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- HEADLINE ISSUES
- COMMUNICATIONS
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- MEDIA REGULATION
- E-COMMERCE
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- ENERGY
- COMPETITION
- STATE REGULATION
- ASPEN SUMMIT
- OTHER TOPICS

Cyberspace and the American Dream: A Magna Carta for the Knowledge Age

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Preamble

The central event of the 20th century is the overthrow of matter. In technology, economics, and the politics of nations, wealth -- in the form of physical resources -- has been losing value and significance. The powers of mind are everywhere ascendant over the brute force of things.

In a First Wave economy, land and farm labor are the main "factors of production." In a Second Wave economy, the land remains valuable while the "labor" becomes massified around machines and larger industries. In a Third Wave economy, the central resource -- a single word broadly encompassing data, information, images, symbols, culture, ideology, and values -- is actionable knowledge.

The industrial age is not fully over. In fact, classic Second Wave sectors (oil, steel, auto-production) have learned how to benefit from Third Wave technological breakthroughs -- just as the First Wave's agricultural productivity benefited exponentially from the Second Wave's farm-mechanization.

But the Third Wave, and the Knowledge Age it has opened, will not deliver on its potential unless it adds social and political dominance to its accelerating technological and economic strength. This means repealing Second Wave laws and retiring Second Wave attitudes. It also gives to leaders of the advanced democracies a special responsibility -- to facilitate, hasten, and explain the transition.

As humankind explores this new "electronic frontier" of knowledge, it must confront again the most profound questions of how to organize itself for the common good. The meaning of freedom, structures of self-government, definition of property, nature of competition, conditions for cooperation, sense of community and nature of progress will each be redefined for the Knowledge Age -- just as they were redefined for a new age of industry some 250 years ago.

What our 20th-century countrymen came to think of as the "American dream," and what resonant thinkers referred to as "the promise of American life" or "the American Idea," emerged from the turmoil of 19th-century industrialization. Now it's our turn: The knowledge revolution, and the Third Wave of historical change it powers, summon us to renew the dream and enhance the promise.

The Nature of Cyberspace

The Internet -- the huge (2.2 million computers), global (135 countries), rapidly growing (10-15% a month) network that has captured the American imagination -- is only a tiny part of cyberspace. So just what is cyberspace?

More ecosystem than machine, cyberspace is a bioelectronic environment that is literally universal: It exists everywhere there are telephone wires, coaxial cables, fiber-optic lines or electromagnetic waves.

This environment is "inhabited" by knowledge, including incorrect ideas, existing in electronic form. It is connected to the physical environment by portals which allow people to see what's inside, to put knowledge in, to alter it, and to take knowledge out. Some of these portals are one-way (e.g. television receivers and television transmitters); others

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are two-way (e.g. telephones, computer modems).

Most of the knowledge in cyberspace lives the most temporary (or so we think) existence: Your voice, on a telephone wire or microwave, travels through space at the speed of light, reaches the ear of your listener, and is gone forever.

But people are increasingly building cyberspatial "warehouses" of data, knowledge, information and misinformation in digital form, the ones and zeros of binary computer code. The storehouses themselves display a physical form (discs, tapes, CD-ROMs) -- but what they contain is accessible only to those with the right kind of portal and the right kind of key.

The key is software, a special form of electronic knowledge that allows people to navigate through the cyberspace environment and make its contents understandable to the human senses in the form of written language, pictures and sound.

People are adding to cyberspace -- creating it, defining it, expanding it -- at a rate that is already explosive and getting faster. Faster computers, cheaper means of electronic storage, improved software and more capable communications channels (satellites, fiber-optic lines) -- each of these factors independently add to cyberspace. But the real explosion comes from the combination of all of them, working together in ways we still do not understand.

The bioelectronic frontier is an appropriate metaphor for what is happening in cyberspace, calling to mind as it does the spirit of invention and discovery that led ancient mariners to explore the world, generations of pioneers to tame the American continent and, more recently, to man's first exploration of outer space.

But the exploration of cyberspace brings both greater opportunity, and in some ways more difficult challenges, than any previous human adventure.

Cyberspace is the land of knowledge, and the exploration of that land can be a civilization's truest, highest calling. The opportunity is now before us to empower every person to pursue that calling in his or her own way.

The challenge is as daunting as the opportunity is great. The Third Wave has profound implications for the nature and meaning of property, of the marketplace, of community and of individual freedom. As it emerges, it shapes new codes of behavior that move each organism and institution -- family, neighborhood, church group, company, government, nation -- inexorably beyond standardization and centralization, as well as beyond the materialist's obsession with energy, money and control.

Turning the economics of mass-production inside out, new information technologies are driving the financial costs of diversity -- both product and personal -- down toward zero, "demassifying" our institutions and our culture. Accelerating demassification creates the potential for vastly increased human freedom.

It also spells the death of the central institutional paradigm of modern life, the bureaucratic organization. (Governments, including the American government, are the last great redoubt of bureaucratic power on the face of the planet, and for them the coming change will be profound and probably traumatic.)

In this context, the one metaphor that is perhaps least helpful in thinking about cyberspace is -- unhappily -- the one that has gained the most currency: The Information Superhighway. Can you imagine a phrase less descriptive of the nature of cyberspace, or more misleading in thinking about its implications? Consider the following set of polarities:

Information Superhighway	Cyberspace
Limited Matter	Unlimited Knowledge
Centralized	Decentralized
Moving on a grid	Moving in space
Government ownership	A vast array of ownerships
Bureaucracy	Empowerment
Efficient but not hospitable	Hospitable if you customize it
Withstand the elements	Flow, float and fine-tune
Unions and contractors	Associations and volunteers

Liberation from First Wave	Liberation from Second Wave
Culmination of Second Wave	Riding the Third Wave

The highway analogy is all wrong," explained Peter Huber in Forbes this spring, "for reasons rooted in basic economics. Solid things obey immutable laws of conservation -- what goes south on the highway must go back north, or you end up with a mountain of cars in Miami. By the same token, production and consumption must balance. The average Joe can consume only as much wheat as the average Jane can grow. Information is completely different. It can be replicated at almost no cost -- so every individual can (in theory) consume society's entire output. Rich and poor alike, we all run information deficits. We all take in more than we put out."

The Nature and Ownership of Property

Clear and enforceable property rights are essential for markets to work. Defining them is a central function of government. Most of us have "known" that for a long time. But to create the new cyberspace environment is to create new property -- that is, new means of creating goods (including ideas) that serve people.

The property that makes up cyberspace comes in several forms: Wires, coaxial cable, computers and other "hardware"; the electromagnetic spectrum; and "intellectual property" -- the knowledge that dwells in and defines cyberspace.

In each of these areas, two questions that must be answered. First, what does "ownership" mean? What is the nature of the property itself, and what does it mean to own it? Second, once we understand what ownership means, who is the owner? At the level of first principles, should ownership be public (i.e. government) or private (i.e. individuals)?

The answers to these two questions will set the basic terms upon which America and the world will enter the Third Wave. For the most part, however, these questions are not yet even being asked. Instead, at least in America, governments are attempting to take Second Wave concepts of property and ownership and apply them to the Third Wave. Or they are ignoring the problem altogether.

For example, a great deal of attention has been focused recently on the nature of "intellectual property" -- i.e. the fact that knowledge is what economists call a "public good," and thus requires special treatment in the form of copyright and patent protection.

Major changes in U.S. copyright and patent law during the past two decades have broadened these protections to incorporate "electronic property." In essence, these reforms have attempted to take a body of law that originated in the 15th century, with Gutenberg's invention of the printing press, and apply it to the electronically stored and transmitted knowledge of the Third Wave.

A more sophisticated approach starts with recognizing how the Third Wave has fundamentally altered the nature of knowledge as a "good," and that the operative effect is not technology per se (the shift from printed books to electronic storage and retrieval systems), but rather the shift from a mass-production, mass-media, mass-culture civilization to a demassified civilization.

The big change, in other words, is the demassification of actionable knowledge.

The dominant form of new knowledge in the Third Wave is perishable, transient, customized knowledge: The right information, combined with the right software and presentation, at precisely the right time. Unlike the mass knowledge of the Second Wave -- "public good" knowledge that was useful to everyone because most people's information needs were standardized -- Third Wave customized knowledge is by nature a private good.

If this analysis is correct, copyright and patent protection of knowledge (or at least many forms of it) may no longer be unnecessary. In fact, the marketplace may already be creating vehicles to compensate creators of customized knowledge outside the cumbersome copyright/patent process, as suggested last year by John Perry Barlow:

"One existing model for the future conveyance of intellectual property is real-time performance, a medium currently used only in theater, music, lectures, stand-up comedy and pedagogy. I believe the concept of performance will expand to include most of the information economy, from multi-casted soap operas to stock analysis. In these instances, commercial exchange will be more like ticket sales to a continuous show than the

purchase of discrete bundles of that which is being shown. The other model, of course, is service. The entire professional class -- doctors, lawyers, consultants, architects, etc. -- are already being paid directly for their intellectual property. Who needs copyright when you're on a retainer?"

Copyright, patent and intellectual property represent only a few of the "rights" issues now at hand. Here are some of the others:

- Ownership of the electromagnetic spectrum, traditionally considered to be "public property," is now being "auctioned" by the Federal Communications Commission to private companies. Or is it? Is the very limited "bundle of rights" sold in those auctions really property, or more in the nature of a use permit -- the right to use a part of the spectrum for a limited time, for limited purposes? In either case, are the rights being auctioned defined in a way that makes technological sense?
- Ownership over the infrastructure of wires, coaxial cable and fiber-optic lines that are such prominent features in the geography of cyberspace is today much less clear than might be imagined. Regulation, especially price regulation, of this property can be tantamount to confiscation, as America's cable operators recently learned when the Federal government imposed price limits on them and effectively confiscated an estimated \$___ billion of their net worth. (Whatever one's stance on the FCC's decision and the law behind it, there is no disagreeing with the proposition that one's ownership of a good is less meaningful when the government can step in, at will, and dramatically reduce its value.)
- The nature of capital in the Third Wave -- tangible capital as well as intangible -- is to depreciate in real value much faster than industrial-age capital -- driven, if nothing else, by Moore's Law, which states that the processing power of the microchip doubles at least every 18 months. Yet accounting and tax regulations still require property to be depreciated over periods as long as 30 years. The result is a heavy bias in favor of "heavy industry" and against nimble, fast-moving baby businesses.

Who will define the nature of cyberspace property rights, and how? How can we strike a balance between interoperable open systems and protection of property?

The Nature Of The Marketplace

Inexpensive knowledge destroys economies-of-scale. Customized knowledge permits "just in time" production for an ever rising number of goods. Technological progress creates new means of serving old markets, turning one-time monopolies into competitive battlegrounds.

These phenomena are altering the nature of the marketplace, not just for information technology but for all goods and materials, shipping and services. In cyberspace itself, market after market is being transformed by technological progress from a "natural monopoly" to one in which competition is the rule. Three recent examples:

- The market for "mail" has been made competitive by the development of fax machines and overnight delivery -- even though the "private express statutes" that technically grant the U.S. Postal Service a monopoly over mail delivery remain in place.
- During the past 20 years, the market for television has been transformed from one in which there were at most a few broadcast TV stations to one in which consumers can choose among broadcast, cable and satellite services.
- The market for local telephone services, until recently a monopoly based on twisted-pair copper cables, is rapidly being made competitive by the advent of wireless service and the entry of cable television into voice communication. In England, Mexico, New Zealand and a host of developing countries, government restrictions preventing such competition have already been removed and consumers actually have the freedom to choose.

The advent of new technology and new products creates the potential for dynamic competition -- competition between and among technologies and industries, each seeking to find the best way of serving customers' needs. Dynamic competition is different from static competition, in which many providers compete to sell essentially similar products at the lowest price.

Static competition is good, because it forces costs and prices to the lowest levels possible for a given product. Dynamic competition is better, because it allows competing

technologies and new products to challenge the old ones and, if they really are better, to replace them. Static competition might lead to faster and stronger horses. Dynamic competition gives us the automobile.

Such dynamic competition -- the essence of what Austrian economist Joseph Schumpeter called "creative destruction" -- creates winners and losers on a massive scale. New technologies can render instantly obsolete billions of dollars of embedded infrastructure, accumulated over decades. The transformation of the U.S. computer industry since 1980 is a case in point.

In 1980, everyone knew who led in computer technology. Apart from the minicomputer boom, mainframe computers were the market, and America's dominance was largely based upon the position of a dominant vendor -- IBM, with over 50% world market-share.

Then the personal-computing industry exploded, leaving older-style big-business-focused computing with a stagnant, piece of a burgeoning total market. As IBM lost market-share, many people became convinced that America had lost the ability to compete. By the mid-1980s, such alarmism had reached from Washington all the way into the heart of Silicon Valley.

But the real story was the renaissance of American business and technological leadership. In the transition from mainframes to PCs, a vast new market was created. This market was characterized by dynamic competition consisting of easy access and low barriers to entry. Start-ups by the dozens took on the larger established companies -- and won.

After a decade of angst, the surprising outcome is that America is not only competitive internationally, but, by any measurable standard, America dominates the growth sectors in world economics -- telecommunications, microelectronics, computer networking (or "connected computing") and software systems and applications.

The reason for America's victory in the computer wars of the 1980s is that dynamic competition was allowed to occur, in an area so breakneck and pell-mell that government would've had a hard time controlling it _even had it been paying attention_. The challenge for policy in the 1990s is to permit, even encourage, dynamic competition in every aspect of the cyberspace marketplace.

The Nature of Freedom

Overseas friends of America sometimes point out that the U.S. Constitution is unique -- because it states explicitly that power resides with the people, who delegate it to the government, rather than the other way around.

This idea -- central to our free society -- was the result of more than 150 years of intellectual and political ferment, from the Mayflower Compact to the U.S. Constitution, as explorers struggled to establish the terms under which they would tame a new frontier.

And as America continued to explore new frontiers -- from the Northwest Territory to the Oklahoma land-rush -- it consistently returned to this fundamental principle of rights, reaffirming, time after time, that power resides with the people.

Cyberspace is the latest American frontier. As this and other societies make ever deeper forays into it, the proposition that ownership of this frontier resides first with the people is central to achieving its true potential.

To some people, that statement will seem melodramatic. America, after all, remains a land of individual freedom, and this freedom clearly extends to cyberspace. How else to explain the uniquely American phenomenon of the hacker, who ignored every social pressure and violated every rule to develop a set of skills through an early and intense exposure to low-cost, ubiquitous computing.

Those skills eventually made him or her highly marketable, whether in developing applications-software or implementing networks. The hacker became a technician, an inventor and, in case after case, a creator of new wealth in the form of the baby businesses that have given America the lead in cyberspatial exploration and settlement.

It is hard to imagine hackers surviving, let alone thriving, in the more formalized and regulated democracies of Europe and Japan. In America, they've become vital for economic growth and trade leadership. Why? Because Americans still celebrate individuality over conformity, reward achievement over consensus and militantly protect the right to be different.

But the need to affirm the basic principles of freedom is real. Such an affirmation is needed in part because we are entering new territory, where there are as yet no rules --

just as there were no rules on the American continent in 1620, or in the Northwest Territory in 1787.

Centuries later, an affirmation of freedom -- by this document and similar efforts -- is needed for a second reason: We are at the end of a century dominated by the mass institutions of the industrial age. The industrial age encouraged conformity and relied on standardization. And the institutions of the day -- corporate and government bureaucracies, huge civilian and military administrations, schools of all types -- reflected these priorities. Individual liberty suffered -- sometimes only a little, sometimes a lot:

- In a Second Wave world, it might make sense for government to insist on the right to peer into every computer by requiring that each contain a special "clipper chip."
- In a Second Wave world, it might make sense for government to assume ownership over the broadcast spectrum and demand massive payments from citizens for the right to use it.
- In a Second Wave world, it might make sense for government to prohibit entrepreneurs from entering new markets and providing new services.
- And, in a Second Wave world, dominated by a few old-fashioned, one-way media "networks," it might even make sense for government to influence which political viewpoints would be carried over the airwaves.

All of these interventions might have made sense in a Second Wave world, where standardization dominated and where it was assumed that the scarcity of knowledge (plus a scarcity of telecommunications capacity) made bureaucracies and other elites better able to make decisions than the average person.

But, whether they made sense before or not, these and literally thousands of other infringements on individual rights now taken for granted make no sense at all in the Third Wave.

For a century, those who lean ideologically in favor of freedom have found themselves at war not only with their ideological opponents, but with a time in history when the value of conformity was at its peak. However desirable as an ideal, individual freedom often seemed impractical. The mass institutions of the Second Wave required us to give up freedom in order for the system to "work."

The coming of the Third Wave turns that equation inside-out. The complexity of Third Wave society is too great for any centrally planned bureaucracy to manage. Demassification, customization, individuality, freedom -- these are the keys to success for Third Wave civilization.

The Essence of Community

If the transition to the Third Wave is so positive, why are we experiencing so much anxiety? Why are the statistics of social decay at or near all-time highs? Why does cyberspatial "rapture" strike millions of prosperous Westerners as lifestyle rupture? Why do the principles that have held us together as a nation seem no longer sufficient -- or even wrong?

The incoherence of political life is mirrored in disintegrating personalities. Whether 100% covered by health plans or not, psychotherapists and gurus do a land-office business, as people wander aimlessly amid competing therapies. People slip into cults and covens or, alternatively, into a pathological privatism, convinced that reality is absurd, insane or meaningless. "If things are so good," Forbes magazine asked recently, "why do we feel so bad?"

In part, this is why: Because we constitute the final generation of an old civilization and, at the very same time, the first generation of a new one. Much of our personal confusion and social disorientation is traceable to conflict within us and within our political institutions -- between the dying Second Wave civilization and the emergent Third Wave civilization thundering in to take its place.

Second Wave ideologues routinely lament the breakup of mass society. Rather than seeing this enriched diversity as an opportunity for human development, they attach it as "fragmentation" and "balkanization." But to reconstitute democracy in Third Wave terms, we need to jettison the frightening but false assumption that more diversity automatically brings more tension and conflict in society.

Indeed, the exact reverse can be true: If 100 people all desperately want the same brass ring, they may be forced to fight for it. On the other hand, if each of the 100 has a

different objective, it is far more rewarding for them to trade, cooperate, and form symbiotic relationships. Given appropriate social arrangements, diversity can make for a secure and stable civilization.

No one knows what the Third Wave communities of the future will look like, or where "demassification" will ultimately lead. It is clear, however, that cyberspace will play an important role knitting together in the diverse communities of tomorrow, facilitating the creation of "electronic neighborhoods" bound together not by geography but by shared interests.

Socially, putting advanced computing power in the hands of entire populations will alleviate pressure on highways, reduce air pollution, allow people to live further away from crowded or dangerous urban areas, and expand family time.

The late Phil Salin (in Release 1.0 11/25/91) offered this perspective: "[B]y 2000, multiple cyberspaces will have emerged, diverse and increasingly rich. Contrary to naive views, these cyberspaces will not all be the same, and they will not all be open to the general public. The global network is a connected 'platform' for a collection of diverse communities, but only a loose, heterogeneous community itself. Just as access to homes, offices, churches and department stores is controlled by their owners or managers, most virtual locations will exist as distinct places of private property."

"But unlike the private property of today," Salin continued, "the potential variations on design and prevailing customs will explode, because many variations can be implemented cheaply in software. And the 'externalities' associated with variations can drop; what happens in one cyberspace can be kept from affecting other cyberspaces."

"Cyberspaces" is a wonderful pluralistic word to open more minds to the Third Wave's civilizing potential. Rather than being a centrifugal force helping to tear society apart, cyberspace can be one of the main forms of glue holding together an increasingly free and diverse society.

The Role of Government

The current Administration has identified the right goal: Reinventing government for the 21st Century. To accomplish that goal is another matter, and for reasons explained in the next and final section, it is not likely to be fully accomplished in the immediate future. This said, it is essential that we understand what it really means to create a Third Wave government and begin the process of transformation.

Eventually, the Third Wave will affect virtually everything government does. The most pressing need, however, is to revamp the policies and programs that are slowing the creation of cyberspace. Second Wave programs for Second Wave industries -- the status quo for the status quo -- will do little damage in the short run. It is the government's efforts to apply its Second Wave modus operandi to the fast-moving, decentralized creatures of the Third Wave that is the real threat to progress. Indeed, if there is to be an "industrial policy for the knowledge age," it should focus on removing barriers to competition and massively deregulating the fast-growing telecommunications and computing industries.

One further point should be made at the outset: Government should be as strong and as big as it needs to be to accomplish its central functions effectively and efficiently. The reality is that a Third Wave government will be vastly smaller (perhaps by 50 percent or more) than the current one -- this is an inevitable implication of the transition from the centralized power structures of the industrial age to the dispersed, decentralized institutions of the Third. But smaller government does not imply weak government; nor does arguing for smaller government require being "against" government for narrowly ideological reasons.

Indeed, the transition from the Second Wave to the Third Wave will require a level of government activity not seen since the New Deal. Here are five proposals to back up the point.

1. The Path to Interactive Multimedia Access

The "Jeffersonian Vision" offered by Mitch Kapor and Jerry Berman has propelled the Electronic Frontier Foundation's campaign for an "open platform" telecom architecture:

"The amount of electronic material the superhighway can carry is dizzying, compared to the relatively narrow range of broadcast TV and the limited number of cable channels. Properly constructed and regulated, it could be open to all who wish to speak, publish and communicate. None of the

interactive services will be possible, however, if we have an eight-lane data superhighway rushing into every home and only a narrow footpath coming back out. Instead of settling for a multimedia version of the same entertainment that is increasingly dissatisfying on today's TV, we need a superhighway that encourages the production and distribution of a broader, more diverse range of programming" (New York Times 11/24/93 p. A25).

The question is: What role should government play in bringing this vision to reality? But also: Will incentives for the openly-accessible, "many to many," national multimedia network envisioned by EFF harm the rights of those now constructing thousands of non-open local area networks?

These days, interactive multimedia is the daily servant only of avant-garde firms and other elites. But the same thing could have been said about word-processors 12 years ago, or phone-line networks six years ago. Today we have, in effect, universal access to personal computing -- which no political coalition ever subsidized or "planned." And America's networking menu is in a hyper-growth phase. Whereas the accessing software cost \$50 two years ago, today the same companies hand it out free -- to get more people on-line.

This egalitarian explosion has occurred in large measure because government has stayed out of these markets, letting personal computing take over while mainframes rot (almost literally) in warehouses, and allowing (no doubt more by omission than commission) computer networks to grow, free of the kinds of regulatory restraints that affect phones, broadcast and cable.

All of which leaves reducing barriers to entry and innovation as the only effective near-term path to Universal Access. In fact, it can be argued that a near-term national interactive multimedia network is impossible unless regulators permit much greater collaboration between the cable industry and phone companies. The latter's huge fiber resources (nine times as extensive as industry fiber and rising rapidly) could be joined with the huge asset of 57 million broadband links (i.e. into homes now receiving cable-TV service) to produce a new kind of national network -- multimedia, interactive and (as costs fall) increasingly accessible to Americans of modest means.

That is why obstructing such collaboration -- in the cause of forcing a competition between the cable and phone industries -- is socially elitist. To the extent it prevents collaboration between the cable industry and the phone companies, present federal policy actually thwarts the Administration's own goals of access and empowerment.

The other major effect of prohibiting the "manifest destiny" of cable preserves the broadcast (or narrowband) television model. In fact, stopping an interactive multimedia network perpetuates John Malone's original formula -- which everybody (especially Vice-President Gore and the FCC) claims to oppose because of the control it leaves with system owners and operators.

The key condition for replacing Malone's original narrowband model is true bandwidth abundance. When the federal government prohibits the interconnection of conduits, the model gains a new lease on life. In a world of bandwidth scarcity, the owner of the conduit not only can but must control access to it -- thus the owner of the conduit also shapes the content. It really doesn't matter who the owner is. Bandwidth scarcity will require the managers of the network to determine the video programming on it.

Since cable is everywhere, particularly within cities, it would allow a closing of the gap between the knowledge-rich and knowledge-poor. Cable's broadband "pipes" already touch almost two-thirds of American households (and are easily accessible to another one-fourth). The phone companies have broadband fiber. A hybrid network -- co-ax plus fiber -- is the best means to the next generation of cyberspace expansion. What if this choice is blocked?

In that case, what might be called cyberspace democracy will be confined to the computer industry, where it will arise from the Internet over the years, led by corporate and suburban/exurban interests. While not a technological calamity, this might be a social perversion equivalent to what "Japan Inc." did to its middle and lower classes for decades: Make them pay 50% more for the same quality vehicles that were gobbling up export markets.

Here's the parallel: If Washington forces the phone companies and cable operators to develop supplementary and duplicative networks, most other advanced industrial countries will attain cyberspace democracy -- via an interactive multimedia "open platform" -- before America does, despite this nation's technological dominance.

Not only that, but the long-time alliance of East Coast broadcasters and Hollywood glitterati will have a new lease on life: If their one-way video empires win new protection, millions of Americans will be deprived of the tools to help build a new interactive multimedia culture.

A contrived competition between phone companies and cable operators will not deliver the two-way, multimedia and more civilized tele-society Kapor and Berman sketch. Nor is it enough to simply "get the government out of the way." Real issues of antitrust must be addressed, and no sensible framework exists today for addressing them. Creating the conditions for universal access to interactive multimedia will require a fundamental rethinking of government policy.

2. Promoting Dynamic Competition

Technological progress is turning the telecommunications marketplace from one characterized by "economies of scale" and "natural monopolies" into a prototypical competitive market. The challenge for government is to encourage this shift -- to create the circumstances under which new competitors and new technologies will challenge the natural monopolies of the past.

Price-and-entry regulation makes sense for natural monopolies. The tradeoff is a straightforward one: The monopolist submits to price regulation by the state, in return for an exclusive franchise on the market.

But what happens when it becomes economically desirable to have more than one provider in a market? The continuation of regulation under these circumstances stops progress in its tracks. It prevents new entrants from introducing new technologies and new products, while depriving the regulated monopolist of any incentive to do so on its own.

Price-and-entry regulation, in short, is the antithesis of dynamic competition.

The alternative to regulation is antitrust. Antitrust law is designed to prevent the acts and practices that can lead to the creation of new monopolies, or harm consumers by forcing up prices, limiting access to competing products or reducing service quality. Antitrust law is the means by which America has, for over 120 years, fostered competition in markets where many providers can and should compete.

The market for telecommunications services -- telephone, cable, satellite, wireless -- is now such a market. The implication of this simple fact is also simple, and price/entry regulation of telecommunications services -- by state and local governments as well as the Federal government -- should therefore be replaced by antitrust law as rapidly as possible.

This transition will not be simple, and it should not be instantaneous. If antitrust is to be seriously applied to telecommunications, some government agencies (e.g. the Justice Department's Antitrust Division) will need new types of expertise. And investors in regulated monopolies should be permitted time to re-evaluate their investments given the changing nature of the legal conditions in which these firms will operate -- a luxury not afforded the cable industry in recent years.

This said, two additional points are important. First, delaying implementation is different from delaying enactment. The latter should be immediate, even if the former is not. Secondly, there should be no half steps. Moving from a regulated environment to a competitive one is -- to borrow a cliché -- like changing from driving on the left side of the road to driving on the right: You can't do it gradually.

3. Defining and Assigning Property Rights

In 1964, libertarian icon Ayn Rand wrote:

"It is the proper task of government to protect individual rights and, as part of it, formulate the laws by which these rights are to be implemented and adjudicated. It is the government's responsibility to define the application of individual rights to a given sphere of activity -- to define (i.e. to identify), not create, invent, donate, or expropriate. The question of defining the application of property rights has arisen frequently, in the wake of oil rights, vertical space rights, etc. In most cases, the American government has been guided by the proper principle: It sought to protect all the individual rights involved, not to abrogate them." ("The Property Status of the Airwaves," Objectivist Newsletter, April 1964)

Defining property rights in cyberspace is perhaps the single most urgent and important task for government information policy. Doing so will be a complex task, and each key area -- the electromagnetic spectrum, intellectual property, cyberspace itself (including the right to privacy) -- involves unique challenges. The important points here are:

- First, this is a "central" task of government. A Third Wave government will understand the importance and urgency of this undertaking and begin seriously to address it; to fail to do so is to perpetuate the politics and policy of the Second Wave.
- Secondly, the key principle of ownership by the people -- private ownership -- should govern every deliberation. Government does not own cyberspace, the people do.
- Thirdly, clarity is essential. Ambiguous property rights are an invitation to litigation, channeling energy into courtrooms that serve no customers and create no wealth. From patent and copyright systems for software, to challenges over the ownership and use of spectrum, the present system is failing in this simple regard.

The difference between America's historic economic success can, in case after case, be traced to our wisdom in creating and allocating clear, enforceable property rights. The creation and exploration of cyberspace requires that wisdom to be recalled and reaffirmed.

4. Creating Pro-Third-Wave Tax and Accounting Rules

We need a whole set of new ways of accounting, both at the level of the enterprise, and of the economy.

"GDP" and other popular numbers do nothing to clarify the magic and muscle of information technology. The government has not been very good at measuring service-sector output, and almost all institutions are incredibly bad at measuring the productivity of information. Economists are stuck with a set of tools designed during, or as a result of, the 1930s. So they have been measuring less and less important variables with greater and greater precision.

At the level of the enterprise, obsolete accounting procedures cause us to systematically overvalue physical assets (i.e. property) and undervalue human-resource assets and intellectual assets. So, if you are an inspired young entrepreneur looking to start a software company, or a service company of some kind, and it is heavily information-intensive, you will have a harder time raising capital than the guy next door who wants to put in a set of beat-up old machines to participate in a topped-out industry.

On the tax side, the same thing is true. The tax code always reflects the varying lobbying pressures brought to bear on government. And the existing tax code was brought into being by traditional manufacturing enterprises and the allied forces that arose during the assembly line's heyday.

The computer industry correctly complains that half their product is depreciated in six months or less -- yet they can't depreciate it for tax purposes. The U.S. semiconductor industry faces five-year depreciation timetables for products that have three-year lives (in contrast to Japan, where chipmakers can write off their fabrication plants in one year). Overall, the tax advantage remains with the long, rather than the short, product life-cycle, even though the latter is where all design and manufacturing are trending.

It is vital that accounting and tax policies -- both those promulgated by private-sector regulators like the Financial Accounting Standards Board and those promulgated by the government at the IRS and elsewhere -- start to reflect the shortened capital life-cycles of the Knowledge Age, and the increasing role of intangible capital as "wealth."

5. Creating a Third Wave Government

Going beyond cyberspace policy per se, government must remake itself and redefine its relationship to the society at large. No single set of policy changes that can create a future-friendly government. But there are some yardsticks we can apply to policy proposals. Among them:

- **Is it based on the factory model, i.e. on standardization, routine and mass-production?** If so, it is a Second Wave policy. Third Wave policies encourage uniqueness.
- **Does it centralize control?** Second Wave policies centralize power in bureaucratic institutions; Third Wave policies work to spread power -- to empower those closest

to the decision.

- **Does it encourage geographic concentration?** Second Wave policies encourage people to congregate physically; Third Wave policies permit people to work at home, and to live wherever they choose.
- **Is it based on the idea of mass culture -- of everyone watching the same sitcoms on television -- or does it permit, even encourage, diversity within a broad framework of shared values?** Third Wave policies will help transform diversity from a threat into an array of opportunities. A serious effort to apply these tests to every area of government activity -- from the defense and intelligence community to health care and education -- would ultimately produce a complete transformation of government as we know it. Since that is what's needed, let's start applying.

Grasping the Future

The conflict between Second Wave and Third Wave groupings is the central political tension cutting through our society today. The more basic political question is not who controls the last days of industrial society, but who shapes the new civilization rapidly rising to replace it. Who, in other words, will shape the nature of cyberspace and its impact on our lives and institutions?

Living on the edge of the Third Wave, we are witnessing a battle not so much over the nature of the future -- for the Third Wave will arrive -- but over the nature of the transition. On one side of this battle are the partisans of the industrial past. On the other are growing millions who recognize that the world's most urgent problems can no longer be resolved within the massified frameworks we have inherited.

The Third Wave sector includes not only high-flying computer and electronics firms and biotech start-ups. It embraces advanced, information-driven manufacturing in every industry. It includes the increasingly data-drenched services -- finance, software, entertainment, the media, advanced communications, medical services, consulting, training and learning. The people in this sector will soon be the dominant constituency in American politics.

And all of those confront a set of constituencies made frightened and defensive by their mainly Second Wave habits and locales: Command-and-control regulators, elected officials, political opinion-molders, philosophers mired in materialism, traditional interest groups, some broadcasters and newspapers -- and every major institution (including corporations) that believes its future is best served by preserving the past.

For the time being, the entrenched powers of the Second Wave dominate Washington and the statehouses -- a fact nowhere more apparent than in the 1993 infrastructure bill: Over \$100 billion for steel and cement, versus one lone billion for electronic infrastructure. Putting aside the question of whether the government should be building electronic infrastructure in the first place, the allocation of funding in that bill shows the Second Wave swamping the Third.

Only one political struggle so far contradicts the landscape offered in this document, but it is a big one: Passage of the North American Free Trade Agreement last November. This contest carried both sides beyond partisanship, beyond regionalism, and -- after one climactic debate on CNN -- beyond personality. The pro-NAFTA coalition opted to serve the opportunity instead of the problem, and the future as opposed to the past. That's why it constitutes a standout model for the likely development of a Third Wave political dialectic.

But a "mass movement" for cyberspace is still hard to see. Unlike the "masses" during the industrial age, this rising Third Wave constituency is highly diverse. Like the economic sectors it serves, it is demassified -- composed of individuals who prize their differences. This very heterogeneity contributes to its lack of political awareness. It is far harder to unify than the masses of the past.

Yet there are key themes on which this constituency-to-come can agree. To start with, liberation -- from Second Wave rules, regulations, taxes and laws laid in place to serve the smokestack barons and bureaucrats of the past. Next, of course, must come the creation -- creation of a new civilization, founded in the eternal truths of the American Idea.

It is time to embrace these challenges, to grasp the future and pull ourselves forward. If we do so, we will indeed renew the American Dream and enhance the promise of American life.

This statement represents the cumulative wisdom and innovation of many dozens of people. It is based primarily on the thoughts of four "co-authors": Ms. Esther Dyson; Mr. George Gilder; Dr. George Keyworth; and Dr. Alvin Toffler. This release 1.2 has the final "imprimatur" of no one. In the spirit of the age: It is copyrighted solely for the purpose of preventing someone else from doing so. If you have it, you can use it any way you want. However, major passages are from works copyrighted individually by the authors, used here by permission; these will be duly acknowledged in release 2.0. It is a living document. Release 2.0 will be released in October 1994. We hope you'll use it to tell us how to make it better. Do so by:

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