI=Time Magazine, TR=Technology Review, BW=Business Week; M=Mademoiselle; C&P=Call and Post (Cleveland); BY=Byte; OP=Oakland Post; HM=Hispanic Magazine; HB=Hispanic Business; WW=Working Woman; RS=Rolling Stone; CC=Christian Century; T=Tikkun; MM=Modern Maturity; W=Wired; SA=Scientific American; N=The Nation; NF=National Forum. Articles are organized by the clusters in which they are situated in Chapters 2-5. The cluster abbreviations are the following: T-D=Trickle-down; NR=New Rules; SG=Social Good; and T-U=Trickle-up.
Table 10: Funding of Information Highway

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Table 10: Funding of Information Highway

^Each article is symbolized by an abbreviation of the source document. The abbreviations and their meaning are the following: TI=Time Magazine, TR=Technology Review; BW=Business Week; M=Mademoiselle; C&P=Call and Post (Cleveland); BY=Byte; OP=Oakland Post; HM=Hispanic Magazine; HB=Hispanic Business; WW=Working Woman; RS=Rolling Stone; CC=Christian Century; T=Tikkun; MM=Modern Maturity; W=Wired; SA=Scientific American; N=The Nation; NF=National Forum. Articles are organized by the clusters in which they are situated in Chapters 2-5. The cluster abbreviations are the following: T-D=Trickle-down; NR=New Rules; SG=Social Good; and T-U=Trickle-up.

^bIn Str=Investment Strategies (usually enabled through government incentive programs).

^cIn this articles there is a call for "new funding sources and mechanisms."
RQ6: What Functions are Served by the Information Highway in the Discourse?

Economic development functions are emphasized throughout the sample. Only two articles do not equate the information highway with economic growth and expansion (Scientific American and Mademoiselle). Use of the information highway to expedite business transactions and consumer services (including entertainment services) is the most emphasized uses the information highway is put to. Using the information highway to access educational, medical or other local community services receives the least attention. Using the information highway to expedite interpersonal communication by computer networking receives moderate attention (see Table 11).
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Table 11: Functions of the Information Highway

Note. ^ = Condition is true only if certain actions are taken.

^Column Headings: EC=Economic Development and includes any references to profits generated for private industry or equating the information highway to United States economy; Bus=Business Transactions; Loc=Local services and refers to access to educational, medical or other local community services; Net=Networking and includes increased interpersonal communication; Cons=Consumer services and includes entertainment, home shopping, movies on demand, and electronic games.
Each article is symbolized by an abbreviation of the source document. The abbreviations and their meaning are the following: TI=Time Magazine, TR=Technology Review; BW=Business Week; M=Mademoiselle; C&P=Call and Post (Cleveland); BY=Byte; OP=Oakland Post; HM=Hispanic Magazine; HB=Hispanic Business; WW=Working Woman; RS=Rolling Stone; CC=Christian Century; T=Tikkun; MM=Modern Maturity; W=Wired; SA=Scientific American; N=The Nation; NF=National Forum.

Articles are organized by the clusters in which they are situated in Chapters 2-5. The cluster abbreviations are the following: T-D=Trickle-down; NR=New Rules; SG=Social Good; and T-U=Trickle-up.

In the "Trickle-Down" cluster the emphasis is on consumer services; access to local resources receives the least attention. In the "New Rules" cluster, networking and business transactions receives the most attention; consumer services the least. In the "Social Good" cluster, there is an even distribution between all functions, and in the "Trickle-Up" cluster, business transactions are emphasized and there is no mention of use of the information highway to expedite access to medical, educational, or other local resources that aid one to function day to day. There is also little mention of the expanded access to interpersonal networking. Clearly, practical useful functions that assist the person to function more effectively day to day are featured only in the "Social Good" cluster. The focus is on functions that expedite business transactions and aid economic growth and expansion.
RQ8: Is the Information Highway Centralized or Decentralized, and How does this Effect Function and Access?

The conflict in scholarly literature as to whether information should be centralized or decentralized is also seen in this discourse. Overall, the information highway is depicted more as decentralized networks that are interconnected than a centralized system. Consumer services are equally emphasized despite whether the information highway is centralized or decentralized, although networking activities are associated more with decentralized networks. For example, in the "Trickle-down" cluster, networking services are more associated with decentralized systems rather than centralized; and too, in the "Social Good" cluster, in two articles in which centralized and decentralized systems are depicted, consumer services are associated with a centralized system, and networking services are associated with a decentralized system. Finally, in the "New Rules" cluster where business transactions and networking services are emphasized, there are no depictions of centralized control.

Only in the "Social Good" and "Trickle-up cluster is there concern expressed that centralized control allows the potential for content control, and the dangers therein. In the Trickle-up cluster, this is a foregone conclusion and little hope is held that decentralized systems alter content control. In the "Social Good" cluster the more decentralized
the less the potential for homogenized information; diversity interests are better served by decentralized systems.

Regardless of whether the information highway is centralized or decentralized, there are few depictions that emphasize access to local information sources to help function better in one's community, and no discussion of the adverse effects of losing a public network. The notion that centralized public networks facilitate universal access is not supported. Without an emphasis on facilitating universal access there is little difference as to whether systems are centralized or decentralized (see Table 12).
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Table 12: Correlation of Control to Function and Access

Note. H=home; O=Office; B=Business transactions; C=Consumer Services; and N=Networking.

aEach article is symbolized by an abbreviation of the source document. The abbreviations and their meaning are the following: TI=Time Magazine, TR=Technology Review; BW=Business Week; M=Mademoiselle; C&P=Call and Post (Cleveland); BY=Byte; OP=Oakland Post; HM=Hispanic Magazine; HB=Hispanic Business; WW=Working Woman; RS=Rolling Stone; CC=Christian Century; T=Tikkun; MM=Modern Maturity; W=Wired; SA=Scientific American; N=The Nation; NF=National Forum. Articles are organized by clusters. Cluster abbreviations are: T-D=Trickle-down; NR=New Rules; SG=Social Good; and T-U=Trickle-up.
Conclusion

The central issue of this dissertation is whether widely-distributed written public discourse centered around an information highway metaphor that was distributed in 1993-1994 suggested an infrastructure that would generate positive social outcomes.

The discourse in this sample does not suggest such an infrastructure. Universal access was not depicted in these articles. By and large the people who were accessing resources on the information highway were professionals in the workplace or people who subscribed to service offerings in the home. There was little discussion of access points in schools or libraries, and no discussion of access points in post offices or other public access sites in the community. The equipment was depicted as easy to use, but there was no discussion of training people to use the equipment or helping people to purchase equipment. Access was clearly a privilege for those who could afford to purchase equipment.

There was a great deal of confusion and conflicting portraits of the role of the federal government in protecting universal access to the population. This character was
sometimes duplicitous with private industry and injurious to universal access issues, other times meant well (advocates universal access) but lagged so far behind private industry that its actions were irrelevant, and in still other stories, the federal government was the only salvation to insure that the future is not a nightmare for a majority of the population.

Only one article indicated any need of subsidy programs to facilitate access for all segments of the population. The vast majority of articles assumed that the information highway will be funded through subscription, advertising subsidies, and business services. There was no mention of common carriers being responsible to provide universal access in exchange for regulatory relief. It was assumed that common carriers and private network providers should offer competitive services to homes and businesses.

Overall, the information highway was depicted more as decentralized networks that were interconnected than a centralized system. Consumer services were equally emphasized despite whether the information highway is centralized or decentralized. Regardless of whether the information highway was centralized or decentralized, there were few depictions that emphasized access to local information sources to help one function better, and no discussion of the adverse effects of losing a public network.
Without an emphasis on universal access there was little difference whether systems were centralized or decentralized. A great deal of confusion, fear, and optimism was generated in these stories because of the recognition that the information highway would reconfigure the business world. Entertainment, consumer, and business services that change day to day life practices were emphasized. This function met with disapproval and mistrust in half of the stories. A quarter of the stories suggested that the function of the information highway should be centered around services that strengthen community, expand democratic principles, and overall enhance people's life experiences. Another quarter of the stories were so dismayed that greed will dominate the information highway that they saw nothing but a highly controlled life causing vulnerability and alienation for most of the population. The economic imperative of the information highway was portrayed as a natural force that was sweeping down on the nation, but in this whirlwind of activity there were still voices of resistance clamoring to be heard and yearning for the government to alter this momentum. From the stories in this discourse a metastory emerges that includes the various stories about the information highway. From this metastory we gain an overall perspective that is inclusive of multiple perspectives that permeate American culture, and thus, expand the possibilities and
Metastory. A hum of uncertainty permeates the air. The information highway is coming: a worldwide maze of fiber optic access roads intertwined with major arteries that speedily transmit data bits. Large transnational corporations are building the information highway. They plan to recoup their investment by selling equipment, communication services to businesses, advertising, and lucrative entertainment and consumer subscribers at home.

The government encourages private companies to keep building by easing regulations designed to protect the general population from too much ownership concentration over public means of communication. Some think by easing these regulations, competition will increase and the public's interest will be protected through natural market forces. Others protest these moves and are convinced that the government is being manipulated by private industry characters who are only interested in personal gain.

The present setting is a highly embattled one. Actions are dominated by private industries who are trying to be in a position to determine access, function, and control of the information highway. Private industries engage in skirmishes over control of on and off ramps, rules to establish the flow
of traffic, ownership of major facilities, as well as the entertainment and consumer services that will be brought to the home. New alliances are formed between various private industry and government characters.

Stories abound about what the future setting of the information highway will be. These stories cluster around four different future scenarios. Different actions in the present generate different endings. If one is competitive and willing to adapt to changing business needs there are new opportunities for those previously discriminated against in the business world; if not, they continue to be left out. In another scenario, if the federal government protects the public's interest on the information highway, people travel freely and gain access to information that is empowering; democracy and communities are strengthened. If the government does not protect the public's interest on the information highway than democracy diminishes, communities are segmented, and people are disempowered and alienated.

The most dominant story is that the information highway will bring entertainment and consumer services to the home. Most people will not travel on the information highway, but rather, selected resources are brought to the home by private industry providers. Even in this agreed scenario there is confusion as to what the impact of this scenario will be on people's day to day lives. In some of these stories people's lives are enriched by the abundance of conveniences and
entertainment brought to them in the comfort of their home by private industry. In an opposite scenario the home is invaded by private industries who extract what little resources are left to the general population; the populace is left in a dazed state and under the control of private industry.

The information highway is coming. It is an unstoppable force in which some will prosper while others may be left out. Government and private industry characters all agree that the primary function of the information highway is to stimulate the economy, but this singular focus leads to a great deal of confusion for the populace. What will the effects of this be in their day to day lives? What will life be like once the information highway is here? What will the rules of the road be?
The metastory that emerged from the smaller stories among the sample is characterized by both consistent and inconsistent assumptions, as well as undeveloped ideas that in their vagueness leave the reader wanting. In this chapter I expand on these findings in the context of the larger theoretical issues that were discussed in Chapter 1. I discuss how the findings in this study support or disagree with the claims about the influence of public discourse on day to day practices. I also elaborate on what the undeveloped stories (nonstories) are that emerged from the metastory and suggest ways in which they can be more fully developed. I conclude with recommendations for how we can strive to balance equity and economic efficiency as we implement communication technologies in day to day life practices.

**Theoretical Considerations**

This study is grounded in scholarly literature that focuses on the role public discourse plays in daily life practices. Claims are made that public discourse influences
power relationships, limits the way we envision an issue, and manufactures consensus throughout culture.

Specific to this project, there is speculation that use of an information highway metaphor bias us to implement communication technologies from a marketplace approach, favoring commercial interests over public interests. There are conflicting claims as to whether use of an information highway metaphor facilitates discriminatory or inclusive access to communication technologies. There are also conflicting claims as to whether an information highway metaphor implies a greater or lesser role for government in the building, implementing, and maintenance of the communication infrastructure. For the most part the findings in this study add support to some of these claims and raise questions about others. The following is an elaboration of this point.

**Influences power relationships.** A common depiction throughout the sample is that the general population is powerless to effect the main function of the information highway, that is, to generate economic development and expansion. There are only four possible responses envisioned for the general population to the inevitability of the information highway: (1) accept the economic imperative and be good consumers; (2) accept the economic imperative and try to capture a piece of the profits; (3) succumb to cynical despair at the complete domination of transnational corporate
interests; and (4) hope that the federal government will protect the public's interest on the information highway. Private industries are portrayed as powerful throughout the sample. Their needs and actions determine what the information highway will be, albeit within constraints governed by marketplace forces.

The prevalence of these assumptions lends support to Deetz's argument that technology "posits a subject, has an epistemology, and structures value choices." Bove's argument that power relationships are distributed through public discourse is also supported. Indeed, humans are characterized as "subjects" in this discourse; private industry characters are monolithic, unstoppable, dominators.

Narrowing of an issue. Lindblom's claim that widely-accepted assumptions narrow the possibilities for how an issue is envisioned is supported but with some caveats. Access, funding, and function are portrayed in reasonably homogenous ways, however there is divergence among the articles as to what the function of the information highway should be and whether people's lives will be enhanced by its implementation.

Despite widespread recognition that the primary purpose of the information highway is to spur economic efficiency and expansion, almost half of the articles (the "Social Good" and "Trickle-Up" clusters) attempt to articulate an alternative view, but with little success. There are smidgens of
alternative scenarios for the information highway, but these stories need further development. For example, in the "Social Good" cluster of articles there are alternatives to a focus on economic efficiency promoted, but the fruition of this function is limited because access and funding are portrayed the same as when the primary function is to generate profits for private industry companies. In the "Trickle-Up" cluster there is complete rejection of the economic expansion function of the information highway, but no alternative view is suggested. This leads to consideration of our next point: is consent manufactured in this discourse?

Manufacturing consent. Despite the homogeneity of some of the assumptions and the reliance on private industry experts to provide much of the information, consent is not created in this discourse. The overwhelming feeling I get at the end of this project is the despair and hopelessness underneath the surface of many of these articles. It is as if the hope of what the information highway could become fades under the bright light of profit and loss columns.

The disparity between the ideal and actual settings in some articles is rather stark. In the "Social Good" cluster there is hope that the information highway will enhance life, but many depictions of people being exploited in a world where government fails to protect the public.
This underlying cynicism is also apparent in the notion that the agenda of the information highway is already established: the question is whether certain segments of the population can capitalize on the opportunities that will be available. This is particularly evident in articles from magazines oriented toward women, African Americans, and Hispanics. Though less true in articles oriented to segments of the population that are traditionally in more powerful positions in our culture, even in these articles there is pessimism expressed about the ability to constrain private industry domination of the information highway.

What may pass as consent may be unexpressed dissent. Policy makers are well advised that while they assume trickle-down benefits to the population through increased competition in the marketplace, this is not a commonly shared assumption in articles in this sample. On the contrary, it is assumed that actions are required to insure future benefits on the information highway. Policy makers need to provide leadership to limit the high degree of ambiguity surrounding the effects of prescribed notions of access, function, and control of the information highway, or else risk an increasingly alienated populace.

**Biases implicit in the information highway metaphor.** The claim that the use of the information highway metaphor assumes a massive infrastructure that focuses on commercial transactions is well supported in this study. Thus, Mander's
claim that transportation metaphors encourage policy goals based on marketplace approaches is supported; however, public interest goals were also discussed in the context of this transportation metaphor. Thus, solo use of a transportation metaphor does not eliminate the conflict between public interest and commercial interest.

The conflicting depictions in scholarly literature as to whether use of the information highway metaphor implies a strong government role and discriminatory or inclusive access is equally conflicting in this discourse. It may be that the strength of using the information highway metaphor is that it allows for high degrees of ambiguity in these uncertain times of policy formation.

To summarize: (1) widely-accepted assumptions do appear to narrow the possibilities for how an issue is envisioned; (2) Despite homogeneity of many assumptions there were seeds of discontent sewn throughout this discourse, thus, raising questions as to the degree of consent that is manufactured in this discourse; (3) Use of the information highway metaphor does appear to influence a focus on commercial transactions, however, use of a transportation metaphor does not eliminate the conflict between public interest and commercial interest; (4) There is ambiguity as to whether use of the information highway metaphor implies heavy government involvement and increased or decreased gaps between segments of the population.
There are also some insights that can be gained on implementing a communication infrastructure that generates positive social outcomes. That is the subject of the next section.

Criteria to Develop an Infrastructure that Generates Positive Social Outcomes.

A claim in scholarly literature is that communication infrastructures in the United States have traditionally been implemented to expand economic development and increase economic efficiency; social applications were more often than not secondary afterthoughts. A question that guided this project is whether this is evident in current discourse about the information highway. In addition, what would be attended to in these articles if one were to pay attention to social goals other than economic efficiency and expansion? In this section I will discuss my findings in the context of these larger theoretical issues.

Equity and economic efficiency. My findings suggest that economic efficiency concerns are focused on in this discourse and social equity concerns are marginalized, but not ignored. The expansion of business opportunities is acknowledged as the major function of the information highway. The implicit recognition of this function defines access and funding throughout many of these articles.

Despite this focus on economic efficiency, there was an idealism in some articles that the government will protect
the public and influence the effects of the information highway to serve higher social goals than only to expand business opportunities. Contrary to this hope, the government character was portrayed as weak and lagging behind private industry characters.

Skepticism is expressed that access to conveniences and information are not enough to insure an uplifting of quality of life for the general population. Convenience was mostly depicted as the ease of home shopping, selecting movies and having them delivered on demand. Seldom were there examples of conveniences focused on getting medical treatment in the home, scheduling appointments and other practical services associated with day to day tasks. Access to information was usually associated with movie schedules, shopping options, or business efficiency. Less mention was made of access to information that would dramatically alter the quality of one's life beyond mere consumerism, such as: educational resources, medical information, community networking, to name a few.

Thus, while many of the articles assumed that people were empowered or disempowered depending on whether they had access to expanded opportunities and information resources, access to information, in and of itself, was not enough to guarantee equity needs were met in all of the articles (see "Social Good" cluster). The type of information (diverse,
culturally enlightening, unfiltered) was important, as well as the freedom of privacy.

Trickle-down thinking was somewhat evident in this discourse but was portrayed as inadequate in achieving equity goals. While it was assumed that most of the successful firms, industries, and households would benefit from the information highway, benefits that would trickle-down were access to lucrative commercial services; little attention was paid to functions that promoted interpersonal communication or helped to build community. Thus, the emphasis was on the trickling-down of consumer services throughout the nation; a rather restricted notion of trickle-down benefits. These articles told the reader how to function on the information highway as consumers and occasional producers, but always within prescribed limits established by private industry. There were few depictions of benefits spreading throughout the culture without intervening actions; free market competition did not in and of itself generate trickle-down benefits for the population. In fact, there was some concern that rather than benefits trickling-down to the general population, the scarce resources of the general population would trickle-up to private industries.

Dordick and Lehman (1994) describe a weak-link approach to planning the infrastructure as one that focuses attention on easing access and use of the information infrastructure for weaker segments of the population. The weak-link
approach is thought by them to balance equity and economic efficiency needs. Aspects of this weak-link approach can be seen in this discourse as there was some attention to easing access to opportunities on the information highway for what are often marginalized segments of the population. Evident in these articles was the limitations of a weak-link approach if applied only to market access concerns. Equity in access to opportunities may improve the weaker links in the economic structure, but do not address essential criteria necessary for an infrastructure to generate positive social outcomes beyond economic opportunity and success. It may be that a weak-link perspective to infrastructure building may be useful, however, delineation of what one should have access to needs to be further defined if equity and economic efficiency needs are to be balanced.

Interestingly, the cable industry was portrayed as the least honest of all the characters. This portrayal is consistent with the reregulation of the cable industry in 1994. What was somewhat astounding is how little coverage of issues important in the scholarly literature was in this popular discourse. Universal access was addressed but only slightly. Noam's concerns about neutral interconnection were visibly absent in this discourse. Hardly any mention was made of how to pay for the information highway. There appears to be little diffusion between scholarly discourse and popular discourse; a problematic given the seriousness of
the issue. In the following section I try to address this problem by discussing the contributions a study such as this can make to help lessen this gap, and perhaps strengthen the role that telecommunication scholars fulfill in policy formation.

Scholarly Contributions

Applying narrative analysis to a telecommunication issue bridges two distinct traditions, rhetoric and telecommunication/mass media within a single project. This project offers a methodological approach that is fruitful in gaining insight on the social construction and potential long-term implications of new communication technologies. Our understanding of implementation issues and the type of communication infrastructure we are constituting is deepened by analyzing the various stories that have wide circulation throughout our culture. By creating a metastory that includes various smaller stories about the information highway, we gain an overall perspective, thus, providing unique and powerful insight into the issue.

Communication scholarship that is focused on telecommunication policy cannot escape the call for research endeavors in the symbolic realm. A shift is occurring in communication studies as the traditional concept of communication studies is confronted by a powerful alternative view. The traditional view focuses on communication as a method to "express our 'inner' purposes, attitudes or
feelings, and to describe the events and objects of the external world" (Pearce, 1989, P. 23). The alternative view focuses on communication as a "reflexive process in which resources are expressed in practices and in which practices reconstruct resources" (Pearce, 1989, P. 23). The span of acceptance of the alternative view of communication appears to be widening within the field of communication and among the various areas within the field (Hardt, 1993; Hall, 1980; Hallaran, 1981; Leeds-Hurwitz, 1992; Rowland, 1993).

Willard Rowland argues that telecommunication scholars tend toward an instrumental, administrative orientation, "grounded in an atheoretical futurism." These approaches focus on problems of a technical capacity and discuss policy options primarily in market and economic terms. Rowland calls for telecommunication scholarship that:

foster a critical social understanding of the changing information technology, to understand not only their promises but also their limitations and vulnerabilities, and to apply that same interpretive discipline on the parallel problems in telecommunications policy (1993; P. 208).

Many current investigations into the implications of technological systems on communication processes focus attention on comparing channels relative to variables, such as: the degree of social presence; uses and gratifications; functions; learning ability; the degree of socioemotional satisfaction; and work efficiency; to name a few (Carey, 1980; Kiesler, Siegel, & McGuire, 1984; Rice, 1987; Rice &
Love, 1987). Some studies compare media effectiveness based on channel (Housel, 1976; Perce & Courtright, 1993; Rice, 1993). But, what is missing from these studies is attention on the actual creation of technology practices, and the implications of the assumptions embedded in these practices.

There are many social/history studies that investigate the social construction of technology practices and often use discourse as a source of analysis (Altman, 1990; Biocca, 1988; Carey, 1989; Czitrom, 1982; Cowan, 1976; De Sola Pool, 1977; Fischer, 1992; Kramarae, 1988; Meyrowitz, 1985; Marvin, 1988; Moyal, 1992; Nye, 1990; Pfaffenberger, 1988; Rakow, 1988; Williams, 1974; Yates, 1989). As illuminating as these studies are, none of them have focused on the information highway or have approached the study of this discourse from a narrative perspective. As has been suggested in this dissertation, using a narrative analysis as a framework for discourse analysis yields interesting insight not heretofore discovered.

Limitations and Key Assumptions

It is beyond the scope of this project to analyze in great detail the pros and cons of trickle-down versus weak-link infrastructure building. I do not presume to predict a necessarily causal relationship between widely-disseminated public discourse and technology practices. I acknowledge the complexity of the relationship between the assumptions embedded in popular magazine articles and the eventual use of
technological systems in day to day life. The way technologies are ultimately used is the result of a complex inter-relationship between public discourse, technology practices, policy formations, and market forces. I view none of these as sole determining factors; all of these are influencing forces that construct the technological systems that act as a backdrop to daily life.

Closing Thoughts

Current Status

This project was initiated four years ago (1992) and while updates to the literature review and background information were constantly made, there are changes that have occurred since the sample was circulated throughout the culture. As mentioned previously, the cable industry was regulated in 1994 and in the Telecommunication Act of 1996 was once again deregulated. Since 1994 there appears to be an increasing globalization of the information highway, as communication technologies become more integrated in a global economy.

I sense a continual expanding number of people engaged in networking activities in their daily practices. I personally communicate with an uncle, a cousin, a sister, and many friends daily through Internet access. Many of my students are actively engaged in networking; a different finding than four years ago when I was teaching
telecommunication students. More and more, people’s practices in which they begin to adopt the technology to uses they see fit within the context of their daily lives help determine the uses technologies fulfill in day to day life. Quite often, these uses are more socially-oriented rather than business-oriented. If so, all the best laid plans in policy forums and corporate boardrooms will eventually need to accommodate, to some degree, the desire of the general population.

This offers hope to me that the future information highway may hold greater potential than indicated in my sample of articles. But, this optimism is guarded. There are limits to what can be accomplished without state and federal commitments to an information highway that provides essential, community-building, life enhancing services. As the future communication infrastructure is put in place there is a great need for national policy that has the interests of the general public at heart. Now is not the time to shrink from this responsibility.

Recommendations

The ambiguity evident in the public discourse indicate a tremendous need for leadership to limit this uncertainty and give assurance to the population that their needs will be addressed. And these needs must go beyond mere consumerism, but with an ideal of how to uplift and enhance the quality of
life for all our citizens. Particularly ambiguous is the issue of access, funding, and the role of government.

Public discourse that refutes the economic imperative as the primary purpose of the communication infrastructure must specifically develop stories that present logical, competent, realistic alternatives and address these areas of ambiguity. The nonstories and vague references to universal access need to become fuller stories that catch the imagination of the reading public as well as policy makers. Academicians need to integrate their research with this popular discourse and help to provide specific details that offer alternatives to the dominant consumerism-based model.

**Parameters for a Well-developed Story**

So, what would an ideal story be that would create an infrastructure that generates positive social outcomes?

**characters.** The general population would be more involved in determining how the information highway develops. Community leaders, parents, school board representatives should be active partners in building the information highway. People should be actively engaged in interacting with systems in their home, traveling at ease to any and all sites available on the information highway, and not waiting at home for private industry characters to deliver the information highway to their home. They should be out seeking and contacting information highway services on their own.
The government should be an active character who protects the interest of the public on the information highway. This character facilitates building the information highway by deregulating certain aspects of the marketplace, but does not give away the channels of communication to private industry firms. Rather, the government continually balances private enterprise with public good, in the spirit of the old days of "enlightened capitalism," when industrialists were expected to expand opportunities and quality of life for the general population.

Private industry characters need to be portrayed as not only interested in private profit, but also in the common good. Rather than focused on short-term profit goals, this character should be motivated to achieve long-term goals that uplift our entire way of life, not just in narrow consumer ways.

There are many actions that are occurring in local communities that are not recognized in widely-distributed public discourse. The following are specific actions that, while not all are particularly unique, need to be a part of the information highway story that receives mass distribution attention.

**action 1**: subsidy and tax incentive programs should focus on insuring equal uniform distribution of infrastructure conduits and equipment. This must go beyond urban/rural distinctions, but include access availability of
equipment in the most impoverished communities as well as the wealthiest.

**action 2:** local and state communities should form outreach and training consortium in which state officials, private industry representatives, education officials and community organizations work in concert to distribute equipment in key public access areas such as: senior citizen centers, public schools, libraries, drug stories, supermarkets, public housing centers. Distribution of easy to use equipment should be viewed in the same way as distribution of public phone booths. Funding for this equipment should come from a variety of sources: community-based fundraising drives, small business donation in specific stories, state and local grants, etc.

**action 3:** Private and public companies who wish to be service providers in a community must contribute equipment and training dollars to facilitate access in public areas as part of a license fee to do business in that community.

**action 4:** Public training programs should be sponsored by public and private educational institutions and the trainers should be high school interns who are residents in the community in which they work.

**action 5:** City government in conjunction with local information providers, broadcasters, librarians, and educators should help develop local databases that provide essential and useful information to the community.
**action 6:** The network should be a combination of private and public network providers who have interconnective capability. Neutral interconnection should be required and regulated through local utility commissions.

**worldview.** The ideal world and actual world should be one and the same. The ideal world is one in which communication technologies are used to enrich all aspects of life, but do not dominate every dimension of waking life. Equity and economic efficiency goals are equally important, but only to the extent that the quality of interpersonal experiences and opportunities are enhanced, not diminished. Gaps between the population are narrowed as a result of equal access to information and opportunities on the information highway. The information highway is easy to use and is a supplement to interpersonal communication, but does not replace active engagement in experiences with people on a face to face basis. Technology is portrayed as a tool, a useful one, but only a tool that does not take the place of a good book, a quiet conversation, or a long stroll on a moon lit light.

If the information highway is to be a massive infrastructure that affects all aspects of life (as is predicted in this study); then policy makers must insure that these roads are public roads, not privately owned and controlled by transnational corporations.
Attention needs to be given to the social possibilities awakened through this new communication infrastructure. Now is the time for us to seriously reflect on the implications of this infrastructure and how it can be implemented to maximize social benefits. We must be careful not to slip into cynical despair or naive hopefulness. In addition, priority needs to be placed on long-term implications rather than succumb to short-term interests. Policy makers, academicians, media writers, and the general population must not shirk their responsibility during these uncertain times. Our future way of life depends on it.


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