

Eight Imperatives

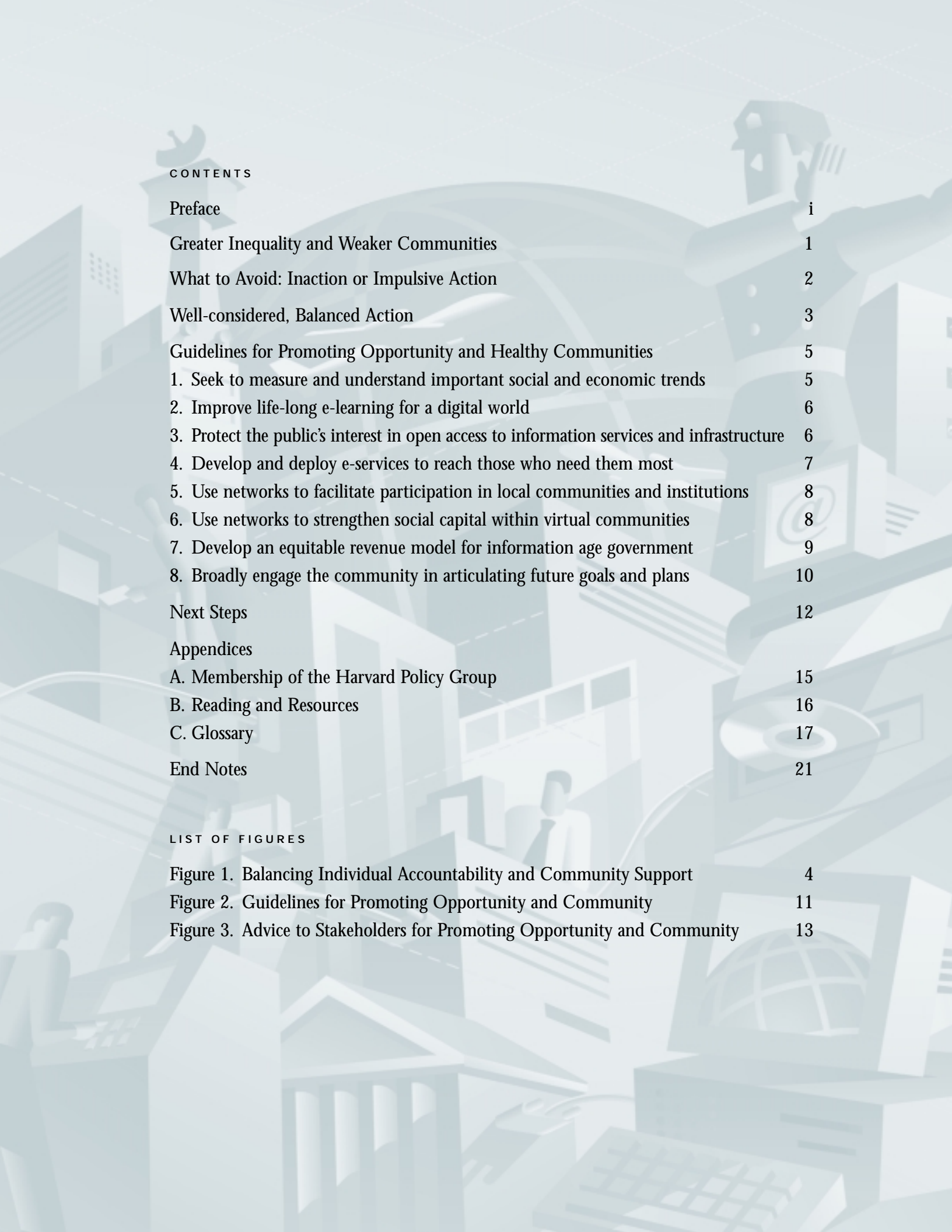
for Leaders in a Networked World



Imperative 8: Prepare for Digital Democracy



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



CONTENTS

Preface	i
The Digital Democracy Problem: Protecting the Public Interest in a Changing and Interdependent World	1
What to Avoid: Citizen Disengagement and “Thin” Democracy	2
“Balanced” Democracy: Combine Breadth <i>and</i> Depth	3
Guidelines for Balanced Democracy	5
1. Strengthen civic education and other efforts to nurture democratic values	5
2. Use IT to make government more accessible and transparent	5
3. Explore new IT-enabled processes for e-politics and e-voting	6
4. Provide intelligent and committed IT support for legislatures	7
5. Develop e-democracy programs for existing governmental institutions	8
6. Develop new approaches and tools focused on cross-jurisdictional problems	8
7. Support e-governance research and experimentation	9
Next Steps	11
Appendices	
A. Membership of the Harvard Policy Group	13
B. Reading and Resources	15
C. Glossary	16
End Notes	20

LIST OF FIGURES

Figure 1. Citizen Participation Patterns	4
Figure 2. Preparing for Digital Democracy	10
Figure 3. Advice for Digital Democracy Stakeholders	12

Overview

“The time is ripe for **public leaders** to engage information **technology** issues more deeply, directly, and successfully.”

PREFACE

As we proceed further into the new millennium, everyone from futurists to the general public has observed that information technologies are changing our patterns of social, commercial, and political interactions. These changes raise profound opportunities and threats for people everywhere. It is a revolutionary period, with many issues not yet fully understood, let alone resolved.

Until recently our public leaders—including elected and appointed officials and their overseers in all branches of government—have too often ignored technology issues or have delegated them to others. The conventional wisdom has been that technology is either not very important, or requires technical expertise rather than leadership, or is 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 about how to successfully engage technology-related issues.

In response to these developments, Harvard University’s John F. Kennedy School of Government assembled 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 managers and general managers, and public officials from federal, state, and local governments in the United States and Canada. Having worked over a three-year period, the HPG concludes that the time is ripe for public leaders to engage information technology issues more deeply, directly, and successfully. To improve the quality of engagement, the HPG has developed a set of eight leadership imperatives for this critical period. Each of the individual imperatives addresses a significant leadership responsibility and is the subject of a separate paper (for a list of the papers, see the back page). Taken together, the HPG papers provide a framework to guide those who seek to develop successful leadership strategies in a networked world.

The report you are reading explores imperative #8: *Prepare for Digital Democracy*. Here we explore challenges that the growth of computer networking brings to democratic governance and how governments can respond by increasing both the breadth and depth of citizen participation in democratic processes.

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

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

THE HARVARD POLICY GROUP ON NETWORK-ENABLED SERVICES AND GOVERNMENT
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As citizens, we care about how well government meets its responsibilities—about traditional concerns for effectiveness and efficiency. We are also concerned about how the government goes about deciding what its responsibilities should be. We typically care about ends even more than means, about politics more than administration. Who does government listen to? What values get priority? How should government officials be held accountable?

Of four often cited benefits of e-government, which is the most important? In an extensive Hart-Teeter poll¹, respondents said:

Government that is more accountable to its citizens	36%
Greater public access to information	23%
More efficient and cost-effective government	21%
More convenient government services	13%

Earlier papers in this series have focused on the output or implementation side of government. In contrast, this paper focuses on the input or policy side. As human interactions go electronic, how and to what extent should we redesign democratic institutions and processes?

“While voting is the central **democratic** act, it can also lead to **flawed** decision-making.”

THE DIGITAL DEMOCRACY PROBLEM: PROTECTING THE PUBLIC INTEREST IN A CHANGING AND INTERDEPENDENT WORLD.

Value created through human interactivity depends on good governance—on resolving conflicts in a civilized and socially productive manner. For example, trade improves when participants trust that contracts will be fairly enforced. When trade “spills over” to uninvolved parties (as with negative spillovers from pollution or positive spillovers from police protection), we need government to stand up for otherwise unrepresented interests.

We thus need at least minimal government to protect the public interest. To this end we give government an enormous degree of power and authority—including, through the

police and the military, the authority to use physical force. Throughout history government has been essential for well-ordered, civilized life. Unfortunately, government has too often also abused its power.

Democracy has been designed to secure the benefits of government while guarding against abuse. The core idea is to make the will of the governed the source of authority. This idea is made operational through voting. In some situations, more than a majority vote is required in order to promote deliberation or protect the rights of minorities. Voting ultimately decides who wields power, and subsequent voting holds those in power accountable. As Lincoln said: democracy is “of the people, by the people, and for the people.”

While voting is the central democratic act, it can also lead to flawed decision-making. Voters may not be paying enough attention to decide issues in a timely manner, or to hold their officials truly accountable. Even when paying attention, the voting public is unlikely, on many issues, to be as knowledgeable as society’s best. Over the years, democracies have thus sought to improve decision-making through representative democracy (where elected officials have time to develop more skill in government problem solving), through broad-based education, and also through free speech and a free press.

Several characteristics of the Information Age make democratic governance even more challenging than it has been in the past:

1. *Rapid rates of economic and social change.* These increase the number of conflicts that need to be resolved.
2. *Growing scientific knowledge and issue complexity.* These increase the need for expertise.
3. *Cross-jurisdictional interactions and interdependencies.* These make it difficult to establish which units of government should be given authority and held accountable.

The challenges of change, complexity, and interdependency are serious – and growing. How can they best be resolved?

“We need depth as well as **breadth.**”

WHAT TO AVOID: CITIZEN DISENGAGEMENT AND “THIN” DEMOCRACY

For democracy to succeed, the link between governance and the will of the people must not be weak or superficial.

However, as interactions grow in scale and complexity, citizens can find that governance becomes burdensome and frustrating. For many people, civic responsibilities fall low on

their personal list of priorities. We aren't as engaged in politics as we once were. While we may go bowling as many times as we did forty or fifty years ago, we don't bowl as often in organized leagues; as Robert Putnam has observed, we are "bowling alone." We have become disengaged from many activities that build trust and social capital.²

But if disengagement is an insidious danger, so is shallow engagement. Given modern communications, politics by plebiscite could replace the deliberative democracy that Madison and others sought in the Federalist Papers. Such a "thin" democracy would also be unlikely to lead to good governance.³ We need depth as well as breadth.

Balanced

“... a well-balanced way to **clarify**
and **empower** the ‘will of the people.’ ”

“BALANCED” DEMOCRACY: COMBINE BREADTH AND DEPTH

For democracy to work well, it must avoid capture by either special or shallow interests. Government blind to the common interest is clearly dangerous. But so is government blind to deliberation and expertise. What we need is a well-balanced way to clarify and empower the “will of the people.”

Such concerns were crucial for the Founding Fathers. They protected free speech and a free press in order to keep government from becoming tyrannical. But they also created representative rather than direct democracy in order to keep popular opinion from becoming tyrannical.

The Information Age raises anew the need to understand and balance such risks. New conflicts are emerging along with new possibilities for citizen engagement. Failing to adjust democracy will be risky, but so will many of the adjustments that might be made.

Figure 1 (see next page) plots patterns of citizen participation in two dimensions. One measures depth of participation or the degree to which decisions emerge from careful citizen deliberation and respect for expertise. The other measures breadth of participation, or the degree to which decisions emerge from broad citizen engagement in the life of the community. Note that all four categories defined in the figure can meet a technical definition of democracy, as sovereignty can be based on free elections.

The worst results—labeled “disengaged democracy”—occur when citizens are neither deeply nor broadly engaged in governance, and the government fails to attract competent and well-meaning leaders. Such a society generates little social capital. The danger of poor governance looms severe.

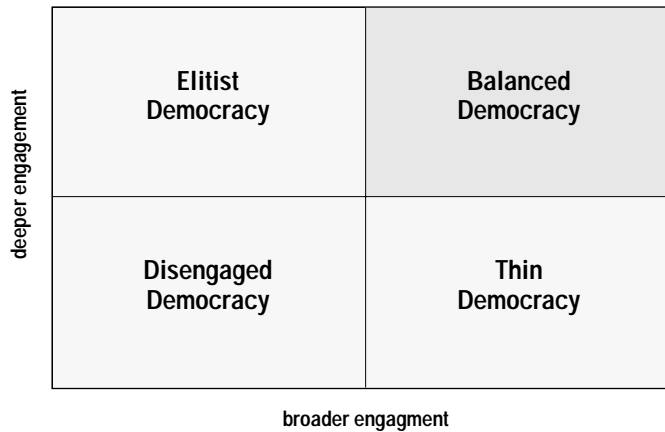


Figure 1: Citizen Participation Patterns

Somewhat better results can be produced even with narrow participation (as is often true in the U.S. today) if decisions are based on thoughtful input and competent officials. This could be called “elitist” democracy. The obvious risks are those of capture by special interests and a related low respect for government.

At the other extreme we have democracy with broad but shallow citizen engagement. While such “thin” democracy should be an improvement over disengagement, it faces severe risks from decisions based on momentary and easily manipulated concerns. Using IT for participation without deliberation would not be consistent with what the Founding Fathers had in mind.

The best hope lies in a “balanced” democracy, where citizen engagement is both broad and deep. The question, of course, is how to strike a proper balance, especially in the 21st century as commercial, social, and political interactions are increasingly specialized and conducted over computer networks.

Adapt

“...we have much yet to do to adapt **democracy** to a **digital** world.”

GUIDELINES FOR BALANCED DEMOCRACY

In preparing democracy for a digital world, consider the following seven guidelines.

1. Strengthen civic education and other efforts to nurture democratic values.

The problem. Democracy depends on people willing to both define and support the “public interest.” Unfortunately, in too many cases our culture seems to emphasize freedoms and personal interest to the exclusion of responsibilities and the public interest.

What to avoid. Do not continue to think of civic education as impossible, sophomoric, or otherwise off-limits.

What to do. Develop civic skills – including the ability to work well with others in resolving conflicts—on a long-term, bi-partisan basis. Encourage support for democracy at home as well as around the world.

An Example. Steven Clift and Minnesota E-Democracy. Minnesota E-Democracy is a non-partisan, citizen-based organization to improve democracy in Minnesota through information networks. Established in 1994, it created the world's first election-oriented web site. Minnesota E-Democracy's focus today is not so much elections as the use of the Internet for citizen participation in all aspects of governance. As part of this effort, the site features “Democracies Online,” including the free newswire service “DO-WIRE.” The site also hosts peer-to-peer public forums based on interests (e.g. Networking Neighborhoods) and geographic constituencies (e.g. Asia, London, California).

For more about Minnesota E-Democracy, visit <http://www.e-democracy.org/>

An Example. “e-Government: An Experiment in Interactive Legislation.” This website, sponsored by U.S. Senators Joseph Lieberman and Fred Thompson, describes nearly 50 e-government proposals and offers citizens an opportunity to read and comment. Visitors to the site can read comments from other visitors. The comments are expected to be useful in creating further e-government initiatives.

For more information about the e-government website, visit http://www.senate.gov/%7Egov_affairs/egov/

2. Improve life-long e-learning for a digital world.

The problem. When it is too difficult to access government information, services, or officials, citizens become frustrated and disengaged.

What to avoid. Do not equate transparency with “shovelware”—i.e., information that has simply been “shoveled” onto the web without editing, references, or connections. High tech veneer does not solve the underlying problems.

What to do. Use technology in a concerted and broadly based effort to make information, services, and officials easy to access. This will promote transparency that leads to longer-term pressure for accountability and responsiveness.

An Example. FirstGov. In September, 2000, as a first step toward web-enabled government, the General Services Administration (GSA) launched FirstGov as a government-wide web portal for the U.S. Federal government. Designed primarily as a search engine for government information, FirstGov provides access to over 31 million federal pages. Facing reluctant buy-in from some agency CIO’s, new developments are under way to expand FirstGov’s utility and reach. Links to state government sites will increase total pages to over 50 million. Plans are also underway to add interactivity and highlight transactional services.

For more about FirstGov, visit <http://www.firstgov.gov/>

An Example. Scorecard. The Environmental Defense Fund (EDF) developed the Scorecard Project to provide the public with internet-accessible data about the impacts of toxic chemicals. Scorecard supplements raw data available through other organizations (such as the Environmental Protection Agency’s Toxics Release Inventory reports). By helping interpret environmental data in terms the public can understand, Scorecard hopes to strengthen and expand the constituency for environmental protection.

For more information, visit <http://www.scorecard.org>

3. Explore new IT-enabled processes for e-politics and e-voting.

The problem. Politics has long been referred to as “the conversation,” yet many people are too busy to talk—or even to listen. This erodes the quality of decision-making as well as the overall legitimacy of the government. Governance is not effective if not seen as responsive to the people.

What to avoid. Do not consider the political system “off limits” when designing new IT-enabled processes. And do not run another election that could possibly be decided by dimpled chads.

What to do. Explore the many options and attributes of electronic voting with their potential for providing better information and increasing voter participation. However, proceed carefully with changes to the electoral process, since public trust in elections is of the utmost importance.

An Example. Youth e-vote. Youth e-Vote was created for the 2000 election by a coalition of educators, youth groups, and technology specialists as an experiment in national registration and online voting. In addition to the student portions of the site, a portion was devoted to teachers for curriculum materials and a chat space. Online voting was conducted voluntarily

through schools and the Youth-e-Vote.net web site. The program encouraged students to learn about candidates, issues, and how elections work. Students were given a registration number and voted for President, Senate, Governor, and other key issues. Results were reported publicly before the actual election.

For more information, visit <http://www.youthevote.net/main.html>

An Example. Arizona Democratic Presidential Primary. In March 2000, the State of Arizona conducted the first legally binding online election in the US. In what was a shock to many, half of the total ballots were cast via a website created by election.com.⁴ Voters who logged on to the Arizona Democratic Party web site were directed to an electronic letter where they verified the contents by clicking. They then filled out a number of screens using identifying information that included an individual seven digit pin number mailed to them prior to the election. After identifying themselves and voting, they received an on-screen certificate of confirmation. Despite some technical problems with servers timing out, voter turnout increased more than 600% compared to the 1996 primary. In many counties, increases in voting by minority populations increased by an even greater percentage.⁵

For more information see: <http://www.election.com/uk/political/arizona/>

4. Provide intelligent and committed IT support for legislatures.

The problem. Often overwhelmed by issue complexity, legislators—and entire legislative bodies—are falling prey to overload.

What to avoid. Do not merely hand out technology—e.g., laptops, email, websites, and other technology—to legislators and other officials without implementing an overall strategy for personal and institutional learning and for coping with overload.

What to do. Use IT to help legislators and staff to break through the barriers that geography and disorganized information place on their productivity. Provide them with technology to help them find what they need for better deliberations and understanding.

An Example. The National Association of Legislative Information Technology (NALIT). This group, like many associations, supports the identification and dissemination of best practices. By evaluating IT issues of particular relevance to legislative bodies, by giving out awards to leading practitioners, and by supporting conferences and seminars, NALIT has witnessed and supported a flowering of IT-based support for legislative bodies. Harnessing the indexing power of intelligent systems, legislators, staff, and even the general public can much more efficiently find research and information than was possible before. According to Joe May, Co-Chairman of the Science and Technology Committee of the Virginia House of Delegates: “Five years ago, it was 10 percent e-mail and 90 percent paper. Now, it’s 10 percent paper and 90 percent e-mail.”

For more information see: <http://www.ncsl.org/programs/lis/nalit/nalithmp.htm>

An Example. E-government in Estonia. Ten years ago, Estonia was just gaining independence from the Soviet Union. Today it is a model of paperless government. Cabinet ministers read, comment, and vote electronically. Although Estonia is a small Baltic nation (1.4 million) and was late in adopting technology, its growth to 214 web connections per 10,000 people now puts it ahead of Germany. The Justice Minister has proposed e-voting in the parliamentary elections set for 2003. If approved, Estonia could become the first European country to allow Internet voting in a national election.

For more, visit: <http://www.riik.ee/riso/report.htm>

5. Develop e-democracy programs for existing governmental institutions.

The problem. While some governments have begun mobilizing for digital democracy, many have not.

What to avoid. Do not think e-democracy will take care of itself or can be prepared for quickly. Allow for analysis, deliberation, and ongoing experimentation.

What to do. At minimum, observe what other governments have been doing—at local, state, and federal levels—and then analyze, adopt, and adapt the most promising initiatives.

An Example. E-government Act of 2001. Also known as the Lieberman/Burns bill, this legislation would create a Federal CIO within OMB to promote e-services and address issues such as privacy and security. It would also establish an interagency fund to break down barriers to interagency cooperation. While the bill is currently stalled (partly due to a reassessment of priorities after September 11, 2001), its components have support from many in government and industry.

For more, visit: http://www.senate.gov/~gov_affairs/050101_press-summary.htm

An Example. UK Online's CitizenSpace. A part of e-democracy efforts by the United Kingdom⁶, this website supports participation in two parts. One provides public information such as how to make a complaint. The other is a gateway to consultation and discussion (Say So). The Say So section provides an index of all Government consultations and monitored forums. Here users can discuss views with other users, find information about elections, and contribute to policy-making through official consultations.

For more information on CitizenSpace, visit: <http://www.ukonline.gov.uk/>

6. Develop new approaches and tools focused on cross-jurisdictional problems.

The problem. Cross-jurisdictional interactions—e.g., financial, health, and education services; pollution flows; even criminal and terrorist activities—are becoming simultaneously more frequent and more difficult to govern.

What to avoid. Do not allow governance in your jurisdiction to focus too exclusively on internal concerns and information. External claims and forces cannot be safely ignored.

What to do. Identify cross-jurisdictional opportunities as well as threats, bringing stakeholders together to analyze and negotiate issues. Seek to develop shared sources of trust and authority.

An Example. Your Voice in Europe. Launched by the European Commission, this multi-lingual, interactive, policy-making website is designed to involve citizens and businesses in the Commission's policy-making process. The site provides access to interactive tools and elements, including a debate on the future of Europe with initial contributions from Göran Persson, President of the European Council and Prime Minister of Sweden; Guy Verhofstadt, Prime Minister of Belgium; Romano Prodi, President of the European Commission; and Michel Barnier, Commissioner responsible for Regional Policy and Reform of the Institutions. The site is available in 11 languages and has received postings from all over the EU.

For more information visit: <http://europa.eu.int/yourvoice/>

An Example. ICANN. The Internet Council for Assigned Names and Numbers (ICANN) is a nonprofit institution organized to govern the worldwide assignment of Internet addresses. This body has so far weathered a number of challenges to its authority as it pursues its innovative approach to providing timely and effective governance. Recently, the ICANN Board chartered an At-Large Membership Study Committee (ALSC) to “forge a consensus on the best method for representing the world's Internet users as individuals.”

For information on ICANN, visit <http://www.icann.org/>

7. Support e-governance research and experimentation.

The problem. A networked world is developing new patterns of social, commercial, and political interactions that will challenge traditional democratic processes and institutions in fundamental ways over the long term.

What to avoid. Do not think too small. Democracy is about far more than electronic voting and plebiscites.

What to do. Support wide-ranging research and experimentation on governance issues. We need to find better ways to engage citizens, develop common ground, and resolve conflicts, much as some of the best private sector organizations have done through their customer service research and experimentation.

An Example. The Pew Internet and American Life Project. The mission of this initiative, funded by the Pew Charitable Trusts, is to “create and fund original, academic-quality research that explores the impact of the Internet on children, families, communities, the work place, schools, health care and civic/political life.” Recent studies include “The Internet, Cities, and Civil Society”. This research covers previously unexplored areas as well as familiar subjects at a new depth. It should provide a wealth of information for decision makers in all sectors.

For more information see: <http://www.pewinternet.org/index.asp>

An Example. The Democracy Online Project. Administered by the Graduate School of Political Management of George Washington University, the Democracy Online Project seeks to “promote online politics in a manner which upholds democratic values.” In January 2001, the project held a series of debates on computerized voting, the results of which are published on the site along with an online campaigning primer.

For more information see: <http://www.democracyonline.org>

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In a heavily networked world, we need new and better ways to involve the public in governance. We need citizens to participate more broadly and deeply, with increased civic engagement leading to more effective deliberation. Faced with growing cross-jurisdictional challenges, we have much yet to do to adapt democracy to a digital world.

1. Strengthen civic education and other efforts to nurture democratic values.
2. Use IT to make government more accessible and transparent.
3. Explore new IT-enabled processes for e-politics and e-voting.
4. Provide intelligent and committed IT support for legislatures.
5. Develop e-democracy programs for existing governmental institutions.
6. Develop new approaches and tools focused on cross-jurisdictional problems.
7. Support e-governance research and experimentation.

In sum: Push for “balanced” democracy: Combine breadth *and* depth.

Figure 2: Guidelines for Digital Democracy

Next Steps

“...report to the public on **progress** toward e-government and **digital** democracy.”

NEXT STEPS

Here are some ways to start applying the above guidelines:

1. ***Assess how well democracy is working in your jurisdiction.*** What are the shared goals that bring people together? What are the primary conflicts to be resolved? What groups do or do not participate in community life? How deep is commitment to shared values and the community? How satisfied are citizens with government?
2. ***Based on your assessment, develop plans to strengthen social capital and utilize electronic channels of communication.*** These plans need not require large up-front financial investments, but they will require leadership. Identifying existing sources of social capital and comparing your community with others can be extremely valuable. Work will be involved in learning to use computers to facilitate “the conversation” of politics.
3. ***Continue to strengthen democratic institutions.*** Civic education needs to be bolstered and recast. Alliances with non-government organizations and participation in cross-jurisdictional communities of interest will also be critical. Develop ways to report to the public on progress toward e-government and digital democracy.

Brief advice for a variety of stakeholders can be found in Figure 3 (next page).

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As more of life is conducted over computer networks, issues of governance are becoming increasingly challenging. We need to develop respected and authoritative means for resolving conflicts and protecting the public interest.

This report offers guidelines for those seeking to prepare democracy for the future. We hope that public leaders—and their overseers in the public at large—will find these guidelines useful.

This is the final report in our series of Eight Imperatives for Leaders in a Networked World. These ideas will be updated and next appear as executive education and toolkit offerings to help leaders turn ideas into action. The challenges of leadership in a networked world will continue to be enormous.

We need your best. And we wish you the best as you step forward to engage information technology issues more deeply, directly, and successfully.

The President. In a digital world, diplomacy and governance will increasingly require people-to-people action on a global basis, not just negotiation among governments. Prepare for it.

Legislators. Your role as interpreter of the will of the people may need to be rethought and recast as technology supports richer communications and a more direct democracy.

Governors. Much as the President provides a focal point nationally, governors play a similar role at the state level. Governors need to mobilize stakeholders to explore issues of social capital and community.

Local government leaders. You will have the greatest need and capacity to encourage IT-augmented community participation. Talk about it, think about it, and then act.

Judges. You will be called to help resolve many new issues where jurisdictional authority is contested. Thoughtful leadership will be required.

Budget directors. Broader and deeper public participation in financial allocations may well require setting up pricing systems to decentralize more decisions to users. Analyze your options, then get into gear.

Agency and program heads. Expand traditional customer analysis to provide citizens with an ongoing and extended governance role in service design and delivery. Use citizen boards creatively.

CIOs. If you've been successful so far, you've undoubtedly communicated well with internal line managers; but for e-government, you must also communicate well with external stakeholders.

Business community. Many businesses have learned to handle politics and governance in a multi-jurisdictional world. Help share and translate your lessons for other stakeholders.

Associations and interest groups. You are gatekeepers of "good practice" within your own communities. Identify good practice for governance as well as for operations.

The media. As always, you will need to assess how well government is working and whether the jurisdictions you reach are keeping up with reasonable expectations.

The public. A world of intelligent networks permits people to participate in politics using smaller blocks of time. Take advantage to become a more effective citizen.

Figure 3: Advice for Digital Democracy Stakeholders

Appendix A

MEMBERSHIP OF THE HARVARD POLICY GROUP ON NETWORK-ENABLED SERVICES AND GOVERNMENT

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Appendix A

MEMBERSHIP OF THE HARVARD POLICY GROUP ON NETWORK-ENABLED SERVICES AND GOVERNMENT

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Appendix B

READINGS AND RESOURCES

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GLOSSARY

Application Service Provider (ASP)—A third-party organization that provides software-based services to clients from a single location over a wide-area network. Represents an outsourcing option for governments who cannot or do not want to deliver and support enterprise applications. Also referred to as Managed Service Providers (MSP) when the software is both delivered and managed by the third-party organization.

Asynchronous Communication—A communication pattern in which the two (or more) parties involved are not communicating at the same time. Telephone conversations are an example of synchronous communication—both parties must be on the telephone at the same time. An email message is an example of asynchronous communication—one party can send a message and the other can read it hours or days later.

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.

E-government—A term commonly used to describe the interaction between government and citizens over the Internet. E-government has evolved rapidly from merely publishing or disseminating government information electronically, to online interactions and transactions between government and citizens. As governments begin to reorganize and integrate their work processes to take advantage of computer networks, e-government may come to define a new or transformed relationship between citizens and government enabled by networks.

Electronic Benefits Transfer (EBT)—Refers to the transfer of government benefits (funds or resources) to individuals through the use of a card technology. Individuals access their benefits through Automated Teller Machines or retail point-of-sale terminals.

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).

Enterprise Application—A software application that is used throughout an organization (or enterprise). For example, payroll systems or resource management systems that are used by multiple departments or an online payment processing application that is used across organizational boundaries are all enterprise applications. Such applications are important for realizing economies of scale and for ensuring information can be shared.

Fast Follower(ship)—In the context of innovation diffusion, a fast follower is one who adopts an innovation shortly after the initial innovator (or first mover), but appreciably before the majority of those who eventually implement the innovation. For a more detailed discussion of innovation diffusion see Everett M. Rogers, *Diffusion of Innovations*, Third Edition. New York: The Free Press, 1983.

Geographic Information System (GIS)—A set of hardware and software tools used to gather, manipulate, and analyze geographically referenced data. GIS are used by many government agencies. For example, transportation departments use GIS to determine the

most efficient corridors for highway construction, and housing departments use GIS to help select the best locations for urban renewal projects.

Geographic Positioning System (GPS)—A system that uses satellites and small, portable receivers to determine the physical position of an object or person. Increasingly ubiquitous, GPS are used to track the locations of airplanes, boats, cars, and even individuals to within an accuracy of a few meters.

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.

Kaizen—Originally defined in Masaaki Imai's book *Kaizen: The Key to Japan's Competitive Success*, *kaizen* refers to a process of continuous improvement through small sustainable steps.

Knowledge-based economy—A term used to describe an economy in which the defining factor of production is knowledge. The 19th century saw the rise of the industrial-based economy in which goods were produced in large industrial manufacturing plants. Today, a growing number of people produce, use, and share knowledge in their day-to-day work. Since information can be expressed digitally, computer networks have enabled the rapid growth of the knowledge-based economy.

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.

Lifecycle Costs—The costs of developing, maintaining, operating, and eventually retiring an IT system or application. When budgeting for IT initiatives, stakeholders often focus on development costs, overlooking future costs that can represent a larger percentage of the full lifecycle costs.

Managed (or Management) Service Provider (MSP)—See: Application Service Provider (ASP).

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)

Open-source—Computer programs that are distributed as open-source are distributed along with access to the source code—the program instructions as written by the programmer. Once distributed, the author of the program must allow users to modify the code and redistribute it freely, while users are prohibited from selling the program or any derivative thereof without the accompanying source code. The open-source nature of the program is usually protected by an open-source license such as the GNU General Public License (GPL). The rationale behind open-source is that a larger community of programmers will use, improve, and develop the program.

Pen-based Computer—A computer that the user interacts with via an electronic pen or stylus rather than a keyboard or mouse. Most PDAs (see below) or hand-held computers are pen-based computers.

Personal Digital Assistant (PDA)—A small hand-held computer that can be carried around by an individual, and that is most commonly used for personal management tasks such as storing phone numbers, reading email, or scheduling. As wireless technologies continue to develop, PDAs are also being used to communicate over networks.

Portal (or Internet Portal)—On one level, a gateway or single point of entry through which the user can access related information from a variety of sources. For example, many governments are launching portals as a single point of entry to government information. It is interesting to note, however, that as governments adjust to the concept of a single point of entry, they are beginning to rethink how they interact with constituents. Rather than organizing the user's experience around agency boundaries, they are breaking down these boundaries to organize information and interactions around the user's needs.

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.

Prototype—A pre-production, functioning model of a system or application. A prototype is generally used for the evaluation of design, performance, or production potential.

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 spillovers 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.

Scope Creep—The gradual accumulation of new or expanded requirements after a project plan (project scope) has been agreed upon by all parties. Scope creep is a significant risk to implementation success as it increases cost and extends project timelines.

Server—A computer program that provides services to other programs or computers. This term is 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.

Share-in-Savings/Revenue—A financing strategy whereby government compensates a private-sector partner with a share of funds saved/raised as a result of the partnership. This financing strategy is commonly used when the private-sector partner agrees to cover the up-front costs of a project. It is also used to align incentives with desired outcomes.

Slow Trigger, Fast Bullet—An analogy used to describe an implementation strategy in which careful project planning and preparation (the slow trigger) is followed by swift and decisive action steps (the fast bullet) that quickly move the project to a stage that safely demonstrates value.

Smart Card—A small electronic device or token (often the size of a credit card) that stores information in a memory chip. Information can be added, read, or changed using a smart card reader.

Software—A catchall 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.

Source Code—See: Open-source.

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.

Total Quality Management (TQM)—A management philosophy that became popular in the 1980s and 1990s. TQM is focused on continuously improving the performance of all individuals and processes in achieving customer satisfaction.

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.

END NOTES

¹The poll is contained in a report by the council for Excellence in Government, *E-Government: The Next American Revolution*. <http://www.excelgov.org/techcon/egovex/index.htm>

²For more on social capital and community see: Robert D. Putnam, *Bowling Alone: the Collapse and Revival of American Community*, (New York: Simon and Shuster, 2000)

³For more on thin democracy see: Joseph S. Nye, Jr., "Information Technology and Democratic Governance," *democracy.com?: Governance in a Networked World*. Elaine Ciulla Kamarck and Joseph S. Nye, Jr. eds., p. 12, (Hollis Publishing Company, 1999)

⁴For a breakdown of voter turnout in the 2000 Arizona Democratic Primary, see <http://www.azdem.org/breakdown.html>

⁵For more information about voter turnout in the 2000 Arizona Democratic Primary, see <http://www.election.com/uk/pressroom/pr2000/0324.htm>

⁶For more information about e-government efforts in the UK, see <http://www.number-10.gov.uk/news.asp?NewsId=2840&SectionId=30>

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