

# Eight Imperatives

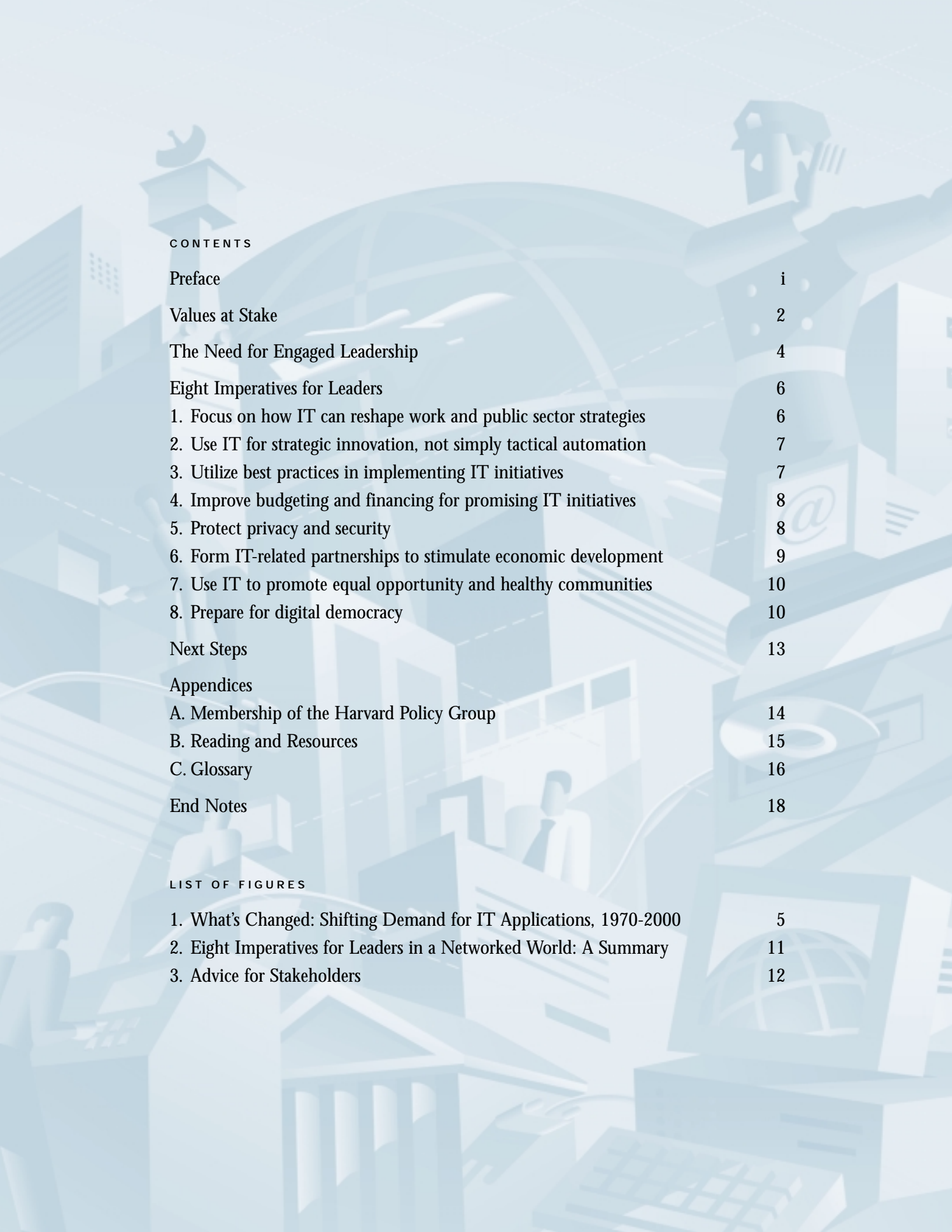
for Leaders in a Networked World:



Guidelines for the 2000 Election  
and Beyond



THE HARVARD POLICY GROUP  
ON NETWORK-ENABLED SERVICES AND GOVERNMENT  
JOHN F. KENNEDY SCHOOL OF GOVERNMENT



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# Overview

“If you want to be an **effective leader** in our **networked world**, you need to engage IT issues.”

## PREFACE

As we enter the new millennium, everyone from social commentators to the general public has observed that information technologies are changing our patterns of social, commercial, and political interaction. These changes raise profound challenges and opportunities for people everywhere. It is a revolutionary period in history, with issues not yet fully understood, let alone resolved. It is a time when—ready or not—we are being forced to make choices that will ultimately redefine the essence of governmental institutions and governance itself.

Until quite recently, however, our public leaders—including elected and appointed officials and their overseers in all branches of government—have too often ignored technology-related issues or have delegated them to others. The conventional political wisdom has been that technology issues are either not very important, or require technical expertise rather than leadership, or are simply too risky for leaders to get personally involved.

These views are changing, however. Due primarily to the astonishing growth of the Internet and e-commerce, technology is now widely acknowledged as a critical force in shaping the future. The need for skillful and committed leadership has become obvious.

But the risks are still there.

As a result, public leaders—often under enormous and competing pressures—remain uncertain as to how to successfully engage technology-related issues.

In response to these developments, Harvard University’s John F. Kennedy School of Government assembled in 1997 a group of distinguished public leaders to explore what was being learned about computer networking and its impacts on the roles and responsibilities of government.

The Harvard Policy Group on Network-Enabled Services and Government (HPG) includes legislative and executive leaders, private sector and public sector leaders, technology and general managers, and public officials from federal, state, and local governments in the United States and Canada. Working over a three-year period, the HPG has developed pragmatic guidelines for those who seek to lead in this critical period.

This report, the first in a series of nine guideline papers, provides an overview of the problem and summarizes eight imperatives for leaders and their followers in an attempt to illuminate the way to success. Papers to follow will individually explore each imperative.

The HPG was made possible through a partnership among the Kennedy School of Government, American Management Systems, Cisco Systems, and IBM's Institute for Electronic Government. Note that the views presented in these papers are those of the individual members of the HPG and not the institutional views of their home organizations or project sponsors. Without the opportunity to meet together and share insights over an extended period of time, it would have been impossible for the group to learn and to produce what it has.

We sincerely hope that these papers will prove helpful to leaders and to the public at large.

THE HARVARD POLICY GROUP  
ON NETWORK-ENABLED SERVICES AND GOVERNMENT  
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JERRY MECHLING, JOHN F. KENNEDY SCHOOL OF GOVERNMENT  
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Now that the 2000 campaign season is in full swing, picture this scenario: The media is out in force to cover the evening's big debate. As the lights come up in the studio, the moderator turns to the candidates, announcing that the first topic will focus on critical issues for the new millennium. She begins with the following question:

*“Our present period in history is widely referred to as the Information Age—in contrast to the Agricultural and Industrial Ages that preceded it—because new capabilities for managing information are creating fundamental changes in the structure and functioning of society. How will you and the next administration respond to the challenges that these changes present?”*

If you're skeptical about this line of questioning, it's time for a reality check:

- Over the past decade, the portion of new capital investment devoted to information technologies has risen from under 10 percent to over 50 percent, making it the largest category of capital investment in the US economy by far.
- Companies in the information industry are now the preeminent generators of market value and wealth. Between 1995 and 1998, IT-producing industries, while accounting for only 8% of U.S. Gross Domestic Product (GDP), contributed on average 35% of the nation's real economic growth. Only about 38 countries have a GDP larger than Bill Gates' personal net worth.
- Banking transactions over the Internet cost only about 3 percent of those at traditional walk-in counters, suggesting the huge productivity gains possible from delivering services over computer networks.
- By the time U. S. Senator Blanche Lincoln of Arkansas begins her first re-election campaign, worldwide e-commerce will have grown to about 30 times what it was when she was first elected in 1998.

If any of these facts are not already familiar, you may find yourself unprepared for some of today's paramount leadership challenges.<sup>1</sup>

Many leaders are not yet ready to take on technology issues in a meaningful way. Even though most readily acknowledge that computers and networks have dramatically transformed the way organizations function as compared to just a few years ago, too few have become actively engaged in the public-policy concerns that technological progress has brought to the fore.

What we suggest is that a posture of disengagement—however valid it may have been in the past—is now outdated. Non-engagement has become a non-starter. People are rightfully demanding that government do better at keeping up with the times. But they also have strong doubts that government can or will do the right thing, and they're virtually certain that it won't do it efficiently.<sup>2</sup> To respond to these challenges while preserving our principles of democracy, we need leaders to help us craft a new and enlightened balance between private interests and the public good.

We are entering a period of historical change comparable to the one that inspired Hamilton, Madison, and Jay to pen the *Federalist Papers* in the late 1780's. Their task was to define a constitutional vision for a new kind of political community: a federal, democratic republic. The challenge for leaders today is to define an economic, social, and political vision for a new kind of society: a knowledge-based society. Leadership will be crucial.

The leaders of the future will come from concerned groups and citizens from across the spectrum of public life: politically elected and appointed executives, legislators and overseers, CEOs and CIOs of both government agencies and private businesses, general managers and civil servants, and interest groups ranging from professional associations to poverty fighters. While specialists will continue to be important, generalists will also be essential.

This paper is designed to help such leaders by defining key values at stake in a heavily networked world and then concisely summarizing eight imperatives for successful leadership. Subsequent papers will examine each imperative in greater depth.

“The challenge for **leaders** today is to define an economic, social, and political **vision** for a new kind of society: a knowledge-based society.”

#### VALUES AT STAKE

Peter F. Drucker begins his cover story for the October 1999 *Atlantic Monthly* by asserting that “[T]he truly revolutionary impact of the Information Revolution is just beginning to be felt.” The advent of the Internet, he continues, is “profoundly changing economies, markets, and industry structures; products and services and their flow; consumer segmentation, consumer values, and consumer behavior; jobs and labor markets. But the impact may even be greater on societies and politics and, above all, on the way we see the world and ourselves in it.”

What far-seeing thinkers like Drucker help us perceive is that rapid growth in information processing and computer networking is ushering in a social and cultural revolution on the

scope and magnitude of those brought about in ages past by the printing press and the steam engine.<sup>3</sup> We can already feel this impact in the mind-boggling proliferation of e-commerce, with the new breed of dotcoms generating over \$3.1 billion over the recent Christmas season, a more than four-fold increase from the previous year.<sup>4</sup> We can also observe the establishment of cornerstones of e-government: voters in Arizona's Democratic presidential primary in March will have the option of casting their ballots online, the first official digital vote in the nation.

These examples are but the proverbial tip of the iceberg. The press abounds with stories of new businesses and services that digital technology has made possible. Proximity no longer needs to be the primary determinant of whom we sell to, purchase from, or consider part of "our community." Changes on all these fronts are occurring much faster than most analysts ever anticipated.

Consequently, basic civic and social values are very much at stake. The following are of particular significance:

**Service effectiveness and efficiency.** Computer networks allow the production and distribution of services to be organized in dramatically new ways. Everything from grocery shopping to postgraduate education to registering a new business or automobile can be handled with greater ease and effectiveness, often at a dramatically lower cost. If designed or managed poorly, however, production and distribution via online systems may merely entrench outmoded and unproductive work processes. *Economic productivity is at stake.*

**Privacy and security.** As inter-networked computers become ever present, vast quantities of data gathered about individuals can be accessed from virtually anywhere. This capability can be used to create far more productive work processes. But the open standards of digital networking also confront us with conflicts over principles of privacy and security. At one extreme, if individuals can't protect access to personal data, rights to privacy and curbs on the power of the state could be seriously eroded. At the other extreme, if individuals are able to restrict access unconditionally, public security measures to identify and prevent illegal activity could be compromised. Computer networking thus raises profound issues about who should be authorized by whom to do what on the network. We need to find solutions that respect individual rights while upholding community standards. We must make the technology fit the rights and not the rights fit the technology. *The constitutional balance between individual liberties and civil order is very much at stake.*

**Equity and community.** Computer networking is transforming the content and competitiveness of work, with jobs free to move around the globe. Perceptions differ on the large-scale social effects of this digitized economy. The pessimistic view sees displaced workers, frayed bonds of civic identity, and inequitable distributions of income and wealth. The optimistic scenario sees the greater productivity enabled by networking as the creator of tangible benefits throughout society—at least in the long term. To realize the optimistic vision, how-



ever, government leaders will need to forge sustaining partnerships with the private sector to create both educational and employment opportunities in accordance with the competitive dynamics of the global economy. *Social justice and cohesion are also at stake.*

**Governance.** Democratic governance resolves conflicts through the application of values determined by legislative and administrative processes and authorized by community electorates. Jurisdiction has traditionally been based on geography and vested in towns, cities, and counties within states and nations. In a networked world, however, interactions increasingly extend beyond the boundaries of existing jurisdictions, making it harder to resolve conflicts. Leaders need to address these cross-boundary phenomena by devising new approaches to governance. *Government's legitimacy and our ability to govern ourselves are at stake.*

In sum, information technologies are transforming human interactions. Jobs, organizations, families, communities, economies—all of our relationships and socialization patterns are changing. While we face the future with substantial optimism, we also feel undeniable anxiety about what lies ahead. Virtually everything is at stake. Although recent times have been unusually good, we worry that governments will not have the courage or capability in the future to do what will need to be done.

Leadership

“The question is not whether **leaders will step forward** to meet their responsibilities, but how they can do so in the best way possible.”

#### THE NEED FOR ENGAGED LEADERSHIP

Times have changed. (See Figure 1.) Computer applications in 1970 and before focused on automating high-volume bureaucratic routines like payroll (at the far left or automation end of the applications spectrum). Benefits were high because work volumes were high; saving a few pennies per check on the payroll could add up if you wrote a lot of checks. Costs were low because work routines had already been well established; this made the programming problems easier to solve and also ensured that an authority figure (i.e., the boss) was readily available to resolve conflicts during implementation. The benefit-cost ratio and thus the demand for computing dropped off to the extent that work volumes were lower and/or the work was non-routine and raised difficult problems that required extensive negotiations to resolve (to the right, or innovations end of the applications spectrum). Automation made sense but true innovation was usually too difficult.



Over the years, however, the exponential growth of computing power—doubling every eighteen months, or over a million-fold in the last 30 years—has increased the benefit-cost ratio for all kinds of applications. The demand curve for applications has shot way up. With most of the automation of high-volume routines already completed, the focus is now on problems that were previously not feasible, moving out the applications spectrum to include low-volume, non-routine tasks and the fundamental redesign of work. For example, Amazon.com is not seeking to automate traditional bookstores, but to reinvent how we shop for books and other consumer goods, moving us away from brick-and-mortar stores to the point-and-click technology of e-commerce. The name of the game is innovation, and leadership is clearly required.

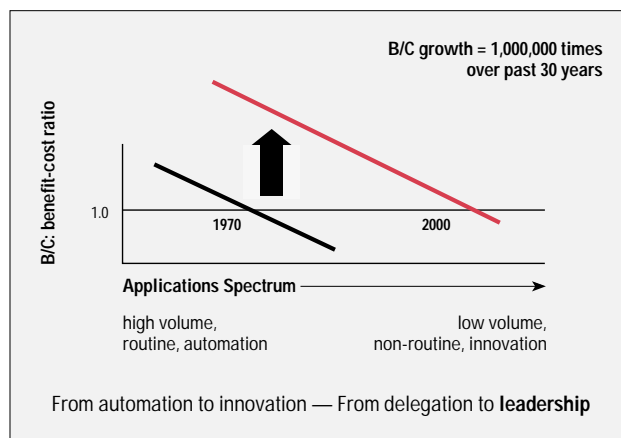


Figure 1: What's Changed: Shifting Demand for IT Applications, 1970-2000

Fortunately, leaders have recently become much more aware that IT issues demand a new approach, primarily because today's challenges—using networks to enhance productivity, improve services, protect privacy, and promote social equity—call first and foremost for resourceful political skills. While we have been living in a networked world for some time now, the institutional and organizational dimensions of the Internet and the broader Information Revolution are just beginning to emerge in to the mainstream. We need to build a social and political consensus around the kind of future we want, and then remove the governmental and broader governance barriers that hold us back from achieving that vision.

Today's needs for leadership are urgent and compelling. The risks, of course, are also formidable. In a networked world, however, the stakes are so high that the return-to-risk ratio is

much more favorable than it used to be. The era of delegation is over. The question is not whether leaders will step forward to meet their responsibilities, but how they can do so in the best way possible.

“Taken together, these **imperatives** form a useful framework for harvesting the **benefits** and avoiding the **risks** of the Information Age.”

#### EIGHT IMPERATIVES FOR LEADERS

If you want to be an effective leader in our networked world, you need to engage IT issues. You need to play a key role in establishing strategic direction, implementing specific projects, and formulating new public policies. The following guidelines are designed to help you develop your action agenda. Each guideline is an imperative—something you as a leader *must* do. Each is vital in its own right. In addition, taken together, these imperatives form a useful framework for harvesting the benefits and avoiding the risks of the Information Age.

### 1. Focus on how IT can reshape work and public sector strategies

*Problem.* The knowledge required to succeed with IT is complex and rapidly changing. Given the large size of many agencies and the checks and balances established to foster debate and deliberation, governments tend to become inwardly focused and fail to keep pace with the innovation required in the Information Age.

*What to avoid.* Don't delegate all responsibility for technology to technologists, or focus on internal operations to the exclusion of externally oriented service improvements and building essential political support.

*What to do.* Learn how digital processing and communications are revolutionizing the workplace and the nature of work, ideally through becoming directly involved in IT projects and working with computer applications as part of your personal routine. (Using a laptop, personal digital assistant, e-mail, and/or the Web is a good way to get started.) Focus in particular on the strategic triad of: a) developing the organizational infrastructure and capacities you will need to function; b) adding value through network-enabled public services and regulations; and c) building support within your oversight community and the general public.

*An example: Lessons from the first movers.* While many leaders have not yet stepped forward on technology issues, some have. In doing so, they have gained valuable experience for

those now preparing for the next wave of problems and opportunities. While singling out elected officials may be controversial (especially in an election year), there is much to learn from US Vice President Al Gore, Governor Michael Leavitt of Utah, Supervisor Kate Hanley of Fairfax County, Virginia, Mayor Ron Gonzales of San Jose, State Senator Scott Howell of Utah, Philadelphia Councilman Brian O’Neill, and Congressman Tom Davis of Virginia. These leaders have been among the earliest in sensing and responding to the importance of information technology issues. They have repeatedly been willing to stand up and debate their views in public without benefit of staff or notes. While leaders need not be experts in technology per se, they must be knowledgeable about how technology reshapes work and the institutions of governance.<sup>5</sup>

## 2. Use IT for strategic innovation, not simply tactical automation

*Problem.* The enormous potential benefits of IT are often compromised if it is used merely to entrench old work processes and organizations rather than to fundamentally redesign them.

*What to avoid.* Don’t focus on incremental improvements to the exclusion of more aggressive innovation.

*What to do.* Push for some strategic ten-fold improvements, and not merely for 10 percent. Foster and protect experimentation. Design an e-government strategy with wide opportunities for “anytime, anyplace” service. Explore service integration across program and organizational boundaries. Seek especially to develop rich and flexible technology-based options for self-service.

*An example: Governor Gary Locke and the State of Washington.* By and large, the private sector still leads in deploying newly conceived electronic services (Amazon.com, eBay.com). The public sector has moved more slowly, proceeding from simple information dissemination to recent support for transactions such as online auto registration. Leading jurisdictions, however, such as the State of Washington under Governor Locke and CIO Steve Kolodney, have been successful with more aggressive innovation. For two of the past three years, Washington has won the “Digital State” award from the Washington, DC-based Progress & Freedom Foundation. Governor Locke has focused clearly and consistently on education and infrastructure in order to prepare the state for a digital world.<sup>6</sup>

## 3. Utilize best practices in implementing IT initiatives

*Problem.* The failure rate of IT initiatives has often been daunting, even though the most difficult problems have been political rather than technological.

*What to avoid.* Don’t approach IT as primarily a technology problem, and don’t delegate IT projects predominantly to technology specialists.

*What to do.* Recognize that technology implementations are usually change-management problems. Place general managers and politically capable leaders in charge of most major IT initiatives. You need leaders who can authoritatively deal with organizational conflicts and budget issues.

*An example: John Koskinen and the many lessons of Y2K projects.* We've learned a great deal over the years about how to successfully implement technology-related initiatives. In particular, the recent experience with Y2K has drawn attention to the importance of politically-grounded project management and our dependence on interconnected computer systems. John Koskinen, as Chair of the President's Council on Year 2000 Conversion, used his broad managerial skills to mobilize the incredibly detailed and persistent activities required to resolve Y2K issues. Technology was important, but management was decisive.<sup>7</sup>

#### 4. Improve budgeting and financing for promising IT initiatives

*Problem.* By focusing on incremental annual changes to existing programs, government budgeting makes it hard to invest in IT initiatives that offer high value but also require long-term, cross-agency innovation.

*What to avoid.* Don't rely too heavily on funding IT through the traditional tax-levy budget.

*What to do.* Analyze economic and budgetary trends to identify sources of financing appropriate for an increasingly electronic economy. Your analysis should explore the principle of letting the direct users of services pay when they are the ones that capture the benefits (i.e., user charges for service elements not inherently public in nature). Also, explore budget reforms to give greater emphasis to multiyear, cross-boundary service integration and innovation (via capital funds, revolving funds, shared-risk investments with the private sector, etc.).

*An example: Ralph Shoemaker and the California Franchise Tax Board.* In 1993, largely under the leadership of Deputy Tax Commissioner Ralph Shoemaker, the state of California pursued a shared-risk investment with the private sector for collecting business taxes. Instead of contracting only for the delivery of specified computer systems, California contracted to pay its partner out of the revenues to be collected if the applications were successful. Both the private sector partner and the government therefore had a strong incentive to improve the collection process so that the department could collect taxes that had previously been left uncollected. Working together they succeeded. The newly collected revenues served as the source of funding for this high-value investment.

#### 5. Protect privacy and security

*Problem.* As technology expands online communications, volatile issues of privacy and security require careful respect for individual rights and responsibilities in the context of maintaining community standards and safety.

*What to avoid.* Don't misunderstand privacy and security issues, either by ignoring them or by allowing their volatility to paralyze efforts to develop new electronic systems and services.

*What to do.* At minimum, understand and implement the "fair information practices" and the "secure information practices" developed over the past twenty-five years. The greater challenges, however, involve heading off destructive controversies as much as possible through up-front planning and the involvement of stakeholders in case-by-case evaluations of the trade-offs inherent with electronic services.

*An example: The European Union's process in addressing privacy and security issues.* For more than a decade now, the European public sector has been more aggressive and comprehensive than the United States has been in addressing issues of privacy and security. While Europe emphasizes private sector abuses in contrast to U.S. emphasis on public sector abuses, their policy processes can serve as an important model in developing the consensus we need for effective action. The Europeans have worked hard to harmonize policies across regional boundaries, and they have also made it clear that privacy and security issues can often be cost-effectively resolved if addressed during systems design rather than only as a remedial action.<sup>9</sup>

## 6. Form IT-related partnerships to stimulate economic development

*Problem.* While the biggest IT benefits often require cooperation across the boundaries that separate one agency from another and the government from the private sector, sustaining cooperation among diverse entities is almost always difficult.

*What to avoid.* Those who ignore cross-boundary opportunities—especially now that the Internet has greatly reduced the obstacles to network interoperability—make a major mistake. Cross-boundary work is enormously more feasible than it used to be.

*What to do.* Mobilize public and private stakeholders for a specific initiative, such as strengthening a regional economy and/or a particular industry. In some cases, this work will merit development of entirely new institutions to design and deliver electronic public services.

*An example: Prime Minister Lee Kuan Yew and Singapore as the "Intelligent Island."* Beginning several decades ago under the strong leadership of then Prime Minister Lee Kuan Yew, the Singaporean government has worked with its private sector to invest in information infrastructure and other electronic commerce initiatives. For example, the TradeNet project implemented in 1987 has enabled shippers, receivers, bankers, insurers, port authorities, customs officials, revenue agencies, and others to use the electronic data interchange that now moves shipments in and out of Singapore twice as fast as before. Singapore has become the only tropical country in the world that is recognized as a developed nation. They are building a comprehensive information infrastructure to support their desire to become the

“Intelligent Island.” Even though Singapore is small and quite different from us in their political culture, they offer important lessons about how to use IT for economic development.<sup>10</sup>

## 7. Use IT to promote equal opportunity and healthy communities

*Problem.* Recent decades have produced increasing inequality in the distribution of income and political influence. A “digital divide” threatens to widen these inequalities and potentially destroy the social cohesiveness of geographically based communities.

*What to avoid.* Don’t try to duck these issues by assuming they’re too unwieldy to remedy. At the other extreme, don’t attempt massive fixes by trying to tax activities that can easily flee to low-tax jurisdictions.

*What to do.* Clarify what “universal service” could and should mean in a world of broadband digital networks. Judiciously develop the kinds of net-based education, job development, and community engagement that are becoming essential for economic and social success.

*An example: The Congress and “E-rate.”* E-rate is a federally mandated subsidy for low-cost Internet connections to schools and libraries. It demonstrates how technological initiatives can be implemented to promote social equity and community cohesion. E-rate is a reasonable first step, but much remains to be done. We don’t know yet how best to support cyberspace and physical communities in a world of global computer networks.<sup>11</sup>

## 8. Prepare for digital democracy

*Problem.* Digital networking is expanding across regional and national boundaries to produce serious problems for policy making and regulatory agencies. Whose values should govern when a person from Los Angeles takes what is claimed to be pornographic pictures of people in Toronto, especially when the pictures are stored on servers in Asia and sold to someone in Germany with money transferred to confidential bank accounts in the Caribbean? How should the governing values be determined and enforced?

*What to avoid.* Don’t take an isolationist posture in response to growing problems of global interactions. And don’t think of Information Age governance simply in terms of electronic voting.

*What to do.* Experiment to make online participation in “the conversation” of politics easier and also more meaningful. Develop initiatives to help legitimize digital communities and give stakeholders a role in setting standards and regulations. For example, note that the development of electronic medical records will involve stakeholders far beyond the reach of any single state or even the entire US medical community. In cyberspace deciding who has the authority to look at a medical record or prescribe a medication is fundamentally a problem of global governance.

*An example: Many experiments in digital democracy.* Many efforts have recently been initiated to explore the political, or “input,” side of government in contrast to the service delivery, or “output,” side. The US Department of Agriculture’s Agriculture Marketing Services, for example, is developing an online rulemaking process, expanding by orders of magnitude the feedback available on proposed regulations. The State of Virginia recently launched its Virginia Regulatory Town Hall website designed to help citizens take a more active role throughout the many steps involved in designing new regulations. The City of Santa Monica, CA, is expanding its web-based and email communication with citizens, building on the very early and innovative success of its Public Electronic Network (PEN) project. A collection of vendors, government agencies, and other interested parties have created QUEST, a program of standards and protocols to deliver government benefit programs through the automated teller machines of bank networks and point-of-sale devices at supermarkets and other retail outlets. And as a final example—for now—the Internet Council for Assigned Names and Numbers (ICANN) has been organized as a nonprofit institution established under US law to govern the worldwide assignment of Internet addresses.<sup>12</sup>

Public leaders can—and must—come to grips with the challenges and opportunities of the Information Age. The eight imperatives summarized here (see Figure 2) can serve as a framework for those seeking to be leaders in the year 2000 and beyond. These guidelines can also be useful for the press and the public.

**For the transition to electronic services:**

1. Focus on how IT can reshape work and public-sector strategies
2. Use IT for strategic innovation, not simply tactical automation
3. Utilize best practices in implementing IT initiatives
4. Improve budgeting and financing for promising IT initiatives

**For emerging challenges to governance:**

5. Protect privacy and security
6. Form IT-related partnerships to stimulate economic development
7. Use IT to promote equal opportunity and healthy communities
8. Prepare for digital democracy

**In sum: Get involved!** Your leadership is required for the world of 2000 and beyond.

*Figure 2: Eight Imperatives for Leaders in a Networked World: A Summary*



The first four imperatives focus primarily on the design and deployment of electronic services and regulations. These are topics where substantial recent experience can be brought to bear. They raise important and urgent concerns of the “next step” variety. *Leaders not mastering these imperatives are in danger of falling visibly behind the curve.*

The final four imperatives focus on the changing nature of commerce, communities, and democracy. These imperatives raise fundamental challenges to our processes of governance, with scarce recent experience to draw on for guidance. *Over the next decade and more, these governance issues will demand the very best we have to offer in terms of good judgment and leadership.*

**Legislators.** Find ways to support public sector innovation and to partner with the private sector for economic development.

**Governors.** Develop a trusted chief operating officer (COO) for internal reform while also pursuing external initiatives for infrastructure and economic development.

**Mayors.** Organize regional efforts for continuing education, information infrastructure, and economic competitiveness.

**Budget directors.** Ensure that your budget planning identifies and protects IT-based investments for long-term, cross-program infrastructure and work redesign.

**Agency and program heads.** Provide electronic access to existing services on a “one-stop, non-stop” basis; then stay close to your customers by using technology to design efficient and flexibly integrated services.

**Chief Information Officers.** Remember that your job is not technology per se, but technology in support of organizational strategy and change management; good infrastructure and good relationships with management will be critical.

**Technology vendors.** Help educate the public and the market, especially on the need for faster innovation, better infrastructure, improved social equity, and public-private partnerships with shared risks and returns.

**Associations and interest groups.** Mobilize grassroots support on a global basis while also developing scorecards to disseminate “best practice” within your community of interest.

**The press.** Educate the public through coverage of major yet often overlooked issues of service redesign and governance.

**The public.** Your welfare—and that of your children and your children’s children—will largely be determined by the quality of jobs and lifestyles in the Information Age. To succeed, you will need governments that will innovate and work with the private sector to develop a caring but competitive Information Age economy.

*Figure 3: Advice for Stakeholders*

# Next Steps

“It is time for a **new generation** of leaders  
to cope with new problems and **new opportunities**.  
For there is a new world to be won.” *John F. Kennedy*

## NEXT STEPS

Leadership in the Information Age requires ongoing involvement, not just an initial effort to understand the issues. Next steps include:

- Continuing to educate yourself. One of the most valuable ways to keep in touch with digital technology is to acquire familiarity with computers, both in the workplace and as part of your daily routines. Anyone personally using the Internet for up-to-the-minute news and information, reference material, electronic shopping, and instant communications will appreciate in short order how powerful it can be. Much can be learned by keeping up with the technology coverage that now appears regularly in general-interest publications such as *Business Week* and the *New York Times*. There is also a wealth of material on the political and organizational impacts of technology in books, trade periodicals, and academic journals. For non-specialist leaders, perhaps the most important activity is to develop a circle of advisors with a good combination of technical, programmatic, and political experience and expertise.
- Assessing your present environment. You can learn a great deal by taking stock of how technology is being used and managed in your own organization. Who are the people and political/organizational processes with the most influence on computer issues? How much attention do these people give to the strategic options opened up by information technologies? How does your organization stack up against best practice in related settings? What can you learn from external clients, stakeholders, and overseers?
- Picking a good target for action. As we have stressed, gaining knowledge about technology isn't an end unto itself—what's vital is translating knowledge into effective strategies and policy initiatives. You will need early on to involve stakeholders and key allies in developing an e-government agenda that is bold enough to generate excitement yet feasible enough to deliver results. For some leaders, this may require focusing on a single system or centerpiece initiative. For others, it may be best to develop a more comprehensive agenda. Although the specifics will vary, the ultimate aim is to turn talk into action.

As we proceed into the new millennium, we need public leaders who will get more directly and effectively engaged with technology issues. Different stakeholders may emphasize different things. (See Figure 3.) In general, however, as John F. Kennedy emphasized during his 1960 presidential campaign, there is a new world to be won.

The purpose of this report has been to introduce some essentials for winning this new world. In subsequent reports, we will provide more detail. But there is no need to wait. The election of 2000 has arrived.

Appendix A

MEMBERSHIP OF THE HARVARD POLICY GROUP  
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Ms. Nada Harris*	<i>(former) Deputy Assistant Secretary, Information Resource Management, US Department of Veterans Affairs</i>
Mr. Jono Hildner	<i>Acting Administrator, Health Division, Oregon Department of Human Services</i>
Ms. Kathleen Hirning	<i>Deputy Director for Information Technology, National Partnership for Reinventing Government</i>
Hon. Scott Howell	<i>State Senator, State of Utah</i>
Mr. Steve W. Jennings	<i>Executive Information Officer, Technology Center, Harris County, Texas</i>
Hon. Randy Johnson	<i>Chairman, Board of Commissioners, Hennepin County, Minnesota</i>
Mr. Paul D. Joseph	<i>Chairman, State and Local Enterprise Solutions Committee, Information Technology Association of America</i>
Mr. William Keller	<i>Deputy Commissioner, Department of Information Technology and Telecommunications, City of New York</i>
Mr. John Kelly	<i>CIO and Director, Government Information Technology Agency, State of Arizona</i>
Mr. William Kilmartin	<i>Vice President, Government and Education Management Systems, American Management Systems</i>
Mr. Steve Kolodney	<i>Director, Department of Information Services, State of Washington</i>
Hon. Timothy Loewenstein	<i>Chairman, Board of Supervisors, Buffalo County, Nebraska</i>
Mr. Bruce W. McConnell	<i>Director, International Y2K Cooperation Center; (former) Chief Information Policy and Technology Branch, US Office of Management and Budget</i>
Mr. Randall Murphy	<i>Administrator, Management Services Department of Lake County, Illinois</i>
Ms. Jane Smith Patterson	<i>Director, Office of Technology, State of North Carolina</i>
Mr. Will Pelgrin, Esq.	<i>Counsel, Office of Technology, State of New York</i>
Mr. Alvin M. Pesachowitz	<i>Chief Information Officer, US Environmental Protection Agency</i>
Mr. Howard A. Peters III	<i>(former) Secretary, Department of Human Services, State of Illinois</i>
Mr. André N. Pettigrew	<i>(former) Member of Executive Cabinet, State of Colorado</i>
Ms. Carolyn T. Purcell	<i>Executive Director, Department of Information Resources, State of Texas</i>
Ms. Wendy Rayner	<i>Chief Information Officer, State of New Jersey</i>
Mr. Rock Regan	<i>Chief Information Officer, State of Connecticut</i>
Mr. Robert Reisner	<i>Vice President, Strategic Planning, US Postal Service</i>
Hon. Marlin Schneider	<i>State Representative, State of Wisconsin</i>

Mr. Larry J. Singer                    *President, Public Interest Breakthroughs, Inc.*

Mr. Phil Smith\*                        *(former) Director, State Federal Relations, State of Iowa*

Ms. Anne F. Thomson Reed        *Chief Information Officer, US Department of Agriculture*

Hon. Barbara Todd                    *Commissioner, Pinellas County, Florida*

Mr. Richard J. Varn                    *Chief Information Officer, State of Iowa*

Hon. J.D. Williams                    *Controller, State of Idaho*

Mr. Terry Wood                        *(former) Councilman, City of Jacksonville, Florida*

Mr. Robert J. Woods\*                *(former) Commissioner of Federal Telecommunication Services, US General Services Administration*

Mr. Gregory Woods                    *Chief Operating Officer, Student Financial Assistance, US Department of Education*

*\*Former HPG Member*

## Appendix B

### READING AND RESOURCES

Public sector leaders need to engage issues of information technology directly and effectively. A short list of helpful readings and resources should include:

Heifetz, Ronald A. *Leadership Without Easy Answers*. Cambridge: Belknap Harvard, 1994.

Industry Canada. *Preparing Canada for a Digital World, Final Report of the Information Highway Advisory Council*. Ottawa: Industry Canada, 1997. available from <http://strategis.ic.gc.ca/SSG/ih01650e.html>

Kamarck, Elaine Ciulla and Joseph S. Nye, Jr., eds. *democracy.com? Governance in a Networked World*. Hollis, NH: Hollis Publishing, 1999.

Margherio, Lynn, et al. *The Emerging Digital Economy*. Washington, D.C.: U.S. Department of Commerce, 1998. See also: Henry, David, et al. *The Emerging Digital Economy II*. Washington, D.C.: U.S. Department of Commerce, 1999.

National Performance Review. Access America. Washington, D.C.: The Review, 1997. Also see the NPR website: <http://www.npr.gov/>

Negroponte, Nicholas. *being digital*. New York : Knopf, 1995.

Organisation for Economic Co-Operation and Development. *The Economic and Social Impact of Electronic Commerce: Preliminary Findings and Research Agenda*. Paris: OECD, 1999.

U.S. Government Working Group on Electronic Commerce. *Towards Digital eQuality: Second Annual Report*. 1999.

Shapiro, Carl, and Hal R. Varian. *Information Rules: A Strategic Guide to the Network Economy*. Boston: Harvard Business School Press, 1999.

Tapscott, Don. *The Digital Economy: Promise and Peril in the Age of Networked Intelligence*. New York, New York: McGraw Hill, 1996.

## GLOSSARY

**Broadband**—A general term for high-volume, multiple-channel telecommunications capacity available via a single medium (e.g. a wire or cable). While narrowband (the equivalent of one telephone voice channel) is adequate for the transmission of text and numerical data, broadband connections allow the efficient and reliable delivery of voice, data, and video over one integrated network. Because multimedia content is seen as vital to businesses and consumers alike, electronic networks are increasingly moving to broadband, which in turn will have important long-term implications for commercial development and civic life.

**Database**—A set of data structured to support the storage, retrieval, and analysis of information, often custom-designed for specific business applications. Databases are central to information processing since they allow new and more efficient ways of assembling records and organizing work. A key step in developing databases is implementing consistent definitions or standards so that data can be meaningfully shared among users. Examples include standard charts of accounts for financial data, standard methods of coding geographical information, and standard templates for archiving audio and video material. (See also: Standards.)

**Digital**—Data that has been created, transmitted or stored as a string of signals coded as “1”s (on) or “0”s (off). Data in digital form (text, numbers, graphics, voice, video, etc.) can be stored and processed by computers and communicated at high speed over electronic networks with complete accuracy and reliability. Exact copies of digital data can be made in which the nth copy is indistinguishable from the original.

**Electronic commerce (or e-commerce)**—Transactions where money is exchanged for valuable goods and services with either the money and/or the goods and services transported over computer networks.

**Encryption**—The act of scrambling information into a form called a cipher, usually to keep it from being read or modified by unauthorized parties. This is achieved through the use of algorithmic “keys” that scramble the information at one end and unscramble it at the other. Computer-based encryption can be used both for purposes that society wants to prevent (criminal and terrorist communications) as well as those it wants to support (private and secure social and commercial communications).

**Hardware**—Broadly, the physical components of information technology: computers, peripheral devices such as printers, disks, and scanners, and the cables and switches that link digital networks. The key components of computer hardware are microprocessor chips, which have doubled in productivity every 18 months, as measured by instructions executed per dollar (a phenomenon referred to as Moore’s law). (See also: Software.)

**HTML**—Hypertext markup language. See: World Wide Web.

**Information infrastructure**—The interdependent capacities and standards for digital communication and data processing (both hardware and software) that support the flow of information, much as a highway infrastructure supports the flow of vehicles. (Hence, the vernacular catchphrase, “Information Superhighway,” as a general reference to the interconnected system of computer networks exemplified by the Internet.) The ongoing expansion of this information infrastructure raises vital issues about when and how to establish and refine the technical standards on which it operates, including important related questions about funding, security, privacy, and collective democratic values.

**Information technology (IT)**—The umbrella term that encompasses the entire field of computer-based information processing: computer equipment, applications, and services, telecommunication links and networks, digital databases, and the integrated technical specifications that enable these systems to function interactively. (See also: Information infrastructure.) The rapid development and expansion of these technologies over the last twenty years has ushered in the current historical period widely referred to as the “Information Age” or “Information Revolution,” comparable in economic and social magnitude to the Industrial Revolution of the early 19th century. The profound transformations brought about by computer networking have made information processing (rather than industrial manufacturing) the key factor in economic productivity and global commerce, thereby supplanting large segments of the traditional blue-collar labor market with a white-collar force of information or knowledge workers.

**Internet**—The vast network-of-networks that uses open rather than proprietary standards to support computer-based communications at an incredibly large and efficient worldwide scale. Originally developed by the U.S. Defense Department for use in research in the 1960s, the Internet has become the foundation of our information infrastructure, an ever-expanding universe of network services and applications organized in geographically dispersed rather than centralized form.

**Leadership**—Any act by an individual member on the behalf of a group, with the intent to get the group to better meet its goals. Leadership for previously known problems relies heavily on authority and technical expertise, while leadership for new or adaptive problems relies on getting the group to confront the inadequacies of its old values and routines and thereby develop more effective solutions. In general, the challenges of the information age (which involve a high degree of confusion and conflict resolution) call for adaptive leadership.<sup>13</sup>

**Marginal cost**—The cost of the next in a series of products. Typically, first products cost more because of the expenditures required to set up the production process, with the unit cost then falling over time as the volume of activity increases. For most manufactured goods, however, diminishing returns-to-scale eventually cause marginal costs to rise. With information-technology products, by contrast, the dynamics are dramatically different: extremely high set-up costs (hundreds of millions of dollars for some software products) followed by almost zero costs for extra copies and no diminishing returns-to-scale for extremely high production volumes. Pricing policies for information goods are thus markedly different than for traditional industrial goods, and pricing policies in the economy at large are likely to change as the Information Age progresses.

**Network**—A set of communication paths (or channels) and the points (or nodes) they connect, including switches to determine which channel will be used when more than one is available. Computer networks, like telephone networks, can be thought of as telecommunications highways over which information travels. Networks benefit greatly from economies of scope and scale. Digital networks typically use packet-switching rather than circuit-switching to greatly increase efficiency and throughput. (See also: Switching)

**Productivity**—The ratio of goods produced in relation to the resources expended in production. Increasing living standards largely depend upon increasing productivity. Production processes that use information efficiently will typically be much more productive overall than older industrial production methods. This is the principal driving force behind the commercial, social, and political changes catalyzed by information technologies.

**Public goods**—Goods with impacts that “spill over” beyond those directly involved in buying and selling, thus weakening market forces as the mechanism for efficient resource allocation. Computer-based services have the potential of providing many positive spill-overs to the public sector, since the marginal cost of IT production over time is virtually zero. One of the paramount political questions of the Information Age is where to draw the boundary between public and private benefits and, therefore, who should pay.

**Server**—A computer program that provides services to other programs or computers. Also used to describe the computer on which such a program operates. In the “client-server” network model, client programs make requests from servers connected to the same network. On the World Wide Web (see below) a browser acts as a client program, making requests for files or other information from web servers. These servers can be located any place in the world that is connected to the Internet.

**Software**—A catch-all term for the sets of instructions (programs) used to operate computer hardware. Software production and maintenance today has become a primary determinant in the success or failure of business and government organizations.

**Standards**—In the context of electronics, standardized technical specifications allow functions to be coordinated by automatically adhering to the set standard. Thus, standards for the voltages used for signaling allow devices to “talk to one another” in a consistent format, and standards for financial accounting allow for the meaningful aggregation and analysis of financial databases. With information technologies there is an inherent tension between the creation of new capabilities through innovation (a few people trying new ways to do things) and the subsequent applications of those capabilities through standardization (many people following established ways of doing things). Determining when and how to set standards is therefore a critical leadership issue, as is deciding whether such standards should be “open” for use by the general public or whether they should be protected by copyright or patent statutes.

**Switching**—The engineering mechanism that designates alternate channels or paths in a telecommunications network. Historically, telephone networks have used circuit-switching, where an entire channel between two connections is made available for the duration of the communication. Most computer networks, by contrast, have been designed to use packet-switching, which breaks up the transmitted data into individual units or “packets,” each of which contains the destination address of the data. The packets are then independently routed through the network and reassembled by the computer at the destination address. Packet-switching allows data from multiple users to efficiently use the same path on the network. Major developments are now underway to enable packet-switched networks to carry digital voice and video more effectively.

**World Wide Web (www or Web)**—Standardized tools and software that allow non-technical users to find, display, and communicate text, graphics, voice, and video located on the Internet. The Web’s fundamental components include HTML (hypertext markup language), pointers or hyperlinks (that rapidly access specific material that may reside on computers halfway around the world), and browsers (software that allows users to display and interact with Web content). Web technology is credited with democratizing the Internet by simplifying and streamlining key networking tools and functions for the general public.



<sup>1</sup> Capital investment data from *The Emerging Digital Economy II*, U.S. Department of Commerce, June, 1999, p.22 and the Executive Summary. For one perspective on the wealth of Bill Gates, see: [web.quuxuum.org/~evan/bgnw.html](http://web.quuxuum.org/~evan/bgnw.html). The banking transaction cost estimates are taken from a research note by the Gartner Group, "The Benefits of Alternate Channels in the Branch," May, 1999. The note estimates that a transaction handled by counter tellers is between \$1.00 and \$2.00 per transaction, while a similar transaction conducted over the Internet costs between \$.02 and \$.05. For an International Data Corp. estimate of worldwide e-commerce growth, see "Setting the E-Commerce Agenda," *Government Technology*, November 1999, 42.

<sup>2</sup> In 1958, when the American National Election Study first asked about public trust, 73% of Americans said they trusted government in Washington to do the right thing just about always or most of the time. By 1980 and again in 1994, the "trust percentage" had dropped to 25%. Harris Poll data in the mid-1990s suggested that the public's confidence in people running Congress and the federal Executive branch had dropped to only one in ten expressing a great deal of confidence. See Joseph S. Nye, Jr, Philip Zelikow, and David King, eds. *Why People Don't Trust Government* (Cambridge: Harvard University Press, 1997), especially Chapters 3 and 8.

<sup>3</sup> See Peter F. Drucker, *Management Challenges for the 21st Century*. (New York: HarperBusiness, 1999). For a view focusing on economics and management, see: Don Tapscott, *The Digital Economy: Promise and Peril in the Age of Networked Intelligence* (New York: McGraw Hill, 1996). For a view focusing on politics and government, see: Elaine Ciulla Kamarck, and Joseph S. Nye, Jr., *democracy.com? Governance in a Networked World* (Hollis, NH: Hollis Publishing Company, 1999).

<sup>4</sup> According to BizRate.com, e-commerce retail business over the recent Christmas season totaled \$3.17 billion on 33.9 million orders. Their comparable retail business number for 1998 was \$730 million.

<sup>5</sup> For the work of Vice President Gore and the National Partnership for Reinventing Government, see: [www.npr.gov](http://www.npr.gov); for information on Governor Leavitt see: [www.governing.com/poy/ptleav.htm](http://www.governing.com/poy/ptleav.htm), for State Senator Howell, see: [www.govtech.net/publications/eCommerce/dec98/toc/toc.shtm](http://www.govtech.net/publications/eCommerce/dec98/toc/toc.shtm), and for information on Utah as a "smart state" see: [www.state.ut.us](http://www.state.ut.us); for a brief bio on Supervisor Hanley see: [www.co.fairfax.va.us/gov/bos/chair/bio.htm](http://www.co.fairfax.va.us/gov/bos/chair/bio.htm), for information on Mayor Gonzales and San Jose, CA see: [www.sjmayor.org](http://www.sjmayor.org); for Councilman O'Neill see: "Past President, Future Leader," *Government Technology*, December 1999, 118; and for U. S. Rep. Tom Davis see: [www.house.gov/tomdavis](http://www.house.gov/tomdavis).

<sup>6</sup> For information on Governor Gary Locke of Washington see: "Locke proposes measures to speed telecommunications in rural areas," ([www.governor.wa.gov/press/00011301.htm](http://www.governor.wa.gov/press/00011301.htm)), and other press releases at [www.governor.wa.gov/press/press.htm](http://www.governor.wa.gov/press/press.htm). For information on Chief Information Officer Steven Kolodney and Washington's Digital State awards see: [access.wa.gov/news/news0912.asp](http://access.wa.gov/news/news0912.asp).

<sup>7</sup> *Government Executive* magazine, through its website (GovExec) has chronicled three years of coverage of the Y2K issue and the leadership John Koskinen provided it as "Y2K czar." See especially the articles from 2-5-98, 3-19-98, and 5-1-98 when Koskinen was sounding the battle cry for a comprehensive, cross-boundary approach to the problem ([www.govexec.com/tech/year2000](http://www.govexec.com/tech/year2000)). Also, for an early and comprehensive articulation of a vision for IT in government that underscores change, involvement of general manager leadership in IT initiatives, and information and IT as strategic resources, see the Vision statement for the Government Information Technology Services (GITS) Working Group ([gits.gov/docs/vision.html](http://gits.gov/docs/vision.html)).

<sup>8</sup> For more information on the California Franchise Tax Board see: [www.ftb.ca.gov](http://www.ftb.ca.gov). Also see: Jerry Mechling and Victoria Sweeney, "Finding and Funding IT Projects, Part 3: Performance Contracting," *Government Technology*, March 1998, ([www.govtech.net/publications/gt/1998/mar/financing/financing.shtm](http://www.govtech.net/publications/gt/1998/mar/financing/financing.shtm)) and: Ralph Shoemaker, "Problem solving partnerships and joint-ventures to share risks and benefits in developing large system technology projects," ([www.arnet.gov/References/Best\\_Pract\\_Docs/textsource/caftb.txt](http://www.arnet.gov/References/Best_Pract_Docs/textsource/caftb.txt)).

<sup>9</sup> For information on EEU privacy and security policies and their potential impacts see: Deborah Hurley, "Security and Privacy Laws: The Showstoppers of the Global Information Society," in *Masters of the Wired World*. ed. Anne Leer. (London ; Alexandria, VA : Financial Times/Pitman, 1999), and: Commission of the European Communities, "Proposal for a Regulation of the European Parliament and of the Council on protection of individuals with regard to the processing of personal data by the institutions and bodies of the Community, and on the free movement of such data," 1999. ([europa.eu.int/eur-lex/en/com/pdf/1999/en\\_599PC0337.pdf](http://europa.eu.int/eur-lex/en/com/pdf/1999/en_599PC0337.pdf))

<sup>10</sup> For information on Singapore and their IT-based economic development strategy see: Infocomm Development Authority of Singapore (IDA) website: [www.ida.gov.sg/Website/IDAHome.nsf/Home?OpenForm](http://www.ida.gov.sg/Website/IDAHome.nsf/Home?OpenForm). The Harvard Business School Case Program also has several case studies on Singapore, e.g.: Lynda M. Applegate, Boon-Siong Neo, and John King, "Singapore TradeNet: Beyond TradeNet to the Intelligent Island," 1995. ([www.hbsp.harvard.edu/hbsp/prod\\_detail.asp?196105](http://www.hbsp.harvard.edu/hbsp/prod_detail.asp?196105)) and Lynda M. Applegate, Boon-Siong Neo, John King, and Carin-Isabel Knoop, "Singapore Unlimited: Building the National Information Infrastructure," 1996. ([www.hbsp.harvard.edu/hbsp/prod\\_detail.asp?196012](http://www.hbsp.harvard.edu/hbsp/prod_detail.asp?196012)).

<sup>11</sup> For more information about E-rate see: [www.ed.gov/Technology/erateforms/slcmai1a.html](http://www.ed.gov/Technology/erateforms/slcmai1a.html).

<sup>12</sup> For an introduction into the USDA's online rulemaking initiatives, see: [www.ams.usda.gov/ip/activities.htm](http://www.ams.usda.gov/ip/activities.htm). Information on the State of Virginia's new regulatory town hall website can be found at: [www.state.va.us/governor/newsre/site1229.htm](http://www.state.va.us/governor/newsre/site1229.htm), and the website itself, at [www.townhall.state.va.us](http://www.townhall.state.va.us). For an historical view of the PEN program in Santa Monica, see the Kennedy School of Government case study written by Pamela Varley, "Blip on the Screen—or Wave of the Future? 'Electronic Democracy' in Santa Monica," 1991, Case number: C16-91-1031.0, ([www.ksgcase.harvard.edu/pdetail.asp?PID=1031.0](http://www.ksgcase.harvard.edu/pdetail.asp?PID=1031.0)). For more recent initiatives in Santa Monica, see their website: [pen.ci.santa-monica.ca.us/cm/index](http://pen.ci.santa-monica.ca.us/cm/index). For information on QUEST members and operating rules see: [www.nacha.org/ebt/ebtmems.htm](http://www.nacha.org/ebt/ebtmems.htm), and the related item: [www.nacha.org/ebt/ebt-charter.htm](http://www.nacha.org/ebt/ebt-charter.htm). For more information on ICANN, see [www.icann.org](http://www.icann.org).

<sup>13</sup> For a further explanation of adaptive leadership and its suitability to complex times, see Ronald A. Heifetz, *Leadership Without Easy Answers* (Cambridge: Belknap Harvard, 1994).



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