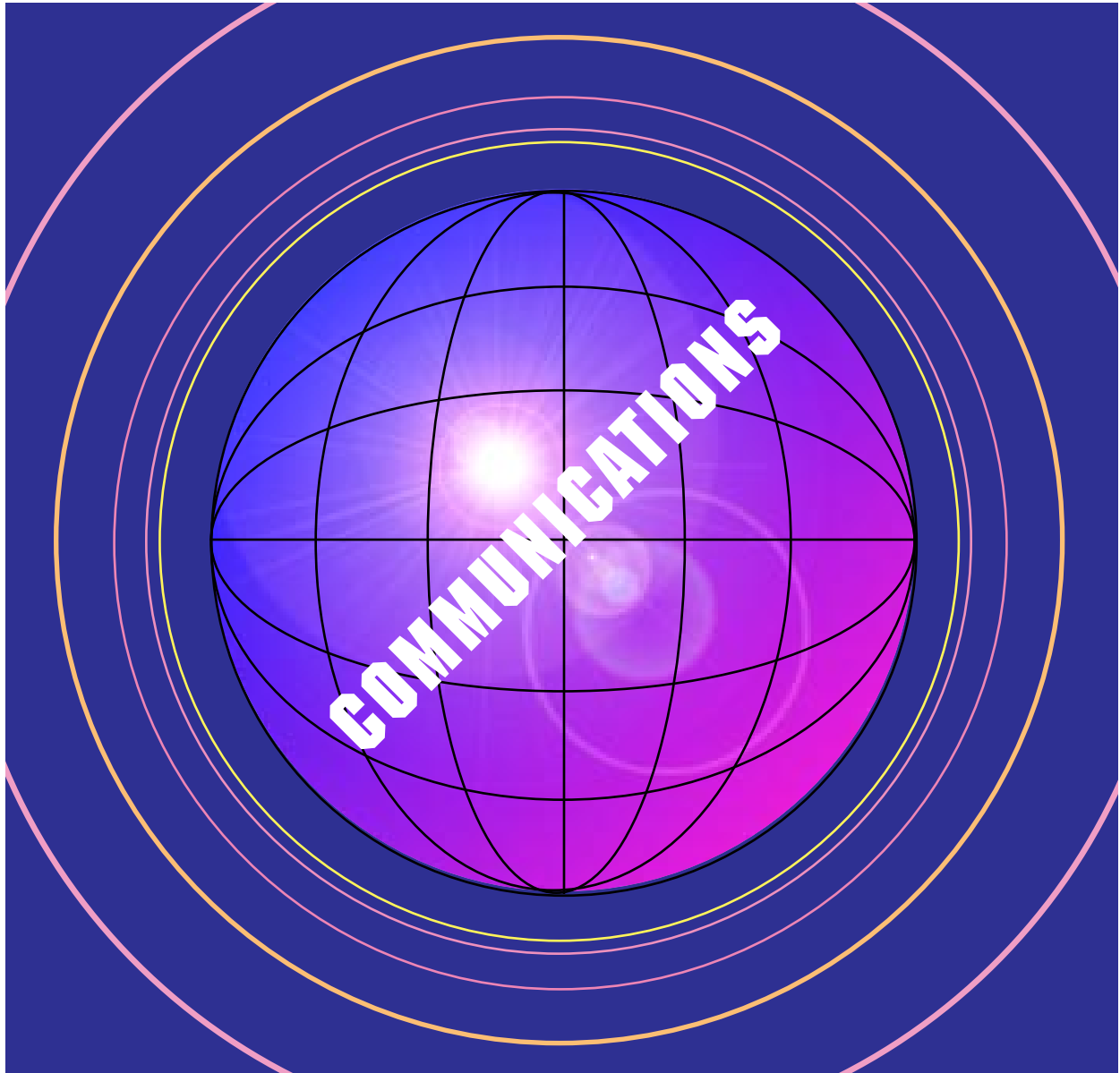


global issues

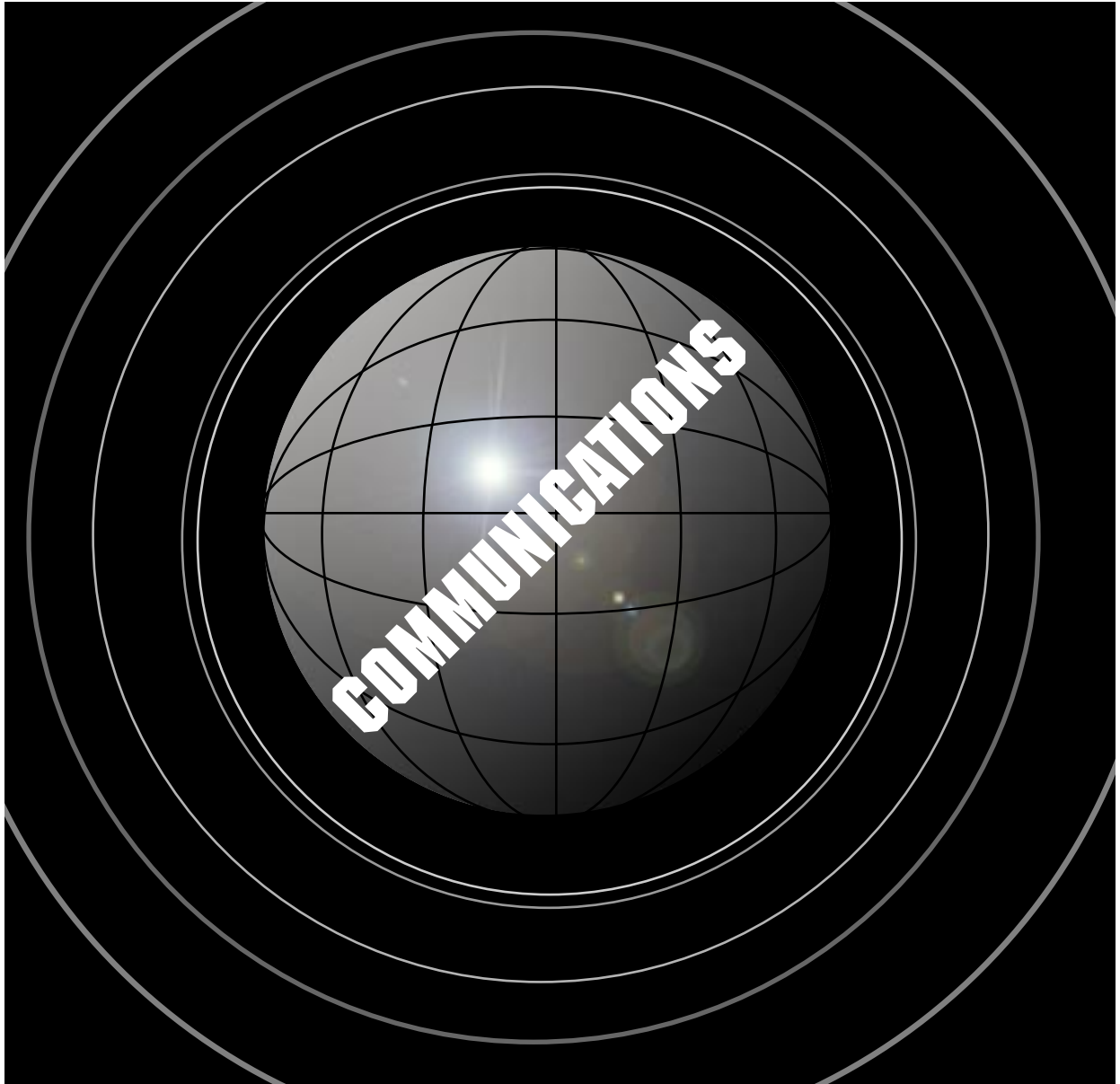


T H E I N F O R M A T I O N S O C I E T Y

SEPTEMBER 1996

Volume 1, Number 12

global issues



T H E I N F O R M A T I O N S O C I E T Y

SEPTEMBER 1996

Volume 1, Number 12

global issues

COMMUNICATIONS: THE INFORMATION SOCIETY

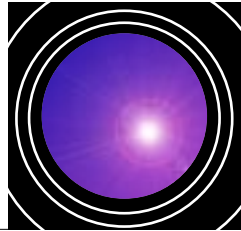
SEPTEMBER 1996
Volume 1, Number 12



The Global Information Infrastructure (GII)
- a massive network of
communications networks - will
forever change the way
citizens around the world live, learn, work
and communicate....The GI is a historic
undertaking. It is strengthened by
participation, bolstered by openness,
and fortified by strong nations and
talented people pursuing dreams
of a better tomorrow.
Join me in building the 21st Century's
first great achievement."

Vice President Al Gore

table of contents



GLOBAL ISSUES

Electronic Journals of the U.S. Information Agency

Volume 1, Number 12

September 1996

COMMUNICATIONS: THE INFORMATION SOCIETY

focus

Basic Principles for Building an Information Society 6

America's vice president outlines the basic guidelines to build a global information society.

By Vice President Al Gore

New Technology Benefits All Nations 8

In an interview, Larry Irving, assistant secretary of commerce for communications and information, says that developing nations can and must be a part of the information age.

By Edmund Scherr

The Internet: Creating a Democratic Global Village 10

In an interview, Stephen Goldstein of the National Science Foundation says that the Internet is a wonderful tool for the free and open exchange of information and opinion throughout the world.

By Jerry Stilkind

commentary

The Electronic Revolution and Developing Countries 13

In an interview, Peter Knight, chief of the Electronic Media Center at the World Bank, says that developing countries can begin to take part in the information revolution.

By Jerry Stilkind

The Internet is Changing Higher Education 15

The president of Harvard University notes that all the information in the world will be of no avail unless it is used intelligently and wisely.

By Neil Rudenstine

Data Deluge: The Changing Role of the Media 22

The CNN world affairs correspondent writes that journalists should be guides to what people want to know about and what they should know about their community, country, and world.

By Ralph Begleiter

Media Developments and Public Policy	24
The foreign editor of <i>USA Today</i> notes that the high speed dissemination of information has just begun. And with it will be new challenges for government, armies, and journalists.	
<i>By Johanna Neuman</i>	
Implications of the Revolution in Communications	28
Excerpts of a panel discussion on the impact of information advancements on democracy.	
America's Information Edge: The Nature of Power	31
Knowledge, more than ever before, is power. How a country uses its information resources will influence its place in world affairs, the authors say in this abridgement of their <i>Foreign Affairs</i> article.	
<i>By Joseph Nye, Jr. and William Owens</i>	

departments

A Bibliography on Creating an Information Society	37
Books, documents and articles dealing with an information society and the building of a Global Information Infrastructure.	
<i>By Martin Manning</i>	
Article Alert	40
Abstracts of recent articles on a global information society.	
Key Internet Sites	41
World Wide Web sites for basic documents and sources of information on creating an information society, plus Internet addresses for sites to U.S. legislation and government agencies.	

GLOBAL ISSUES

Electronic Journals of the U.S. Information Agency
ejglobal@usia.gov

Publisher	Judith S. Siegel
Editor	John Walsh
Managing Editor	Edmund Scherr
Text Editor	Jim Fuller
Intrernet Editor	Tim Brown
Associate Editors	Guy Olson
.....	Wayne Hall
Contributing Editors	Judith Greenspan
.....	Jerry Stilkind
Reference and Research	Martin Manning
.....	Monica Mierszewska
.....	Joan Taylor
Art Director	Patricia Gipple
Editorial Board	Howard Cincotta
.....	Judith S. Siegel
.....	Pamela H. Smith

USIA's electronic journals, published and transmitted worldwide at two-week intervals, examine major issues facing the United States and the international community, and inform foreign publics about the United States. The journals — ECONOMIC PERSPECTIVES, GLOBAL ISSUES, ISSUES OF DEMOCRACY, U.S. FOREIGN POLICY AGENDA and U.S. SOCIETY AND VALUES —provide analysis, commentary, and background information in their thematic areas. French and Spanish language versions appear one week after the English. The opinions expressed in the journals do not necessarily reflect the views or policies of the U.S. Government. Articles may be reproduced and translated outside the United States unless there are specific copyright restrictions cited on the articles. Current or back issues of the journals can be found on the U.S. Information Service (USIS) Home Page on the World Wide Web at "<http://www.usia.gov/journals/journals.htm>". They are available in several electronic formats to facilitate viewing on-line, transferring, downloading, and printing. Comments are welcome at your local USIS office or at the editorial offices — Editor, Global Issues (I/TGIC), U.S. Information Agency, 301 4th Street SW, Washington, D.C. 20547, United States of America. You may also communicate via email to ejglobal@USIA.gov.

f o c u s



BASIC PRINCIPLES FOR BUILDING AN INFORMATION SOCIETY

By Al Gore
Vice President of the United States

The Global Information Infrastructure (GII) — a massive network of communications networks — will forever change the way citizens around the world live, learn, work, and communicate.

This global network would permit the most remote village to browse through the most advanced library. It would allow doctors on one continent to examine patients on another. It would help a family in the Northern Hemisphere stay in touch with relatives in the Southern Hemisphere. And it would instill in citizens everywhere a deeper sense of their shared stewardship of our small planet.

Developed and developing nations in a number of international gatherings have forged a consensus that the best information network would be built on five core principles: private investment, competition, flexible regulation, open access, and universal service. The goal of these guiding principles is to speed the development of the GI and ensure its longevity.

These principles were adopted in Buenos Aires two years ago at the meeting of the International Telecommunication Union and affirmed last year at the G7 Telecommunications Ministerial in Brussels. They have also been reaffirmed in a wide range of regional and multilateral fora — the Asia Pacific Economic Cooperation meeting, the Summit of the Americas, and they were noted at the Information Society and Development Conference.

All five principles are tightly linked and depend on one another for their force. We should think

about how these principles can advance both the particular interests of individual nations and the common interests of all citizens of the world.

Let me review the core principles.

Let's start with private investment and competition. President Clinton signed into law the Telecommunications Reform Act of 1996, which will open our communications markets to competition among a host of companies. We believe that liberating private businesses to compete with each other has proven time and again to be the best technique for sparking creativity, creating jobs, boosting profits, and bringing an array of new services to consumers.

This is a tremendous opportunity for the private sector — as we have seen in South America, in Asia, and now in parts of Africa. But private investment, wherever it occurs, must be accompanied by robust competition.

We've learned that lesson in the United States. When a federal judge broke up AT&T, the world's largest telephone monopoly, the results surprised even the fiercest proponents of deregulation. The price of a long-distance telephone call dropped dramatically. New companies, with new jobs, burst onto the scene. And AT&T itself eventually became a stronger company — more competitive and innovative.

Developments in Chile also illustrate the benefits of private investment and open competition. In 1994, Chile put in place a strongly pro-competitive regulatory structure.

The number of long-distance carriers in Chile increased from one to 12. The portion of homes with telephone service jumped by more than 50 percent. And prices dropped from about two U.S. dollars per minute to about one-fifth of a U.S. dollar per minute. The industry's revenues increased too — about twice as fast as the overall economy.

Private investment and competition are essential for the GII's development.

So is smart, flexible regulation, the third principle. In order for investors to take risks and competition to take hold, regulations must ensure stability, freedom, and flexibility, while also offering consumers fair prices and wide choices.

In the United States, we regulate many communications industries through an independent agency, the Federal Communications Commission (FCC). This expert body has the know-how to make technical decisions. And with other agencies in the U.S. Department of Justice and Department of Commerce, the FCC has the capacity to monitor changing market conditions.

Just as these new technologies are overthrowing the old commercial order, those of us in government must topple outdated regulatory structures while remaining true to their underlying values and ideals.

Another core principle — tightly linked to the principles of private investment, competition, and flexible regulations — is open access. All nations and all parties need to be able to connect to the GII.

The reason can be illustrated, in part, by a principle well-known in computer science as Metcalfe's Law. Metcalfe's Law holds that the power of a computer network increases at roughly the square of the number of people connected to it.

That's why the Internet is growing so fast. The more people who connect, the more other people there are who want to connect. If you double the number of people on line, you quadruple

the number of possible ways to link people and combine their talent and ideas. That is why open access is so important. Keep people off the network, and the networks won't be as valuable. Let people on, and the value everyone derives will soar.

Therefore, the owners of networks must charge non-discriminatory prices for access to their networks. The only way to realize the true promise of the GII is to guarantee that everyone who connects has access to thousands of different information sources — from video programming to electronic newspapers to computer bulletin boards — from every nation, in every language.

The fifth and final principle is perhaps the most important — universal service. We believe that universal service can be a natural outgrowth of the first four principles. Certainly the combination of open access, flexible regulations, competition, and private investment will tug us in that direction. But by themselves they will not take us fully to that destination.

That is why President Clinton and I have challenged our nation's private sector to help connect every school in America to the information superhighway by the end of this decade. And that is why I renew my call for the creation of a Global Digital Library, so all the world's citizens will have quicker and richer access to all the world's information.

Of course, in each nation the exact contours of universal service will differ. But its basic shape should be similar in most locales. For instance, providing basic service at prices people at all income levels can afford, making high quality service available regardless of a person's geographic location or physical ability, and teaching consumers how to use these technologies effectively.

The GII is a historic undertaking. It is strengthened by participation, bolstered by openness, and fortified by strong nations and talented people pursuing dreams of a better tomorrow.

Join me in building the 21st century's first great achievement.



NEW TECHNOLOGY BENEFITS ALL NATIONS

An Interview by Edmund Scherr

Larry Irving, assistant secretary of commerce for communications and information, says that “no country will be a truly rich country unless it has a robust telecommunications and information industry.” He emphasizes that developing nations can and must be a part of the information age. Irving says that millions of people in those countries “will be lifted out of poverty because of what telecommunications will provide them in an increased standard of living.”

Q. How far is the world from an information society?

Irving. You’re looking at a world where 80 percent of the households don’t have a telephone. We’re living in a world where 50 percent of the people don’t use a telephone, and 50 percent of the people live two hours from a telephone. We take for granted in western society PCs and cellular phones and pagers, and those things don’t exist in a lot of societies.

The promise of the information revolution is that you’re going to improve medical care and education, and you’re going to drive economies; you’re not going to just drive telecommunications economies. When you put a telecommunications infrastructure in a country, you improve their overall economy.

You can’t run a 21st century business anywhere on this globe without access to the telecommunications infrastructure. So there are hundreds of millions of people who live in poverty, who, as this Information Age begins to accelerate, will be lifted out of poverty because of what telecommunications will provide them in an increased standard of living. And that’s exciting.

Q. What about the growth of the telecommunications sector in the United States and in the world?

Irving. In the developed world, there is the potential to improve health care, education, and job creation. With the current U.S. edge in technology, the telecommunications sector will be a larger part of the U.S. economy. Some 10 percent of our economy right now is based on telecommunications and information technology. We expect in a decade it will grow to 20 percent. Probably the largest single segment of our economy will be telecommunications and information industries.

It will probably grow from 6 to 12 percent of the global economy. What oil and coal were for this century, that’s what telecommunications information technology will be for the 21st century. And if you want a job or if you want an economy that works, you’ve got to understand and exploit these technologies. No country will be a truly rich country unless it has a robust telecommunications and information industry.

Q. Can the developing countries skip old information technologies and start with advanced telecommunications?

Irving. The potential for developing nations is that advanced technologies, like wireless and satellite technologies, are all going to leapfrog them into cutting-edge systems.

When you think of the tremendous expenditure in this country of putting copper wire across the length and breadth of the United States, imagine what it would cost to do the same thing in Africa or Asia.

The reality is you don't have to do it that way anymore. You can now use satellite and wireless technologies at a fraction of the cost of what laying wire would be, and provide significant cost savings, and still give people access to a cornucopia of telecommunications products and services.

The prices of advanced information technologies are falling in the face of competition. Developing nations are able to enter the information age at a steeper point on the learning curve and at a lower point on the cost curve.

Once the basic technology, for example, the cellular phone, is worked out in the United States, engineers in Brazil or Sierra Leone or India can improve it just as well. Once they understand the basic technology, a lot of engineers around the world can do it. They become not just importers and users, but they become the manufacturers and creators, too.

Q. Then in the long run, the United States and other industrialized countries will not dominate the market for telecommunications equipment?

Irving. The United States or Western Europe or Japan or the developing Asian countries are not going to dominate these technologies for very long. There are large untapped telecommunications markets in China, Indonesia, the African continent, and India. When you start manufacturing electronic products in those areas, you're going to begin to develop your own technologies, your own skills.

Bring people telephones, open up markets, increase foreign investment in developing countries, and then these nations can grow their own economy. You will see partnerships between countries. And we all learn something from each other—that a truly free global marketplace in telecommunications benefits everybody.

Q. Administration officials have said that the building of an information infrastructure should

be driven by the private sector. What is the role of government?

Irving. The role of government is to steer, not to run. We're going to try to develop a framework that permits industry to make the investments it should make and provides consumers the choices they want and in the areas and the marketplaces that wouldn't otherwise work.

In sectors of governmental expertise—providing health care, providing education, providing a social safety net—the government has got to find ways to use information technology more efficiently.

There is a clear governmental role: creating a structure so that these technologies can be used for improving the quality of life of its citizens.

Q. What about the role of regional organizations in encouraging the building of a Global Information Infrastructure?

Irving. The APEC nations are talking about developing an Asian-Pacific Infrastructure, and there have been information discussions among the Latin American nations. There is a lot happening, and all of these activities build on each other. We're trying to take the core vision, as expressed by President Clinton and Vice President Gore, and use that as the core for developing a national, a regional, and then a global information society and information infrastructure.

All of the global and regional efforts to build an information infrastructure are really based on "Local Information Infrastructures." It comes down to the decisions made in either states or cities or countries as to how they are going to deploy their infrastructure in a way that they can fit into the larger infrastructures. I'm real excited about the potential for some of these regional cooperative relationships.

Edmund Scherr writes on information and other global issues for the U.S. Information Agency.



THE INTERNET: CREATING A DEMOCRATIC GLOBAL VILLAGE

An interview by Jerry Stilkind

Some countries are limiting access to the Internet by individuals, business and nongovernmental groups in an effort to continue their control over the information their people get about their government and the outside world. Some countries are limiting access to this latest tool in the information revolution in order to preserve state-run telecommunications monopolies. Individuals and groups in these societies are finding ways to circumvent the government monopolies.

Steven Goldstein, program director for inter-agency and international coordination at the National Science Foundation, believes that the Internet is a powerful tool for bringing about open and competitive economies and free political systems.

Question. Are government, business or individuals taking the lead in expanding the Internet, providing more access to the Internet in developed and in developing countries?

Goldstein. That's a difficult question because every country is different, and if I had to give a one-word answer, I'd say "everybody." I think that Europe, Western Europe at least, and a whole lot of Eastern Europe, are very much like the United States in that the Internet is being used by most sectors of society.

The United States is perhaps three to five years ahead, but the gap is closing quickly when we talk about Europe. The reason that we might be ahead is that European countries have historically had monopoly telecommunications providers. The prices have been very high for the user, many times the prices that U.S. people pay, and as a result growth in Europe has been somewhat inhibited.

Monopolies also don't have to be as responsive to their users, their customers, as companies that are competing, so it's been harder for Internet service providers in other countries to get the telecommunications facilities that they needed in order to operate. In some cases the monopolies are trying to set up Internet services of their own, and so it's to their benefit to inhibit the growth of competing providers; and since they are in control of the facilities, they can control their competitors.

A case in point is China. The Ministry of Post and Telecommunications in China controls most of the circuits, and they wanted to control the Internet so that they could be the sole providers. But some other ministries have access to telecommunications facilities, and they are developing competing systems. Despite the efforts of the Ministry of Post and Telecommunications in China to monopolize Internet growth, there is quite rapid growth in certain areas.

For example, there is the China Education and Research Network, which is largely an academic network, and that's growing rapidly even though it gets most of its facilities from the Ministry of Post and Telecommunications. I really don't want to single out China here; the same thing is happening in several other countries.

Q. Who is pushing for alternatives to the state monopolies and how did they start?

Goldstein. As a general rule, the rapid growth of the Internet is due to hard-working entrepreneurs, whether they happen to be within government agencies or nongovernmental organizations or just private business people. And everywhere you look in any country where there is Internet, the growth is exponential, explosive.

But you say, who is doing that? In the early days, it was the academic sector that was doing it, and often it had to fight entrenched government bureaucracies to get licenses to operate. A good example is Peru. The Academic Network of Peru grew very, very fast after initially overcoming the objections of government agencies that wanted to control this method of providing information; even though the agencies weren't technically capable of doing it, they didn't want to let anybody else do it.

Now, an interesting thing has happened in Peru. The telephone monopoly was bought up by Telephonica de Hispana, which is the Spanish PTT, which has bought monopoly rights to a number of PTTs in Latin America, and they have introduced an Internet service, and they are trying to crush the academic Internet service.

Q. I take it that you feel that all countries should have some competition in telecommunications services?

Goldstein. That's one of the principles that Vice President Gore enunciated as part of his proposal for a global information infrastructure, to promote free and open competition and free and open access. It was also enunciated in the Summit of the Americas (held in December 1994) by the vice president. We believe that competitive provision of services would be to everybody's benefit.

Q. How are governments of developed and developing countries using the Internet?

Goldstein. Governments use the Internet in two ways. One, they use it as any other business would for internal communications or for communications with customers. Two, they use it to provide services, to provide informational services. So, for example, both the United States and Canada and, I imagine, many other countries have very useful Web pages where you can get information and download forms, and get names and addresses of people you want to contact. Some of the names are uplinks; if you click on them on the Web page, you can actually send electronic mail to people in government. So, it's for conducting your own affairs and for providing informational services to the public. I think one of the first governments to adopt the Web for doing business was Costa Rica.

Q. How did that come about, and what did they do?

Goldstein. Well, I'm a very bad historian, so I can't remember the date. But just when the U.S. government was looking around to use the Web, the government of Costa Rica had adopted Internet technology to do its business. And one of the reasons is that somewhere in the laws of Costa Rica it is written that all citizens will be computer literate. So they train all the kids in school, even in remote villages that have a computer. The kids are taught to use computers as part of their schooling. And so it pays off on a national level; most of the population will accept computers, just the way it will accept any other appliance.

So it was just natural when the Internet was introduced into Costa Rica that sooner or later the government would use it. In Costa Rica there are essentially three classes of Internet users or three sectors of the Internet. There is the academic sector, the government sector, and the commercial sector.

Q. Are nonprofit organizations as well as academic organizations using the Internet a lot outside of the United States?

Goldstein. Absolutely. Now, the nongovernment organizations (NGOs) are probably among the more burdened organizations when it comes to getting access to the Internet largely because they don't have a lot of money.

I've seen the argument in many countries: "We (nonprofit organizations) do so much good for the country and because we have so little money, we should be given the same kind of access as the academic sector."

The academic sector usually turns around and says, "Well, wait a minute; we were given (in some countries) especially low rates because we were so important to the country and to the country's growth, but part of the bargain is we can't let anybody use the network that's not in the academic sector. And so you, nongovernmental organization, you're going to have to go and get your service from somebody else."

And when they go to somebody else, somebody else says, "Sure, but you have to pay the same

rates that everybody else pays." And the NGOs reply, "But we can't afford it."

In some countries the academic sector has a lot of people in it who might be called establishment, whereas the NGOs often have groups that might be considered anti-establishment; so there is an element of class struggle involved in this thing, too.

Q. Will the Internet, to use a phrase that's pretty popular, contribute to building a "global village?"

Goldstein. It already has. As an example, if you want to be a tourist in some country, you can find Web pages about that country and find out what's going on. In many cases you can make hotel reservations, you can register for tours and you can find out about concerts. You can use your charge card to do that in many cases because they've got anti-theft systems on the Internet. You know, if you're persistent and spend a few hours searching around, you can find out about almost anything that you want in many parts of the world.

I think more important than that is that there are a lot of discussion groups composed of people with shared areas of interest from all parts of the world, and they are just regular members of the community.

This way you can be part of a community without any national borders. Anybody can join an Internet discussion group. Where we happen to be physically is unimportant; we're just part of that community. There are thousands of mailing lists for interest groups. As I've said, networks

have been established in different ways in different countries. In some cases entrepreneurs have set up the network. For example, the first provider that went on line in Uganda was a commercial company. The first provider that went on line in Mongolia, and still the only provider in Mongolia, was a commercial company. The biggest market share provider in the newly independent states of the former Soviet Union is a commercial company, REOCOM.

Q. Do you agree with those who believe that this new technology will have profound effects on our societies?

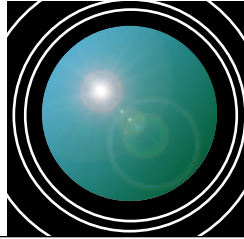
Goldstein. The Internet continues to undergo metamorphosis and will probably continue to do that for years and years and years. At this particular point in its life cycle, it reaches most countries of the world, at least the capital cities, and its reach in developing countries will be spreading, both geographically and throughout society.

It has managed in almost every country to defy those who would control it, who want to control the freedom of expression and information. Therefore, it is a wonderful tool for the free and open exchange of information and opinion throughout the world.

As one of our diplomats said about one of the trouble spots of the world, if we could manage to give everybody a computer with Internet access, the bad guys would have a hard time taking over again.

Jerry Stilkind is a writer on information and other global issues for the U.S. Information Agency.

c o m m e n t a r y



THE ELECTRONIC REVOLUTION AND DEVELOPING COUNTRIES

An Interview by Jerry Stilkind

All developing countries can begin to take part in the information revolution that is sweeping through the industrialized world. The initial investment is not large, according to Peter Knight, chief of the World Bank's Electronic Media Center.

The new technology can help leapfrog over some of the current stumbling blocks to development. The alternative is to fall even further behind in the creation of a viable economy and to become an ever more marginal player in world affairs, Knight says.

Question. Will the information age be of benefit to developing countries? Can they profit from it when sophisticated equipment and sophisticated skills are necessary for information technology?

Knight. The information revolution is really a two-edged sword. It offers tremendous potential for catch-up for countries that are able to surf (ride the crest of) this technological wave, which is really one of the great waves of the 20th Century.

Those that cannot ride the wave are threatened with falling far behind; and if they are far behind now, they will become further marginalized and left out. That is the greatest threat and the greatest opportunity in Africa, for example.

It is the least developed continent, the least connected continent, and it's lagging on virtually every development indicator. And yet what do these new technologies offer? They are bringing down the cost of storing, processing, and transmitting information, knowledge, even wisdom.

That makes the world's knowledge base accessible to every person on this globe.

However, to mobilize the resources and the vision to "get on the wave," so to speak, requires visionary leadership, it requires international help, and it is not an easy thing to achieve.

Q. Are there examples of developing countries that have been able to take advantage of the information revolution?

Knight. In terms of the really revolutionary things, I don't think there are countries that have yet really done this. You can find pieces of countries where there are certain policies and programs that are exemplary of what could be done. But I don't think any of the least developed countries is mobilizing itself, trying to take advantage of the learning potential of accessing the world's knowledge base and building new learning systems, mobilizing international resources to help them do this, and then translating it into massive programs, community information and learning centers.

You have to understand that the Internet was not heard about a lot before the late 1980s, although it had been around before then. Now we've had this acceleration of connectivity. In Africa, only 13 sub-Saharan countries have a full Internet connection, and, for the most part, they are not very broad-based connections, the major exception being South Africa. This potential is really looming up now, and we see the ability to connect people wherever they may be to the most advanced sources of knowledge and information.

Q. What prerequisites are necessary for a developing country to enter the information revolution? Isn't the information revolution for people who have technical skills?

Knight. We're talking about learning systems, and right now a lot of the learning systems are pretty primitive. With wireless technologies, meaning satellites and cellular telephone systems and so forth, there is the possibility of bringing the "world's knowledge base" even to remote, rural areas.

Now, how to get the right knowledge into the right minds, that's something that is an organizational problem. It's a political problem, it's a regulatory problem; it's more than a technological problem or even a financial problem. Resources are likely to flow in this direction where there are, let's say, good business plans and investment opportunities.

I'm not trying to minimize the difficulties, but there is capital waiting to be invested in telecommunications systems that will bring down sharply the cost of access to information and knowledge.

Q. What can get the capital flowing into developing countries?

Knight. It really involves partnerships of all kinds. It's partnership between business and the public sector, which needs to establish a regulatory framework and what we call an "information-friendly environment" in which private capital can work. Business has to have an appropriate regulatory framework.

We in the World Bank are thinking about proposing a major international effort to work together with African leaders and people to develop what they call "Africa's Information Society Initiative." The initiative is a set of proposals, and a vision of the future that has been endorsed by ministers responsible for planning and development but which is a long way from being converted into reality.

It is an attempt to bring together the world's knowledge of financial, technical and other resources to design and operate and implement

the kind of revolution to help countries that are really badly lagging catch up. This is not a simple task, but it's one that is, I think, feasible. It's something that could mobilize attention, and there has been considerable leadership showed, for example, by South Africa.

Q. Has the Bank been lending specifically for information age projects?

Knight. That's something that's in evolution. I think the Bank is moving away from direct finance of telecommunications. It was never a very large part of our total, but I think the feeling in the Bank is that the private sector is the most appropriate source of funding for this, and that there is a lot of capital ready and eager to flow into investments in the telecommunications sector. Our goal is more to help develop what we call an "information-friendly environment," a regulatory framework that will encourage the flow of capital, both domestic and foreign, rather than retard it, as is the case in many countries today.

Q. What is the cost of information technology and training?

Knight. In the case of Internet connectivity—I'm not saying to build a whole national information infrastructure—one doesn't need a huge investment. For less than the price of one MIG-29 or F-16 moderately well equipped, one can virtually put a connection into every sub-Saharan African country lacking one and provide training, free connectivity for a year or so, maybe do just about everything except pay the local staff. So we're not talking about huge amounts of money. These investments can be made on the order of \$500,000 to get started. It's not a national information infrastructure; that's going to be much, much more.

Q. Which countries have taken the lead in beginning to build an information infrastructure?

Knight. I have picked Brazil, Russia, and South Africa as three countries that have a tremendous potential.

Jerry Stilkind writes on information and other global issues for the U.S. Information Agency.



THE INTERNET IS CHANGING HIGHER EDUCATION

By Neil Rudenstine

Remarks by Harvard University President Rudenstine at the Harvard Conference on the Internet and Society, May 29, 1996.

I want to talk about the Internet and higher education: what changes are taking place in universities as a result of this recent advance in information technology? Are the changes significant and are they likely to be long-lasting (as I believe they are)? If so, why?

The questions are obviously important, because our conclusions will determine whether Harvard and other institutions should make very large financial investments in the next five to ten years, at a time when flexible resources are clearly constrained.

But more important than the financial issues are those of substance. Any deep transformation in communications—in our ability to gain access to data, information, and ultimately knowledge, and in processes that can help us to discover, invent, teach, and learn—will necessarily have profound effects on higher education. So as we assess the new information technology—the Internet—we have to make the right bet, because the stakes are high.

When I refer to the Internet in this talk, I mean to use the term as shorthand for a cluster of technologies that includes networked personal computers, hypertext and hypermedia, the World Wide Web, and other adjuncts.

This cluster has, during the past few years, already begun to have a dramatic effect on the ways that many students and faculty are approaching the whole activity of teaching and learning. In the context of Harvard and at

least some other universities, these changes are more dynamic and pervasive than any previous breakthrough in information technology during this century—including the introduction of the personal computer itself. The effects are visible in nearly every part of our own campus, as well as elsewhere in higher education.

There are moments of real transformation, and the rapid emergence of the Internet is one of them.

From one point of view, the Internet marks just one more point on a long continuum of inventions—one that has unfolded over the course of the last century and a half—from the telegraph and cablegram, through the telephone, radio, recorded sound, film, television, early calculating machines, and then the earliest computers. But we know that certain events along a continuum can represent much more than another simple step in a natural, gradual progression. There are moments of real transformation, and the rapid emergence of the Internet is one them.

Many inventions (such as radio, film, and television) have of course had a massive effect on society—on how people spend their time, entertain themselves, and even gain information. But, in spite of many predictions, these particular inventions have had little effect on formal, serious, advanced education. Why should the Internet be any different? Is there any evidence—or a reasoned explanation—for betting on the Internet, when so many earlier inventions have fallen short of expectations?

Let me start by mentioning a few facts. In our Faculty of Arts and Sciences, as well as nearly all of our nine professional schools, teachers and students—including freshmen—are on-line, with easy access to the network. E-mail is commonplace. Activity on the Net is heavy at nearly all times of day and night,

with the only major slowdown occurring between 3:00 a.m. and 6:00 a.m.

In 1992, we began a retrospective conversion of Harvard's entire library catalogue system—the largest university library system in the world—at a projected cost of \$22 million. By next year, full catalogue entries for the (approximately) 12 million volumes, in our 92 libraries, will be on-line and “searchable” in any number of ways. In addition, there are, of course, more and more actual texts, images, and other materials on-line. The rate of change and growth is exceptionally fast.

A year ago, the Arts and Sciences Website (which includes many subsites) experienced about 150,000 “hits” in the single month of March. This March, just one year later, the number of “hits” had increased from 150,000 to 2.3 million. There is no sign of a slowdown.

A year ago, the volume of e-mail traffic on the Arts and Sciences network was about 80,000 transactions per day. Twelve months later, the number had grown by about 170 percent, from 80,000 to about 215,000 per day—or about 6.5 million per month. These figures, let me stress, are only for Arts and Sciences. They do not include our Schools of Business, Design, Dentistry, Education, Government, Law, Medicine, Public Health—or our central administration and various other units.

So if I am asked whether something very unusual—something qualitatively and quantitatively different—is under way, the answer is a clear “yes.” And we are only at the beginning. In purely economic terms, Harvard has recently committed itself to spend approximately \$50 million on new administrative data systems in the next five years. In addition, we expect to spend something in the range of \$75 million to \$100 million on academic-related information technology—above and beyond the substantial investments already made since the early 1990s.

The last time universities experienced such far-reaching change in information processing, along with exponential expenditure growth, was during the last quarter of the nineteenth century and the first quarter of the twentieth. It was

then that the huge information systems that we call university research libraries reached their point of “takeoff” in accelerated development.

At Harvard, the moment of takeoff came during the 1870s and 1880s. When that moment arrived, universities were forced to confront many problems—including that of information overload—similar to several of the “electronic” problems we now face.

In 1876, for instance, Harvard's President Charles Eliot reported that the main library building had become completely inadequate to accommodate the sharp rise in acquisitions. Books, he said, “are piled upon the floors. . . . Alcoves are blocked upThousands of [volumes] . . . have been placed in temporary positions.”

He noted that large numbers of books were being stored haphazardly: “42,000 volumes scattered among twenty-nine [locations] . . . in sixteen different buildings.”

The real challenges, however, were not those of space and money. They were organizational and conceptual. How should books be arranged for optimal use? What kind of cataloguing system could be invented to allow rapid access to the huge number of volumes that were now being acquired? How could convenient linkages be created among books and articles in different but related fields? How should library books be integrated into the university's programs of instruction; especially if the library owned only one or two copies of a book which fifty or sixty students were asked to read for class discussion?

Finally, what was to prevent students (and even faculty) from disappearing into the stacks for days on end, pursuing a subject from book to book, shelf to shelf, unable to discriminate easily among the unlimited number of volumes, or to absorb more than a small fraction of the information available on a given topic? And what could possibly prevent less industrious students from simply browsing their lives away in sweet procrastination?

Some of these fears were not completely new. Anxieties had been building for some

As early as the 18th century, Diderot remarked that “a time will come when it will be almost as difficult to learn anything from books as from the direct study of the whole of the universe.”

time. As early as the 18th century, Diderot remarked that “a time will come when it will be almost as difficult to learn anything from books as from the direct study of the whole of the universe. . . . The printing press, which never rests [will fill] huge buildings with books [in which readers] will not do very much reading. . . [Eventually] the world of learning—our world—will drown in books.”

Meanwhile, a treatise on public health, published in Germany in 1795, warned that excessive reading induced “a susceptibility to colds, headaches, weakening of the eyes, heat rashes, gout, arthritis, asthma, apoplexy, pulmonary disease, indigestion, nervous disorders, migraines, epilepsy, hypochondria, and melancholy.” People were warned not to read immediately after eating, and only to read when standing up, for the sake of good digestion. Fresh air, frequent walks, and washing one’s face periodically in cold water were also prescribed for habitual solitary readers. Most of all, it was feared that excessive reading would make people socially dysfunctional, would take the place of direct human contact, and could well lead to a society composed of certified misfits.

Historical parallels are never exact, but the story of university research libraries, and of the habit of solitary reading, has some obvious relevance to modern information technology—especially to the Internet’s ability to give individuals unbounded access to a new universe of information that they do not yet know how to manage at all well.

There is also the serious problem of the very mixed quality of the information available. How do we sort it? How do we gain maximum return on the time and energy invested in searching?

More recently, another concern has surfaced: the problem of electronic addiction. A Washington Post article reported that, at MIT, students unable to break the Internet habit, riveting themselves to their computers for days on end, can request that the university simply deny them access, cold turkey, whenever they try to sign on.

At Columbia, the university’s Center for Research on Information Access noted that there is an increasing number of students who “really drift

off into [the Internet] . . . world, at the expense of . . . everything else.” Several students have already flunked out, purely electronically.

Given this situation, it is not surprising that many people are now asking some of the same questions that were raised in the early days of research libraries—and expressing some of the same fears. The Internet is in fact not easy to navigate; much of its available information is trivial; it appears to be hazardous to the health of at least some people; and it also has the capacity to distract many people from following what others regard as more serious pursuits.

Some of these concerns can be alleviated by recalling the story of our research libraries and their evolution. Other concerns—such as the worry that the Internet may turn out to be no more educationally useful than radio or television—need to be answered differently.

More recently, another concern has surfaced: the problem of electronic addiction.

Why is the Internet likely to succeed as a vehicle for real education, when so many other inventions have faltered? Why isn’t it simply one more in a long train of distractions? Doesn’t it, ultimately, take students and faculty further and further away from books, from the hard work of sustained study and thought, and from direct human contact with other students and faculty?

Let me suggest some of the main reasons why I believe that the Internet is fundamentally different from those earlier electronic inventions, and why I believe it is already having—and it will continue to have—such a major effect on higher education.

To begin with, there is the steadily mounting evidence of dramatic change and intensity of use, as I mentioned just a few moments ago. All of this is certainly not a mirage. More fundamentally, there is in fact a very close fit—a critical interlock—between the structures and processes of the Internet, and the main structures and processes of university teaching and learning. That same fit simply did not (and does not) exist with radio, film, or television. This point is in many respects a remarkably simple one, but—in the field of education, at least—it makes absolutely all the difference.

If I say there is a critical interlock or fit here, I mean nothing more complicated than the plain

fact that students can carry forward their work on the Internet in ways that are similar to—and tightly intertwined with—the traditional ways that they study and learn in libraries, classrooms, lecture halls, seminars, informal discussion groups, laboratories, and in the writing and editing of papers or reports.

Some of these activities are more cumbersome and less successful when transplanted to the Internet environment. Others are substantially improved. In most cases, however, the new technology acts primarily as a powerful supplement to—and reinforcement of—the major methods that faculty and students have discovered, over the course of a very long period of time, to be unusually effective forms of teaching and learning in higher education.

Specific examples can be helpful here, so that we can see more clearly how the capacities and processes of the Internet relate so closely to the university's traditional forms of education. For instance, the Internet—as we know—can provide access to essentially unlimited sources of information not conveniently obtainable through other means.

Let's assume for the moment that most of the technical and other problems of the Internet will in time be solved: that there will be, as there are now in the research library system, efficient ways of helping users to find what they want; that there will be procedures for information quality control, and for creating more effective linkages among different bodies of knowledge in different media.

At that point, the Internet and its successor technologies will have the essential features of a massive library system, where people can roam through the electronic equivalent of book stacks, with assistance from the electronic equivalent of reference librarians. In short, one major reason why the characteristics of the Internet are so compatible with those of universities, is that some of the Internet's most significant capabilities resemble, and dovetail with, the capabilities of university research libraries. Just as the research library is an extremely powerful instrument for learning, so too is the Internet—and for much the same reasons.

In fact, the library and the Internet are being viewed increasingly as a versatile unified system, providing an enormous variety of materials, in different formats—so that data, texts, images, and other forms of information can be readily accessed by students and faculty alike. Indeed, we are already well along this path.

If we now shift for a minute from libraries to the formal curriculum, we can see that the Internet has another set of highly relevant capabilities: it can provide unusually rich course materials on-line. For instance, traditional text-based Business School "cases" are already being transformed. I recently reviewed one of the new generation of multimedia cases, which focused on a small sock-manufacturing plant in China—an American-owned plant plagued by serious production and delivery problems, and losing money much faster than it could make either toes or heels.

The materials for this case began with a video tour of the plant, close-up moving pictures of the workers operating their machines—or not operating them—followed by interviews with several managers at different levels in the company's hierarchy. Interviews with the workers were also available. Detailed production and supply data, financial spread sheets, and a company report containing an official analysis of what was wrong with the plant—all of this and more was obtainable in the electronic course-pack.

What one saw, of course, was that the interviews with different people revealed totally different theories about the plant's problems, and the data was anything but conclusive. The company's official report, meanwhile, only served to complicate the picture further. Students who were taking this course had to analyze not just a text and statistics, but also the whole range of attitudes, expressions, and behavior—recorded on video—of the different executives, as well as the workers

How many of the plant's problems were basically cultural—since the key American manager spoke no Chinese, and had to communicate with the workers through interpreters? How many problems were the result of a more general

Some of the Internet's most significant capabilities resemble, and dovetail with, the capabilities of university research libraries.

human systems failure, given the fact that the plant was embedded in a larger surrounding bureaucracy? How much of the difficulty stemmed from internal inefficiency, bad organization, and managerial blundering?

What is so effective about cases that are presented in this way, is that far more of the entire human and social—as well as operational and financial—situation can be revealed, and this requires students to deal with a vivid dramatization that is much closer to the complicated reality of an actual company that is functioning in a particular culture. Suddenly, the case becomes three-dimensional or multidimensional. The viewer has to bring to bear all the skills of a careful observer of human nature, along with those of an operations analyst, a financial analyst, and a scholar of organizational behavior. In short, the Internet turns out to be an exceptionally fine tool for the creation of densely woven, multilayered, and highly demanding new course materials, that are in several respects superior to traditional case studies.

Once again, an important component of university learning, the course and its texts, can now be reinforced—in this instance, it can be considerably enhanced—by the introduction of Internet technology.

Another point of compatibility between the processes of the Internet, and those of the university, concerns the basic activity of communication. We know that the constant exchange of ideas and opinions among students—as well as faculty—is one of the oldest and most important forms of education. People learn by talking with one another, in classrooms, laboratories, dining halls, seminars, and dormitories. They test propositions, they argue and debate, they challenge one another, and they sometimes even discover common solutions to difficult problems.

The Internet allows this process of dialogue—of conversational learning—to be transferred easily and flexibly into electronic form. Communication can be carried on at all hours, across distances, to people who are on-campus or off-campus. Student study groups can work together on-line; faculty members can hold electronic office hours,

in addition to their “real” office hours; and teaching fellows can make themselves available for after-class electronic discussions.

In all these ways, the Internet works to create a new forum, a limitless number of electronic rooms and spaces where one of the most fundamental educational processes—energetic discussion and debate—can be carried on continuously.

Students who are consistently reticent in actual classrooms are more likely to speak out, regularly and confidently, on the network.

It’s also worth noting that recent experience suggests that student participation levels tend to rise in the electronic forum. Students who are consistently reticent in actual classrooms are more likely to speak out, regularly and confidently, on the network.

No one should believe that electronic communication can be—or should be—a substitute for direct human contact. But the electronic process has some features that do permit an actual extension of the scope, continuity, and even the quality of certain forms of interaction, even though communication over the network lacks other absolutely essential aspects of “real” conversations in the presence of “real” people. Finally, the Internet may well be having—it’s not altogether easy to tell—a subtle but significant effect on the relationships among students, faculty members, and the subject or materials that are being studied in a course.

Let me oversimplify for a moment. The direction of movement in teaching and learning has, for more than a century, been shifting away from a previously established model that viewed the faculty member (or an authoritative text, or a canon of text) as the dominant presence—as the transmitter—with the student as a kind of receiver.

Since at least the 1870s, the emerging theories of education have stressed not so much the authority of the faculty member as a teacher, but the role of the student as an active agent, an energetic learner: someone who asks questions, searches for information, discusses ideas with others, and generally moves ahead as if he were an investigator, discoverer, or adventurous scholar in the making.

In this model, the faculty member retains “residual” authority; but the faculty role, more and more, is to draw students out, to steer but not

actually direct the discussion unless it becomes necessary to do so. The faculty also organizes the structure of the curriculum, of courses, and class assignments.

But the course materials are not likely to be treated as “authoritative texts” that offer definitive solutions. They’re intended to be approached critically, and they are usually arranged in a point-counterpoint way. This arrangement inevitably suggests that many or even most of the important questions in a course are still open and unresolved, waiting to be discussed, addressed and answered.

As a result, it’s perfectly natural for us now, in the 1990s, to assume—something that would have been quite radical just a little more than a century ago—that students should conduct much of their education on their own: with constant guidance and the right kind of Socratic teaching from the faculty, but with a very large part of the positive charge coming from the students themselves.

We don’t have to agree fully with this theory of education in order to see that it has in fact produced very potent results in colleges and universities. We can also see why the structure and basic processes of the Internet technology appear to be so closely linked to—so compatible with—the approach to education that I’ve just been describing.

The Internet virtually requires or even demands that the user be an engaged agent, searching for information and then managing or manipulating whatever is found—solving problems, but-tressing arguments with evidence, and exploring new, unknown terrain. Students are beguiled into tracing linkages from one source to another. They can easily share ideas with others on e-mail. They ask for comments and criticisms. Their posture or attitude, seated in front of the computer, is to make something happen. And they generally act or pursue, rather than merely react and absorb.

So, if we step back and look at the full picture that I’ve tried to sketch, we can, I think, start to understand why the Internet and its successor technologies will not only have a profound effect on society in general—as radio, film, and

television previously did—but why it has so quickly and dramatically begun to transform significant aspects of higher education, in a way that previous inventions simply did not.

As I’ve tried to suggest, the cluster of technologies that we call the Internet has very distinctive powers—a unique ability to complement, to reinforce, and to enhance many of our most powerful traditional approaches to university teaching and learning.

In the end—as we know—education is a fundamentally human process. It is a matter of values and significant action, not simply information or even knowledge.

The Internet is new, it is different, and there is always reason for caution when things are changing so quickly. We need to find the right pace in order to achieve the best possible results for education—and those results will require an intense focus on the substance of what the new technology can deliver, as much as on the process. It takes time and money to create superior course materials. It also takes considerable faculty expertise—technical as well as scholarly. It will take time before the Internet and the Web are easily navigable, and before they possess a large enough store of rich material to rival our greatest research libraries.

But these things will happen, and as they do, education will be enriched. Meanwhile, I believe that universities have a special responsibility to exert real leadership in this sphere: not so much in the development of the technology itself, but in the imaginative and thoughtful uses of the best technology for the purposes of better teaching and learning.

We must be prepared to do now—over the course of the next ten to twenty years—what our predecessors achieved during the late 19th century, when they made a conscious decision to create unrivaled university research libraries, new curricula, and new teaching methods.

It can be done, and now is the time to begin. Is there a cautionary note on which to end? Only one: good data, new information, and excellent communications are all critical to virtually everything that we do, in universities and in life. But they are not self-justifying, and they obviously do not in themselves constitute the essential stuff of education.

All the information in the world will be of no avail, unless we can use it intelligently and wisely. In the end—as we know—education is a fundamentally human process. It is a matter of values and significant action, not simply information or even knowledge.

The Internet will not tell us what to do about individuals and societies that cannot afford to be on the Net. It will not tell us how to pay attention to those who are left out of the race—or who appear to have already lost the race. It will not show us—any more than our libraries full of books will show us—how to create a humane and just society. So, as we think in this

conference about the effects of the Internet on society, let us not forget what we mean by a “society”: what it is that we want to have an effect on—and what kind of an effect we want to have. It is how we address these questions—of values, of aspirations, of the consequences of our choices on real human lives, all lives—that will finally determine the effectiveness of our new technologies for education, and for people and communities around the world.

Permission obtained covering republication/translation of the text—including USIA’s home page on the Internet—by USIS and the press outside the United States. On the title page, credit the author and carry: “Speech by President Neil Rudenstine at Harvard’s Conference on the Internet and Society, May 29, 1996.”



DATA DELUGE: THE CHANGING ROLE OF THE MEDIA

By Ralph J. Begleiter

One of the most disturbing trends of the new "Information Age" stems from the information glut.

American humorist Russell Baker in a *New York Times* column joked about it, and he hit on the fundamental dilemma of the public, the media, and the policymaker.

Baker noted that the underlying assumption of the "information highway" is that the troubles of the world are the result of a lack of information. He complained that it's really quite the opposite.

The world is being "battered senseless, then buried under avalanches of information...assaulted by a ceaseless flow of information," Baker wrote. "No one can digest it, make sense of it or judge whether it's information worth having."

He likened the situation to Walt Disney's interpretation of the "Sorcerer's Apprentice" in "Fantasia," with Mickey Mouse's dreams of relentless water-toting brooms eventually flooding the castle.

Baker complained, correctly, that the information age is only open to those who can afford the new technology, which excludes millions worldwide. But he failed to point out the incredible challenge posed by the opposite of "exclusion" from the information highway, the challenge that the relentless flood of information poses for public policy.

The technology of the information age suddenly enables the public, more than ever, to selectively limit the information it absorbs on national and international affairs.

The profusion of television channels and computer sources demands that individuals screen their

information intake, sometimes not very carefully. Television surveys reveal that people sat for hours absorbing every minute detail of the O.J. Simpson murder trial on television, then switched off their sets when the news returned on CNN and other stations.

As much as they knew about the Simpson case, they failed to discover the policy challenges of the day, whether it's human rights abuses in Chechnya and Bosnia, the complex diplomacy of the Arab-Israeli peace process, or new environmental regulations for power plants.

This phenomenon is often referred to as the "filter" or "gatekeeper" role of the news media, which often "force-feeds" new ideas, events, and trends into the public stream of consciousness. It may be becoming less influential. Screening many topics out of an individual's daily information diet can have the disastrous consequence of preventing important news from penetrating the public's consciousness.

But at the very moment when this "gatekeeper" role is becoming less influential in broadcasting and the Internet, it may well be more needed than ever.

As a journalist, I worry about this trend. It magnifies the distinction between "information" and "journalism." The satellite age—the information age—brings a glut of information, such as word-for-word dissemination via the Internet of the proceedings of the U.S. Congress, but leaves our public without the crucial analysis and context, the elucidation and illumination, traditionally provided by journalists.

Journalists in the information age may see their "gatekeeper" role become more defined as "guides" or "escorts."

As “gatekeepers,” the media select information that reaches their audiences. But in the world of the Internet, a new role is emerging. That role is steering people to reliable, accurate information amid the deluge of data available.

Journalists should be guides to what people want to know about and what they should know about their community, country, and world.

The media must even persuade people to pay attention to topics that are currently not of interest to them.

These are new responsibilities journalists must accept.

The deluge of information available need not be curtailed. In fact, the freedom of the Internet, which allows almost anyone with a computer to “publish” inexpensively to the world, should continue unfettered. The Internet’s freedom is

what sets it apart from the more controlled media of the past, including newspapers, television, and radio.

But the Internet’s freedom also creates its overwhelming flood of information, and consumers of information have few resources on which to depend for sorting through the flood. That’s where the new responsibilities of journalists come in. Serving as “guides,” or “escorts”—as gauges of credibility for the vast array of information on the Internet. Consumers need journalists to help them determine what’s worth reading and what’s not.

As former CBS News President Ed Klauber once said: “In a democracy it is important that people not only should know, but should understand.”

Ralph J. Begleiter has been covering international affairs for CNN for 14 years. He is World Affairs Correspondent, CNN Washington.



MEDIA DEVELOPMENTS AND PUBLIC POLICY

By Johanna Neuman

It is a commonly held view in Washington these days that the advent of instantaneous and global satellite technology has given the news media more of a voice in international affairs than ever before.

Diplomats call it the CNN effect, and the term is not a compliment. It suggests that when CNN floods the airwaves with news of a crisis from abroad, policymakers have no choice but to redirect their attention to the latest disaster zone. The term CNN effect also has a slight sinister cast to it, suggesting that the television pictures will provoke an emotional outcry from the public to “do something” about the latest incident, whether such action is warranted or not.

When I first set out to write my book, *Lights, Camera, War: Is Media Technology Driving International Politics?*, I too held the view that media technology was driving foreign policy.

I remember standing in an Air Force hanger in Saudi Arabia a few days before the Persian Gulf War began, watching Secretary of State James Baker deliver an ultimatum. With cameras rolling, Baker told 400 cheering U.S. airmen and airwomen that we were on the brink of war, that unless Saddam Hussein withdrew from Kuwait, the allies would go to war with Iraq.

Baker told me later that he wasn't talking to the soldiers, and he wasn't talking to us journalists, but rather he was talking to one man, Saddam Hussein, sitting in his bunker in Baghdad, watching CNN. It was easier and more reliable for Baker to deliver his message on CNN than through any diplomatic pouch or personal envoy.

I set off to write a book on the information revolution. I began to read history, to see how

other inventions, other new media technologies, had changed the political landscape of their time. And in the process of reading history, I discovered a pattern. Whenever a new media technology arrived on the scene—from the printing press to the Internet, from the telephone to the photograph—the new invention produced virtually the same result.

Diplomats complained that the new invention robbed them of sufficient time to think, that it tethered them more directly to their capitals. I am particularly fond of an anecdote about British envoy Arthur Buchanan, who was asked in 1861 to assess the telegraph's impact on diplomacy. “It reduces, to a great degree, the responsibility of the minister,” he lamented. “For he can now ask for instructions instead of doing a thing on his own.”

In every era too, journalists boasted that the new media technology gave them more power and influence than ever before. William Randolph Hearst, publisher of the sensationalist *New York Journal*, sent one of his illustrators to Havana to drum up interest in what would eventually become the Spanish-American War. The artist, Frederic Remington, was disappointed in a lack of action in Cuba.

“Everything is quiet,” he telegraphed Hearst, using the latest technology to speed his message. “There is no trouble here. There will be no war. I wish to return.” To which Hearst replied, in a cable that may be apocryphal but clearly demonstrates his view of journalism's impact on diplomacy: “Please remain. You furnish the pictures and I'll furnish the war.”

The generals tended to adore the new technology, understanding that speed of information

delivery was critical to their victory. How often have you read of battles fought and lives lost after treaties had been signed in home capitals? Speed of information was an asset to the generals.

William Tecumseh Sherman, the Civil War general, loathed the press and threatened reporters with court-martial if they appeared at his camps; he nevertheless valued the telegraph that speeded both news copy and battle information. "The value of the magnetic telegraph in war cannot be exaggerated," Sherman wrote in his memoirs. "Hardly a day intervened when General Grant did not know the exact state of facts with me, more than 1500 miles off, as the wires ran."

Of course speeded information also gave political leaders a chance to influence battle. Abraham Lincoln was a frequent visitor to the White House telegraph, awaiting, sometimes futilely, word from his recalcitrant generals that a battle had been joined.

In every generation, too, politicians groaned that their orations had been cut to soundbites. In 1889, the London Spectator lamented the telegraph's impact on politics. "The constant diffusion of statements in snippets, the constant excitements of feeling unjustified by fact, the constant formation of hasty or erroneous opinions, must in the end, one would think, deteriorate the intelligence of all to whom the telegraph appeals."

Then as now, critics despaired at the changes required by a new technology. Present-day predictions that an age of computer information will make the television networks obsolete have their echo in earlier clashes of technology and media power.

There is even precedent on the economic front for the current debate over who will benefit from the Information Highway, with social scientists of various stripes debating various questions. Often there were economic reasons for the resistance. The turf-conscious chief engineer of the British Post Office, testifying before a committee of Parliament, was asked if the telephone merited attention. "No sir," he said. "The Americans have need of the telephone, but we do not. We have plenty of messenger boys."

Among the intellectuals, the fear was that new technology would somehow dilute the quality of public discourse. Among the politicians, the fear was that it would empower the public. Soon after the Russian Revolution, Joseph Stalin rejected a proposal from Leon Trotsky to build a modern telephone system. "It will unmake our work," he said. "I can imagine no greater instrument of counter-revolution in our time."

To this day, the phone system in the former Soviet Union is a disaster, and many local governments and businesses have leapfrogged a generation of technology, skipping the burden and expense of land phone lines to go straight to cellular.

At one point I thought of calling the book *Echoes*, because every time I went to the library there were echoes in the history, echoes of the issues we are dealing with today in the CNN effect. But soon enough I began to realize that for all these marvels, what changed when a new invention intersected with the political world was not the substance of a message but its speed and method of delivery.

Baker, standing in that hanger in Saudi Arabia, understood this. He understood that CNN gave him a new tool for sending a message, but that its contents still depended on a thoughtful policy. In short, I began to develop a corollary theory, that for all the demands and annoyances of a new media technology, political leadership mattered more.

Some leaders excelled at using a new invention that happened on their watch. One only has to listen to Franklin Roosevelt's Fireside Chats to understand the power of conquering radio. Others tripped and fumbled their way around a new invention. Poor Lyndon Johnson never could master television to make his case to the country about Vietnam. Some people said his ears were too big, his glasses too small, his hair too thin. Others said the war was wrong, or at least poorly planned. Either way, television, like all the other inventions, gave the public more of a voice and demanded of leaders that they prove their case by the latest available means.

Another finding was that every new invention tended to produce a period of less than stellar journalism, a time of experimenting with the new technology to test the bounds of taste. There

is no worse chapter of American journalism than coverage of the Civil War, abetted by the telegraph.

The telegraph allowed reporters covering the Civil War to distinguish themselves as sensation-alists. Exaggeration became the hallmark of Civil War journalism, complete fabrication not at all uncommon. One correspondent begged a wounded officer not to die before he had finished interviewing him, promising him his last words would appear in "the widely circulated and highly influential journal I represent."

Circulation skyrocketed as newspapers discovered they could sell five times their nominal run with details of a battle. Reporters often bribed telegraph operators to give preference to their copy over a competitor's. And publishers, much like today's TV talk show producers, clamored for more. "Telegraph fully all news you can get," *Chicago Times* editor Wilbur F. Storey ordered a reporter, "and when there is no news, send rumors."

There was one other lesson in the history, and it dawned slowly. Conventional wisdom holds that photographs tell a thousand words, that one picture can galvanize a nation to action. We think of the photographs that became icons for the anti-war movement in Vietnam — naked children running from napalm, General Lo-wan shooting a Viet Cong ambusher. We think of that photograph on November 9, 1989, the night the Berlin Wall fell, the dancing atop a symbol of repression.

We think of the pictures from Somalia, where it is widely believed that pictures got us in and pictures got us out. Videotape of starving Somalis on CNN forced President Bush to send in the Marines, goes this refrain, and pictures of an American corpse being dragged through the streets of Mogadishu by gleeful Somalis forced President Clinton to bring the Marines home.

But the truth is more textured, and deserves some respect. Bush got into Somalia in part because he wanted to leave office a humanitarian. Clinton got out in part because he had escalated the conflict from a humanitarian mission to something it was never designed to be, a man-hunt for one warlord whose supporters grew ugly toward the Americans

I began to understand, in short, that captions count. It matters what the public thinks when it sees the photographs, what it understands of the conflict in question, and that's where our role as journalists has changed little in the last 500 years.

Those pictures of a body dragged through the streets of Mogadishu, in a different time, might have evoked a different response. Americans might have found them grounds for avenging the wrong, for staying to finish the fight. Instead, we came home. It matters what interpretation governments and humanitarian groups and, yes, the news media put on those pictures.

No better example exists than Tiananmen Square, where in 1989 Chinese students demonstrated for democracy. Who can ever forget that photograph of a single protester, his white shirt flapping in the wind, standing in front of a tank? In the West that photograph became a symbol of one man's defiance against tyranny. But in China authorities put the same photograph on display with a different caption, one that credited the restraint of the Chinese troops in not mowing down their fellow citizens. It is hard to know if that interpretation was accepted by the Chinese who saw that photograph on exhibit, but it is surely a different way to look at the picture.

The idea that context mattered seemed to suggest that individuals can make a difference, that technology is not determinative. Oh yes, it leaves its pattern, it unleashes great shock waves of change in the way in which information is relayed, and it forces political figures to learn new methods of communicating. But technology does not dictate outcomes.

Marshall McLuhan, a media guru of the 1960s, liked to say that the medium was the message, that it didn't matter what the television anchor said, the pictures behind him told their own story. Well Marshall McLuhan was wrong. It does matter what the caption says. It matters what people say about a photograph and what they write about it. It matters what people hear about it and what they think they saw. Technology changes everything about the way in which we experience information, but leaves for us the way in which we use it.

There is no better precedent for the changes unleashed by satellite television than the upheaval delivered by the telegraph. Quite simply, the telegraph ushered in a revolution in the way international relations were conducted. From an age when messages were delivered at the speed of transportation—a horse, a sailing ship, a train—diplomats braced themselves for what they considered instantaneous communication.

The shift was almost beyond imagining. Samuel F.B. Morse, inventor of the telegraph, marveled: “We can speak to and receive an answer in a few seconds of time from Hong Kong, where 10 p.m. here (New York) is 10 a.m. there. China and New York are in interlocutory communication. We know the fact, but can imagination realize it?” But soon enough the political system absorbed the demands of the new technology, and the photograph and film and radio came to make new demands of policy makers and journalists.

Well I believe that in 1996 the CNN effect has lost its punch. I do not think that, if pictures of starvation in Somalia came across our airwaves today, the public would rise up and demand intervention. Call it compassion fatigue or inoculation to the shock, but I think the political system has absorbed the changes satellite television demanded.

Now it is on to cyberspace, where governments will be competing against media organizations and special interest groups and even terrorists for the attention of viewers. To a generation that thought the train was a vast leap in the speed of delivering a message, the telegraph seemed unabashedly a revolution. So too for a generation that thought CNN represented the ultimate in delivery of real-time information. The future is much more daunting.

A word about volume. Digital technology will carry more information than any invention gone before, a testament to the ingenuity of inventors to crash through the parameters of imagination. At first this seems an anomaly, since the telegraph, telephone, radio, television, and computer messages all travel at the same speed. But

once the computer receives a message, it can download a larger quantity of material in a minute than any other medium. The speed of information relayed is the same, but the volume of information conveyed is bigger.

To a generation that thought the train was a vast leap in the speed of delivering a message, the telegraph seemed unabashedly a revolution. So too for a generation that thought CNN represented the ultimate in delivery of real-time information.

What’s coming is a revolution. Glass fibers will be able to carry at least 150,000 times as much information as the standard copper wires now used to connect the computer to a modem. An hour’s worth of digital video will be delivered in seconds.

The speeded dissemination of information has just begun. And with it will come new challenges for government, for armies, for journalists. I believe it will be harder for our leaders to conduct a national conversation in cyberspace. They will be competing against special interest groups and media powerhouses and even direct messages from terrorists for the public’s attention. But it is up to individuals to try.

Stripping away the awe of novelty and the excitement of invention, there is simply nothing in technology’s charter to suggest the fundamentals will change in the next generation, when diplomats communicate with the public by computer and viewers sign onto the Internet to customize their own version of history.

There is magic in the technology and wonder in its results. There is speed in delivery and an information explosion. There is a new day for diplomacy, a novel outlet for public opinion, and a steep test for journalism.

Above all, there is a challenge to leaders to exploit the new inventions. But technology gives no odds on its use. That is for people to determine, leaders and their publics, you and me, individuals all.

Johanna Neumann is the foreign editor of USA Today newspaper.



IMPLICATIONS OF THE REVOLUTION IN COMMUNICATIONS

Following are excerpts of a USIA-sponsored panel discussion moderated by USIA Director Joseph Duffey. The participants were retired Admiral William Owens, vice chairman of the board of Science Applications International; Francis Fukuyama, director of the telecommunications project, Johns Hopkins School of Advanced International Studies, and Anthony Rutkowski, vice president, of the General Magic company and former president of the International Internet Society.

Duffey. How will the information revolution change how we work, our culture and how we are governed?

Fukuyama. Let me speak about three subjects: democracy, culture, and equality—nice, small subjects.

The basic message in all three is a kind of a “Yes, but” conclusion, which is to say, yes, in fact, I think we are on the cusp of a really major social revolution but, in a way, it may not unroll as smoothly or in as linear a fashion as we think.

It’s one of the major clichés of our present age to say that George Orwell was wrong. The telescreen that was supposed to be the instrument of centralized state control turned out to be just the opposite, and that the telescreen is basically the network personal computer and that, in fact, has empowered individuals and eliminated the control and bottleneck over information that authoritarian governments and other kinds of hierarchies held previously.

This is essentially technologies of freedom. But I think we have to be a little bit careful in the way that we think about this. First of all, the types of technologies correspond to different elements of the process of democratic consolidation. Democracy exists on a variety of different levels.

At the top level you have ideology, which is the basic sense of legitimacy that people have about their systems of government.

A layer below that are the institutions like constitutions and elections that people create in order to implement democratic principles.

Below that, you have a layer which is composed of civil society, which is all of the intermediate groups and associations that, as Toqueville indicated, are necessary to stay in a democracy.

And finally, at the bottom level, you have culture, which has to do with habits and morals of different peoples.

And every one of those four areas really has to democratize and develop before you can have a stable democracy, and each one is affected by a different type of technology.

When we talk about technology having promoted the democratic revolution, it really is at the level of ideology and institutions, and we have to admit that is not the most recent technologies, but some pretty old-fashioned ones.

It’s essentially radio and primarily broadcast TV that were essential in delegitimizing many governments in the former Soviet Union—the East Germans that could see the West German standards of living on West German television.

Other democratic advances have been spurred by the proliferation of certain simpler and older technologies, like voice telephone and fax and AM radio.

In the future the real impact of things like network computers will not be on these upper level domains of ideology and institutions, but really in terms of civil society and culture.

E-mail and network computers are really great. They are very good for creating groups of people and allowing them to interact as groups. You can't do that with telephones, you can't really do that with broadcast media. You can do that with computers.

The interesting developments in the future will be the way that computer networks are used to create new forms of civil society, a lot of times, not nationally based, but transnational.

I guess I'm not terribly worried about the hegemony of English and of American culture.

If you look at the history of the printing press, you would see that this technology was actually the encouragement of national literatures in every European country, because previously culture had been the domain of people that spoke Latin. With the development of printing presses, you had the possibility for the development of local cultures, much more particularized kinds of cultures, because people within a society found the economic means to communicate.

I suspect that, whatever the hegemony of English and American culture and technology right now, that is simply not going to be the case for long.

Finally, the question of equality is a very troublesome one.

There's been a lot of talk about stagnant wages. One figure is that, for people with less than a high-school education, their real incomes have fallen by something like 20 percent over the last generation.

I really think that most labor economists would say that it is primarily due to the advance of technology and, when we talk about modern technology, that means information technology. The impact of these technologies is very complicated. It destroys some jobs. It creates other new ones. It deskills some. It reskills others.

But the general impact is what has been called the intellectualization of skill—the education requirements and the cognitive abilities of people to live in this new environment grow higher every year, and it leads to, among other things, low-skilled workers in the United States falling off the edge.

Rutkowski. The Internet's Worldwide Web is used in nearly every country of the world. The only (areas not hooked up) are some countries in Africa, and that's going to change soon, too, as the thresholds for getting access diminish. That's going to be a real revolutionary change this year.

Technology will soon be on the marketplace that for a couple hundred dollars, can use virtually any communications medium to browse the Web or to get e-mail. And that's going to change things further.

Duffey. Is the information revolution an international movement? Are young people worldwide becoming part of the Net?

Rutkowski. Around the world the young have been the early adopters of the Internet. They're also primarily the innovators.

It's forever amazing to me how you can go to Japan or Singapore or Eastern Europe and find the same kind of computer nerds. This technology is capable of being assimilated and adopted very quickly by young people around the world.

Duffey. Is this a culture of computer enthusiasts or are other people also involved with computers?

Rutkowski. The Worldwide Web and an easy e-mail have changed that. Increasingly you have vast numbers of people that are professional people, that are creative people, that are business people, around the world using these technologies in clever and innovative ways, and that's going to be part of the changing paradigm.

At the same time, you're seeing older people, who have extra time on their hands using the Net.

Duffey. How will the information revolution influence communities of people formed around common interests?

Fukuyama. One of the big changes that e-mail and the Web have created is the possibility for the rise of a much bigger non-governmental-organization (NGO) sector, which will be transnational.

Makers of foreign policy, in general, are going to face uncertain areas. They're going to face a world in which they're dealing not simply with state actors but with a lot of transnational actors and substate actors that, in a way, will make our lives much more difficult, because they're harder to influence and control.

As in previous communications revolutions, everybody is going to complain about how foreign policy is now out of control, but if you look at previous communications revolutions, the policy makers simply figure out how to adapt and they figure out how to use these organizations to their own benefit, because they can be used to mobilize support for positive policies as well as get in the way of executing others.

Question from the audience. A virtual world is a world without borders. What is the impact of this on nation-states?

Fukuyama. Let's take something simple—the protection of intellectual property rights. Last time

I checked, there was absolutely no way to defend a fundamental right, like the right to property, without a state.

Similarly, in many ways, this information world creates a whole new range of international crimes that transcend national borders that are very difficult to solve, that again are very difficult to solve without the state mechanisms. It may require more international collaboration, but you still need state mechanisms.

This idea that we're all going to get homogenized into an internationalist culture—the Internet or whatever—is just a little silly, because people like to live in cultural and moral communities of various sorts, and the reason they like it is that it's different from those of other peoples, and it has all sorts of particularities.

One of the things you're seeing is a kind of backlash against the globalization that's brought about by the capitalist economy, that people want to hold onto their Scottish identity or their French language in Quebec.



AMERICA'S INFORMATION EDGE: THE NATURE OF POWER

By Joseph Nye, Jr. and William Owens

Nye is dean of the John F. Kennedy School of Government at Harvard University and a former assistant secretary of defense for international affairs in the Clinton administration. Owens is former vice chairman of the Joint Chiefs of Staff in the Clinton administration. This article is an abridgement of the original, which appeared in Foreign Affairs, March/April 1996.

THE POWER AND RESOURCES OF THE FUTURE

Knowledge more than ever before, is power. The one country that can best lead the information revolution will be more powerful than any other. For the foreseeable future, that country is the United States. America has apparent strength in military power and economic production. Yet, its more subtle comparative advantage is its ability to collect, process, act upon, and disseminate information, an edge that will almost certainly grow over the next decade. This advantage stems from Cold War investments and America's open society, thanks to which it dominates important communications and information processing technologies—space-based surveillance, direct broadcasting, high-speed computers—and has an unparalleled ability to integrate complex information systems.

This information advantage can help deter or defeat traditional military threats at relatively low cost. In a world in which the meaning of containment, the nuclear umbrella, and conventional deterrence have changed, the information advantage can strengthen the intellectual link between U.S. foreign policy and military power and offer new ways of maintaining leadership in alliances and ad hoc coalitions.

The information edge is equally important as a force multiplier of American diplomacy, including

“soft power”—the attraction of American democracy and free markets. The United States can use its information resources to engage China, Russia, and other powerful states in security dialogues to prevent them from becoming hostile. At the same time, its information edge can help prevent states like Iran and Iraq, already hostile, from becoming powerful. Moreover, it can bolster new democracies and communicate directly with those living under undemocratic regimes. This advantage is also important in efforts to prevent and resolve regional conflicts and deal with prominent post-Cold War dangers, including international crime, terrorism, proliferation of weapons of mass destruction, and damage to the global environment.

Yet, two conceptual problems prevent the United States from realizing its potential. The first is that outmoded thinking clouds the appreciation of information as power. Traditional measures of military force, gross national product, population, energy, land, and minerals have continued to dominate discussions of the balance of power...

The second conceptual problem has been a failure to grasp the nature of information. It is easy to trace and forecast the growth of capabilities to process and exchange information. The information revolution, for example, clearly is in its formative stages, but one can foresee that the next step will involve the convergence of key technologies, such as digitization, computers, telephones, televisions, and precise global positioning. But to capture the implications of growing information capabilities, particularly the interactions among them, is far more difficult. Information power is also hard to categorize because it cuts across all other military, economic, social, and political power resources, in some cases diminishing their strength, in others multiplying it...

MILITARY CAPABILITY AND INFORMATION

The character of U.S. military forces is changing, perhaps much more rapidly than most appreciate, for, driven by the information revolution, a revolution in military affairs is at hand. This American-led revolution stems from advances in several technologies and, more important, from the ability to tie these developments together and build the doctrines, strategies, and tactics that take advantage of their technical potential.

ISR is the acronym for intelligence collection, surveillance, and reconnaissance. Advanced C4I refers to technologies and systems that provide command, control, communications, and computer processing. Perhaps the best-known advance is precision force, thanks to the videotapes of precision-guided munitions used in Operation Desert Storm. The latter is a broader concept than some imagine, for it refers to a general ability to use deadly violence with greater speed, range, and precision.

In part because of past investments, in part serendipitously, the United States leads other nations in each of these areas, and its rate of improvement will increase dramatically over the next decade....

These technologies provide the ability to gather, sort, process, transfer, and display information about highly complex events that occur in wide geographic areas. However, this is important for more than fighting wars. In a rapidly changing world, information about what is occurring becomes a central commodity of international relations, just as the threat and use of military force was seen as the central power resource in an international system overshadowed by the potential clash of superpowers.

There has been an explosion of information. Yet, some kinds of information—the accurate, timely, and comprehensible sort—are more valuable than others. Graphic video images of Rwandan refugees fleeing the horror of tribal hatreds may generate worldwide sympathy and demands for action. But precise knowledge of how many refugees are moving where, how, and under what conditions is critical for effective action.

Military information on the disposition, activity, and capabilities of military forces still ranks high

in importance because military force is still perceived as the final arbiter of disagreements. More to the point, concerns that military force may be used still figure prominently in what states do.

The growing interdependence of the world does not necessarily establish greater harmony. It does, however, make military force a matter of interest to audiences outside the local theater. The direct use of military force no longer calls up the specter of escalation to global nuclear holocaust, but it remains a costly and dangerous activity....

The concept of deterrence undergirding the emerging American military system of systems envisions a military strong enough to thwart any foreign military action without incurring a commensurate military risk or cost. Those who contemplate a military clash with the United States will have to face the prospect that it will be able to halt and reverse any hostile action, with low risk to U.S. forces....

THE INFORMATION UMBRELLA

The information technologies driving America's emerging military capabilities may change classic deterrence theory. Threatening to use military force is not something Americans will do automatically or easily and has always had some undesirable side effects. In an era in which soft power increasingly influences international affairs, threats and the image of arrogance and belligerence that tends to go with them undercut an image of reason, democracy, and open dialogue.

America's emerging military capabilities—particularly those that provide much more real-time understanding of what is taking place in a large geographical area—can help blunt this paradox. They offer, for example, far greater pre-crisis transparency. If the United States is willing to share this transparency, it will be better able to build opposing coalitions before aggression has occurred. But the effect may be more general, for all nations now operate in an ambiguous world, a context that is not entirely benign or soothing.

In this setting, the emerging U.S. capabilities suggest leverage with friends similar to what extend-

ed nuclear deterrence once offered. The nuclear umbrella provided a cooperative structure, linking the United States in a mutually beneficial way to a wide range of friends, allies, and neutral nations. It was a logical response to the central issue of international relations—the threat of Soviet aggression. Now the central issue is ambiguity about the type and degree of threats, and the basis for cooperation is the capacity to clarify and cut through that ambiguity.

The set of fuzzy guidelines and meanings the Cold War once provided has been replaced by a deeper ambiguity regarding international events. Because nearly all nations viewed the international system through Cold War lenses, they shared much the same understanding. To nations throughout the world, the character and complexities of a civil war in the Balkans would have been far less important than the fact of disruption there because the event itself could have triggered a military confrontation between NATO and the Warsaw Pact. Details on the clashes between Chinese and Soviet border guards did not really matter; what counted was that a split had appeared in one of the world's great coalitions. Now the details of events seem to count more.

With the organizing framework of the Cold War gone, the implications are harder to categorize, and all nations want to know more about what is happening and why to help them decide how much it matters and what they should do about it. Coalition leadership for the foreseeable future will proceed less from the military capacity to crush any opponent and more from the ability quickly to reduce the ambiguity of violent situations, to respond flexibly, and to use force, where necessary, with precision and accuracy.

The core of these capabilities—dominant situational knowledge—is fungible and divisible. The United States can share all or part of its knowledge with whomever it chooses. Sharing would empower recipients to make better decisions in a less-than-benign world, and should they decide to fight, they could achieve the same kind of military dominance as the United States.

These capabilities point to what might be called an information umbrella. Like extended nuclear deterrence, they could form the founda-

tion for a mutually beneficial relationship. The United States would provide situational awareness, particularly regarding military matters of interest to other nations. Other nations, because they could share this information about an event or crisis, would be more inclined to work with the United States.

The beginnings of such a relationship already exist. They were born in the Falklands conflict and are being developed today in the Balkans. At present, the United States provides the bulk of the situational awareness available to the Implementation Force, the U.N. Protection Force, NATO members, and other nations involved in or concerned with the conflict there. It is possible to envision a similar central information role for the United States in other crises or potential military confrontations, from clarifying developments in the Spratly Islands to cutting through the ambiguity and confusion surrounding humanitarian operations in Cambodia and Rwanda. Accurate, real-time, situational awareness is the key to reaching agreement within coalitions on what to do and is essential to the effective use of military forces, whatever their roles and missions....

All this implies selectively sharing U.S. dominant battlespace knowledge, advanced C4I, and precision force. Old-era thinking might recoil from such a prospect, and it would have to overcome long-established prejudices against being open and generous with what might broadly be called intelligence. In the past, two presumptions supported this reluctance: first, that providing too much of the best information risked disclosing and perhaps even losing the sources and methods used in obtaining it, and second, that sharing information would disclose what the United States did not know and reduce its status as a superpower.

These assumptions are now even more questionable than before. The United States is no longer in a zero-sum game that makes any disclosure of capabilities a potential loss for itself and a gain for an implacable opponent. The character of this growing prowess is different. For one thing, the disparity between the United States and other nations is quite marked. U.S. investment in ISR—particularly the high-leverage space-based aspects of this set of systems—exceeds that of all other nations combined, and

America leads by a considerable margin in C4I and precision force as well....

Some other nations could match what the United States will achieve, albeit not as early. The revolution is driven by technologies available worldwide. Digitization, computer processing, precise global positioning, and systems integration—the technological bases on which the rest of the new capabilities depend—are available to any nation with the money and the will to use them systematically to improve military capabilities.

Exploiting these technologies can be expensive. But more important, there is no particular incentive for those nations to seek the system of systems the United States is building—so long as they believe they are not threatened by it. This is the emerging symbiosis among nations, for whether another nation decides to make a race out of the information revolution depends on how the United States uses its lead. If America does not share its knowledge, it will add incentives to match it. Selectively sharing these abilities is therefore not only the route of coalition leadership but the key to maintaining U.S. military superiority....

THE SOFT SIDE OF INFORMATION POWER

One of the ironies of the twentieth century is that Marxist theorists, as well as their critics, such as George Orwell, correctly noted that technological developments can profoundly shape societies and governments, but both groups misconstrued how. Technological and economic change have for the most part proved to be pluralizing forces conducive to the formation of free markets rather than repressive forces enhancing centralized power.

One of the driving factors in the remarkable change in the Soviet Union was that Mikhail Gorbachev and other Soviet leaders understood that the Soviet economy could not advance from the extensive, or industrial, to the intensive, or postindustrial, stage of development unless they loosened constraints on everything from computers to Xerox machines—technologies that can also disseminate diverse political ideas. China tried to resist this tide, attempting to limit the use of fax machines...but the effort failed. Now not only fax machines but satellite dishes have proliferated in China....

This new political and technological landscape is ready-made for the United States to capitalize on its formidable tools of soft power, to project the appeal of its ideals, ideology, culture, economic model, and social and political institutions, and to take advantage of its international business and telecommunications networks....

In this information-rich environment, those responsible for four vital tasks can draw on America's comparative advantage in information and soft power resources. These tasks are aiding democratic transitions in the remaining communist and authoritarian states, preventing backsliding in new and fragile democracies, preempting and resolving regional conflicts, and addressing the threats of terrorism, international crime, proliferation of weapons of mass destruction, and damage to the global environment. Each requires close coordination of the military and diplomatic components of America's foreign policy.

Engaging Undemocratic States and Aiding Democratic Transitions

Numerous undemocratic regimes survived the Cold War, including not only communist states such as China and Cuba, but a variety of unelected governments formed by authoritarians or dominant social, ethnic, religious, or familial groups. Ominously, some of these governments have attempted to acquire nuclear weapons, among them Libya, Iran, Iraq, and North Korea. U.S. policies toward these countries are tailored to their respective circumstances and international behavior. The United States should continue selectively to engage those states, such as China, that show promise of joining the international community, while working to contain those regimes, like Iraq's, that offer no such hope. Whether seeking to engage or isolate undemocratic regimes, in every case the United States should engage the people, keeping them informed on world events and helping them prepare to build democratic market societies when the opportunity arises.

Organizations such as the U.S. Information Agency are vital to the task of aiding democratic transitions. Again China is instructive. The USIA international broadcasting arm, the Voice of America, has in the last few years become the primary news source for 60 percent of the educated Chinese....

Protecting New Democracies

Democratic states have emerged from the communist Soviet bloc and authoritarian regimes in other regions, such as Latin America, where for the first time every country but Cuba has an elected government. A major task for the United States is preventing their reversion to authoritarianism....

An important program here is the International Military Education and Training program. Begun in the 1950s, IMET has trained more than half a million high-level foreign officers in American military methods and democratic civil-military relations. With the end of the Cold War, the program has been expanded to deal with the needs of new democracies and emphasizes training civilians to oversee military organizations and budgets....

Preventing and Resolving Regional Conflicts

Communal conflicts, or conflicts over competing ethnic, religious, or national identities, often escalate as a result of propaganda campaigns by demagogic leaders, particularly those who want to divert attention from their own failings, establish their nationalist credentials, or seize power. Yet in developing countries, telephones, television, and other forms of telecommunication are rapidly growing, creating an opening for information campaigns by USIA and other agencies to undermine the artificial resolve and unity created by ethno-nationalist propaganda. At times, U.S. military technology may be used to suppress or jam broadcasts that incite violence, while USIA can provide unbiased reportage and expose false reports....

The negotiation of the Bosnian peace agreement at Dayton, Ohio, last fall illustrated a diplomatic dimension of information power. The United States succeeded in getting an agreement where for years other negotiating parties had failed in part because of its superior information assets. The ability to monitor the actions of all parties in the field helped provide confidence that the agreement could be verified while detailed maps of Bosnia reduced potential misunderstandings....

Crime, Terrorism, Proliferation and Environment

The fourth task is to focus U.S. information technology on international terrorism, internation-

al crime, drug smuggling, proliferation of weapons of mass destruction, and the global environment. The director of the CIA, John M. Deutch, has focused his agency's efforts on the first four of these, while the State Department's new Office of Global Affairs has taken the lead on global environmental issues. Information has always been the best means of preventing and countering terrorist attacks, and the United States can bring the same kind of information processing capabilities to bear abroad that the FBI used domestically to capture and convict the terrorists who bombed the World Trade Center....

The United States has used its information resources to uncover North Korea's nuclear weapons program and negotiate a detailed agreement for its dismantlement, to discover Russian and Chinese nuclear cooperation with Iran quickly and discourage it, to bolster U.N. inspections of Iraqi nuclear facilities, and to help safeguard enriched uranium supplies throughout the former Soviet republics. And mounting evidence on environmental dangers such as global warming and ozone depletion, much of it gathered and disseminated by American scientists and U.S. government agencies, has helped other states understand these problems and can now begin to point the way to cost-effective remedies....

THE COMING AMERICAN CENTURY

The premature end of what *Time* magazine founder Henry Luce termed the American century has been declared more than once by disciples of decline. In truth, the twenty first century, not the twentieth, will turn out to be the period of America's greatest preeminence. Information is the new coin of the international realm, and the United States is better positioned than any other country to multiply the potency of its hard and soft power resources through information. This does not mean that the United States can act unilaterally, much less coercively, to achieve its international goals.

The beauty of information as a power resource is that, while it can enhance the effectiveness of raw military power, it ineluctably democratizes societies. The communist and authoritarian regimes that hoped to maintain their centralized authority while still reaping the economic and

military benefits of information technologies discovered they had signed a Faustian bargain.

The United States can increase the effectiveness of its military forces and make the world safe for soft power, America's inherent comparative advantage. Yet, a strategy based on America's information advantage and soft power has some prerequisites. The necessary defense technologies and programs, ISR, C4I, and precision force, must be adequately funded....

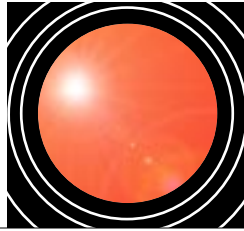
Diplomatic and public broadcasting channels through which information resources and advantages can be applied must be maintained... Congress should...actively support USIA's efforts to exploit new technologies, including the agency's new Electronic Media Team, which is working to set up World Wide Web home pages on democratization and the creation and functioning of free markets.

The final and most fundamental requirement is the preservation of the kind of nation that is at

the heart of America's soft power appeal. In recent years this most valuable foreign policy asset has been endangered by the growing international perception of America as a society riven by crime, violence, drug abuse, racial tension, family breakdown, fiscal irresponsibility, political gridlock, and increasingly acrimonious political discourse in which extreme points of view make the biggest headlines. America's foreign and domestic policies are inextricably intertwined. A healthy democracy at home, made accessible around the world through modern communications, can foster the enlargement of the peaceful community of democracies, which is ultimately the best guarantee of a secure, free, and prosperous world.

Permission obtained covering republication/translation/abridgment of the text—including the USIA home page on the Internet—by USIS/press outside the United States—excluding the press in Australia, Greece, Hungary and Spain. Additionally, all rights (USIS/press) are unavailable in Japan. On title page, credit the authors and carry: Reprinted by permission from FOREIGN AFFAIRS, March/April 1996. Copyright (C) 1996 by the Council on Foreign Relations, Inc.

departments



A BIBLIOGRAPHY ON CREATING AN INFORMATION SOCIETY

By Martin Manning

REFERENCE SOURCES

Held, Gilbert.

DICTIONARY OF COMMUNICATIONS TECHNOLOGY.

2d ed. New York: Wiley, 1995. 501p.

Kurz, Raymond A. et al.

INTERNET AND THE LAW: LEGAL FUNDAMENTALS FOR THE INTERNET USER.

Rockville, MD: Government Institutes, 1996. 248p.

Morse, David, editor.

CYBERDICTIONARY: YOUR GUIDE TO THE WIRED WORLD.

Santa Monica, CA: Knowledge Exchange, 1996. 313p.

Rose, Lance.

NETLAW: YOUR RIGHTS IN THE ONLINE WORLD.

Berkeley: Osborne McGraw-Hill, 1995. 372p.

U.S. Congress. House.

COMMITTEE ON COMMERCE.
COMMUNICATIONS ACT OF 1934 AS AMENDED BY THE TELECOMMUNICATIONS ACT OF 1996.

Washington: GPO, 1996. 330p.

GENERAL WORKS

Boyle, James.

SHAMANS, SOFTWARE, AND SPLEENS: LAW AND THE CONSTRUCTION OF THE INFORMATION SOCIETY.

Cambridge, MA: Harvard University, 1996. 270p.

Burstein, Daniel and David Kline.

ROAD WARRIORS: DREAMS AND NIGHTMARES ALONG THE INFORMATION HIGHWAY.

New York: Dutton, 1995. 466p.

Cronin, Mary J.

DOING MORE BUSINESS ON THE INTERNET: HOW THE ELECTRONIC HIGHWAY IS TRANSFORMING AMERICAN COMPANIES.

2d ed. New York: Van Nostrand Reinhold, 1995. 368p.

Drake, William J., editor.

THE NEW INFORMATION INFRASTRUCTURE: STRATEGIES FOR U.S. POLICY.

New York: Twentieth Century Fund, 1995. 448p.

Firestone, Charles M. and Jorge R. Schement.

TOWARD AN INFORMATION BILL OF RIGHTS AND RESPONSIBILITIES.

Washington: Aspen, 1995. 143p.

Gates, Bill with Nathan Myhrvold and Peter Rinearson.

THE ROAD AHEAD.

New York: Viking, 1995. 286p.

Grossman, Lawrence K.

THE ELECTRONIC REPUBLIC: RESHAPING DEMOCRACY IN THE INFORMATION AGE.

New York: Viking, 1995. 290p.

Herz, J.C.

SURFING ON THE INTERNET: A NETHEAD'S ADVENTURES ON-LINE.

Boston, MA: Little, Brown, 1995. 321p.

Hoffmann, Lance J, editor.

BUILDING IN BIG BROTHER; THE CRYPTOGRAPHIC POLICY DEBATE.

New York: Springer-Verlag, 1995. 560p.

Kahin, Brian and Janet Abbate, editors.

STANDARDS POLICY FOR INFORMATION INFRASTRUCTURE.

Cambridge, MA: MIT, 1995. 53p.

Kling, Rob, editor.

COMPUTERIZATION AND CONTROVERSY: VALUE CONFLICTS AND SOCIAL CHOICES. 2D ED.

San Diego, CA: Academic, 1996. 952p.

Klinger, Richard.

THE NEW INFORMATION INDUSTRY: REGULATORY CHALLENGES AND THE FIRST AMENDMENT.

Washington: Brookings, 1996. 208p.

LaQuey, Tracy and Jeanne C. Ryder.

THE INTERNET COMPANION: A BEGINNER'S GUIDE TO GLOBAL NETWORKING.

Reading, MA: Addison Wesley, 1992. 196p.

Lebow Irwin.

INFORMATION HIGHWAYS AND BYWAYS: FROM THE TELEGRAPH TO THE 21ST CENTURY.

New York: Institute of Electrical and Electronics Engineers, 1995. 307p.

Ludlow, Peter, editor.

HIGH NOON ON THE ELECTRONIC FRONTIER: CONCEPTUAL ISSUES IN CYBERSPACE.

Cambridge, MA: MIT Press, 1996. 580p.

Miller, Steven E.

CIVILIZING CYBERSPACE: POLICY, POWER AND THE INFORMATION HIGHWAY.

New York: ACM; Reading, MA: Addison-Wesley, 1996. 413p.

Negroponte, Nicholas.

BEING DIGITAL.

New York: Knopf, 1995. 243p.

Neuman, Johanna.

LIGHTS, CAMERA, WAR: IS MEDIA TECHNOLOGY DRIVING INTERNATIONAL POLITICS?

New York: St. Martin's, 1996. 327p.

Rothman, David H.

NETWORK! WHAT PEOPLE ARE REALLY DOING ON THE INTERNET, AND WHAT IT MEANS TO YOU.

Rocklin, CA: Prima, 1996. 344p.

Slouka, Mark.

WAR OF THE WORLDS: CYBERSPACE AND THE HI-TECH ASSAULT ON REALITY.

New York: Basic Books, 1995. 185p.

Stoll, Clifford.

SILICON SNAKE OIL: SECOND THOUGHTS ON THE INFORMATION HIGHWAY.

New York: Doubleday, 1995. 247p.

Tapscott, Don.

THE DIGITAL ECONOMY: PROMISE AND PERIL IN THE AGE OF NETWORKED INTELLIGENCE.

New York: McGraw-Hill, 1996. 342p.

Targowski, Andrzej.

GLOBAL INFORMATION INFRASTRUCTURE: THE BIRTH, VISION, AND ARCHITECTURE.

Harrisburg, PA: Idea Group, 1996. 383p.

Turkle, Sherry.

LIFE ON THE SCREEN: IDENTITY IN THE AGE OF THE INTERNET.

New York: Simon and Schuster, 1995. 347p.

U.S. Advisory Council on the National Information Infrastructure.

A NATION OF OPPORTUNITY: REALIZING THE PROMISE OF THE INFORMATION SUPERHIGHWAY.

Washington: National Telecommunications and Information Administration, U.S. Dept. of Commerce; for sale by GPO, 1996. 107p.

U.S. Information Infrastructure Task Force.

THE GLOBAL INFORMATION INFRASTRUCTURE: AGENDA FOR COOPERATION.

Washington: GPO, 1995. 49p.

Wallace, Jonathan and Mark Mangan.

SEX, LAWS, AND CYBERSPACE.

New York: M&T Books, 1996. 304p.

ARTICLES

Clark, Charles S.

REGULATING THE INTERNET

(*CQ Researcher*, vol. 5, no. 24, June 30, 1995, pp. 561-584)

Draper, Mark.

BEYOND CYBERSPACE

Vital Speeches of the Day, vol. 61, no. 23, September 15, 1995, pp. 726-733)

Gray, Paul.

THE GLOBAL INFORMATION INFRASTRUCTURE

(*Information Systems Management*, vol. 13, no. 3, Summer 1996, pp. 7-14)

THE INTERNET: THE ACCIDENTAL SUPERHIGHWAY

(*Special Section/ Economist*, vol. 336, no. 7921, July 1, 1995, pp. 3-9, 14-18)

KNOWLEDGE, NETWORKS, AND CHANGING SOCIAL RELATIONSHIPS

(*The Information Society*, vol. 1, no. 12, January-March 1996. Entire issue. Editor-in-Chief: Rob Kling)

LAW AND THE INTERNET

(*Journal of Computer Mediated Communication*, vol. 2, no. 1, 1996. Entire issue. Special issue editor: Anne W. Branscomb) Issue can also be found at:

<http://www.usc.edu/dept/annenberg/vol2/issue> or
<http://shum.huji.ac.il/jcmc/vol2/issue1>

SYMPOSIUM: THE NET

(*Journal of Communication*, vol. 46, no. 1, Winter 1996. Entire issue. Guest Editors: John E. Newhagen and Sheizaf Rafael)

VINTON CERF: POET-PHILOSOPHER OF THE NET (EDUCOM

Review, vol. 31, May 1996, pp. 26-41) Issue can also be found at:

<http://www.educom.edu/web/pubs/pubHomeFrame.html>

Webster, Frank.

WHAT INFORMATION SOCIETY?

(*The Information Society*, vol. 10, no. 1, January-March 1994, pp. 1-23)

WELCOME TO CYBERSPACE

(*Time*, vol. 145, no. 12, Spring 1995. Entire issue)

WHAT ARE WE DOING ONLINE?

[a forum] (*Harper's Magazine*, vol. 291, no. 1743, August 1995, pp. 35-46)



ARTICLE ALERT: BUILDING AN INFORMATION SOCIETY

Here are abstracts of a few recent articles relating to a global information society.

Duggan, Ervin S.

THE INFORMATION SUPERHIGHWAY
(*Vital Speeches of the Day*, vol. 62, no. 17, June 15, 1996, pp. 524-527)

The president and CEO of the Public Broadcasting Service notes that for the most part, "technology promises revolutions more often than it delivers them." He says that it is not too late to change the vision of the information superhighway.

Floridi, Luciano.

INTERNET: WHICH FUTURE FOR ORGANIZED KNOWLEDGE, FRANKENSTEIN OR PYGMALION?
(*The Information Society*, vol. 12, no. 1, January-March 1996, pp. 5-16)

The author, a philosopher, contends that "the global network is only a stage in the endless self-regulating process through which the human encyclopedia constantly strives to respond to its own growth."

McChesney, Robert W.

THE INTERNET AND U.S. COMMUNICATION POLICY-MAKING IN HISTORICAL AND CRITICAL PERSPECTIVE
(*Journal of Communication*, vol. 46, no. 1, Winter 1996, pp. 98-124)

This article explores trends that dominate the United States, global media, and communications. New communication technologies cannot solve social problems; this is the ultimate responsibility of humans who, acting consciously, can address and even resolve poverty, racism, sexism, militarism and environmental degradation.

THE WEB: WHERE IT'S @,"

(*Washington Post*, June 30 - July 3, 1996). Four-part series.

The Web, which has the potential to transform communications, is used by millions for research and pleasure. Even though a complicated, invisible technology runs the web, its future still looks bright. The articles are: "On the Internet, a World Wide Information Explosion Beyond Words" (June 30): A1, A14-A15; "There's No Place Like a Home Page" (July 1): A1, A8; "The Tangle Behind an Easy-to-Use Tool" (July 2): A1, A6-A7, and "The Site-Seers' Guide to Some Way-Out Internet Futures" (July 3): A1, A18.

**(There is a more comprehensive Article Alert offered on the international home page of the U.S. Information Agency:
<http://www.usia.gov/admin/001/wwwhapub.html>)**



INFORMATION SOCIETY: KEY INTERNET SITES

(Please note that USIS assumes no responsibility for the content and availability of the resources listed below which reside solely with the provider.)

BACKGROUND MATERIAL ON GLOBAL INFORMATION INFRASTRUCTURE (GII)

(This site for the Information Society and Development Conference has links to information society web sites around the world.)

<http://www.csir.co.za/isad/links.html>

CENTER FOR DEMOCRACY AND TECHNOLOGY

(The mission of the Center For Democracy and Technology is to "develop and advocate public policies that advance constitutional civil liberties and democratic values in new computer and communications technologies.")

<http://www.cdt.org/index.html>

CONGRESSIONAL LEGISLATIVE INFORMATION

(This site, maintained by the Library of Congress, includes texts of legislation, — pending or approved — the status of bills and the daily record of proceedings on the floor of the House and Senate — the "Congressional Record.")

<http://thomas.loc.gov/>

EUROPEAN COMMISSION'S INFORMATION SOCIETY PROJECT OFFICE (ISPO)

(The ISPO, part of the European Commission's action plan on Europe's way to the Information Society, was conceived to "support, promote and orient private and public actions in the field of the information society.")

<http://www.ispo.cec.be/Welcome.html>

G7 INFORMATION SOCIETY PILOT PROJECTS

(Information about pilot projects adopted by the G7 industrial nations at their Information Society summit, February 1995 in Brussels.)

<http://enterprise.ic.gc.ca/G7/>

GOVERNMENT DOCUMENTS

(This Federal Depository Library, located at the University of Tennessee at Knoxville, has Internet access to a wide range of U.S. government information and reports. There are some 1,400 Federal Depository Libraries.)

<http://www.lib.utk.edu/gpo/govdoc.html>

INTERNET SITE FOR NEWSPAPERS

("Editor & Publisher" magazine's Interactive Online Newspaper database has 1521 online newspaper entries.)

<http://www.mediainfo.com:4900/ephome/newspaper/nphrm/online.htm>

INTERNET SOCIETY HOME PAGE

The Internet Society is a non-governmental, international organization for global cooperation and coordination for the Internet and its internetworking technologies and applications.

<http://www.isoc.org/>

MASSACHUSETTS INSTITUTE OF TECHNOLOGY (MIT) MEDIA LABORATORY

(MIT's Media Laboratory, founded in 1985, carries on advanced research into a broad range of information technologies including digital television, electronic publishing, artificial intelligence and education-related technologies.)

<http://nicholas.www.media.mit.edu/>

NATIONAL TELECOMMUNICATIONS AND INFORMATION ADMINISTRATION (NTIA)

(NTIA, part of the U.S. Department of Commerce, is involved in a broad range of activities to extend the benefits of the Information Superhighway. The site has links to U.S. government agencies involved in telecommunications and information.)

<http://www.ntia.doc.gov/>

USIA — GLOBAL INFORMATION INFRASTRUCTURE

(This site includes speeches, documents and reports on efforts to build a Global Information Infrastructure. It also includes material on the U.S. telecommunications reform legislation.)

<http://www.usia.gov/topics/gii/gii.html>

USIA INTERNATIONAL HOME PAGE

(This home page of the U.S. Information Agency and its worldwide U.S. Information Service offices provides information on U.S. government policies, American society and culture. It also includes reports on current developments at the White House, State, Commerce, Treasury and other government agencies.)

<http://www.usia.gov/usis.html>

U.S. INFORMATION INFRASTRUCTURE TASK FORCE (IITF)

(The White House formed the IITF to articulate and implement the administration's vision for the National Information Infrastructure (NII).)

<http://iif.doc.gov/>

U.S. NATIONAL INFORMATION INFRASTRUCTURE VIRTUAL LIBRARY

(This site has documents and links to material about U.S. efforts to build a National Information Infrastructure.)

<http://nii.nist.gov/>

WEB SITES WITH AN INTERNATIONAL FLAVOR

(Part of NTIA, this Office of International Affairs home page includes links to regional and government departments worldwide involved in GII programs.)

<http://www.ntia.doc.gov/oiahome/dianelist.html>

WHITE HOUSE

(Included on this site are material on the president and vice president, White House documents, a tour of the White House and the daily releases of the White House press office.)

<http://www.whitehouse.gov/>