

**Information Technology and
the New Global Economy**
Tensions, Opportunities, and the Role of Public Policy

A Report of the Thirteenth Annual Aspen Institute
Roundtable on Information Technology

David Bollier
Rapporteur



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Foreword

Globalization has increased for centuries with constant improvements of transportation and communications technologies. It has taken a giant leap in recent years, however. Previously, physical and human resources moved around the world by means of land, sea, and air transportation. Now, with data serving as a basic resource and digital communications the means of transport, financial capital is moving throughout the world at nearly the speed of light and work is moving to the worker at the same velocity, reshaping the landscape of the world economy. Information and digital technologies that initially cost a great deal, with little direct return, are now showing tremendous dividends in terms of productivity in developing countries and large industrial firms. The digital economy is finally coming to fruition.

The dream of idealists, economists, and technologists is that the promise of digital technologies, the instantaneity of global communications, concomitant growth of economies around the world, and improvements in learning tools and techniques will benefit billions of the earth's people.

Rapid changes in technologies and economies often meet resistance and tension, however, as they come up against social and cultural institutions. Tectonic shifts cause earthquakes above ground as well as beneath the surface, and there are signs of crises throughout the world. Global cohesiveness and world markets promised by rapid communications meet dislocation and disruption when work is auctioned to laborers in distant lands, and what appears on the screen is not sold in the marketplace.

The promises and problems of the global digital economy come face-to-face in this report of the 2004 Aspen Institute Roundtable on Information Technology. Conference rapporteur David Bollier weaves between stories of villagers gaining world market prices for their goods through instant connection to relevant information, on one hand, and poor people left behind educationally, socially, and economically as the world passes by, on the other. It is a time of rapid growth, volatility, sharing, and selfish competitiveness. It is a time when video game behavior may describe the world's economic players; when confusion can lead to frustration and dis-

ruption; and when societies, communities, and governments ultimately will have to understand the new realities of the global digital economy.

The aim of this volume is to provide some context and insight into the unfolding of these new economic realities and the global economic landscape on which the world's players will live, learn, innovate, offer, consume, thrive, and die. As Bollier states in his conclusion:

It is a fantasy, then, to believe that intoxicating visions of globalization can be achieved without taking serious account of international political and social ramifications. Achieving this vision will require attention to how China and India will move forward economically; how social resistance to outsourcing will be addressed; how governments will renegotiate the "social contract" with their citizens; and how developing nations will be incorporated into the global economy.

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February 2005

INFORMATION TECHNOLOGY
AND THE NEW GLOBAL ECONOMY

David Bollier

Information Technology and the New Global Economy

Tensions, Opportunities, and the Role of Public Policy

Introduction

Changes in technology have been transforming commerce, politics, and culture for centuries. Yet it is now becoming clear that the explosion of the Internet and assorted digital technologies is provoking epochal changes in the global economy. Finance capital now roams the world with unprecedented speed. Transportation and logistics have become radically more efficient. Work readily moves to wherever it can be most skillfully and cheaply performed. Innovation and productivity are forging ahead, sometimes at blinding speeds.

These changes have brought undeniable gains in prosperity for many segments of the world. They also have introduced complicated and novel problems. As the world economy becomes more tightly interdependent, for example, it is becoming more complicated for governments to manage national economies. As market pressures become fiercer, governments also face new problems in preserving a “social safety net” for their citizens. Corporate strategy and management have become more difficult as information technologies change the very terms of competition. Companies require not only finance capital and cheap resources but access to skilled workers and innovative partners.

Sweeping changes in the global economy pose special challenges for developing nations. How can they improve their lot while integrating themselves into the global economy? How might the large industrialized nations help developing nations achieve greater social stability and economic growth? As markets and technology gallop ahead—a seemingly unstoppable juggernaut—there are urgent new pressures to mediate the tensions between new technologies and economic growth, on one hand, and social needs and political stability, on the other.

To explore these issues, the Aspen Institute Communications and Society Program convened 23 leading entrepreneurs, technologists, academics, venture capitalists, and policy experts for the 13th annual Aspen Institute Roundtable on Information Technology. The conference took place August 4–7, 2004, in Aspen, Colorado, and was moderated by Charles M. Firestone, executive director of the Communications and Society Program. This report offers an interpretive synthesis of the conference discussions.

Portrait of a Changing Global Economy

One of the most important forces shaping the global economy is information and communications technology (ICT). A convergence of technologies—the personal computer, software, the Internet, and broadband and wireless communications, among others—is not only integrating international commerce; it is changing the internal practices of business. This transformation often is described as globalization, which the Asian Development Bank has defined as “a process of economic integration of the entire world through the removal of barriers to free trade and capital mobility, as well as through the diffusion of knowledge and information.”

It is widely recognized that globalization involves deep structural transformations in the conduct of international commerce, politics, and culture. Understanding these transformations—and finding ways to accommodate and exploit them—may be one of the most important challenges of our time.

Robert Hormats, vice chairman of Goldman Sachs (International), offered a broad overview of globalization and the “tectonic shifts” it is catalyzing. He suggested that there is not only a geographic “pulling together” of different, once-remote corners of the world but also a “pulling apart” of societies, based on different levels of education, training, and skills. “The tectonic shifts are not just among societies but *within* societies,” Hormats said. “There are new divisions within societies between skilled and nonskilled and between well-trained and non-well-trained workers.”

These twin dynamics—the pulling together and pulling apart of economic and social institutions—are transforming the international economy in novel ways. “You’re getting hubs of excellence—pockets of skills—that are being integrated together by the global economy and by information technology,” said Hormats. “People are able to do price discovery online. They are able to understand changes in markets across the world on a real-time basis. Virtually everyone has access to information and the ability to communicate and network that they did not have before. A farmer in Kenya growing cotton or sisal has the opportunity to see what the world price is and how it’s changing and then to determine how much he or she will produce and when to sell it.”

“The tectonic shifts are not just among societies but *within* societies.”

Robert Hormats

The networked economy is rapidly spreading the “auction process” of markets to more parts of the globe, bringing with it new efficiencies and price transparency. A subtle but significant shift, said Hormats, is the use of information technology not just to gain access to least-cost production but to seek out innovative and skilled workers wherever in the world they might be.

These changes have both positive and negative effects, said Hormats. On the positive side, they create an anti-inflationary bias all around the world because technology is boosting efficiency, competition, and productivity. On the other hand, the greater interconnectedness of the world economy means that financial markets are more prone to volatility. There are fewer “buffers” that can temper extreme shifts, slow down economic transactions, and provide more time for reflection and planning. “We’re seeing everything condensed and occurring on a much more immediate basis,” said Hormats. “That puts enormous pressure on capital markets because they have to adjust very rapidly.”

“It puts even more pressure on labor markets,” Hormats added. Previously, factories that laid-off workers could rehire them once the economy improved. Now jobs that are lost in a given factory or sector often are lost forever. In the new work environment, people may not be able to simply change jobs; they may need to re-educate and retrain themselves for entirely new careers. New technologies are sending jobs abroad in search of productivity gains or eliminating entire classes of jobs forever.

Not surprisingly, the new economic realities are intensifying the stress on elected officials and political systems around the world. It is much harder for governments to leverage economic gains from turbulent global markets while providing enough jobs and social benefits to their citizens. For their part, developing countries face daunting challenges simply to participate in the global economy and improve their long-term prospects.

New Business Models for the Networked Environment

Information technologies are propelling at least two other major structural changes. First, they are forcing “dramatic changes in the way that corporations are run,” said Hormats. “Companies have to be run with a much greater eye toward outsourcing, but they must also develop specific internal competences if they are going to take advantage of external opportunities and integrate them into the firm. That requires people at the corporate level who are able to manage multilayer, multicultural, multiregional organizations and who can integrate the many components.”

Second, information technologies are democratizing and diffusing information more broadly around the world, creating new economic opportunities for people who traditionally have been excluded. Hormats compares this effect to the impact of the Gutenberg printing press on the Catholic Church’s and monarch’s power and monopoly on information. In a similar manner today, said Hormats, information technology is providing new opportunities to 3 billion people in China, India, and many developing nations. Thanks to information technologies, these people are increasingly able to become part of globally linked production, supply, and distribution chains.

Bill Coleman, co-founder and first chief executive officer (CEO) of the software company BEA and founder and CEO of Cassatt, compares the explosion of information technologies and globalization to earlier industrial revolutions. The point of these revolutions, he emphasized, is not the technologies themselves but the new systems that are built on them. “If you read Alfred Chandler’s book *The Visible Hand*, you will see that the Industrial Revolution took us from a mercantile society to one with a new chain of commerce. We mobilized a highly automated production, communications, and transportation capability to create volume manufacturing that could be sourced from, and distributed to, anywhere in the world. We created a new way of conducting business on a global basis. That produced a dramatic increase in productivity on the order of 150–200 percent, and it created the middle class.”

Today’s industrial/commercial revolution revolves around the electronic network, said Coleman, and it has three primary characteristics: The network is available to everyone, anywhere in the world, so that there is now total access; there is total transparency in economic activity; and the network allows for “straight-through processing” of resources and money—a dynamic frequently associated with the computer company Dell, said Coleman. Thanks to networking technologies, Dell is able to build computers to order, fulfill orders quickly, and keep overhead and inventory costs low. “Dell actually has a negative cost of capital,” said Coleman, “because their receivables are shorter than their payables.”

Coleman contends that only four companies have truly capitalized on the advantages of the networked environment—Amazon, eBay, Yahoo, and Google. These companies exemplify the “pull” model of business—a commercial strategy that relies on free network access and total transparency to “pull” consumers to the business, unlike the traditional “push” model that relies on centralized control and marketing. This is a new matrix for commerce, said Coleman: “It enables groups of interest to form dynamically and almost instantaneously. It is a viral, growing thing that changes all the time. New business models are created and destroyed all the time; the whole chain of commerce is turning upside-down.”

John Hagel, a management consultant and author of *Out of the Box, Net Gain*, and other business books, frames the tectonic shift in commerce a

“ I think in order to make that move from ‘push’ to ‘pull,’ you have to have a more loosely coupled way of organizing resources. This has large implications for how businesses are organized.”

John Hagel

bit differently. “It is a move from very tightly coupled, efficiency-oriented uses of information technology to much more loosely coupled ‘islands of specialization.’ I think in order to make that move from ‘push’ to ‘pull,’ you have to have a more loosely coupled way of organizing resources. This has large implications for how businesses are organized.”

The shift Hagel sees occurring is almost a matter of worldview and philosophy: “We are moving from a top-down design approach, which says that you must specify in great detail all of the activities that go on within the system, to a much more modular design philosophy, which

says that you may want to keep the modules relatively independent and focus on defining the interfaces that facilitate modules coming together in more flexible ways over time.”

Gilman Louie, president and CEO of In-Q-Tel, a private technology development enterprise funded by the Central Intelligence Agency (CIA), agrees that the whole paradigm for production is changing: “It is no longer going to be a linear model, with somebody pushing one end of the pipe and someone else pulling on the other end. Rather, it is about assembling what is needed for a moment in time, in a collaborative value-creation chain, where every piece adds value.” The transition Louie sees is a move from “standardization of production to virtualization and then to personalization.”

Innovation and Specialization: The Key Economic Drivers

Information technologies have such transformative effects on the global economy because they are boosting productivity in radical

ways. “There are really only two ‘free lunches’ that can be had, economically speaking,” said Bill Coleman. “These are specialization and innovation. Most everything else is just moving money around and reallocating it.

“Specialization is characterized by free trade on a global basis, and innovation is characterized by invention and its diffusion. Specialization and innovation generate a ‘free lunch’ because they increase productivity without increasing the capital flow. This is all about productivity, and it’s all about cycle—the speed with which innovation and specialization can occur.”

Coleman described how the traditional cycles of productivity that are based on innovation and specialization have accelerated dramatically: “If we look at the Industrial Revolution, productivity goes through a cycle. A technology is invented somewhere and used locally. It is very high value added; it has a very high competitive advantage; and it requires high skill levels. But as a new technology diffuses and is incorporated into practice, it becomes low value added and low competitive differentiation. That’s when labor arbitrage takes over, such as outsourcing. That’s obviously what’s happening now. That’s happening in all industries—automotive, railroad, shipping, etc.”

Coleman said that “innovation is not only the most highly leveraged way to increase productivity” but “it also leads to the creation of new industries, which in turn leads to greater trade and the diffusion of technologies that raise the lower-end skills of the next generation and then the generation after that.”

“It is no longer going to be a linear model, with somebody pushing one end of the pipe and someone else pulling on the other end. Rather, it is about assembling what is needed for a moment in time, in a collaborative value-creation chain, where every piece adds value.”

Gilman Louie

The Importance of Complementary Innovation

One reason innovation and productivity gains may be so dramatic in the global economy is because the networked environment offers far greater opportunities for complementary innovation. Paul Milgrom, a professor of economics at Stanford University, pointed out the historical importance of complementary innovations in helping to realize the full potential of a new technology.

For example, Milgrom said, most people associate the steam engine with James Watt, but much of that technology's real value came from subsequent improvements—a separate condenser; introduction of steam above and below the pistons to increase power and efficiency; the invention of lower-pressure steam engines and high-pressure engines. “Continuing innovation is not only about making something more efficient but about developing useful new applications,” said Milgrom. “The large, clumsy, low-pressure steam engine would never have been useful for shipping without follow-on innovations.”

Similarly, development of hybrid corn was not simply a scientific discovery that suddenly changed agriculture, said Milgrom. Agricultural extension stations were critical to the diffusion and acceptance of hybrid corn. It turns out that differences in latitude can cause differences in the corn's growth. “An important theme throughout history is the role that complementary innovations play in making a basic innovation work well in new environments,” said Milgrom.

“Continuing innovation is not only about making something more efficient but about developing useful new applications.”

Paul Milgrom

This theme is a leitmotif of the Industrial Revolution, in fact. “Historically, a lot of capabilities have to come together to form centers of innovation,” said Bill Coleman. “The first mover in a new technology isn't necessarily the first one to actually capitalize on it.” Coleman cites the role the United States played in capitalizing on innovations wrought by the Industrial Revolution in

Great Britain. The British may have pioneered innovations in transportation, he said, but the United States built upon and exploited inventions that originated elsewhere, such as steel manufacturing, railroads, telegraphs, and electricity.

Murray Gell-Mann, the distinguished physicist and co-founder of the Santa Fe Institute, pointed out that history is full of innovations in pure science that were never developed or applied in their time. “The steam engine was available at the museum in Alexandria, but it was a model that never led to any application. The Hellenistic world had an excellent capacity for invention, but very few of them were developed or deployed.”

“I like to think of innovation as invention implemented.”

John Seely Brown

A key distinction must be made between *invention* and *innovation*, said John Seely Brown, former chief scientist of Xerox Corporation and now a visiting scholar at the Annenberg Center at the University of Southern California. “I like to think of innovation as invention implemented,” he said. “We don’t really understand why a lot of inventions work until years and sometimes decades later. Even something as simple as Claude Shannon’s information theory [based on a classic 1948 paper that offers a theoretical, mathematical model for communications engineering] was a hunch; his mathematics was actually somewhat bogus. We didn’t understand until many years later the actual mathematical basis of information theory. All our cell phones depend on the mathematics.”

To the Sony Corporation, the differences between invention and innovation are so significant that it has formally separated the two functions. As described by Gilman Louie of In-Q-Tel, “Sony decided that it needed to be the inventor because it could not compete with Panasonic, which was regarded as the innovator. So Sony had to reduce the cycle times for its inventions and specialize in doing that because it figured Panasonic would always be the innovator. Once Sony invented something, Panasonic would be able to produce it cheaper, faster, and in greater quantities.”

Sony went so far as to create two separate groups within its organization—research and development (R&D) scientists and engineers to do the inventing and another group to do the product marketing and reengineering. Engineers stay within their respective groups and do not migrate with the product.

Some further distinctions were introduced. A *product* or *technology* innovation might be less consequential than a *practice* or *process* innovation. “A lot of value-creation actually comes from process and practice innovations that take advantage of new technologies,” said management consultant and author John Hagel. “Those are often harder for competitors to copy because they tend to be path-dependent and involve cumulative learning. They are much harder to replicate.”

It also may be useful to consider the difference between *incremental* innovation and *disruptive* innovation. “The best technology doesn’t always win,” noted Amir Alexander Hasson, president of United Villages (a company dedicated to bringing wireless infrastructure to rural communities around the world). The classic example is the VHS video player’s triumph over the Sony Betamax, which was regarded as the superior technology. Many factors affect the success of a new invention—its installed base, the timing of its marketing, the pricing, and so forth—but some factors will have only incremental effects while others will be disruptive.

As discussion continued, it became clear that there is a wide range of factors that stimulate innovation or complement invention so that innovation may occur.

One powerful stimulus to innovation is war. The history of science from the Greeks onward shows that military conflict has always been a force driving technological innovation. Another stimulus to innovation is finance capital. A 2002 book by Carlota Perez, *Technological Revolutions and Finance Capital: The Dynamics of Bubbles and Golden Ages* (Edward Elgar Publishing), explains how the changing relationship between technological advances and finance capital shapes the pattern of economic cycles. Venture capitalists often are the source of

ideas that enable an interesting invention to become the basis for a profitable business.

Marketing also can be an important complement to innovation. The invention of the photocopier was a technological breakthrough, but photocopiers became ubiquitous in modern life only because of a marketing innovation. “Without the concept of ‘per-click’ payment for copies, Xerox would not be here today,” said John Seely Brown. “The early copiers cost \$25,000 to \$30,000, so you had to find a way to let people use them without taking the financial risk. Charging by the copy was a way of letting the market experiment with a machine that was foreign and relatively expensive. It was a powerful complementary innovation.”

Other complementary innovations also were mentioned:

- The educational resources of a country can affect the types of knowledge its economy can develop and market.
- The social norms of a society can affect whether it will tolerate business failures (through bankruptcy law) and labor mobility.
- Government may play an influential role in helping new inventions develop sufficiently to become marketable.
- Politics can affect whether certain technologies (such as stem cell research) will be allowed to develop.

Rather than look at the role of any single factor affecting innovation, John Seely Brown urged that people focus on “innovation ecologies”—the holistic environments that affect how innovation occurs. “The dynamics of knowledge flow in an ecology can foster and drive some of the complementary innovation we are talking about,” he said. Indirect connections that are made—to new professional and personal contacts, to supportive institutions, and to new ideas—can be as important in stimulating innovation as direct interventions.

Do Patents Foster or Impede Innovation?

What role does patent protection play in promoting or impeding innovation? This question has become controversial in recent years, as patents have been granted for inventions that have historically been regarded as unpatentable—business methods, software design, and more. Patents are supposed to foster and accelerate innovation by rewarding innovators for the risk and investment they shoulder. Many critics charge, however, that patents slow innovation by providing overly broad legal protection for inventions.

The goal is to have a proper balance in patent law, pointed out Paul Milgrom of Stanford University: “We want to protect inventors in order to make sure that there’s some return on their investments so that they will continue to make innovations. But we don’t want too much protection because we want subsequent innovations to take place.” The history of the Industrial Revolution in Great Britain showed the value of patents, said Milgrom, quoting from Joel Mokyr’s book, *Lever of Riches: Technological Creativity and Economic Progress* (Oxford, 1992): “The security offered by patent law to persons who would spend large sums results in many new and important improvements that are manufactured.”

Although the value of patent law in spurring innovation is well-established, said Milgrom, it is equally recognized that patent law “should be tailored so that what’s being protected are large investments that are generating innovations. That’s where the protection needs to be supplied. It is not needed for the so-called ‘cheap lunches,’ where you get very large returns for small investments.”

Physicist Murray Gell-Mann took issue with this formulation, however: “If a modest inventor makes a crucial contribution to something that then makes a vast amount of money, why should there not be some adequate patent protection to assure this inventor a return—not proportionate to the 10 cents he put in but to the \$4 billion that the invention made?” After all, inventors cannot always know at the outset how much money their innovation may end up making. A classic case in point is the computer operating system MS-DOS, which consisted of 50,000 lines of code, much of it acquired from another company—

which ended up being the foundation for the Microsoft Corporation, now one of the most valuable companies in the world.

In response, Milgrom conceded that some people may have ethical concerns about whether the inventor of a modest innovation should be entitled to huge returns. On efficiency grounds, however, Milgrom said, “The inventions that need the most protection are the ones that are the most expensive to make.” If patent protection is too broad, it may end up stifling further innovations.

Corning is a company that has demonstrated the need for such patent protection, said John Seely Brown, former director of Xerox PARC: “Corning will invest in a new technology for as long as 18 years so long as it believes it can 1) launch an industry, not a product; and 2) protect its ideas.”

Brown noted that Corning was responsible for developing fiber optic cable and the glass substrate for liquid-crystal display (LCD) panel. “There are very few corporations that are willing to show that kind of patience,” he said. “The only way they can do so is if they really believe that they can unleash a huge market that they can protect. Corning is willing to tackle problems that go to the root of a problem only because they know they will be able to capture the results through intellectual property.”

What about the proliferation of far-fetched patents, however? Several conference participants pointed out that the U.S. Patent Office is granting large numbers of dubious patents to new technologies, and this patent proliferation stifles innovation and triggers expensive litigation.

“The number of things that are being patented that are inherently *not patentable* is infinite,” said Philip Merrill, president and chairman of the Export-Import Bank of the United States. Common “inventions” such as a mortgage evaluation software program and the “look” of an onscreen garbage can are actually being granted patent protection.

The problem is not patents per se, said Cassatt's Bill Coleman, but failure to tighten patent standards: "The real problem we're having, at least with software, is the failure to define what invention really is. My previous company, we'd file as many as 50 patents on a new product when it came out. We'd patent every teeny aspect of it, much of which was not 'invention.'"

Stanford professor Paul Milgrom believes that more empirical work is needed to clarify the proper scope of patent protection: "We need to identify the categories where innovations are expensive and research-intensive. Where the innovations are cheap and cumulative, that's where it is important to avoid excessive patent protection. That can be determined empirically."

Assuming that the proper levels of patent protection can be achieved, a related question arises: How can important new technologies be financed, given the intense pressures to satisfy short-term market criteria?

Gilman Louie of In-Q-Tel lamented that it is growing much harder for companies to become market leaders in new and important technologies when the demand for short-term return on investment is so intense. This issue became clear to Louie when he learned that every lab at IBM recently was told that it will be judged by its contribution to profitability, which foreclosed certain lines of research that would either cost too much money (e.g., \$100 million for the company to dominate a given technological market) or take too long to show adequate returns.

"The real problem we're having, at least with software, is the failure to define what invention really is."

Bill Coleman

"I think there is a huge gap in investment that the venture capitalists can't cover and that the public markets consider too risky," said Louie. "This is going to be a big challenge for this country." Venture capitalists typically invest no more than \$10 million to \$100 million at three- to five-year time horizons, which means that certain classes of research and development simply will not be attempted.

What policy innovations might help address this problem? At a private level, Corning is able to pursue major R&D breakthroughs because it has a certain stability through its ownership by a local family, and its R&D track record makes for a compelling story for investors. Many participants agreed that government has an important role to play in encouraging long-term R&D. Historically, the Defense Advanced Research Projects Agency (DARPA) has played such a role.

Government leadership on R&D can be exceedingly difficult in today's political climate, however, because elected officials have the same short-term orientation as investors. "I've been at a number of meetings at the White House where they say, 'There's no way we're going to go down this road because it would be political suicide to take it to Congress and admit that the political benefits will come 'two presidents later,'" says one conference participant. Why make budgetary sacrifices for space exploration, stem cell research, or any number of other long-term research projects when the benefits may well accrue to another political party?

Japan has been able to overcome some of these issues because of the long-term vision of its companies, said James M. Manyika, a partner in McKinsey & Company who advises high-tech companies on strategy and operational issues: "There's a certain level of stability of ownership and institutional structure in companies like Samsung that allows them to have very long-term visions in their investments. There is still an open question about their success. But at least from the point of view of their investment time frame and their potential impact, Japanese companies take a very long view."

“I think there is a huge gap in investment that the venture capitalists can't cover and that the public markets consider too risky. This is going to be a big challenge for this country.”

Gilman Louie

China has an interesting approach to this problem, said Robert Hormats of Goldman Sachs. “The government has sponsored a number of venture capital funds that have a very long-term perspective—10 to 20 years out. They are funding exactly the same kinds of programs that In-Q-Tel is, on a very large scale.”

Such examples suggest that nations may not be able to depend exclusively on markets to coordinate the kinds of long-term investments that their economies need. New sorts of institutional mechanisms and government leadership may be needed to provide training, seed capital, and long-term research funding.

Challenges to the New Global Economy

The first part of this report outlines some of the unfolding patterns of change being spurred by ICT. The overall vision is moving forward rapidly and is highly appealing—at least to most investors, economists, and industrial sectors. Can it be realized, however? This part of the report examines a variety of factors that may complicate or thwart the emergence of a new, more integrated global economy.

There are at least four salient challenges: 1) the political and economic stability of China as it aggressively seeks to integrate itself into the global economy; 2) possible backlashes against the trend in U.S. business to outsource work; 3) new forms of social resistance to the globalization agenda; and 4) the difficulties of stimulating economic development in developing countries.

The Question of China

Donald Tang, vice chairman and senior managing director of Bear Stearns, outlined some of the wrenching problems facing China—and indirectly, the rest of the world—as it tries to transform itself from a less-developed nation to a competitive industrial power.

About 20 years ago, China’s leadership inaugurated a new set of policies known as MUG—an acronym that stands for modernization, urbanization, and globalization. The goal is to transform China’s economy

from top to bottom, introducing more efficient technologies; to improve the education and training of workers; to bring millions of peasants from the countryside into major urban centers; and to integrate the Chinese economy into the global economy.

These ambitious goals transformed China to where it is today. It also contains the seeds of major disruption as a by-product, however, because MUG also works to eliminate jobs, Tang explained. Rapid efficiency gains and elimination of redundant bureaucratic layers entail massive job layoffs even as the inflow of peasants into cities creates new pressures for job creation. The Chinese government's commitment to its power base means that creating jobs must take precedence over market-based economic development.

The government's solution has been to grow the economy at an aggressive rate. Tang described China's challenge: "The MUG policy creates a situation which results in the loss of 8 million jobs each year. Just to keep up—to have a net change of jobs at zero—the government needs to have the gross domestic product [GDP] grow at least 4 to 5 percent a year."

The Chinese government has had little choice but to manage this tension—and ensure a growth in GDP of 8 percent a year—by using the banking system as an instrument of social policy. Money is being lent to priority industries and used to finance government infrastructure projects as a way to create new jobs.

In a sense, the strategic use of bank lending has been successful. Many new airports, bridges, and roads have been built, and these efforts have employed millions of people in constructive (but not always economically viable) projects, said Tang. Some 15 million Chinese people are moving into urban areas every year, and another 250 million are expected to do so over the next two decades. Along the way, MUG policies have created a new Chinese middle class comprising 19 percent of the population. MUG also has created a burden, however, of constant job creation in urban centers and new tensions between existing residents and newcomers.

Shrewdly, China has been selectively protectionist in different export/import areas while allowing foreign national corporations to invest in—and derive profits from—Chinese businesses. Although foreign investors have difficulty liquidating their investments, in the meantime they have access to a large and growing market. “Making it hard to get out of China is good for China,” said Tang, “because that means investors have to spend more money in China and then hire more people and build more capacity.”

In considering China as an integrated company—China, Inc.—the modernization drive and rapid buildup of infrastructure projects are driving global commodity prices up and therefore increasing the cost of doing business. On the other hand, the emerging middle class of China does not have enough purchasing power to absorb all the production capacity that China has been building, said Tang. So China has to rely on its “export machine” to balance the huge imbalance. Because managers have no pricing power, the result has been a flat revenue line for China, Inc. Facing rising costs and a flat top-line, China is experiencing a “less profitable” or “profit-less” expansion.

Over the short term, these policies have enabled the Chinese government to continue to create new jobs, build new businesses, and manage GDP growth. The outlook is worrisome, however, warns Tang: “In a couple of years, as the population starts to age, as consumers start to spend, as depositors gain access to foreign banks (as a result of the World Trade Organization agreement), the Chinese government will lose its overall command-and-control of the Chinese banking system, with potentially vast implications for the nation’s ability to manage its growth. The Chinese government has historically been able to both operate and regulate its economy, but soon it may just be able to regulate it by its own proactive efforts.” The crucial question is whether the Chinese leadership will be able to satisfy 800 million peasants while modernizing the Chinese economy.

Paradoxically, the Western countries that enjoy inexpensive goods from China do not appreciate the considerable windfall that they now enjoy, said Tang. This benefit may soon become more precarious, he

warned: “In a way, America, Australia, Canada, and Brazil are getting a bonus from China as commodity prices rise. On the other hand, consumers of developed countries like ours are able to buy goods from Wal-Mart cheaply because of the Chinese. We do not say ‘thank you’; we just blame them [the Chinese] for our job losses.”

Yet in a way, said Tang, the Chinese are doing the rest of the world a huge favor. They have absorbed higher commodity costs while suffering under revenue caps set by world markets. “Chinese leaders carry the world on their shoulders in a way, trying to maintain the net job creation level at zero in order to hang on to their own power,” said Tang.

If and when the Chinese banking system can no longer be used as a tool to ensure new job creation, the Chinese economy could fluctuate. That fluctuation would have enormous economic, political, and strategic reverberations around the world, pointed out Mickey Kantor, former U.S. Trade Representative and partner in the Mayer, Brown, Rowe & Maw law firm.

“Consumers of developed countries like ours are able to buy goods from Wal-Mart cheaply because of the Chinese. We do not say ‘thank you’; we just blame them [the Chinese] for our job losses.”

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Because China is a major supplier of capital to the United States, commodity prices probably would soar. If the Chinese military were needed to quell domestic disturbances, one could imagine great political instability that would affect much of the world. It would disrupt outsourcing from the United States and other large countries and shut down the stock market and disrupt capital markets worldwide. Although such a scenario may seem remote, Gilman Louie of In-Q-Tel pointed out that “low-probability/high-consequence events are the very definition of potential discontinuity.”

The Outsourcing Controversy

Another challenge to the new global economy comes from the new wave of outsourcing. “There is growing apprehension among business leaders, economists, and ordinary Americans that we are witnessing what may well be the largest out-migration of non-manufacturing jobs in the history of the U.S. economy,” write Ashok Deo Bardhan and Cynthia Kroll.

Part of the consternation stems from the fact that service jobs, including white collar and computer sector jobs, can now be sent to foreign workers with reasonable ease. Some analysts worry that jobs are not the only thing being outsourced to other countries. Outsourcing now entails entire occupations in electronics manufacturing, business support services (call centers and computer systems design), and telecommunications, software publishing, and Internet service.

Bardhan and Kroll, writing for the Fisher Center for Real Estate and Urban Economics, note that employment in these sectors has plummeted by 15.5 percent in the United States as a whole and 21 percent in the state of California, corresponding to a job loss of more than 1 million and 200,000 jobs, respectively, in these sectors alone. This trend is likely to continue in the years ahead. Forrester Research estimates that about 473,000 computer services jobs will go offshore by 2015. Not surprisingly, the accelerating transfer of U.S. jobs to foreign countries—especially jobs that traditionally have been regarded as “safe”—has caused a fair amount of political controversy, especially during the 2004 election season.

Economist Paul Milgrom of Stanford University pointed out that, in a sense, outsourcing of jobs is simply a new version of a very old phenomenon—reaping comparative advantage through trade: “It’s trade in intermediate goods—labor—and all the arguments you’re hearing are versions of arguments that have been made for many, many years: ‘If we trade with other countries, we enrich people there and hopefully, we can sell some goods to people there. They buy more of our goods with their new income, and they ship goods to us more cheaply than we can make them ourselves.’ These are very traditional advantages.

When we talk about outsourcing, we are not talking about anything new in that respect.”

What is new about outsourcing today, said Milgrom, “is the speed of change and the ways we have to deal with these practices.... You can lose a lot of jobs, very fast. And the economy therefore has to be able to adjust at a faster rate than it did in the past.” Milgrom said that governments must develop new types of social policies to deal with rapid dislocation of workers.

One fallacy in the outsourcing debates, said Robert Hormats of Goldman Sachs, is the idea that labor markets are a zero-sum game—“that a job lost in Texas is a job lost in Texas, period. Labor markets are always in flux. It’s a big mistake to think that there is only one set of jobs, and it is static. In fact, if you create jobs in India and elsewhere, there are opportunities to create new jobs in the United States. We create jobs in the United States at a much more rapid rate than we outsource jobs. And the key is to keep that pace up. It is also essential to provide support to temporarily and permanently displaced workers.”

“Labor markets are always in flux. It’s a big mistake to think that there is only one set of jobs, and it is static.”

Robert Hormats

Management consultant and author John Hagel expressed frustration at the polarization of discussion about outsourcing and offshoring. (Hagel distinguishes between the two because the latter takes account of global dynamics that the former does not.) “We see two different sides discussing the issue at different levels and not really communicating with each other. One side focuses on near-term job loss and resists the notion that economic disruption can be a good thing. The other extreme tends to take a macroeconomic view that says, ‘Not to worry, the savings that we generate from offshoring will be reinvested, which will create new jobs and everybody will be fine.’”

Hagel believes that an “intermediate level of discussion” needs to focus on the implications of offshoring for business enterprises. This notion is the subject of a forthcoming book, *The Only Sustainable Edge: Why Business Strategy Depends on Productive Friction and Dynamic Specialization* (Harvard Business School Press), that Hagel has co-authored with John Seely Brown. More executives need to regard offshoring as an opportunity and a potential challenge to transform their enterprises and their competitive capacities. Hagel explained:

Our sense is that a lot of executives still view offshoring as essentially a form of wage-arbitrage. All we’re doing is getting access to lower-wage labor and generating near-term cost savings. End of subject. In fact, we think that’s much too narrow a view of the opportunities created by offshoring and that the real opportunity is much more about gaining access to distinctive skills—and even more importantly, access to mechanisms to rapidly enhance and deepen those skills. It is in this context that we think the real value-creation opportunity exists.

Hagel pointed to the “distinctive skills” that certain countries are developing, which U.S. companies would do well to exploit. For example, Chinese companies have developed leading-edge skills for wireless hardware and software; Indian companies have a lead in the software development process.

The real long-term competitive advantages, said Hagel, come from developing partnerships in countries where distinctive skill sets are flourishing. Offshoring simply to gain access to low-cost labor is a short-term game that does little to enhance a company’s long-term competitive advantage because any cost advantages are quickly competed away. The point is to enter into partnerships with skilled talent in foreign countries and then to develop those talents in tandem with those of one’s own company.

Hagel cited the development of the motorcycle industry in China, noting that “a fundamentally different architecture of motorcycle design is being used to drive down costs and deliver more value to

customers.” He also cited Cummins’ work in India to redesign lower-powered engines that are more appropriate for certain market segments—a change that enabled the company to move into new foreign markets. Amir Hasson of United Villages noted that the next generation of cell phones is being designed by users in India and China, who are far more intensive users of cell phone applications than Americans and therefore are more able to develop follow-on innovations.

“We think there is a longer-term opportunity to take product innovations that are being developed in offshore markets and bring them back into developed markets in Europe and the United States,” said Hagel. “These new products offer greater value at lower cost and potentially compete with the existing product vendors in markets with more traditional product offerings.”

Leveraging the skills of one’s foreign partners entails three major challenges, said Hagel. First, a greater reliance on offshoring means that some core operating processes—product design, manufacturing, call center operations that deal with customers—may be sent abroad. “What does that mean?” asked Hagel. “It means that anybody has access to those skills, not just your own company. The opportunity to differentiate your company in those areas actually goes down. Anyone can use those same outsource operations, so where is the differentiation for your company, going forward?”

A second challenge is managing the complexities of a distributed global operation. “Hard-wired process management techniques are very ill-equipped to handle these challenges,” said Hagel. An exemplary counterpoint, he said, is the Chinese firm Li & Fung. “They manage a process network of 7,500 business partners around the world, and they do it in a very flexible, loosely coupled way. This is totally different from the more tightly coupled process management approaches that U.S. companies have traditionally used.”

A third challenge, said Hagel, “is how do you take that coordination and use it to actually build skills more rapidly, not just for yourself, but

for your business partners as well? They are a whole different set of skills and capabilities that most companies, at this point, just don't have today."

The strategic use of offshoring may reach its pinnacle when a company learns to leverage assets that it doesn't directly control, added John Seely Brown of the Annenberg School of Communications. "That's a different mindset in terms of management. There are a lot of things that you can do with assets that you don't control if you can think of new ways to manage. If you really want a return on assets, there is no better return than using someone else's resources to improve your own books."

The larger implication of these propositions, said Hagel, is a changing economic rationale for the firm. "Increasingly, as transaction costs come down as a result of information technology, we believe the rationale for the firm is going to shift much more to capability-building. Are you able to build skills and capability more rapidly within your firm than somebody can outside of your firm? That will be the distinctive rationale for organizing firms, as opposed to people operating as individuals. Ultimately, most executives are much too complacent about the challenges, as well as the opportunities, that are being created by offshoring,"

Robert Hormats of Goldman Sachs agreed with Hagel's analysis, adding, "Many corporations make the mistake of thinking that they can outsource without making fundamental changes in the way they run their operations at home—that outsourcing is something that happens 'over there.' But if you're going to take advantage of outsourcing, you have to change the whole mentality of the way you do business."

The Untold Benefits of "In-sourcing"

For all the attention being paid to offshoring of jobs, little attention goes to what might be called "in-sourcing"—that is, creation of new jobs in the United States as a result of foreign investment.

Phillip Merrill of the Export-Import Bank pointed out that "25 percent of the net worth of investment capacity of the wealth of every sin-

gle country in the world, including North Korea, is invested in the United States. It's because the United States is stable, because it is the common market, and because there is transparency."

Foreign investment has resulted in in-sourcing of 6.5 million jobs in recent years, said Merrill, by some of the largest companies of the world—such as Toyota, Honda, BMW, and Siemens. "My favorite example is Germany," said Merrill. "Germany is no longer Germany; Germany is the United States," in the sense that Daimler-Chrysler, Siemens, BMW, and other large German corporations have made large jobs-creating investments in the United States.

Bill Coleman of Cassatt emphasized that there is a cycle of outsourcing and subsequent in-sourcing that is exemplified by the semiconductor industry. "I've talked to a semiconductor CEO who has outsourced everything in his company except the architecture and distribution," said Coleman. "That's all the comparative advantage that is left in semiconductors. Everything else is overseas—the actual design, chip manufacturing, and even most of the distribution. That's the only reason we can buy a \$500 computer with a 17-inch flat screen display. But guess what many computer companies are in-sourcing? Manufacturing. That's where the competitive advantage is. They have to deliver to you, custom-built, in seven days. They can't do that if the manufacturing is overseas; the costs won't let them. So this is the natural cycle of economics."

Martin N. Bailey and Diana Farrell, writing in *McKinsey & Co. Quarterly*, agree that outsourcing tends to create significant economic benefit for the United States over time: "For every dollar of corporate spending outsourced to India, the U.S. economy captures more than three-quarters of the benefit and gains as much as \$1.14 in return. Far from being a zero-sum game, offshoring creates mutual economic benefit."

Amir Hasson of United Villages presented statistics from the Organization for International Investment suggesting the scope of in-sourcing to the United States. "U.S. subsidiaries from other countries employ 6.4 million Americans," Hasson said. "U.S. subsidiaries pay an

annual payroll of \$350 billion and average 19.1 percent growth in all of those companies. The list goes on. Over the past 15 years, manufacturing in-sourced jobs grew by 82 percent.”

The real issue, as many conference participants noted, is for U.S. firms to keep their eye on their long-term comparative advantages and focus on them. As Bill Coleman put it, “It’s our duty to improve productivity and ride these curves.”

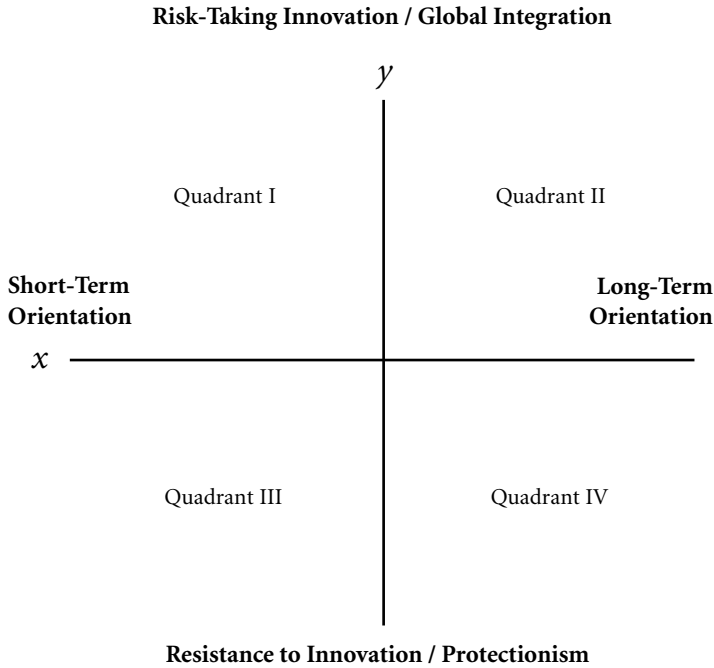
Social Resistance and Other Disruptions

One of the recurrent patterns of technological change is social resistance. Technological change tends to be disruptive, which tends to spur affected segments of society—workers, professional specialties, geographic regions—to mount different forms of political resistance. Striking an equitable balance between contesting parties is important. The economic gains of new technologies will not be fully realized if there is significant opposition, after all. Yet allowing social resistance to veto new technologies generally is not a viable strategy either.

Economist Paul Milgrom of Stanford University cited Muslim resistance to the printing press in the 15th century and its long-term implications for Arab peoples: “The prophet Mohammed supposedly said that whoever imitates a people becomes one of them. In the Ottoman Empire, that was interpreted as a stricture against importing foreign technology. That’s one reason why, despite the invention of moveable type and the printing press in 1453, it was not until 1730—almost 300 years later—that we see the use of moveable type in the Muslim world for the first time, even though it was certainly known in that world.”

Adapting a graph used by Thomas Friedman in his book *The Lexus and the Olive Tree*, Charles Firestone, executive director of the Aspen Institute Communications and Society Program, presented a chart that “graphs” a nation’s support for (or resistance to) technological innovation, free markets, and free trade.

Chart of Nations' Attitudes Toward Innovation



Conference participants found this chart to be a rough but useful way to understand how different nations approach innovation and trade policy. After first characterizing the behaviors associated with each quadrant, participants suggested which nations should be placed in each of the four quadrants.

Management consultant and author John Hagel noted that countries whose policies align with quadrant III are likely to be the most static and protectionist, whereas those in quadrant II will be more innovative, dynamic, and supportive of free trade: “If you’re managing for the next quarter and short-term results, one of the implications is that you move toward a zero-sum game mindset. You’re focused on existing resources—a protectionist kind of mindset that wants to win as much as possible today. In this quadrant, you’re not

focused on longer-term economic growth and productivity gains. If I take a longer-term approach [quadrant II], I will invest more in innovation and R&D and begin to look for opportunities to integrate with the global economy and to discover complementary innovations.”

Conference participants debated which nations should be assigned to which quadrant. They agreed that the United States belongs in quadrant II—the zone of the most innovative, dynamic, free-trading economies.

“It is too simplistic to classify a nation as either protectionist or integrationist; some nations are both at the same time.”

Jerry Murdock

Other nations that belong in this quadrant include Great Britain, Poland, the Czech Republic, and even Slovakia and Romania. The policies of these nations seek to “grow the pie” through innovation and growth, and these countries regard economics as a dynamic, positive-sum game.

At the other extreme, the nations whose policies fall into quadrant III were said to be Saudi Arabia and North Korea. The nations in this quadrant tend to envision technology and markets as fairly static, so they adopt trade policies that assume a negative-sum game, in which the economic victors win only at the expense of other nations. Countries such as Brazil, Italy, and Spain were assigned to quadrant IV because they cling to certain protectionist policies yet also show a greater long-term orientation and global integration than many other nations.

Several participants emphasized that the chart is only a crude tool for making relative comparisons among nations. It fails to take account of some important complexities. Jerry Murdock, co-founder and managing director of Insight Venture Partners, warned, “There is a lot more complexity in the trade policies of a nation because of politics. It is too simplistic to classify a nation as either protectionist or integrationist; some nations are both at the same time.” For example, the United

States—a highly innovative nation committed to an integrated global economy—has shown its own protectionist streak in its trade policies for agriculture, broadcasting, and electronics technologies that have national security implications. China is selectively protectionist in many areas, but it is also very integrated into the global economy.

The chart also is limited in depicting the value of a nation’s social “safety net” policies. If a nation wants to maintain strong national health care and other social programs, does that make it an innovative, risk-taking nation (because the social programs make economic change less disruptive) or a static, protectionist nation (because such programs drain money from the private sector)?

This discussion led Mickey Kantor, the former U.S. Trade Representative, to call the label “free trader” a misnomer: “Frankly, I think it’s brain-dead politics. Protectionism and free trade don’t exist. I’m for ‘rules-based trade.’ I think in a world this complicated, and with the realities of globalization and technology, only rules-based trade makes sense. The questions are: What are the rules going to be, and who is going to set them? And how are you going to move in the correct direction?”

Of course, determining “what are going to be the rules” and “who is going to make them” is the essence of politics. In a larger sense, the ways in which a nation determines the “correct direction” for itself are framed by its polity. A democratic nation that sanctions citizen participation, open policymaking, and free elections is likely to adopt different policies to govern markets than those adopted by a nation controlled by an elite political party, family dynasty, or dictator.

Many participants noted a structural tension between democracy and globalization—a tension that has both positive and negative aspects. Mickey Kantor observed, “Democracy is a problem in the sense that accountability and transparency can get in the way of making decisions. Also, it takes longer to make decisions when there are various constituencies involved.”

Philip Merrill of the Export-Import Bank agreed: “Democracy and the marketplace are opposite sides of the same coin. The advantage of the totalitarian government [in spurring innovation] is that it can direct something to take place without the checks and balances that exist in either democracy or the marketplace. But the other side of that coin is, those governments can go down a road and pursue projects that are absolutely unproductive—totally wasted capital.”

“Correcting a mistake is just as important as going in the right direction in the first place.”

Philip Merrill

“The point is that R&D commitments can be checked and balanced by the marketplace. But once the government is involved, you have a stake that you can’t pull out of, especially if two or three governments are involved.... Correcting a mistake is just as important as going in the right direction in the first place.”

Donald Tang of Bear Stearns agreed: “In China, you have very few checks and balances on government policy. The reason it is hard to do business in China is that there is no common denominator, such as economics.”

The Video Game Theory of the Global Economy

If government decisions sometimes need to be checked by the marketplace, the citizens of a nation often believe that market outcomes need to be checked by democracy. The democratic will—or, in a less exalted form, social sentiment “on the street”—must be seriously reckoned with. Particularly in a global culture now connected by electronic networks, dissenters can set into play all sorts of obstructionist forces. In its most benign, constructive form, dissent can express itself as a call for democratic accountability and salutary reform. In its most worrisome form, dissent can express itself through terrorist acts. In either case, the Internet and global integration have empowered such voices.

It is important to understand how “network effects” are changing the dynamics of international politics, trade policy, and commerce, said Gilman Louie of In-Q-Tel. The basic scenario mirrors what occurs in

massively multi-player video games, in which tens of thousands of players participate in the same online game. “Everybody is playing the game and having a good time,” said Louie. “But there’s always one player who wins all the time, and everybody resents it. So different groups decide to band together.

After the winning player, there is a second-tier group. They are really good players, but they really hate the guy who always wins. (Think France, Germany, and China.) So in order to figure out how to win the advantage in this ‘net war,’ these players go offline. They use instant messaging to conspire how to take down the first player—because you never want the first player to win because that’s the end of the game. You’ve got to keep the game alive.

Then there is a third tier of players who want to be in the second tier but aren’t good enough. They know they can’t win, even if they partner with someone. But the second tier doesn’t want to partner with third-tier players because it considers them a distraction. We see this in the EU [European Union] right now; they don’t want other nations in. So the third-tier players try to ‘make nice’ with the first tier and maybe get some scraps.

Finally, there is a fourth tier of players who either quit by going off to another game or decide to become disrupters. Some become isolationists and say, ‘I’m not going to worry about the rest of the world; I’m just going to put a big wall around myself and deal with my own internal problems, have my own religion and my own point of view. I’ll talk to myself and feel better.’ Others become disrupters whose job it is to make sure that nobody else can win, so that everybody loses.

Louie illustrated the mindset of the disrupter by telling a story told by Russian schoolchildren:

A Russian child, Alexis, sees a bottle and kicks it over. A genie comes out and says to Alexis, “I’ll give you one wish.” (This is a Russian genie, so he gives only one wish.) And the genie says to Alexis, “I’ll give you anything you want, but you only get one.”

Alexis is annoyed, and says, “I’m a Russian. I don’t give a damn. I don’t need anything. Go away.”

The genie says, “No, no, no. I see Peter across the way, and he has a cow. You don’t have a cow. Why don’t I give you a cow?”

Alexis turns to the genie and says, “No, I have a better idea. Kill the cow.”

The Russian story captures the essence of what Louie calls the “video game theory” of the global economy. The moral of the story is directly relevant to the United States today, said Louie. “We’re so far ahead of

“Without some way to keep everybody ‘in the game,’ you run the risk that others will try to disrupt the system. You must appeal to some notion of fairness, as opposed to simple economic rationality, or this effort won’t be sustainable.”

James Manyika

the rest of the world that we have got to ask ourselves: Who are going to be our competitors? Who are going to be our allies? Who are going to be our disrupters? And how do you play out this game for the next 20 years?”

One implication of the video game theory is that it is not enough to give the “excluded” players access to the game. Half of humanity—the 3 billion people who live below the poverty line—do not have access to the world economy, noted James Manyika of McKinsey & Co. Providing them access is equivalent to saying, “Come on—get online and that will solve the problem.’ But that may make it worse. It actually gives them access to disrupt the game.”

If developing nations are going to be integrated into the global economy, the video game theory implies that these nations cannot simply be helped with enabling tools—technology, access to markets, and so forth. There must be a plausible “theory of change” for changing the circumstances for that half of humanity, said Manyika.

By the terms of the video game theory, it becomes critical to prevent spoilers from ruining the game for everyone. The “winners” have a new imperative—call it self-interest—for preventing certain players from defecting and becoming disrupters. “Without some way to keep everybody ‘in the game,’” warned Manyika, “you run the risk that others will try to disrupt the system. You must appeal to some notion of fairness, as opposed to simple economic rationality, or this effort won’t be sustainable.”

Robert Hormats of Goldman Sachs echoed this perspective: “We’ve got to figure out ways of bringing potential disrupters into the system in a legal fashion. Bringing these countries into the World Trade Organization is extremely important because it creates a sense of participation in common laws and practices. There’s cheating, for sure, but everyone is in the same system. The system has to be seen not as a system dominated by the United States but one in which there is a more collective notion of how the system ought to be run.... We have to give [potential disrupters] a process that enables them to grow and participate in the global economy.”

As it happens, the video game theory not only portrays the situation, it offers some useful strategic guidance. Gilman Louie reported that in global role-playing games and long-term scenario planning sessions, one of the best ways to deal with disrupters is to keep everyone committed to the gaming by making it seem as if anyone can “move up.”

Louie said, “The multilateral engagement strategy seemed to work best. If you are a smart leader in a game—in other words, you are the winning player—you never allow yourself to be the winner. Your job is to keep the game going and interesting for all the other players. And the way you do that is to purposely make some mistakes along the way so that other players can gain some ground. And you help players. You bring them back and help them believe that they can go from the third tier to the second tier.

“I offer that up as one strategy for a successful ongoing game, which we are calling the global game now. Defining victory as the United States winning at everyone else’s expense will cause the world to choose the spoiler alternative.” The shrewdest long-term strategy for the

United States, said Louie, is “suboptimal behavior” because it helps prevent defections that could easily disrupt the game.

This perspective offers “a powerful way of thinking,” said Idit Caperton, CEO of MaMaMedia, a company that creates Internet media applications to help children learn. “But only to a point; it assumes a game designer who can in fact engineer all players’ intentions, moves, and decisions. It also assumes that there must be an ongoing winner, a super-strong force, who can control and be ‘shrewd’ and make people believe this or that.” Caperton is unsure that the “global game” video game metaphor should be pressed too far.

If one accepts the general template of the video game analysis, however, one clear implication is that the “social contract” between governments and their citizens, as well as the relationship between the market and social needs, must be recalibrated. A relentless drive to achieve maximum market gains will produce Pyrrhic victories. The best, most sustainable market gains will come through enlightened self-interest that suboptimizes benefits to the winner.

Domestically, this strategy might mean a more aggressive government role in developing programs to mitigate “transitional” disruptions (unemployment, the need for retraining, etc.) caused by free trade. It also means that government social policies will need to respond more rapidly and flexibly to social dislocations, as Stanford professor Paul Milgrom suggested.

The bureaucratic rigidity that characterizes so many social protections must change, said Jérôme Huret, president of Aspen Institute France. “Most advanced European countries have fallen into the trap that, in order to provide a social safety net, they must provide rigid forms of job security,” said Huret. “This idea has become so embedded that no politician dares question it. The challenge is how to keep the fluidity and yet provide the kind of social protections that are necessary for a modern society.”

Internationally, strategies to keep everyone “in the game” may prove more daunting. The essential issue is how to move nations from quad-

rant III to quadrant II. What new strategies for economic development should the “winners” of the global economy promote to keep the third- and four-tier “players” from defecting and disrupting “the game,” causing everyone to “lose”?

New Approaches to Development

Gilman Louie of In-Q-Tel was bluntly realistic in his assessment of conventional development approaches: “I think the United States does itself a disservice in believing, or trying to sell, the notion that a country can actually move from quadrant III to quadrant II. In most cases, that is not likely to succeed. You’ll end up creating false expectations. Whether it’s free trade, democracy, or whatever you may want to call it, it won’t deliver for the people, and then they will end up in a worse position. I worry about countries that think they can go from quadrant III to quadrant II without going across one of those other quadrants because I don’t think that is a successful strategy.”

The best strategy for a nation stuck in quadrant III, said Louie, is to capitalize on a uniquely valuable asset or service (such as Singapore’s high-tech expertise) and “go across the bottom [of the chart] and then up. What that means is, don’t change too much of what you’re doing, but sell more of it. Go across the bottom, and, hopefully, that will buy you time to come up with a strategy to transform your economy so that it can move toward quadrant II. Very few countries can do that because only those countries with unique capabilities and values can make that happen. But if you can, it is a potential strategy.”

A second development strategy resembles that pursued by Japan, said Louie. A nation with a beleaguered economy might reasonably say, “I’m not going to open up my economy to global integration because I will get crushed. There is a lot of competition and I don’t really care if I’m liked; I must take care of my home base and stabilize and transform my country. I need to cut bilateral trade agreements, not multilateral ones. So I’m going to transform my economy and try to grow it, but I’m going to keep a big wall around it and only let trade come in selectively.”

Louie says this approach resembles Japan's policies because it seeks to retain their large corporations, social philosophy, and banking system even though they impede future growth and integration with the global economy.

“You can’t cook a chicken for five minutes at 1000°. Some things just take a certain amount of time and a certain amount of experience. This tends to be overlooked in issues of development.”

John Kunzweiler

self-interest. In a truly integrated world, I don't think these nations have a choice.”

Should developing nations have to struggle with these challenges alone? Isaac Shongwe, managing director of Letsema Holdings Ltd. and CEO of Micor Logistics, thinks not. He rhetorically asked, “Is there a responsibility for the people who are occupying quadrant II to get other people up there? If the name of the game is competition, developing countries will never get there.” James Manyika of McKinsey & Co. replied, “I'm not sure it's so much of a responsibility [of the nations in quadrant II] as much as it is a necessity in their own

If the developed world can recognize this fact, what affirmative steps might it take to help spur development among the excluded half of humanity?

“Realistically, there's no formula or cookie-cutter approach,” said Amir Hasson of United Villages. “There are some basic things that we have identified—education, basic infrastructure—and some internal reforms such as deregulation. But those are very general ideas. The trick will be for each country to figure out for itself, on a case-by-case basis, how it can specialize in a certain area and find its own competitive advantage.”

That said, there are stages of development that any country seems to go through, said John T. Kunzweiler, a senior partner at Accenture, a

management consulting and technology services company. “You can’t cook a chicken for five minutes at 1000°,” Kunzweiler said. “Some things just take a certain amount of time and a certain amount of experience. This tends to be overlooked in issues of development.”

According to Lt. General SS Mehta (Ret.), a former high officer of the Indian Army, developing nations need to address an agenda of what he calls “economic security”—which consists of food, water, energy, environment, technology, and education. These issues must be addressed in combination, Mehta said, because citizens will still face great insecurity if any one of these areas is deficient. “With the pervasive nature of ICT, it is essential that the developing countries leverage ICT for sustainable economic growth by encouraging innovation to enable indigenous needs to be addressed in affordable ways,” he said.

Incorporating China and India into the global economy over the next several decades will be a significant achievement, participants agreed. Reaching the 2 billion people who live in rural regions of the world, most of whom do not have basic communications, poses an even more formidable challenge. There is great interest among these people to learn English and computer programming, said Hasson, but “there has not been an economically viable way of extending communications technologies to these poor people.”

Hasson believes that this challenge won’t be met by nongovernmental organizations that spend a few million dollars on isolated projects. “It will require an entrepreneur-led commercial model at the local level, which allows people to create microenterprises and be successful at it,” Hasson said. He cited the success of the Grameen Bank project that has brought cell phone technology to remote regions of Bangladesh.

How to Build a Middle Class?

An urgent question for policymakers to confront, beyond issues of access to technology, said John Seely Brown of the Annenberg School, is how to create a middle class. Several broad strategies were suggested by other participants.

Robert Hormats of Goldman Sachs believes that it is important to make upward mobility more feasible. “The key point is not so much whether a nation’s economy is open or closed, although open is far better than closed because it introduces competitive pressures; it is whether it emphasizes the protection of jobs against *any* kind of change. If a

“I’ve run a small state and had to compete against a lot of big states, and I can tell you that the biggest detriment [to development] is intellectual capital. That’s the thing you have the most difficulty building.”

Gaston Caperton

country is going to integrate into the global economy, it must establish the potential for upward mobility—the potential for people to get a better education and higher skills.... Countries that do not have this internal sociological concept—the possibility of upward mobility and an acceptance of ‘creative destruction’ that leads to better jobs and opportunity over the long term—are going to find it very hard to integrate into the global economy.”

Some of the barriers to developing a middle class in poor countries are cultural, noted Alan Wade, chief information officer at the Central Intelligence Agency (CIA). “If we looked at what are called ‘failed

economies,’ people there do not have an aspiration to become more like industrialized economies. They see a set of values that does not fit their lives. Part of our discussion has to be, How do we create that aspiration? How do we persuade people that there is hope and a better life in moving in that direction?”

A major impediment to developing a middle class in poor countries may be the domestic policies of the developed world, said former U.S. Trade Representative Mickey Kantor: “Europe, the United States, Japan, Korea, and other developed countries have harmed Africa, Asia, and Latin America in the most profound way by continuing to implement agricultural subsidies [for their own farmers].... Unless we address this political issue, we can’t even begin to address the problem

of abject poverty and move people out of the fields, educate them, and begin to build a middle class. These countries have no foreign direct investment and therefore no technology transfer. They can't even get their people into world markets in terms of food [export], where they could, in fact, begin to make some progress. So we [developed nations] are really at fault here."

Gaston Caperton, former governor of West Virginia and now president of the College Board, offered some lessons from his own attempts to bring economic development to his small, less-affluent state: "I've run a small state and had to compete against a lot of big states, and I can tell you that the biggest detriment is intellectual capital. That's the thing you have the most difficulty building."

To bolster education—which often is regarded as an engine for building a middle class—Caperton urges development of both infrastructure and intellectual capital. "That's the *only* way you can get to where you have to go," he said, citing the example of Ireland. "Ireland once had the worst economy in Europe; now it has the strongest economy. It took intellectual capital, infrastructure, and a smart economic policy. It also takes leadership."

South Korea may be a case study of this approach, too, said Robert Hormats. "At the end of the Korean War, [South] Korea was considered a basket case by the U.S. Agency for International Development. But the Koreans invested whatever money they had—and it wasn't much—in education. The American advisors said, 'What are you doing, investing in education? There are no jobs for educated Koreans!' The Koreans said, 'We'll create the educated people and the jobs will come.'

"I think that underscores a critical point," said Hormats "Education is the starting point. If you believe the Korean model, and most Asian models, they are education-based."

The crux of education and training, however, is not simply the transmission of information, warned John Seely Brown, co-author of the book *The Social Life of Information*. Real intellectual capital is created through development of social relationships and tinkering with prob-

lems in a hands-on way. “There is an interesting yin-yang relationship between the construction of intellectual capital and social capital,” said

“The Internet is creating fundamentally new ways to create social capital.”

John Seely Brown

Brown. “You can see this where the educational system enables people to tinker with issues by learning how to build things, fix things, design things, and understand things.”

The ability to “tinker” may play a surprisingly large role in a nation’s ability to pursue complementary innovations that eventually lead towards economic leadership, said Idit Caperton of MaMaMedia. “If an edu-

cation system, or a country’s culture in general, invites creative thinking and tinkering, you get software, hardware, and management innovation of the sort we see in India. In China, by contrast, the culture and the education system promote information memorization and not much originality and creativity—which does not lead to many inventions or complementary innovations in technology. This is something the Chinese Ministry of Education is trying to change now.”

Learning through tinkering is not just about innovation, said John Seely Brown; it is a process of building identity. “People’s identities are getting constructed through the building of really interesting artifacts—and then opening them to the world through ‘open source/social source’ movements,” he said.

Brown noted that although in a sense open-source software development “makes no sense at all, economically,” in other ways it is critical to the development of identity, community, and certain types of social capital—all of which do have important economic implications. “The Internet is creating fundamentally new ways to create social capital. You can see this in [South] Korea, where the country’s broadband policy is creating a new kind of social capital arising from the interplay of cyberspace and social space. It is completely beyond anything we can understand in this country.” If one is going to promote education as a development strategy, then understanding the

role of community and identity is important, said Brown. “The other side of cognition is identity.”

Retired Indian General SS Mehta emphasized that education should not be regarded simply as a credential for white-collar employment: “With the coming of the knowledge economy and burgeoning unemployment, the need of the hour is to develop a four-collar workforce,” said Mehta: “A white-collar workforce, a grey-collar workforce (the knowledge worker), a blue-collar workforce for the shop floor, and a rust-collar workforce for lower-order skills, in areas where none exists. These skills should be benchmarked to global standards, and movements within them should be possible through training and experience.”

Conclusion

The conference’s survey of the complicated problems caused by information technologies make one point clear: Much more attention will need to be paid to the structural disruptions that are affecting people’s daily lives, political governance, and corporate decision making.

The new technologies offer some tremendous promise for integrating the excluded half of humanity into the global economy. The economic development that these technologies can enable can facilitate improvements in education, health care, nutrition, and general prosperity. Some nations have already demonstrated how information technologies, combined with economic reforms and other public policies, can improve their lot. The new technologies also offer great promise in improving productivity, innovation, and economic growth.

Whether developing nations will be able to develop their own competitive economic capacities remains an open question, however. Can the poor nations of the world make sustainable gains, or will they forever be left behind? Answering this question could be pivotal for the future of the global economy. As Gilman Louie’s “video game theory” suggests, if developing countries are not incorporated into the world economic community in some acceptable way—if they cannot make economic progress—they have new opportunities to defect from the “game” and become disrupters. This power is significant in an age of

global interdependence. Disruptions in one locality or node can quickly radiate out to affect the entire economic or communications system, as acts of terrorism have shown.

It is a fantasy, then, to believe that intoxicating visions of globalization can be achieved without taking serious account of international political and social ramifications. Achieving this vision will require attention to how China and India will move forward economically; how social resistance to outsourcing will be addressed; how governments will renegotiate the “social contract” with their citizens; and how developing nations will be incorporated into the global economy.

The institutional and political transformation that these issues are likely to require is daunting. Nation-states, corporations, national cultures, and individuals must all find new ways, mutually and simultaneously, to come to terms with the market-driven juggernaut of technological change. This observation suggests that we must redouble our efforts to understand the many complex, interconnected dimensions of the challenges ahead.

Notes

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APPENDIX

Thirteenth Annual Aspen Institute
Roundtable on Information Technology

***Redrawing the Global Economic Landscape:
The Role of Information and Communications Technologies***

Aspen, Colorado
August 4–7, 2004

Roundtable Participants

Madeleine Albright

Principal
The Albright Group

David Bollier

Independent journalist
and consultant

John Seely Brown

Former Chief Scientist
Xerox Corporation
and
Director Emeritus
Xerox Palo Alto Research
Center (PARC)

Gaston Caperton

President
The College Board

Idit Caperton

Chief Executive Officer
MaMaMedia

William T. (Bill) Coleman III

Founder, Chairman, and Chief
Executive Officer
Cassatt Corporation

Cary Davis

Managing Director
Warburg Pincus

Charles M. Firestone

Executive Director
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Murray Gell-Mann

Distinguished Fellow
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John Hagel

Author and management
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Amir Alexander Hasson

President
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Robert D. Hormats

Vice Chairman
Goldman Sachs (International)

Note: Titles and affiliations are as of the date of the conference.

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About the Author

David Bollier (www.bollier.org) is an author, activist, and consultant with a varied public-interest portfolio. He is a co-founder of Public Knowledge, a Washington policy advocacy organization that defends the public's stake in intellectual property law. He also is the author of *Brand-Name Bullies: The Quest to Own and Control Culture* (John Wiley & Sons, 2004), a collection of stories about copyright and trademark abuses and their effects on creativity.

Bollier is senior fellow at the Norman Lear Center at the University of Southern California Annenberg Center for Communication, where, with Laurie Racine, he directs the Creativity, Commerce & Culture project. Since 1984 he has also worked with television writer/producer Norman Lear as a public affairs and political advisor. Much of Bollier's recent work has focused on developing a new language of the commons—a project that began with his book *Silent Theft* (Routledge, 2003) and now continues through his Web portal and blog, www.OntheCommons.org. Bollier lives in Amherst, Massachusetts.

Prior Publications in the Roundtable on Information Technology Series

People / Networks / Power: Communications Technologies and the New International Politics (2003)

David Bollier, rapporteur

This report explores the sweeping implications of information technology for national sovereignty, formal and informal diplomacy, and international politics. Bollier describes the special challenges and new rules facing governments and nongovernmental organizations in projecting their messages globally. The author further explores the relationships between the soft power of persuasion and the more traditional hard power of the military and discusses how governments will have to pay close attention to newly burgeoning social communities in order to prosper. 68 pages, ISBN Paper: 0-89843-396-7, \$12.00 per copy.

The Rise of Netpolitik: How the Internet Is Changing International Politics and Diplomacy (2002)

David Bollier, rapporteur

How are the Internet and other digital technologies changing the conduct of world affairs? What do these changes mean for our understanding of power in international relations and how political interests are and will be pursued? *The Rise of Netpolitik* explores the sweeping implications of information technology for national sovereignty, formal and informal international diplomacy, politics, commerce, and cultural identity. The report begins with a look at how the velocity of information and diversification of information sources are complicating international diplomacy. It further addresses the geopolitical and military implications as well as how the Internet is affecting cross-cultural and political relationships. It also emphasizes the role of storytelling in a world where the Internet and other technologies bring our competing stories into closer proximity with each other and where stories will be interpreted in different ways by different cultures. 69 pages, ISBN Paper: 0-89843-368-1, \$12.00 per copy.

The Internet Time Lag: Anticipating the Long-Term Consequences of the Information Revolution (2001)

Evan Schwartz, rapporteur

Some of the unintended consequences of the Internet and the freedoms it symbolizes are now rushing to the fore. We now know that the network of terrorists who attacked the World Trade Center and the Pentagon made full use of communication technologies, including e-mail, Travelocity.com, automatic teller machines (ATMs), data encryption, international money transfers, cell phones, credit cards, and the like. Is the Internet an epochal invention, a major driver of the economy for many years to come, or just a passing fad? Will the new phenomena of recent years—such as the contraction of hierarchies, instant communication, and lightning-fast times to market—last beyond the funding bubble? What is the next new economy? What are the broader social consequences of the answers to those earlier questions? This report takes a wide-ranging look at the economic, business, social, and political consequences of the Internet, as well as its wide-ranging ramifications for the process of globalization. 58 pages, ISBN Paper: 0-89843-331-2 \$12.00 per copy.

Uncharted Territory: New Frontiers of Digital Innovation (2001)

David Bollier, rapporteur

This report looks critically at key insights on the new economy and its implications in light of the digital revolution. The report begins with an examination of the interplay between the current economy and the capital economy and then probes the emerging world of mobile commerce and its potential for driving the next great boom in the economy. It further explores new business models resulting from the combination of mobile communications and the new economy. 68 pages, ISBN Paper: 0-89843-307-X 12.00 per copy.

Ecologies of Innovation: The Role of Information and Communications Technologies (2000)

David Bollier, rapporteur

This report explores the nature of innovation and the role of the information and communications sectors in fostering ecologies of innovation. In this context, the report examines the ways in which the creation of new ecologies are affecting significant societal institutions and policies, including foreign policies, industry and business structures, and power relationships. 44 pages, ISBN Paper: 0-89843-288-X, \$12.00 per copy.

The Global Wave of Entrepreneurialism: Harnessing the Synergies of Personal Initiative, Digital Technologies, and Global Advance (1999)

David Bollier, rapporteur

This report examines problems arising from the growth of entrepreneurialism and digital technologies. 41 pages, ISBN Paper: 0-89843-264-2, \$12.00 per copy.

The Global Advance of Electronic Commerce: Reinventing Markets, Management, and National Sovereignty (1998)

David Bollier, rapporteur

This report addresses issues of electronic commerce in the context of global marketplace impact and the transformation of national sovereignty. 64 pages, ISBN Paper: 0-89843-236-7, \$12.00 per copy.

The Networked Society: How New Technologies Are Transforming Markets, Organizations, and Social Relationships (1997)

David Bollier, rapporteur

This report explores how electronic networking—the Internet and intranets—is transforming commerce, organizational performance and leadership, business and social relationships, and personal identity and allegiances. 43 pages, ISBN Paper: 0-89843-213-8, \$10.00 per copy.

The Future of Electronic Commerce (1996)

David Bollier, rapporteur

This report examines communications and information technologies that are redefining the fundamental conditions and relationships of commercial transactions, as well as the implications of the new electronic commerce for individuals, businesses, and society. 64 pages, ISBN Paper: 0-89843-188-3, \$10.00 per copy.

The Future of Community and Personal Identity in the Coming Electronic Culture (1995)

David Bollier, rapporteur

This report concentrates on issues of personal identity, community-building, and setting boundaries in our lives and our environment; it includes a background paper titled “The New Intermediaries” by Charles M. Firestone. 48 pages, ISBN Paper: 0-89843-166-2, \$10.00 per copy.

The Promise and Perils of Emerging Information Technologies (1993)

David Bollier, rapporteur

This report explores the use of complex adaptive systems as a model for determining information technology's role in the workplace and in diverse societal settings. It includes a background paper by John Seely Brown, Paul Duguid, and Susan Haviland titled "Towards Informed Participants: Six Scenarios in Search of Democracy in the Electronic Age," which offers progressive scenarios of how the interaction of humans and information technologies might influence and affect democratic life in the coming decade. 44 pages, ISBN Paper: 0-89843-149-2, \$10.00 per copy.

The Information Evolution: How New Information Technologies Are Spurring Complex Patterns of Change (1993)

David Bollier, rapporteur

This report explores the use of a new paradigm of co-evolving complex adaptive systems for thinking about information, information technologies, and information-oriented societies. 28 pages, ISBN Paper: 0-89843-132-8, \$10.00 per copy.

About the Communications and Society Program

www.aspeninstitute.org/c&s

The Communications and Society Program is a global forum for leveraging the power of leaders and experts from business, government, and the nonprofit sector in the communications and information fields for the benefit of society.

Its roundtable forums and other projects aim to improve democratic societies and diverse organizations through innovative, multidisciplinary, values-based policymaking. They promote constructive inquiry and dialogue and the development and dissemination of new models and options for informed and wise policy decisions.

In particular, the Program provides an active venue for global leaders and experts from a variety of disciplines and backgrounds to exchange and gain new knowledge and insights on the societal impact of advances in digital technology and network communications. The Program also creates a multidisciplinary space in the communications policymaking world where veteran and emerging decision makers can explore new concepts, find personal growth and insight, and develop new networks for the betterment of the policymaking process and society.

The Program's projects fall into one or more of three categories: communications and media policy, communications technology and the democratic process, and information technology and social change. Ongoing activities of the Communications and Society Program include annual roundtables on journalism and society, telecommunications policy, Internet policy, information technology, and diversity and the media. The Program also convenes the Aspen Institute Forum on Communications and Society, in which chief executive-level leaders of business, government, and the nonprofit sector examine issues relating to the changing media and technology environment.

Conference reports and other materials are distributed to key policymakers and opinion leaders within the United States and around the world. They also are available to the public at large through the World Wide Web.

