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THE PERFORMANCE OF FEDERAL CIOs: HOW DO THEY COMPARE TO CIOs IN THE PRIVATE SECTOR?

HEARING

BEFORE THE

SUBCOMMITTEE ON GOVERNMENT MANAGEMENT, INFORMATION, AND TECHNOLOGY

OF THE

COMMITTEE ON GOVERNMENT REFORM

HOUSE OF REPRESENTATIVES

ONE HUNDRED SIXTH CONGRESS

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CONTENTS

Page

Hearing held on March 24, 2000 1

Statement of:

Doll, Otto, commissioner, Bureau of Information and Technology, State of Arizona, president, National Association of State Information Resource Executives 34

Flyzik, Jim, Chief Information Officer, Department of the Treasury, vice chairman, CIO Council 25

Knutson, Gerald J., vice president, Communications and Information Services, U.S. West 64

Krupa, Suzanne, chief information officer, the Rowe Companies 70

McClure, David L., Associate Director, Governmentwide and Defense Information Systems, U.S. General Accounting Office 4

Letters, statements, et cetera, submitted for the record by:

Doll, Otto, commissioner, Bureau of Information and Technology, State of Arizona, president, National Association of State Information Resource Executives, prepared statement of 37

Flyzik, Jim, Chief Information Officer, Department of the Treasury, vice chairman, CIO Council, prepared statement of 28

Horn, Hon. Stephen, a Representative in Congress from the State of California, prepared statement of 3

Knutson, Gerald J., vice president, Communications and Information Services, U.S. West, prepared statement of 66

McClure, David L., Associate Director, Governmentwide and Defense Information Systems, U.S. General Accounting Office, prepared statement of 7

THE PERFORMANCE OF FEDERAL CIOs: HOW DO THEY COMPARE TO CIOs IN THE PRIVATE SECTOR?

FRIDAY, MARCH 24, 2000

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON GOVERNMENT MANAGEMENT,
INFORMATION, AND TECHNOLOGY,
COMMITTEE ON GOVERNMENT REFORM,
Washington, DC.

The subcommittee met, pursuant to notice, at 10 a.m., in room 2154, Rayburn House Office Building, Hon. Stephen Horn (chairman of the subcommittee) presiding.

Present: Representatives Horn and Turner.

Staff present: J. Russell George, staff director and chief counsel; Randy Kaplan, counsel; Matt Ryan, senior policy director; Bonnie Heald, director of communications; Bryan Sisk, clerk; Ryan McKee, staff assistant; Trey Henderson, minority counsel; and Jean Gosa, minority assistant clerk.

Mr. HORN. The Subcommittee on Government Management, Information, and Technology will come to order.

The purpose of this hearing is to assess the effectiveness of Federal Government's chief information officers, the CIOs, in comparison to their counterparts in the public and private sectors.

The Clinger-Cohen Act of 1996 required each of the major departments and agencies in the executive branch to appoint a CIO to manage the agencies' information technology programs. In addition, the Clinger-Cohen Act required that agencies reform their information technology management organizations based largely on the successful practices of the private sector. To emphasize the importance of the CIO's role in management, the act also required that the Federal CIOs report directly to agency heads.

This morning the General Accounting Office will release a new executive guide entitled, "Maximizing the Success of Chief Information Officers: Learning from Leading Organizations." This GAO guide acknowledges that the position of CIO in the Federal Government is still evolving. And, in fact, agencies are taking steps toward better utilizing the talents and leadership of their CIOs. However, the breathtaking speed of this information age demands an equally fast response from Federal agencies. From e-government and e-security to e-taxes, chief information officers in the private sector have provided the technical and managerial expertise that has successfully brought corporate America into an era dominated by high technology. The private sector knows that information

management not only dictates how a business works, but increasingly defines what that business is.

Federal CIOs must be empowered to provide the same type of leadership in government agencies. The Federal Government's senior management, the Cabinet Secretaries, agency leaders, their immediate staffs and the CIOs, must rise together to meeting the technical and management challenges that lie ahead. The Federal Government cannot respond to the information age in a stone age manner.

We welcome our panel of witnesses, and we look forward to your testimony.

[The prepared statement of Hon. Stephen Horn follows:]

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OPENING STATEMENT
Chairman Stephen Horn
"The Performance of Federal CIOs:
How Do They Compare to CIOs in the Private Sector?"

A quorum being present, the Subcommittee on Government Management, Information, and Technology will come to order.

The purpose of this hearing is to assess the effectiveness of the Federal Government's Chief Information Officers (CIOs) in comparison to their counterparts in the public- and private-sectors.

The Clinger-Cohen Act of 1996 required each of the major departments and agencies in the executive branch to appoint a CIO to manage the agencies' information technology programs. In addition, Clinger-Cohen required that agencies reform their information technology management organizations, based largely on the successful practices of the private sector. To emphasize the importance of the CIO's role in management, the Act also required that Federal CIOs report directly to agency heads.

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From "e-government" and "e-security" to "e-taxes" chief information officers in the private sector have provided the technical and managerial expertise that has successfully brought corporate America into an era dominated by high technology. The private-sector knows that information management not only dictates how a business works, but it increasingly defines what that business ***is.***

Federal CIOs must be empowered to provide the same type of leadership in government agencies. The Federal Government's senior management -- the Cabinet Secretaries, agency leaders, their immediate staffs, and the CIOs -- must rise together to meet the technical and management challenges that lie ahead. The Federal Government cannot respond to the "information age" in a "stone age" manner.

We welcome our panel of witnesses and look forward to their testimony.

Mr. HORN. Let me explain how we work here. One, we swear in all the witnesses.

No. 2, we go down the line of the agenda, and automatically your full statement is put in the record. We would like you to summarize it between 5 and 8 minutes, and that permits us to have a lot of time for questioning and a dialog between members of the panel.

So if you would stand, raise your right hands, we will swear you in. And anybody that is going to be whispering to you, put them up, too.

[Witnesses sworn.]

Mr. HORN. The clerk will note that all five witnesses have affirmed the oath.

Mr. McClure is the Associate Director for the Governmentwide and Defense Information Systems for the GAO.

STATEMENT OF DAVID L. McCLURE, ASSOCIATE DIRECTOR, GOVERNMENTWIDE AND DEFENSE INFORMATION SYSTEMS, U.S. GENERAL ACCOUNTING OFFICE

Mr. MCCLURE. Thank you, Mr. Chairman. It is a pleasure to be here and talk about the role of the chief information officer in the Federal Government and to introduce our recent study on maximizing the success of chief information officers. Your subcommittee plays a very important role in focusing both oversight attention and facilitating constructive dialog on critical information management issues in the government, and we are looking forward to working with you in that regard.

Mr. Chairman, we are witnessing an unparalleled movement into the electronic and digital age for business and government. In the Federal Government, technology investments are paramount to realizing the programmatic results expected under the Results Act, to improve basic fundamental management and to maximize human capital skills. IT projects, as you know, can produce spectacular improvements in operations and performance if managed well. They can leave legacies of costly failures if managed poorly. With the spending rate for IT approaching $40 billion annually, we can ill-afford not to manage these investments with increasing scrutiny and a demand for tangible benefits at acceptable cost.

The CIO positions were created by the Clinger-Cohen Act in 1996 to tackle these issues. The progress to date is mixed and uneven. We certainly made a lot of progress in many areas. There is more interaction between Federal CIOs, program managers, and chief executives in the Federal agencies than in the past. Senior investment boards have been created and are being used on a consistent basis across almost all of the major Federal departments and agencies to make investment decisions. We have a very active CIO Council that has brought governmentwide attention to some important issues like security, critical infrastructure protection, IT human capital, and investment planning.

The heavy involvement of the CIOs in the Y2K problem also helped to sensitize agency executives to the increasing role that technology is playing in helping to achieve their mission outcomes and in their daily operations. We have as a result of the Y2K experience a much better inventory of mission-critical systems in the Federal Government. However, we also have problem areas that

continue to persist, and in our reviews of agencies since the Clinger-Cohen Act, we have noticed a consistent pattern of problems.

There is inconsistent application of IT investment management across the government, and incomplete cost-benefit and risk data before projects are actually approved. Improvements are needed in software development, architecture, and certainly to security. These are areas where the Federal CIOs can certainly help make marked improvements and move the government forward.

Today we are releasing our executive guide on maximizing the success of chief information officers. It is one in a series of guides that we have put out on best practices in information management and technology. Others have dealt with investment management, capital planning, security, and human capital, and many of these guides have formed governmentwide consensus on how to basically approach some of the fundamental IT management challenges in government.

What I wanted to do with you today is give you some highlights of what we found in the study and answer any questions that you may have about the specifics. We have a chart up in the hearing room that basically outlines for you what we found in the study, and I just wanted to again point out some highlights.

We found some critical success factors, some guiding principles, and some key players that are important to achieve success of CIOs. The first column, downward column, on the chart focuses on alignment and has to do with factors that are outside the domain of the CIO. This is an important point. In all of the case study organizations that we have looked at, the success of the CIO was heavily dependent upon executive management understanding, first, in the role of information management to the organization, and second, in figuring out the best positioning of the CIO in the organization structurally as well as the skill set that meets the organizational needs and problems that the company or the public sector organization is experiencing at that moment in time.

There is no cookie-cutter approach to selecting a CIO. Our study showed that. There is a fundamental need for both business as well as technical skills. The key point is matching the right person to the organizational needs at that moment, and that direction coming from the executive level of the corporation.

The second downward column deals with promoting organizational credibility, and this is, again, an important point to make in this regard. CIOs in these organizations focused on earning credibility and establishing credibility, and used a series of management approaches to do so. They managed to put in standards, processes, and basic approaches that consistently followed industry standards for good IT management. They were constantly focused on results, and balancing both short-term results with a need to show long-term improvement. The need for short-term results was critical for the CIOs to be able to establish their credibility record and to partner effectively with the business side of the organization.

In the third column are our execution responsibilities. Once a CIO is positioned, and once he or she determines how to build credibility through informal and formal networks, we have to get down to the business of implementation. Several key practices were

notable here. First, organizing the CIO organization in a way that, again, provided effective services and products to the organization that it served. Not all of them were formed in the same fashion, not all of them were focused on the same products and service delivery, but this was a dialog they had to have with the business of the corporation before they could figure out what skill sets and what particular products and services were critical to achieving mission or programmatic outcomes.

The last column deals with developing human capital. This is pressing for private and public sector. It is a competitive market. We noticed in the best practice organizations that we looked at, there was a variety of techniques used for attracting, retaining, and refreshing skill sets. And there were a variety of techniques used to motivate employees internally to make sure that they executed their responsibilities in a very, very well-conducted fashion.

If we compare the Federal agencies to those practices, we find one area of commonality, and that deals with credibility-building. We see a lot of success in the Federal CIOs in the last 4 years moving to use informal and formal means to establish credibility.

In the other areas there is less commonality and distinct chart differences. Federal organizations don't go through the same process in which the chief executive officer along with the executive peers figure out what specific skills they need in a CIO before the selection is made. We see less interaction between the CIOs in the Federal Government and the executive management tier, and we also see less focus of the Federal CIOs on performance measurement both at the project level, but, more importantly, on the IT function itself, and how it is delivering value to the organization as a whole.

So in conclusion, the study points out that there are indeed areas where we can learn to capitalize more on positioning and putting in place CIOs that can really make a difference. Agency leaders must help facilitate success in IT management. The CIOs are necessary, but alone they cannot do this job. They have to have top executive support. They have to have working partnerships with business—the business side of the organization, and they have to have skilled and motivated people to be able to pull off the vast range of responsibilities that they have. The CIOs themselves can reinforce these things, and in the years to come we should be looking for CIO credibility to be enhanced through attention to those specific areas. And progress has certainly been made, and it is admirable progress in the short time since the passage of the act.

I will be happy to answer questions specifically about the guide as we move on.

Mr. HORN. Thank you very much, Mr. McClure.

[The prepared statement of Mr. McClure follows:]

United States General Accounting Office

GAO

Testimony

Before the Subcommittee on Government Management, Information and Technology, Committee on Government Reform, House of Representatives

For Release on Delivery
Expected at
10 a.m.
Friday,
March 24, 2000

CHIEF INFORMATION OFFICERS

Implementing Effective CIO Organizations

Statement of David L. McClure
Associate Director, Governmentwide and Defense Information Systems
Accounting and Information Management Division





Mr. Chairman and Members of the Subcommittee:

Thank you for inviting me to participate in today's hearing on the role of chief information officers (CIOs) in the federal government. As you know, Mr. Chairman, the rapid pace of technological change and innovation has offered unprecedented opportunities for the government to use information technology to improve operational performance, reduce costs, and enhance service responsiveness to the public. Yet, at the same time, it has raised a range of thorny issues surrounding managing and integrating complex information management (IM) processes; computer hardware and software; telecommunications networks; and, most important, aligning IT with business needs. Consequently, it is increasingly critical that federal agencies have effective leadership and focused management control over the government's $38 billion in annual spending on information management and technology that goes beyond what would be required solely in a technical support function.

Since the passage of the Clinger-Cohen Act in early 1996, all 24 major cabinet departments and executive agencies have appointed CIOs. Spurred by the Y2K computing problem, many have also begun implementing essential information management processes, such as IT investment management controls, cost estimation processes, and IT architectures. In light of these developments, I would like to briefly touch upon the progress that has been made in establishing federal CIOs and the challenges that remain in achieving the long-term success of these positions. At the same time, I will point out that in order to reap the full benefits of these reforms, more remains to be done to ensure that federal CIOs establish themselves as effective information management leaders, build credible IM organizations, and deliver high-value IT investment results. I also want to introduce an important study we have just completed, entitled *Maximizing the Success of Chief Information Officer Organizations – Learning From Leading Organizations*, which can be used to help address the challenges surrounding CIOs. We are publicly releasing this study today; it is based on the best practices of prominent private and state government organizations.[1] The report suggests ways federal agencies can go about ensuring that CIO functions are effectively integrated into overall performance-based and accountability management approaches.

[1] *Executive Guide: Maximizing the Success of the Chief Information Officers: Learning From Leading Organizations, Exposure Draft* (GAO/AIMD-00-83, March 2000).

Progress Made In Establishing Federal CIO Positions

To reap the full benefits of new technologies, federal agencies must have effective information management leaders who can transform IT dollars into prudent investments that achieve cost savings, increase productivity, and improve the timeliness and quality of service delivery. This was widely recognized by the Congress in the 1990s as it worked in conjunction with the administration to craft several key information management reform laws, notably the Federal Acquisition Streamlining Act of 1994, the revision of the Paperwork Reduction Act (PRA) in 1995, and the Clinger-Cohen Act of 1996. Other than the Computer Security Act of 1987, these were the first major information management reforms instituted in the federal government since 1980. The Clinger-Cohen Act, for example, required major departments and agencies to appoint CIOs and implement IT management reforms largely grounded in successful commercial IT management practices.[2] In particular, the act established CIO positions that report directly to the agency heads and have IM as a primary function. As noted below, the CIOs are responsible for a wide range of strategic and tactical information management activities outlined in the Clinger-Cohen Act, such as developing architectures, managing and measuring the performance of IT investment portfolios, and assisting in work process improvements. This mirrors the evolution of the CIO position in industry where it has largely moved from solely a technical support focus to a much more executive and strategic level position.

[2]The fiscal year 1997 Omnibus Consolidated Appropriations Act, Public Law 104-208, renamed both Division D (the Federal Acquisition Reform Act) and E (the Information Technology Management Reform Act) of the 1996 DOD Authorization Act, Public Law 104-106, as the "Clinger-Cohen Act of 1996."

Key Clinger-Cohen Requirements for the CIO

- Work with the agency head and senior program managers to implement effective information management to achieve the agency's strategic goals.
- Assist the agency head in establishing a sound investment process to select, control, and evaluate IT spending for costs, risks and benefits.
- Promote improvements to the work processes used by the agency to carry out its programs.
- Increase the value of the agency's information resources by implementing an integrated agencywide technology architecture.
- Strengthen the agency's knowledge, skills, and capabilities to manage information resources effectively.

Effective selection and positioning of CIOs can make a real difference in building the institutional capacity and structure needed to implement the management practices embodied in Clinger-Cohen and PRA.[3] But the position is both relatively new and evolving in the federal government, and agency leaders face many challenges from the growing expectations for dramatic improvements in implementing improved IT management practices and demonstrating cost-effective results. Just finding an effective CIO can be a difficult task, since the individual must combine a number of strengths, including leadership ability, technical skills, an understanding of business operations, and good communications and negotiation skills. Also, the individual selected must match the specific needs of the agency, which must be determined by the agency head based on the agency's mission and strategic plan. The CIO must recognize the need to work as a partner with other business or program executives and to build credibility in order to be accepted as a full participant in the development of new

[3]The PRA of 1980 took the first step toward today's CIO position by designating senior information resources management positions in major departments and agencies. The revision of PRA in 1996, required agencies to indicate in strategic IRM plans how they were applying information resources to improve productivity, efficiency, and effectiveness of government programs, including the delivery of services to the public.

organizational systems and processes and to achieve successful outcomes with IT investments.

Even with the right person in place, the agency head must make a commitment to the success of the CIO by assuring that adequate resources are available and a constructive management framework is in place for implementing agencywide IT initiatives. The resolution of problems founded in unsound investment control processes, poor project management, and weak software development and acquisition capabilities requires executive commitment and active support.

CIOs' progress in working with agency executives to meet these challenges has been mixed. On the positive side, responding to the Year 2000 (Y2K) date conversion challenge helped most agency leaders recognize the importance of consistent and persistent top management attention to information management and technology issues.[4] Progress has been made in strengthening IT management capabilities in order to rectify past failures with costly modernization efforts, e.g., by developing IT architectures, strengthening cost-estimating processes, and improving software acquisition capabilities.[5] In addition, in responding to Y2K, many agencies developed inventories of their information systems, linked those systems to agency core business processes, and jettisoned systems of marginal value.[6] Moreover, more agencies have established much-needed IT policies in areas such as system configuration management, risk management, and software testing.

According to officials at the Office of Management and Budget (OMB), the Y2K problem also gave agency CIOs a "crash course" in how to accomplish projects. Many CIOs were relatively new in their positions and expediting Y2K efforts required many of them to quickly gain an understanding of their agency's systems, work extensively with agency program managers

[4]*Critical Infrastructure Protection: Comprehensive Strategy Can Draw on Year 2000 Experiences* (GAO/AIMD-00-1, October 1, 1999)

[5]*Tax Systems Modernization: Blueprint Is A Good Start But Not Yet Sufficiently Complete to Build or Acquire Systems* (GAO/AIMD/GGD-98-54, February 24, 1998); *Major Management Challenges and Program Risks: A Governmentwide Perspective* (GAO/OGC-99-1, January 1999); *Customs Service Modernization: Actions Initiated to Correct ACE Management and Technical Weaknesses* (GAO/T-AIMD-99-186, May 13, 1999); *Federal Aviation Administration: Challenges in Modernizing the Agency* (GAO/T-RCED/AIMD-00-87, February 3, 2000).

[6]*Year 2000 Computing Challenge: Leadership and Partnerships Result in Limited Rollover Disruptions* (GAO/T-AIMD-00-70, January 27, 2000).

and chief financial officers (CFOs), and become familiar with budgeting and financial management practices.[7]

The Federal CIO Council has also facilitated positive developments.[8] For example, the Council has been working actively with the Office of Personnel Management to develop special pay rates for hard-to-hire IT professionals. It has facilitated the development of a web-based information consolidation tool, which provides a standard IT budget reporting format and should assist agencies in linking their internal planning, budgeting, and management of IT resources. The Council also assisted administration officials in tracking the progress of Presidential Decision Directive 63, which tasked federal agencies with developing critical infrastructure protection plans, identification and evaluation of information security standards, and best practices and efforts to build communication links with the private sector. Further, in addressing the Y2K challenge, the Council participated in governmentwide efforts to develop best practices for Y2K conversion and to address important issues such as acquisition and Y2K product standards, data exchange issues, telecommunications, buildings, biomedical and laboratory equipment, and international issues.

Still, agencies face incredible challenges in effectively managing their IT investments and in assuring that these investments make the maximum contribution to mission performance that is possible. Some of our recent reviews have found that fundamental IT investment processes are incomplete and not working consistently to help achieve better project outcomes. For example, IT portfolio selection, control, and evaluation processes and performance metrics have not been developed to gauge the progress of investments or their contribution to program outcomes.[9]

[7] *Critical Infrastructure Protection: Comprehensive Strategy Can Draw on Year 2000 Experiences* (GAO/AIMD-00-1, October 1, 1999).

[8] The Council was created by Executive Order 13011, July 16, 1996, *Federal Information Technology*. The Council is to be the principal interagency forum to improve agency practices on such matters as the design, modernization, use, sharing, and performance of agency information resources. The Council is to make recommendations and provide advice to agencies and organizations but does not have policy authority. The order also created the Information Technology Services Board to identify and promote the development of innovative technologies, standards, and practices among agencies, state and local governments, and the private sector.

[9] *Defense IRM: Poor Implementation of Management Controls Has Put Migration Strategy at Risk* (GAO/AIMD-98-5, October 20, 1997); *Indian Trust Funds: Interior Lacks Assurance That Trust Improvement Plan Will Be Effective* (GAO/AIMD-99-53, April 28, 1999); and *Air Traffic Control: FAA's Modernization Investment Management Approach Could Be Strengthened* (GAO/RCED/AIMD-99-88, April 30, 1999).

Acquisitions may be executed faster, but in many cases the link to program performance is lost so the real value of the investment cannot be determined. In short, more clarity could be given to how IT investments are being or will be used to improve performance or help achieve specific agency goals and ensuring that better data exists to guide informed decisions. Other common problem areas include inadequate progress in designing and implementing IT architectures before proceeding with massive modernization efforts and immature software development, cost estimation, and acquisition practices.[10] These are areas where the agency heads were assigned specific responsibility in the PRA and in the Clinger-Cohen Act, and for which CIOs were appointed to help rectify poor agency track records.

Information security is another widespread and growing problem confronting federal CIOs. A rash of break-ins at federal websites and disruptions caused by the Melissa computer virus and other malicious viruses sent via the Internet recently highlighted this concern. However, our reviews show that this problem runs much deeper. In particular, our October 1999 analysis of our own and inspector general audits found that 22 of the largest federal agencies were not adequately protecting critical federal operations and assets from computer-based attacks.[11] Among other things, we found that agencies are lacking the strong, centralized leadership needed to protect critical information and assets as well as sound security planning, effective control mechanisms, and speedy response to security breakdowns.[12] These weaknesses pose enormous risks to our computer systems and, more important to the critical operations and infrastructure they support, such as telecommunications; power distribution, national defense, and law enforcement; government services; and emergency services. In the case of computer security, too,

[10] *Major Management Challenges and Program Risks: A Governmentwide Perspective* (GAO/OGC-99-1, January 1999).

[11] *Information Security: Weaknesses at 22 Agencies* (GAO/AIMD-00-32R, November 10, 1999) and *Critical Infrastructure Protection: Fundamental Improvements Needed to Assure Security of Federal Operations* (GAO/T-AIMD-00-7, October 6, 1999).

[12] *DOD Information Security: Serious Weaknesses Continue to Place Defense Operations at Risk* (GAO/AIMD-99-107, August 26, 1999); *Information Security: Many NASA Mission-Critical Systems Face Serious Risks* (GAO/AIMD-99-47, May 20, 1999); *Audit of the Department of State's 1997 and 1998 Principal Financial Statements*, Leonard G. Birnbaum and Company, LLP, August 9, 1999; *Information Systems: The Status of Computer Security at the Department of Veterans Affairs* (GAO/AIMD-00-05, October 4, 1999); *IRS Systems Security: Although Serious Improvements Made, Tax Processing Operations and Data Still at Serious Risk* (GAO/AIMD-99-38, December 14, 1998); and *Financial Management Service: Significant Weaknesses in Computer Controls* (GAO/AIMD-00-4, October 4, 1999).

the responsibility has been given to the agency heads by the PRA and Clinger-Cohen Act with CIOs to provide support.

Clearly, more remains to be done to realize the full potential of CIOs as information management leaders, to build CIO organizations that have the credibility needed to be successful; to define the measures necessary to gauge this success and demonstrate results, and to put in place the structure for organizing information management to meet pressing business needs. The CIO executive guide that we are releasing today is designed to help resolve these challenges. Through our research and interviews with CIOs and other executives in case study organizations, we have developed a framework of critical success factors and leading principles. Federal agencies can turn to this guide for pragmatic assistance in leveraging the CIO position.

Learning to Maximize the Success of CIO Organizations

Mr. Chairman, our research has demonstrated that CIOs of leading organizations use a consistent set of IM principles to execute their responsibilities successfully. These principles, listed below, span a broad range of management imperatives, from executive leadership and change management through organizational design and workforce development.

Some principles need to be addressed by top executives across the organization, rather than by the CIO. For example, along with other top executives, the chief executive officer (CEO) must recognize the role of IM in creating value to the business before appointing a CIO. In addition, the CEO must also undertake responsibility for defining and instituting the CIO position. The other principles are squarely within the domain of the CIO. For example, the CIO must take full responsibility for ensuring the credibility of the IM organization. While other leaders can contribute to this principle, the CIO must be seen as the leader of the unit and must consistently raise the visibility and demonstrate the value of the IM organization across the enterprise. Overall, the principles are strikingly simple and strongly supported by a wide range of other CIO-based research. Nevertheless, consistent attention and commitment often remains elusive and pinpoints the notable difference between leading organizations and others.

Six Principles of CIO Management

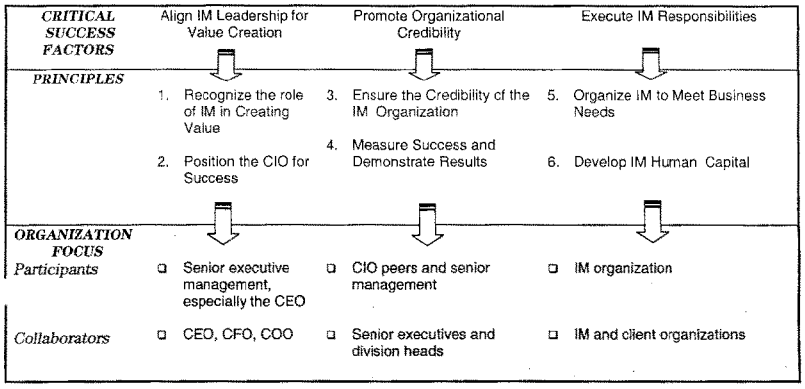
- Recognize the role of IM in creating value
- Position the CIO for success
- Ensure the credibility of the IM organization
- Measure success and demonstrate results
- Organize IM to meet business needs
- Develop IM human capital

Let me also underscore, Mr. Chairman, that the principles are most effective when implemented together in a mutually reinforcing manner. As ad hoc efforts, each principle addresses a single aspect that while necessary, is not sufficient for success by itself. And the failure to execute a single principle may render others less effective. Nevertheless, organizations may find it more feasible to address one principle before another.

The Foundations for Achieving CIO Success: Consistent Critical Success Factors and Key Characteristics

The six principles we identified naturally fell into three critical success factors that are useful for understanding issues of implementation and impact. These critical success factors are (1) align IM leadership for value creation, (2) promote organizational credibility, and (3) execute IM responsibilities. These success factors provide focus for the CIO when planning how to address the six principles. As the CIO develops strategies for approaching each of the six principles, he or she must consider who else in the organization must be involved in the leadership and what parts of the organization must be involved in the implementation. Within each critical success factor, a specific level of the organization contributes to the leadership, along with the CIO, and a specific part of the organization is involved in carrying out the activities that lead to the successful execution of the factor. For example, to align IM leadership for value creation, the CEO and most other senior executives must actively endorse the CIO and demonstrate the CIO's role in the strategic management of the organization. The second success factor requires the collaboration of the next lower layer of management where IM successes will be observed. Finally, the third factor is where the rubber hits the road, and the IM organization itself must demonstrate its effectiveness.

Figure 1: Critical Success Factors for CIOs



Each principle identified in our guide is also defined by key characteristics. These key characteristics represent the specific approaches we observed that contribute to the success of the CIO. For example, to ensure the credibility of the IM organization, successful organizations ensure that (1) the CIO model complements organizational and business needs, (2) the CIO's roles, responsibilities, and accountabilities are clearly defined, and (3) the CIO has the right technical and management skills to do the job. To define performance measures, IM managers generally engage both their internal and external partners and customers and continually work at establishing feedback between performance measurement and business processes.

As CIOs or senior agency executives use our guide, they may want to compare their organization to these key characteristics to assess the extent to which their organization resembles those we visited in the development of our guide. They may also gain insight into what aspects of their organization they should address as they work to enhance the effectiveness of their CIO position. Our guide also presents case studies illustrating how these key practices are employed within specific

organizations. And it suggests specific strategies for implementing both principles and characteristics.

Table 1: Key Characteristics of CIO Principles

	Principles	*Key Characteristics*
Recognize the role of IM in creating value	Instituting an effective CIO organization does not start with the selection or placement of an IM leader, or setting up a structure for managing information resources and activities. Rather, it begins with consideration of the role of IM and how vital it is to accomplishing mission objectives.	• IM organization functions and processes are incorporated into the overall business process. • Mechanisms and structures are adopted that facilitate an understanding of IM and its impact on the organization's overall strategic direction.
Position the CIO for success	There is no one way to establish a CIO position, but there are a number of practices and strategies that senior managers in leading organizations use to help define and institute their CIO positions to effectively meet business needs.	• The CIO model is consistent with organizational and business needs. • The roles, responsibilities, and accountabilities of the CIO are clearly defined. • The CIO has the right technical and management skills to meet business needs. • The CIO is a full member of the senior management team.
Ensure the credibility of the IM organization	Instituting a CIO position consistent with organization needs and finding a credible leader to fill the job are no guarantee of CIO success. CIOs themselves must employ strategies to legitimize their roles and successfully collaborate with their business counterparts to guide IM solutions and meet mission needs.	• The CIO has a legitimate and influential role in leading top managers to apply IM to meet business objectives. • The CIO has the commitment and trust of line management. • The CIO accomplishes quick, high-impact, and visible IM successes in balance with long-term strategies. • The CIO learns from and partners with successful leaders in the organization.

	Principles	Key Characteristics
Measure success and demonstrate results	In many organizations, the value of IM is considered difficult to measure. However, it has become increasingly evident that without a measurement process where results can be demonstrated, not only is IM at a disadvantage when competing for scarce resources, but also when making its case in support of IM initiatives.	• IM managers engage both their internal and external partners and customers when defining measures. • Managers at all levels ensure that technical measures are balanced with business measures. • Managers continually work at establishing active feedback between performance measurement and business processes.
Organize IM to meet business needs	The IM organization must provide effective, responsive support to the business through efficient allocation of resources and the day-to-day execution of responsibilities.	• The IM organization has a clear understanding of its responsibilities. • The extent of decentralization of IM resources and decision-making is driven by business needs. • The structure of the IM organization is flexible enough to adapt to changing business needs. • The IM organization executes its responsibilities reliably and efficiently.
Develop IM human capital	Given prevailing market forces and internal legacies, the IM organization must provide an effective, responsive IM workforce to help accomplish mission and goals.	• The IM organization identifies necessary skills. • The IM organization develops innovative ways to attract and retain talent. • The IM organization provides needed training, tools, and methods.

How Leading Organizations Compare With Federal CIO Management Practices

In our discussions with half of the Federal CIO Council members, they agreed that the six primary principles emerging from our study were relevant to the issues and challenges confronting them. However, the specific approaches to executing those principles differed, and for a number of principles, the federal sector seemed to not provide much focus at all. For example, while leading organizations generally define the role and authority of their CIO position carefully given the needs of the enterprise, and then select a CIO with the skills to meet the challenge,

senior executives in the federal sector do not seem to go through the same process of linking CIO type and skills to agency needs. In addition, leading organizations work hard to forge partnerships at the top levels of the organization, something seen less frequently in the federal sector.

This lack of attention to the CIO as the focal point of IM practice in the agency extends to the failure of agency heads to include their CIOs in executive business decision-making. In the federal government setting, IM is still too often treated as purely a technical support function rather than a strategic asset critical to improving mission performance and achieving more cost-effective results. As a result, the CIO's role is often further from the strategic planning of the organization than in the organizations we contacted for our guide. Moreover, federal organizations are often less flexible in reassigning IM staff and structuring capabilities across business and technology lines due to the highly decentralized IM responsibilities found in many large agencies.

Also, the relative inflexibility of federal pay scales makes it difficult to attract and retain the highly skilled IT professionals required to develop and support the systems being proposed. I will be discussing these and other constraints further momentarily, but I would like to point out that such challenges tend to slow the progress of implementing other principles.

Interestingly, the practices of federal CIOs tended to be most similar to those CIOs in our study in those principles in which CIOs could exert the most personal control. That is, federal CIOs tend to use the same approach to building credibility within the enterprise as our case study CIOs did. In addition, both groups of CIOs tend to have similar problems with performance measures and demonstrating results. Our case study CIOs had made more advances in building links between IM and business objectives, but the measures themselves are still evolving. On the federal side, the ties to mission performance are not as strong, perhaps because of a lack of collaboration between the program areas and the IM organization in the development of mission requirements, though provisions of the Clinger-Cohen Act are providing the motivation to improve this process.

Table 2: How Leading Organizations Compare With Federal Practices

Critical Success Factors	Principle	What a Leading Organization Does	What the Federal Government Does
Align IM Leadership for Value Creation	*Recognize the Role of IM in Creating Value*	• CEOs and governors ensure that the IM organization is a key business player • CIO is part of the executive decision-making process	• IM generally still viewed as a support function instead of as a strategic activity • CIO is not always involved in strategic and policy-making decisions
	Position the CIO for Success	• Defines clear CIO role and authorities • Matches CIO type and skills set with business needs • Forges CIO partnership with CEO and other senior executives	• Does not always clearly define CIO role or authority • Does not always match CIO selection with agency needs • Does not always provide executive support for the CIO position
Promote Organizational Credibility	*Ensure the Credibility of the IM Organization*	• CIO builds credibility through effective IM leadership, good working relationships, track records, and partnering with customers and peers	• Uses practices similar to leading organizations
	Measure Success and Demonstrate Results	• Strong links exist between business objectives and performance measures • Performance management structure still evolving	• Weak links between agency goals and IM/IT performance measures • Required annual performance plans still in preliminary stages
Execute IM Responsibilities	*Organize IM to Meet Business Needs*	• Reassigns IT staff as needed to best serve interests of customers • Structures the organization along business lines as well as IM functional areas	• Tries to meet needs of customers with a fixed organizational structure • Structures the organization primarily along IM functional areas
	Develop IM Human Capital	• Maintains up-to-date professional skills in technology management • Outsources entry-level positions but largely hires at all levels of experience	• Provides limited amount of training in technology management • Assumes entry-level IM staff will remain in federal service as a career

Additional Constraints on Federal CIOs Warrant Further Attention

Our interviews with federal CIOs and agency executives helped to highlight several aspects of the environment in which federal CIOs operate that are, in some respects, not common in private industry. In some cases, analogies do exist outside the federal sector, but it is important to understand these differences as contextual factors affecting the speed, pace, and direction of CIO integration in the federal government. As such, these factors may warrant further dialogue and empirical study. The outcomes of these discussions and reviews can form the basis for a

constructive dialogue between the Congress and the executive branch on future revisions to IT management statutes and executive branch policies.

- First, senior executive management in the federal sector can differ significantly from the private sector. The agency head and other top executives are political appointees who are often more focused on national policy issues than building capabilities essential for achieving the desired strategic and program outcomes. This can deny the CIO the CEO-level support that is so critical for the successful integration of IM into the core business or mission functions. The Clinger-Cohen Act addresses this situation by holding the agency heads accountable for IT and requiring the CIOs to work with other executives in the management of their agencies' information resources.

- Second, the federal budget process can create funding challenges for the federal CIO that are not found in the private sector. For example, certain information projects may be mandated or legislated, so the CIO does not have the flexibility to decide whether to pursue them. This ties up IT investment funds that might otherwise have been spent on other priorities. Additionally, the annual budget cycle of the federal government creates a great deal of uncertainty in funding levels available year-to-year, particularly when IT dollars are part of overall agency discretionary spending. The multitude of players in the budget process can also lead to unexpected changes in funding and the loss of the connection between budget and achievement of agency mission. This can create dynamic decision-making challenges for long-term investment strategies. Further, IT funds are often contained within the appropriations for a specific program, making them less visible. As a result, the CIO may not have control or direct oversight of key parts of the IT funding within the agency. The Clinger-Cohen Act addresses this by requiring fact-based decision-making for project initiation and control. OMB is charged with reviewing the decision support and inspecting the link between budget proposal and expected performance outcomes.

- Third, human capital decisions in the federal sector are often constrained relative to the flexibility found elsewhere. Current federal IM job descriptions do not match the occupations recognized in the IM industry today. Funds for skill refreshment are often among the first to be scaled back in across-the-board budget cuts. The Office of Personnel Management has also found IM salaries in the federal government to be lower than in the private sector and incentives available in the private sector do not exist in the federal government.

- Fourth, the federal CIO may direct an organization without the full range of functional responsibilities that would typically be a CIO's responsibility in the private sector. For example, some federal CIOs are in charge of larger policy and oversight functions with little operational responsibility. While this may be an appropriate model for some agencies, it is critical that any model be matched with the overall needs of the agency and legislative responsibilities in mind.

- Fifth, the range of responsibilities, as defined by legislation, that accrue to the CIO are very broad in the federal sector, including areas like records management, paperwork burden reduction and clearance, and Freedom of Information Act requirements, for which there is little parallel in the private sector. While federal CIOs often may not have the operational responsibility for the full range of activities covered in legislation, they are charged with ensuring that these functions are effectively performed.

Leadership turnover; shifts in business direction, priorities, and emphasis; changing funding levels; and human capital issues are real issues in all organizations—public and private. As such, these constraints should not be viewed as reasons for why the federal CIO cannot be successful. Instead, these constraints should be recognized and anticipated so that effective management approaches can be put in place to mitigate risks and address accountability.

Concluding Remarks

Mr. Chairman, as the federal government moves to fully embrace the digital age and focuses on electronic government initiatives, leadership in the management of the government's information resources is of paramount importance. Yet, as our study shows, as a single individual, a CIO cannot ensure the successful implementation of information management reforms. Rather, the CIO must be buttressed by the full support of agency heads, the commitment of line managers, clearly defined roles and responsibilities, effective measures of performance, highly skilled and motivated IT professionals, and a range of other factors.

The practices and key characteristics defined in our CIO guide can put agencies on the right path toward incorporating these ingredients. Moreover, they can help agencies and their CIOs to identify and correct underlying IM weaknesses that have undermined their modernization initiatives. They can even help ensure that agencies will be well positioned to take advantage of cutting-edge technologies in order to transform service delivery and performance. However, implementing the practices alone is not enough. To achieve real success, agency executives as well as the Congress must provide sustained support and attention to facilitating

CIO effectiveness and addressing any structural challenges facing CIOs. Using this support, CIOs themselves must be now focused on results—making sure that IT investments make their agencies more innovative, efficient, and responsive.

Mr. Chairman, this completes my statement. I would be happy to answer any questions that you or Members of the Subcommittee may have.

Contact and Acknowledgments

For future contacts regarding this testimony, please contact David L. McClure at (202) 512-6257. Individuals making key contributions to this testimony included Cristina Chaplain, Lester Diamond, Tamra Goldstein, Sondra McCauley, Tom Noone, and Tomas Ramirez.

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Mr. HORN. The document that I have been thumbing my fingers through looks like a very thorough job, and I believe you might have a best-seller at the Government Printing Office.

Next is Mr. Jim Flyzik, Chief Information Officer, Department of the Treasury, and vice chairman of the CIO Council. Mr. Flyzik.

STATEMENT OF JIM FLYZIK, CHIEF INFORMATION OFFICER, DEPARTMENT OF THE TREASURY, VICE CHAIRMAN, CIO COUNCIL

Mr. FLYZIK. Mr. Chairman and members of the subcommittee, I appreciate the opportunity to discuss the role of the chief information officer in the public and private sectors. First I want to thank the chairman and other members of this subcommittee for your continued support and encouragement toward the improvement of information technology performance and accountability in the Federal Government.

As many of you know, I serve as the Deputy Assistant Secretary for Information Systems and Chief Information Officer for the Treasury Department. In this role I recognize I provide strategic direction and oversight for all information technology programs within the Treasury Department and its 14 bureaus. Since February 1998, I have served as the vice chair of the Federal CIO Council, where I play a key role in the strategic direction of the Council and the Federal Government's use of information technology.

Today I would like to focus my comments on three issues: the evolution of the CIO in the Federal Government, some differences between the public and private sector CIO roles, and key challenges facing Federal CIOs.

The role of the CIO in public sector is evolving through various stages. In the first stage the role was ill-defined, and the CIO was thought of as a technician and then perhaps as an adjunct to the CFO. As a result of the Clinger-Cohen Act, the work of the Federal CIO Council, the growth of the Internet, e-commerce, and the success in addressing the Y2K problem, the CIO is now progressing toward a business partner and a peer with senior management.

CIOs were able to demonstrate their value and the value of technology to their organizations while addressing the serious issues involved with Y2K. In the private sector many CIOs have evolved into a chief technology officer, working side by side with the CEO, as evidenced by the many dot-com organizations. The public sector CIO has not yet reached this level of influence. As my colleague, the Associate Director of the GAO, has testified, most business decisions today involve technology. The CIO should be positioned at the table with the CEO, chief operating officer, and CFO where he can work as a team with senior management. It is critical that the CIO be involved in agency budget and resource allocation decisions. If CIOs are to be held responsible and accountable for results, they will need the authority to influence resource decisions. At Treasury I am fortunate to have an excellent working relationship with the CFO and other senior officials, which allows me to be involved in all investment decisions.

There is also a disparity from agency to agency in the organizational placement and authority of the CIO. Regardless of the orga-

nization placement, however, CIOs must demonstrate value and earn credibility to be effective.

Although many of the key IT challenges within the public and private sector are similar, there are several areas where they differ. As public employees, we must abide by statutory and regulatory requirements unique to the Federal Government. We agree that these requirements are important and necessary to guarantee the integrity of our actions for our citizens, but we must also recognize that they impose restraints on our ability to procure products and services, recruit IT professionals, and quickly make resource adjustments to meet dynamic market priorities. Let me explain.

The public sector cannot compensate IT professionals at the same level as the private sector. We are constrained in hiring young IT professionals at entry levels competitive with the private sector. The private sector can recruit based on talent and based on market conditions. We also have a difficult time justifying promotions based on specialized technical skills. The Federal CIO Council is working closely with the Office of Personnel Management to address these concerns.

Private sector CIOs can work directly with their CEO to make immediate decisions on resource allocation and procurement priorities to meet changing market drivers. Public sector CIOs must plan well in advance and work through various layers of government to achieve such change.

Another concern is difficulty of the government to fund interagency and intergovernmental IT programs. Although the business cases for governmentwide efforts are compelling, the current appropriations processes make funding such projects problematic. The current "passing of the hat" approach to interagency project funding is not a viable long-term solution. The Federal CIO Council is working with OMB, the CFO Council, and other governmentwide groups to identify possible strategies to address this matter.

CIOs in the public sector also carry unique responsibilities to set information policies within their agencies and comply with governmentwide policies. The public sector CIO must find ways to reduce paperwork burdens on the public, adopt sound records management programs, and disseminate government information.

Last, I would like to mention some challenges facing Federal CIOs. There have been several studies focusing on these challenges. I had the opportunity to participate in many of these studies, including the fine work done by GAO in the report they are releasing at this hearing today. Some challenges CIOs face include taking advantage of rapidly evolving technology to make the government more effective, hiring and retaining skilled IT professionals in the government, assuring information system security and privacy in preventing unauthorized system intrusions, obtaining adequate funding particularly for interagency and intergovernmental programs, and empowering the CIO as a key decisionmaker and ensuring that we cost-effectively apply technology through such processes as IT capital planning and investment management within the agency.

In summary, I would like to reiterate that the position of the CIO is evolving in a positive direction. I believe the Y2K success, the Internet, e-commerce, and other industry trends are creating a

heightened awareness of the importance of information technology. This heightened awareness will accelerate the evolution of the Federal CIO consistent with the experiences in the private sector. It will also result in the true implementation of all provisions of the Clinger-Cohen Act.

I would like to thank the subcommittee for the support it has given to the work of the Federal CIO Council. Without your support, we would not have been able to achieve the national success we enjoyed with Y2K. I would also like to express my appreciation and commend GAO for the excellent work they are doing in this area. I would like to thank the members of the subcommittee for the opportunity to present to you this morning.

Mr. Chairman, this concludes my formal remarks, and I would be happy to respond to questions.

Mr. HORN. Thank you, Mr. Flyzik. That is helpful testimony from the firing line.

[The prepared statement of Mr. Flyzik follows:]

TEXT AS PREPARED FOR DELIVERY

March 24, 2000

TREASURY DEPUTY ASSISTANT SECRETARY (INFORMATION SYSTEMS) AND CHIEF INFORMATION OFFICER (CIO) TESTIMONY BEFORE THE HOUSE SUBCOMMITTEE ON GOVERNMENT MANAGEMENT, INFORMATION AND TECHNOLOGY

Mr. Chairman and members of the Subcommittee, I appreciate the opportunity to appear today to discuss the role of the Chief Information Officer in the public and private sectors. First, I want to thank the Chairman and the other members of the Subcommittee for your continued support and encouragement toward the improvement of information technology performance and accountability in the Federal Government.

As many of you know, I serve as the Deputy Assistant Secretary for Information Systems and Chief Information Officer for the Treasury Department. In this role, I provide strategic direction and oversight for all information technology programs within the Treasury Department and its fourteen Bureaus. Since February of 1998, I have served as the Vice Chair of the Federal CIO Council where I play a key role in the strategic direction of the Council and the Federal Government's use of information technology.

Today, I would like to focus my comments on three issues: the evolution of the CIO in the federal government, some differences between the public and private sector CIO roles, and key challenges facing CIO's.

THE EVOLUTION OF THE CIO IN THE PUBLIC SECTOR

The role of the CIO in public sector is evolving through various stages. In the first stage, the role was ill defined and the CIO was thought of as a technician and then as an adjunct to the Chief Financial Officer (CFO). As a result of the Clinger-Cohen legislation, the work of the Federal CIO Council, the growth of the Internet, E-Commerce, and the success in addressing the Year 2K problem, the CIO is progressing towards a business partner and a peer with senior management. CIO's were able to demonstrate their value and the value of technology to their organizations while addressing the serious issues involved with Year 2K. In the private sector, many CIO's have evolved into a Chief Technology Officer working side-by-side with the CEO, as evidenced by the many .com organizations. The public sector CIO has not yet reached this level of influence.

As my colleague, the Associate Director of the U.S. General Accounting Office will attest, most business decisions today involve technology. The CIO should be positioned at the table with the CEO, COO and CFO where he or she can work as a team with senior management. It is critical that the CIO be involved in agency budget and resource allocation decisions. If CIO's are to be held responsible and accountable for results, they will need the authority to influence resource decisions. At Treasury, I am fortunate to

have an excellent working relationship with the CFO, so I am involved in all investment decisions.

There is a disparity from agency to agency in the organizational placement and authority of the CIO. Regardless of organizational placement, CIO's must demonstrate value and earn credibility to be effective. In Treasury, I enjoy a strong working relationship between the CIO, CFO and other senior officials.

DIFFERENCES BETWEEN PUBLIC AND PRIVATE SECTOR CIO's

Although many of the key IT challenges within the public and private sector are similar, there are several areas where they differ. As public employees we must abide by statutory and regulatory requirements unique to the Federal Government. We agree that these requirements are important and necessary to guarantee the integrity of our actions for our citizens but we must also recognize that they impose constraints in our ability to procure products and services, recruit IT professionals, and quickly make resource adjustments to meet dynamic market priorities. Let me explain.

The public sector cannot compensate IT professionals at the same level as the private sector. We are constrained in hiring young IT professionals at entry levels competitive with the private sector. The private sector can recruit based on talent and compensate based on market conditions. We also have a difficult time justifying promotions based

on specialized technical skills. The Federal CIO Council is working closely with the Office of Personnel Management to address these concerns.

Private sector CIO's can work directly with their CEO's to make immediate decisions on resource allocations and procurement priorities to meet changing market drivers. Public sector CIO's must plan well in advance and work through various layers of Government to achieve such change.

Another concern is the difficulty of the government to fund interagency and intergovernmental IT projects. Although the business cases for government wide efforts are compelling, the current appropriations processes make funding such projects problematic. The current "passing of the hat" approach to interagency project funding is not a viable long-term solution. The Federal CIO Council is working with OMB, the CFO Council and the other government wide groups to identify possible strategies to address this matter.

CIO's in the public sector also carry unique responsibilities to set information policies within their agencies and comply with government wide policies. The public sector CIO must find ways to reduce paperwork burdens on the public, adopt sound records management programs for historical archiving and disseminate government information.

KEY CHALLENGES FACING CIO's

Lastly, I would like to mention some challenges facing Federal CIO's. There have been several studies focusing on the challenges facing CIO's today. I had the opportunity to participate in many of these studies including the fine work done by GAO in the report they are releasing at this Hearing today. Challenges CIO's face include:

1. Taking advantage of rapidly evolving technology to make government more effective.
2. Hiring and retaining skilled IT professionals.
3. Assuring information systems security and privacy and preventing unauthorized system intrusions.
4. Obtaining adequate funding, particularly for interagency projects
5. Empowering the CIO as a key decision maker and ensuring that we cost effectively apply technology through such processes as IT capital planning and investment management within the agency

SUMMARY

In summary, I would like to reiterate that the position of the CIO is evolving in a positive direction. I believe the Year 2K success, the Internet, E-Commerce and other industry

trends are creating a heightened awareness of the importance of IT. This heightened awareness will accelerate the evolution of the federal CIO consistent with the experience in the private sector. It will also result in the true implementation of provisions of the Clinger-Cohen legislation.

I would like to thank the subcommittee for the support it has given to the work of the Federal CIO Council. Without your support we would not have been able to achieve the National success we enjoyed with Y2K. I would also like to express my appreciation and commend GAO for the excellent work they are doing in this area. I would like to thank the members of the Subcommittee for the opportunity to present this morning. Mr. Chairman, this concludes my formal remarks and I would be happy to respond to any questions.

Mr. HORN. Next is Mr. Otto Doll, the Commissioner of the Bureau of Information and Technology, the State of South Dakota, and president of the National Association of State Information Resource Executives.

Mr. Doll, we are delighted to have you with us.

STATEMENT OF OTTO DOLL, COMMISSIONER, BUREAU OF INFORMATION AND TECHNOLOGY, STATE OF ARIZONA, PRESIDENT, NATIONAL ASSOCIATION OF STATE INFORMATION RESOURCE EXECUTIVES

Mr. DOLL. Thank you, Mr. Chairman and members of the subcommittee. I appreciate the opportunity this morning to share the State's insight into the dynamics of the CIO-Governor relationship that has evolved over the last few years. Public sector CIOs can be of vital importance to our public leaders' decisionmaking on matters of governance. The proper alignment of information technology to government programs is a key enabler of effective government. A CIO who can support the chief executive's vision, whether of a mayor, Governor or the President, facilitates the achievement of government's goals.

To achieve effective use of IT, the States have been gravitating to CIOs reporting to the Governor. NASIRE's survey shows 27 CIOs currently report to a Governor, up from 8 in 1996. A Cabinet-level reporting relationship appears critically important. Technology has become too important to the business of government today. IT is how business is delivered in government; therefore, the CIO must be a party to the highest level of business decisions. This is consistent with private sector's direction as shown by companies such as General Motors, whose CIO is at the board of directors level.

Three variations on this CIO structure currently exist in State government today where the CIO reports to a Governor without an advisory board, to a Governor after consulting with an advisory board, or to a governing board and then to the Governor.

NASIRE's survey also shows 29 States have some sort of technology commission in a supporting or oversight role. Separating technology from government programs seems impossible today.

State CIOs are responsible for leading the Governor's visions and goals into action. As such, the CIO needs to inspire the leaders to dedicate political capital to the IT agenda. One powerful dynamic of IT, whether a State is driven by education, criminal justice, economic development or whatever, IT can enable any of them.

State CIOs' scope of authority is primarily confined to the executive branch of government, but has expanded in many States to the educational systems, some into the judicial branch, and a few into the legislative branch. Based on objectives set by the Governors of the State, CIOs develop a process whereby each agency is learning within the constructs of their organization the breadth of the organizational information in a statewide sense while working toward these common objectives. The larger the enterprise view and responsibilities of the CIO, the better the IT solutions Government achieves.

Functional authority of the State CIO is concentrated in enterprisewide hardware and software systems as opposed to the

desktop world of personal computing, examples being telecommunications networks, large data processing centers, large information centers, data warehouses, and public access facilities.

CIOs are gaining authority over IT purchasing and acquisitions, IT facilities, IT personnel, and office automation. By combining managerial and technical knowledge, the State CIO can contribute significantly by bringing to government economies and efficiencies of scale in procurement, interoperability of systems, elimination of duplicative processes, data-sharing capabilities, and security in privacy.

State CIOs' scope of approval authority is usually overseeing of statewide IT plans and policies; approving statewide technical IT standards, rate schedules, budgets, personnel classifications, and salaries and resource acquisitions. CIOs are being asked to improve individual departmental IT rate schedules, personnel classifications, and resource acquisitions.

Many States are considering their CIOs for operational control of IT assets. The CIO is then in the best position to ensure that IT investments are meeting the Governor's policy objectives. This approach matches the private sector where CIOs generally have budget and operational authority.

NASIRE's survey showed that 30 State CIOs have responsibility in at least three of the following four categories: planning, policy, standards, and acquisitions. Some 25 percent of CIOs have minimum dollar thresholds on their scope of authority. Successful State CIOs spend most of their time offering perspective, context, and direction to both technology and program personnel. Considering the considerable size and rate of growth of IT expenditures by government, the CIO must advocate the wise deployment and use of IT resources to solve business problems or to capitalize on opportunities.

Several elements have been found to contribute to successful Governor-CIO approaches. Shared IT vision by both the Governor and CIOs sets appropriate expectations of what technology can and cannot do. Strong accountability begets trust, the capital of governance. Sufficient level of authority allows working across agency and jurisdictional boundaries. Good management skills allows the CIO to get technologists and program personnel to realize the IT vision. Balance of business and governance orientations allows appropriate use of business principles in a public sector context. And finally, the ability to function in public administration allows the CIO to be effective in the political and civil service spheres.

The State CIO also cooperates with local and Federal authorities, often serving as the facilitator of multijurisdictional initiatives. Governments see the value of sharing information, such as law enforcement has seen for many years, and integrating their processes in digital government is enabling, as is sharing IT infrastructure such as networks. Having a key authority figure in the CIO allows States to better coordinate resources across local, State, and Federal Government for the complex information systems required to solve the governance of today.

The Y2K issue provided unique insight on the importance of the CIO position in government. Y2K presented the most extensive IT initiative ever undertaken, with coordination being required be-

tween governments, businesses, and the public. All aspects of IT were affected. Dealing with such a massive project showed that we cannot rely on the stovepipe models of the past. Until Governors took ownership of the Y2K problem through their CIOs and the Federal Government took ownership through the President's appointment of John Koskinen, the proper coordination of policy and processes was not possible.

Mr. Koskinen, in essence, served as the CIO of the Federal Government. He brought accountability and action to bear on the Y2K challenge, just as the State CIOs were doing in the States, as were many county and city CIOs across the country. Mr. Koskinen aligned the numerous Federal agencies and provided a single point of contact for the States, just as the State CIOs were providing a single point of contact between the myriad of State agencies and the Federal Government.

Why not have the structure in place to deal with nationwide law enforcement standardization, digital government initiatives, digital divide solutions, et cetera? In the increasingly technology-reliant world we live in, the CIO serves as the government's information management leader and key strategist to the decision points facing our political leaders. The role of aligning technology to achieve government program goals has never been so crucial to effective government. The CIO plays an essential role for making information technology work for government.

Again, I appreciate the opportunity to share our thoughts and look forward to your questions.

Mr. HORN. Well, thank you very much, Mr. Doll. That is very helpful information.

[The prepared statement of Mr. Doll follows:]

NASIRE

Representing Chief Information Officers of the States

Memorandum

From: Chris Walls, NASIRE Project Coordinator

Date: March 21, 2000

RE: Testimony of Otto Doll, President, NASIRE

Attached is the testimony of NASIRE President Otto Doll to the U.S. House of Representatives Subcommittee on Government Management, Information and Technology.

Please contact Chris Walls, NASIRE Project Coordinator, at (606) 514-9174 if you have any questions.

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STATEMENT OF OTTO DOLL
PRESIDENT, NASIRE – REPRESENTING
CHIEF INFORMATION OFFICERS OF THE STATES
BEFORE THE
UNITED STATES CONGRESS -
SUBCOMMITTEE ON GOVERNMENT
MANAGEMENT, INFORMATION, AND TECHNOLOGY

MARCH 24, 2000

Executive Summary

Public sector Chief Information Officers (CIO) can be vital to our public leaders' decision-making on matters of governance. The proper alignment of information technology (IT) to government programs is a key enabler of effective government. A CIO who can support the chief executive's vision — whether of a mayor, governor or the president — facilitates the achievement of government's goals.

To achieve effective use of IT, the states have been gravitating to CIOs reporting to the governor. A survey conducted by NASIRE in February 2000 shows that 27 CIOs report to their governors — up from eight in 1996 (see Exhibits I and II). A cabinet-level reporting relationship appears critically important. Technology has become too important to the business of government today. IT is how business is delivered in government; therefore, the CIO must be a party to the highest level of business decisions. This is consistent with private industry's direction as shown by such companies as General Motors, whose CIO is at the board of directors level.

Three variations on this CIO structure exist in state government today: the CIO reports to the governor without an advisory board; the CIO reports to the governor after consulting an advisory board; or the CIO reports to a governing board and then to the governor. The NASIRE survey shows 29 states have some sort of technology commission in a supporting or oversight role.

Separating technology from government programs seems impossible today. State CIOs are responsible for putting their governors' visions and goals into action. As such, a CIO needs to inspire the leaders to dedicate political capital to the IT agenda. One powerful dynamic of IT is that it can enable all government services and initiatives - education, criminal justice, economic development, etc.

State CIO scope of authority is primarily confined to the executive branch of government but has expanded in many states to educational systems, the judicial branch, and to a lesser extent the legislative branch. Based on objectives set by the governor, the state CIO develops a process whereby each agency is learning, within the constructs of their own organization, the breadth of organizational information in a statewide sense while working toward these common objectives. The larger the enterprise view and responsibility of the CIO, the better IT solutions a government achieves.

Functional authority of the state CIO is concentrated in enterprise-wide hardware and software systems (as opposed to the desktop world of personal computers) — examples being telecommunications networks, large data processing centers, large information systems, data warehouses, and public access facilities. CIOs are gaining authority over IT purchasing and acquisitions, IT facilities, IT personnel, and office automation. By combining managerial and technical knowledge, the state CIO can contribute significantly by bringing to government economies and efficiencies of scale in procurement, interoperability of systems, elimination of duplicative processes, data-sharing capabilities, and security and privacy.

State CIO scope of approval authority is usually over the setting of statewide IT plans and policies and approving statewide technical IT standards, rate schedules (usually for shared IT services), budgets, personnel classifications, and salaries and resource acquisitions. CIOs are being asked to approve individual departmental IT rate schedules, personnel classifications, and resource acquisitions. Many states are considering their CIOs for operational control of IT assets. The CIO then is in the best position to ensure that IT investments are meeting the governor's policy goals. This approach matches the private sector where CIOs generally have budget and operational authority.

The NASIRE survey showed that 30 state CIOs have responsibility in at least three of the following four categories: planning, policy, standards and acquisitions. Some 25% of CIOs have minimum dollar thresholds on their authority.

Successful state CIOs spend most of their time offering perspective, context and direction to both technologists and program personnel. Considering the substantial size and rate of growth of IT expenditures by government, the CIO must advocate the wise deployment and use of IT resources to solve business problems or capitalize on opportunities.

Several elements have been found to contribute to successful governor-CIO approaches:

- **Shared IT vision** – by both the governor and the CIO – sets appropriate expectations of what technology can and cannot do;
- **Strong accountability** – begets trust – the capital of governance;
- **Sufficient level of authority** – allows working across agencies and jurisdictional boundaries;
- **Good management skills** – allows CIO to get technologists and program personnel to realize the IT vision;
- **Balance of business and governance orientations** – allows use of appropriate business principles in a public sector context; and
- **Ability to function in public administration** – allows CIO to be effective in the political and civil service spheres.

The state CIO also cooperates with local and federal authorities, often serving as the facilitator of cross-jurisdictional initiatives. Governments see the value of sharing information (as law enforcement has for many years), integrating their processes and

sharing IT infrastructure (such as networks). Having a key authority figure in the CIO allows states to better coordinate resources across local, state and federal government for the complex information systems required to solve the governance problems of today.

The Y2K issue provided unique insight on the importance of the CIO position in government. Y2K presented the most extensive IT initiative ever undertaken — with coordination being required between governments, business and the public. All aspects of IT were affected. Dealing with such a massive project showed that we cannot rely on the *stovepipe* models of the past.

Until governors took ownership of the Y2K problem through their CIOs and the federal government took ownership through the President's appointment of John Koskinen, the proper coordination of policy and processes was not possible. Mr. Koskinen, in essence, served as the CIO of the federal government. He brought accountability and action to bear on the Y2K challenge, just as the state CIOs were doing in the states (as were mayor, county, and city CIOs across the country). Mr. Koskinen aligned the numerous federal agencies and provided a single point of contact for the states, just as the state CIOs were providing a single point of contact between the myriad of state agencies and the federal government. Why not have this structure in place to deal with nationwide law enforcement standardization, digital government initiatives, digital divide solutions, and other IT challenges?

In the increasingly technology-reliant world we live in, the CIO serves as the government's information management leader and key strategist to the decision points facing our political leaders. The role of aligning technology to achieve government program goals has never been so crucial to effective government. The CIO plays an essential role in making information technology work for government.

The remainder of this white paper delves into the experiences of state CIO models to identify the elements contributing to successful governor-CIO approaches. The dynamics of state CIO models are shown through the scope of CIO authority and their roles and responsibilities. Finally, the lessons learned from state and federal interactions during the Y2K issue are examined to shed light on the federal CIO model.

CIO Models Used in the States

Six basic CIO structures exist which may be ranked very broadly on their relative "strength" as follows:

Reports to governor = strong (+)
Reports to department chief = weak (-)
Has no IT board = strong (+)
Has an advisory IT board = neutral (0)
Has a governing IT board = weak (-)

The resulting CIO models are:

++ reports to governor but no board (SD)
+0 reports to governor after consulting an advisory board (VA)
+- reports to a governing board and then the governor (NC)
-+ reports to department chief but no board (WI)
-0 reports to department chief after consulting an advisory board (SC)
-- reports to a governing board and then department chief (NH)
(analysis of the statutory language for SD, NC, WI and NH is in the Appendix)

A more complete accounting of authority would take into evaluation budgeting (submits directly/indirectly to governor/legislature or governing board), procurement (review/approval), and philosophical judgements such as having enterprise-wide authority, including oversight of educational systems, telecommunications networks, etc. Most states seem to be moving toward one of the top three "strong" positions listed above.

Exhibits I and II represent CIO organizational relationships with governors for 1996 and 2000. CIOs are moving closer to their governors. Every state has variations on the six categories.

Dynamics of State CIO Models

Scope of authority. CIO scope of authority is primarily in the executive branch only, but it has expanded in some states to educational systems, the judicial branch, and to a lesser extent the legislative branch. Functional authority is concentrated in enterprise-wide hardware and software systems (as opposed to the desktop world of personal computers), such as telecommunications networks, large data processing centers, large information systems, data warehouses, and public access facilities. CIOs are gaining authority over IT purchasing and acquisitions, IT facilities, IT personnel, and office automation. Approval authority scope is usually over the setting of statewide IT plans; setting of statewide IT policies; approval of statewide technical IT standards; approval of rate schedules for shared IT services; approval of IT budgets for statewide projects; approval of IT personnel classifications and salaries for statewide IT operations; and approval of IT

resource acquisitions for the statewide IT organizations. CIOs are moving into approving individual departmental rate schedules for IT, approving IT personnel classifications for individual departments, and approving IT resource acquisitions for the individual departments.

By combining managerial and technical knowledge, CIOs can contribute significantly, by bringing to government economies and efficiencies of scale in procurement, interoperability of systems, elimination of duplicative processes, data-sharing capabilities, and improvements in security. A common problem that CIOs face is the fragmentation in IT budgeting and the lack of overall budget authority. Many states still divide IT budgets by agency, even though total state IT spending represents a growing portion of state budgets (2-3% in most states).

Another obstacle facing state CIOs is the lack of operational control. A lack of operational control can ultimately result in the failure of the best budgeting strategies. Coordinated implementation is required to ensure that IT investments are meeting the governor's policy goals. In the private sector, CIOs generally have budget and operational authority.

A survey conducted by NASIRE in February 2000 showed that 30 CIOs have responsibility in at least three of the following four categories: planning, policy, standards, and acquisitions. Some 25% have minimum dollar thresholds on their authority.

CIO salary ranges also vary considerably. The lower end of the salary scale ranges from $61,000 to $80,000, and the higher end ranges from $91,000 to more than $100,000. The salary ranges generally reflect the CIO's position in state government. The lower range reflects primarily bureau- or sub-cabinet level positions; the higher range reflects primarily cabinet-level positions. However, these salary ranges are influenced by state demographics.

Roles and responsibilities. CIO roles and responsibilities can include: gaining legislative approval for IT appropriations and general legislative advocacy for IT; approval for all major IT projects; authority to enter into outsourcing arrangements; management of public access to state data; and translation of IT terminology for political appointees. CIOs are being given more authority for managing IT contracts; authority over the state purchasing function; authority to approve sole source IT contracts; responsibility for statewide process re-engineering; and, to a lesser degree, the responsibility for developing economic development policy using IT outside of government.

In almost half of the states, the CIO has responsibility for nearly all IT functions at the cabinet or sub-cabinet level, except for purchasing and contracting. At the bureau level, policy development, purchasing, contracting, business processes, and budget oversight are notably lacking among CIOs' responsibilities. Twenty-seven CIOs report directly to their governor. The others report to their administrative or financial department chief. Also, 29 states responding to NASIRE's February 2000 survey have some sort of IRM

commission in a supporting/oversight role. This seems to have no relationship to the CIO's position in the state hierarchy.

Elements Contributing to Successful Governor-CIO Approaches

Several elements can contribute to a successful governor-CIO approach to IT management:

- **Shared IT vision** – by both the governor and the CIO – sets appropriate expectations of what technology can and cannot do;
- **Strong accountability** – begets trust – the capital of governance;
- **Sufficient level of authority** – allows working across agencies and jurisdictional boundaries;
- **Good management skills** – allows CIO to get technologists and program personnel to realize the IT vision;
- **Balance of business and governance orientations** – allows use of appropriate business principles in a public sector context; and
- **Ability to function in public administration** – allows CIO to be effective in the political and civil service spheres.

Governors are creating environments that will maximize their CIO's ability to maintain the budget and operational controls necessary to achieve overall state IT goals.

Federal Y2K Experience

The Y2K issue provided unique insight on the importance of the CIO position in government. Y2K presented the most extensive IT initiative ever undertaken — with coordination being required between governments, business and the public. All aspects of IT were affected. Dealing with such a massive project showed that we cannot rely on the *stovepipe* models of the past.

Until Governor's took ownership of the Y2K problem through their CIOs and the federal government took ownership through the President's appointment of John Koskinen, the proper coordination of policy and processes was not possible. Mr. Koskinen, in essence, served as the CIO of the federal government. He brought accountability and action to bear on the Y2K challenge, just as the state CIOs were doing in the states (as were mayor, county, and city CIOs across the country). Mr. Koskinen aligned the numerous federal agencies and provided a single point of contact for the states, just as the state CIOs were providing a single point of contact between the myriad of state agencies and the federal government. Why not have this structure in place to deal with nationwide law enforcement standardization, digital government initiatives, digital divide solutions, and other IT challenges?

Exhibit I: State CIO Organizational Relationships *(2000)*

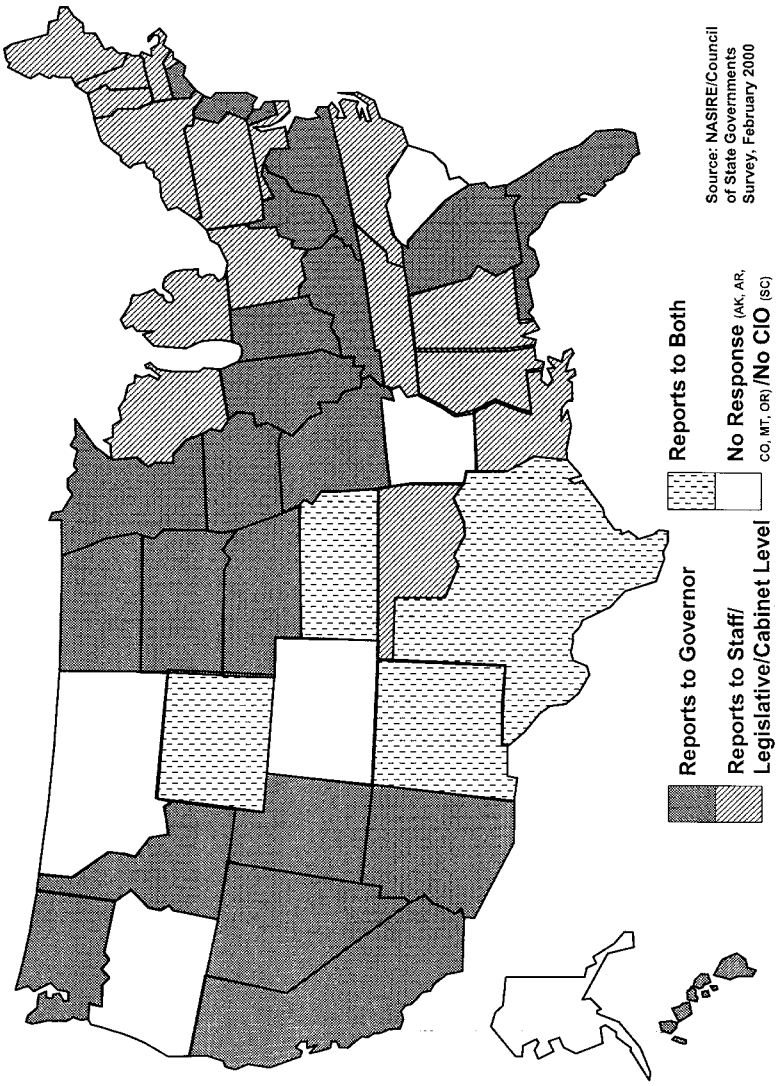
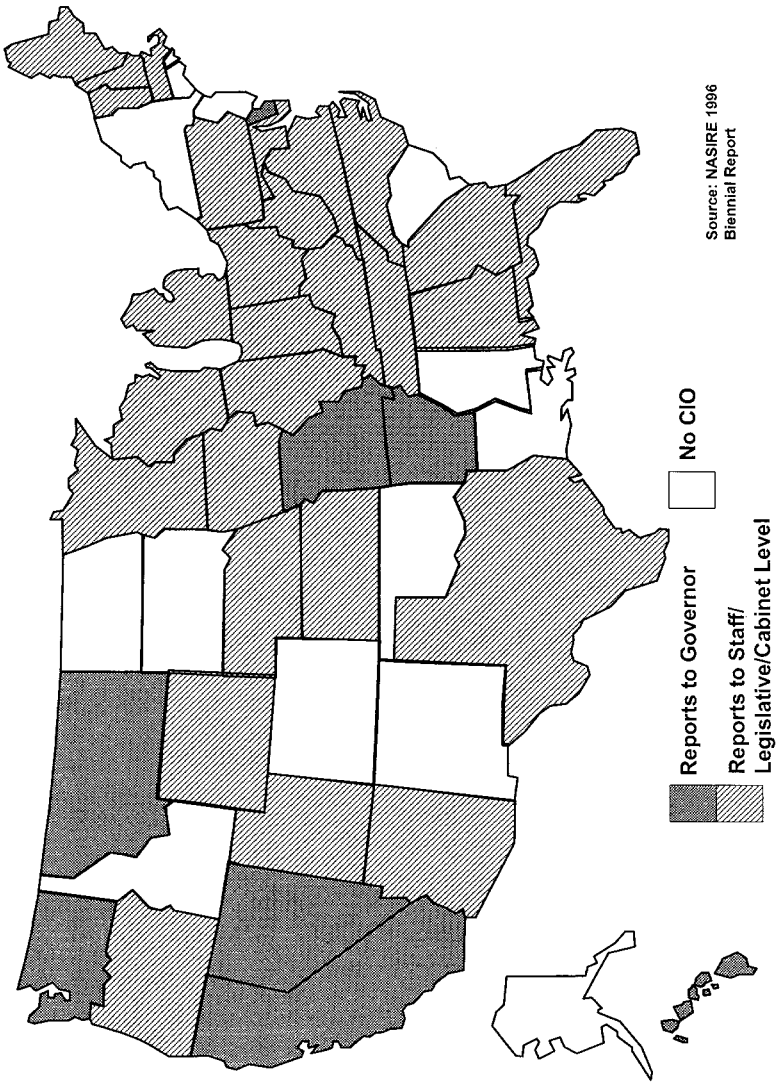


Exhibit II: State CIO Organizational Relationships *(1996)*



APPENDIX: The Role of the CIO

State Statutory Information

South Dakota: Cabinet level without a governing board
North Carolina: Sub-cabinet level with a governing board
Wisconsin: Bureau level without a governing board
New Hampshire: Information technology governing board

Commissioner
Bureau of Information and Telecommunications
(http://www.state.sd.us/bit/index.htm)
Office of Executive Management
State of South Dakota
(as of 03/20/00)

Statute	Language
1-33-2	Governor as head of office. The head of the office of executive management is the Governor.
1-33-3	Bureaus and other agencies constituting office. The Office of Executive Management consists of the Bureau of Finance and Management, the Bureau of Intergovernmental Relations, the Bureau of Administration, the Bureau of Personnel and the Bureau of Information and Telecommunications and any other agencies created by administrative action or law and placed under the Office of Executive Management.
1-33-37	Bureau of Information and Telecommunications created. There is hereby created within the Office of Executive Management the Bureau of Information and Telecommunications.
1-33-39	Appointment of commissioner of Bureau of Information and Telecommunications. The commissioner of the Bureau of Information and Telecommunications shall be appointed by, and serve at, the pleasure of the Governor.
1-33-40	Determining divisions within the Bureau of Information and Telecommunications. Divisions within the Bureau of Information and Telecommunications shall be determined by the commissioner.
1-33-41	Bureau of Information and Telecommunications authorized to contract with other state agencies. The Bureau of Information and Telecommunications may contract with other state agencies for administrative support, accounting, payroll and personnel services.
1-33-42	Definitions. Terms used in §§ 1-33-37 to 1-33-61, inclusive, unless the context otherwise plainly requires, mean: (1) "Data processing," any automated collection, storage, manipulation and retrieval of data including: central processing units for micro, mini and mainframe computers; any related peripheral equipment such as, but not limited to, terminals, document scanners, word processors, intelligent copiers, disk units, tape units, controllers, plotters, offline memory storage, printer devices and data transmission equipment; and any software such as, but not limited to, operating systems, teleprocessing monitors, data base monitors, library and maintenance routines and application programs. (2) "Office systems technology," office equipment such as typewriters, duplicating, photocopy and paper handling machines or equipment, micrographic equipment, and printing equipment and services. (3) "Services," the providing of consultant assistance for any aspect of information

	technology, to include data processing, office system technology and telecommunication systems and networks. (4) "Telecommunications," any transmission, emission or reception of signals of any kind containing communications of any nature, by wire, radio, optical or other electromagnetic means, including all facilities, equipment, supplies and services for transmission, emission or reception. Telecommunications does not include data processing services provided or authorized by the Bureau of Administration or Federal Communication Commission licensed facilities under the control of the South Dakota Board of Educational Telecommunications.
1-33-43	Functions of Bureau of Information and Telecommunications. The Bureau of Information and Telecommunications shall perform functions to include, but not be limited to: (1) Providing technical and management assistance to state agencies and institutions as to systems or methods to be used to meet information and communication requirements efficiently and effectively; (2) Developing and proposing operational technical standards for the state information systems which will ensure the interconnection of computer networks and information of state agencies; (3) Purchasing from, or contracting with, suppliers and communications common carriers for communications facilities or services; (4) Cooperating with any federal, state, or local emergency management agency in providing for emergency communication and information services; (5) Providing, where deemed feasible, a means whereby local governmental agencies, the association authorized by § 13-8-10.1, and the school administrators of South Dakota may utilize the state communication and information systems and service; and (6) In cooperation with the appropriate state agencies, plan, design, and conduct experiments in information services, equipment, and technology, and to implement enhancements in the state information system.
1-33-44	Installation of data processing, telecommunication and office equipment -- Approval of requests. The Bureau of Information and Telecommunications shall develop, install and direct office systems technology, software and services; telecommunication equipment, software and services; and data processing equipment, software and services to serve statewide needs. The Bureau of Information and Telecommunications may approve, disapprove or modify requests of departments, agencies, commissions, institutions, or any other units of state government which involve the acquisition by lease or purchase of any office systems technology, software and services; telecommunication equipment, software and services; and data processing equipment, software and services. The bureau shall take into consideration the unique needs of the separate legislative and judicial branches of government, the constitutional offices and the public utilities commission when evaluating requests for software acquisition. Nothing in this section may be construed to prevent the legislative and judicial branches of government, the constitutional offices and the public utilities commission from carrying out their separate functions or responsibilities.

1-33-45	Service agency for data processing -- Agreements with political subdivisions. The Bureau of Information and Telecommunications, at the direction and under the control of the Governor, and subject to the provisions of this chapter, shall develop and administer a service agency whose primary purpose shall be to serve statewide needs relating to automatic data processing services and to provide such services for any department, agency, commission, institution, or any other units of state government and for any of the political subdivisions of the state. The commissioner of information and telecommunications is hereby authorized to enter into agreements with any political subdivision for such purposes, and any political subdivision is hereby authorized to enter into such agreements for automatic data processing services.
1-33-46	Board of regents -- Joint exercise of power. To effectuate the purposes of this chapter, the South Dakota Board of Regents may provide and enter into an agreement for the joint exercise of governmental power with the Bureau of Information and Telecommunications.
1-33-47	Expenditures of appropriated moneys by board to acquire equipment -- Deposit in fund. Moneys appropriated to state boards, commissions, agencies and other instrumentalities for the purchase of equipment may be paid to the Bureau of Information and Telecommunication and expended by the bureau to acquire the equipment by purchase or by lease. Moneys so paid in any year but not required to be expended for lease purchase payments shall be deposited in a fund administered by the Bureau of Information and Telecommunication which shall be available for renewal and replacement of existing equipment. Any money in the fund is continuously appropriated for the purposes of §§ 1-33-47 and 1-33-48.
1-33-48	Commissioner allowed to enter into agreements to acquire equipment. The commissioner of information and telecommunication may enter into purchase or lease-purchase agreements providing for the acquisition of equipment for state boards, commissions, agencies and instrumentalities, and shall have all powers determined by the commissioner to be necessary to accomplish this purpose.
1-33-49	Rules and regulations by commissioner of information and telecommunications -- Administrative charges for contractual services. The commissioner of information and telecommunications is empowered and it shall be his duty, to prescribe regulations, not inconsistent with law for the government of his bureau, the distribution and performance of its business, and the custody, use, and preservation of records, papers, books, and property pertaining thereto and on such other subjects as the law may specifically authorize him to make regulations. The commissioner of information and telecommunications shall promulgate rules pursuant to chapter 1-26 to establish administrative charges for the contractual services authorized by § 1-33-38.
1-33-50	Internal service fund for data processing -- Use of revenues -- Maximum operating balance. There is hereby established in the state treasury a data processing internal service fund. Any receipts or revenues into said fund may be expended for the purpose of defraying the expenses of the data processing services provided by the service agency authorized by § 1-33-45. The fee schedule for services rendered by the service agency shall provide for a maximum operating balance of two months' average operating expenditures incurred by such operation. This average shall be calculated on

	an accrual basis and shall be double a moving monthly average of the twelve months' operating expenditures preceding the month of operation.
1-33-51	Service agency financed by internal service fund -- Fee schedule. The operations of the service agency shall be financed by means of appropriations, gifts, grants or reimbursements for services rendered which shall be receipted into the data processing internal service fund authorized and established in the state treasury by § 1-33-48. The fee schedule for such services shall be designed, to the extent practicable, to recover all costs incurred in the operation of the service agency.
1-33-56	1-33-56. Purchase of central processing unit authorized – Equipment reserve replacement account. The Legislature hereby declares that it is in the interest of the state to enter into an agreement to purchase a central processing unit for the state computer system. The bureau of information and telecommunications is hereby authorized to enter into an agreement to purchase on a sixty-month basis a central processing unit to provide the state with needed computer capacity. The data processing internal service fund established in the treasury is hereby divided into an administrative account and an equipment reserve replacement account. The fee schedule for the use of the equipment mentioned above shall be designed to the extent practicable to recover cost as if the equipment were under a regular lease agreement. The difference between such costs and the amount necessary to pay the purchase agreement shall be established in the equipment reserve replacement account to be used at a future date.
1-33-57	Functions, authorities and positions of the Office of Educational Telecommunications transferred. The functions, authorities and positions of the office of educational telecommunications, provided in chapter 13-47, are hereby transferred to the Bureau of Information and Telecommunications.
1-33-58	Commissioner of Bureau of Information and Telecommunications to perform functions of secretary of Department of Education and Cultural Affairs. The commissioner of information and telecommunications shall perform the functions of the secretary of the Department of Education and Cultural Affairs relating to the Office of Educational Telecommunications, provided in chapter 13-47. (See §§ 13-47-1 to 13-47-2 below.) 13-47-1. South Dakota Board of Directors for Educational Telecommunications created -- Composition and appointment of members. There is created the South Dakota Board of Directors for Educational Telecommunications, which shall consist of the commissioner of information and telecommunications or an authorized representative, the executive director of the Board of Regents or an authorized representative, a representative of the Bureau of Information and Telecommunications selected by the secretary, and six others appointed by the Governor with the advice and consent of the senate. At least one of the appointive members shall be representative of the nonpublic institutions of higher education in the state. The terms of the appointive members of the board shall be for a period of three years, two terms expiring each year. Not more than four of the appointive members may be from the same political party. 13-47-1.1. Board and facilities as educational telecommunications section. The board and all its facilities and functions comprise the educational

	telecommunications office of the bureau of information and telecommunications. 13-47-2. Function of board of directors. It shall be the function of the board to consider and establish policy for and exercise all necessary control over the state educational telecommunications network, and to carry out the duties imposed in this chapter, or as otherwise authorized and assigned to said board by law.
1-33-59	1-33-59. Functions, authorities and positions of Office of Rural Development Telecommunications Network transferred. The functions, authorities and positions of the Office of Rural Development Telecommunications Network, pursuant to chapter 1-33 are hereby transferred to the Bureau of Information and Telecommunications. (See § 1-33-26 below.) 1-33-26. Creation of Office of Rural Development Telecommunications Network -- Purposes. There is hereby created within the Bureau of Information and Telecommunications an Office of Rural Development Telecommunications Network for the purposes of advising the commissioner of information and telecommunications in identifying statewide video telecommunications network options, creating a telecommunications network, providing cost-effective services for education, government, business and rural economic development, ensuring network uses are consistent with the best interests of the state and network users. The Bureau of Information and Telecommunications shall establish policies and rules to implement the Rural Development Telecommunications Network.

Chief Information Officer
Office of Information Technology Services
(http://www.its.state.nc.us/)
Department of Commerce
State of North Carolina
(as of 03/20/00)

Statute	Language*
143B-472.40A	As used in this Part: (1) `Distributed information technology assets' means hardware, software, and communications equipment not classified as traditional mainframe-based items, including personal computers, local area networks (LANs), servers, mobile computers, peripheral equipment, and other related hardware and software items. (2) `Information technology' means electronic data processing goods and services and telecommunications goods and services, microprocessors, software, information processing, office systems, any services related to the foregoing, and consulting or other services for design or redesign of information technology supporting business processes. (3) `Information technology portfolio management' means a business-based approach for analyzing and ranking potential technology investments and selecting those investments that are the most cost-effective in supporting the strategic business and program objectives of the agency. (4) `Information technology enterprise management' means a method for managing distributed information technology assets from acquisition through retirement so that total ownership costs (purchase, operation, maintenance, disposal, etc.) are minimized while maximum benefits are realized. (5) `Office' means the Office of Information Technology Services as established in this Part.
143B-472.41	Information Resource Management Commission. (a) Creation; Membership. -- The Information Resource Management Commission is created in the Department of Commerce. The Commission consists of the following members: (1) Four members of the Council of State, appointed by the Governor. a) (Expires June 30, 2001.) The Secretary of State. (2) The Secretary of Administration. (3) The State Budget Officer. (4) Two members of the Governor's cabinet, appointed by the Governor. (5) One citizen of the State of North Carolina with a background in and familiarity with information systems or telecommunications, appointed by the General Assembly upon the recommendation of the President Pro

* All language (except § 143B-472.41) per Senate Bill 222, effective 01/01/00.

Tempore of the Senate in accordance with G.S. 120-121.

(6) One citizen of the State of North Carolina with a background in and familiarity with information systems or telecommunications, appointed by the General Assembly upon the recommendation of the Speaker of the House of Representatives in accordance with G.S. 120-121.

(7) The Chair of the Governor's Committee on Data Processing and Information Systems.

(8) The Chair of the State Information Processing Services Advisory Board.

(9) The Chair of the Criminal Justice Information Network Governing Board.

(10) (Expires June 30, 2001.) The State Controller.

(11) The Director of the Administrative Office of the Courts or the Director's designee. Members of the Commission shall not be employed by or serve on the board of directors or other corporate governing body of any information systems, computer hardware, computer software, or telecommunications vendor of goods and services to the State of North Carolina. The two initial cabinet members appointed by the Governor and the two initial citizen members appointed by the General Assembly shall each serve a term beginning September 1, 1992, and expiring on June 30, 1995. Thereafter, their successors shall be appointed for four-year terms, commencing July 1. Members of the Governor's cabinet shall be disqualified from completing a term of service of the Commission if they are no longer cabinet members. The appointees by the Governor from the Council of State shall each serve a term beginning on September 1, 1992, and expiring on June 30, 1993. Thereafter, their successors shall be appointed for four-year terms, commencing July 1. Members of the Council of State shall be disqualified from completing a term of service on the Commission if they are no longer members of the Council of State. Vacancies in the two legislative appointments shall be filled as provided in G.S. 120-122. The Commission chair shall be elected in the first meeting of each calendar year from among the appointees of the Governor from the Council of State and shall serve a term of one year. The Secretary of Commerce shall be secretary to the Commission. No member of the Information Resource Management Commission shall vote on an action affecting solely his or her own State agency.

(b) Powers and Duties. -- The Commission has the following powers and duties:

(1) To develop, approve, and publish a statewide information technology strategy covering the current and following biennium that shall be updated annually and shall be submitted to the General Assembly on the first day of each regular session.

(2) To develop, approve, and sponsor statewide technology initiatives and to report on those initiatives in the annual update of the statewide information technology strategy.

(3) To review and approve biennially the information technology plans of the executive agencies and the Administrative Office of the Courts. This review shall include plans for the procurement and use of personal computers and workstations.

	(4) To recommend to the Governor and the Office of State Budget and Management the relative priorities across executive agency and Administrative Office of the Courts information technology plans. (5) To establish a quality assurance policy for all agency information technology projects, information systems training programs, and information systems documentation. (6) To establish and enforce a quality review and expenditure review procedure for major agency information technology projects. (7) To review and approve expenditures from appropriations made to the Office of State Budget and Management for the purpose of creating a Computer Reserve Fund. (8) To develop and promote a policy and procedures for the fair and competitive procurement of information technology consistent with the rules of the Department of Administration and consistent with published industry standards for open systems that provide agencies with a vendor-neutral operating environment where different information technology hardware, software, and networks operate together easily and reliably. (c) Meetings. -- The Information Resources Management Commission shall adopt bylaws containing rules governing its meeting procedures. The Information Resources Management Commission shall meet at least monthly.
143B-472.50	Office of Information Technology Services; State Chief Information Officer. (a) There is established the Office of Information Technology Services as a division of the Department of Commerce. The Office may also be referred to as `ITS'. (b) The Office of Information Technology Services shall be managed and administered by the State Chief Information Officer who shall be appointed by the Secretary of Commerce. The State Chief Information Officer shall report to the Secretary.
143B-472.51	Powers and duties of Office of Information Technology Services. (a) The Office of Information Technology Services has the following powers and duties: (1) Procure all information technology for State agencies, except The University of North Carolina and its constituent institutions. (2) Submit for approval of the Information Resources Management Commission all rates and fees for common, shared State government-wide technology services provided by the Office. (3) Submit for approval of the Information Resources Management Commission recommended State government-wide, enterprise-level policies for information technology. (4) Develop standards, procedures, and processes to implement policies approved by the Information Resources Management Commission. (5) Assure that State agencies implement and manage information technology portfolio-based management of State information technology resources, in accordance with the direction set by the State Chief Information Officer. (6) Assure that State agencies implement and manage information technology

	enterprise management effort of State government, in accordance with the direction set by the State Chief Information Officer. (7) Provide recommendations to the Information Resources Management Commission for its biennial technology strategy and to develop State government-wide technology initiatives to be approved by the Information Resources Management Commission. (8) Develop a project management, quality assurance, and architectural review process that adheres to the Information Resources Management Commission's certification program and portfolio-based management initiative. (9) Establish and utilize the Information Technology Management Advisory Council to consist of representatives from other State agencies to advise the Office on information technology business management and technology matters. (b) Other State agencies and local governmental entities may use the information technology programs, services, or contracts offered by the Office in accordance with the policies and rules adopted by the Information Resources Management Commission.
143B-472.52	Information technology portfolio-based management. (a) The purposes of information technology portfolio- based management are to: (1) Ensure agencies link agency information technology investments with business plans. (2) Facilitate risk assessment of information technology projects and investments. (3) Ensure agencies justify information technology investments on the basis of sound business cases. (4) Ensure agencies facilitate development and review of information technology performance related to business operations. (5) Identify projects that can cross agency and program lines in order to leverage resources. (6) Assist in State government-wide planning for common, shared information technology infrastructure. (b) The Office shall coordinate with the Office of State Budget and Management and the Office of State Planning to integrate agency strategic and business planning, technology planning and budgeting, and project expenditure processes into the Office's information technology portfolio-based management. The Office shall provide recommendations for agency annual budget requests for information technology investments, projects, and initiatives to the Office of State Budget and Management. (c) In cooperation with State agencies, the Office shall conduct and maintain a continuous inventory of each State agency's current and planned investments in information technology, a compilation of information about these assets, and the total life cycle cost of these assets. In implementing the provisions of this

	subsection, the Office shall submit State government-wide policies for review and approval to the Information Resources Management Commission. The Office shall consult with the Office of State Controller to establish and implement the State government-wide information technology inventory. The Office shall develop and implement State government-wide standards, processes, and procedures for the required inventory and for the management of the State government- wide information technology portfolio. State agencies shall participate in the information technology portfolio management and shall comply with the standards and processes established by the Office in accordance with this subsection. The provisions of this subsection shall not relieve any department, institution, or agency of the State government from accountability for equipment, materials, supplies, and tangible and intangible personal property under its control. (d) No State agency information technology project shall proceed without the prior certification by the Information Resources Management Commission of the project. The Information Resources Management Commission may establish thresholds at an agency level based on project cost, potential project risk, or agency size and budget.
143B-472.53	Enterprise management of information technology assets. (a) The purpose of enterprise management is to create a plan and implement a State government-wide approach for managing distributed information technology assets to minimize total life cycle costs of assets, defined as total ownership costs from acquisition through retirement, while realizing maximum benefits for transacting the State's business and delivering services to its citizens. (b) With input and recommendations from State agencies, the Office shall develop a plan for the State government-wide management of distributed information technology assets. The plan shall prescribe the State government-wide infrastructure and services for managing these assets. The plan shall be submitted to the Information Resources Management Commission for approval. (c) Upon receiving approval by the Information Resources Management Commission, the Office shall ensure agency implementation of the plan, including the development of appropriate standards, processes, and procedures. The implementation effort shall follow Information Resources Management Commission project reporting policies. State agencies must participate in the enterprise management of information technology assets and must comply with the standards and processes of the Office.
143B-472.54	Procurement of information technology. Notwithstanding any other provision of law, the Office shall procure all information technology for State agencies except The University of North Carolina and its constituent institutions. The Office shall integrate technological review, cost analysis, and procurement for all information technology needs of those State agencies in order to make procurement and implementation of technology more responsive, efficient, and cost-effective.
143B-427.67	Information technology reports. (a) The Office shall develop an annual budget for review and approval by the Information Resources Management Commission prior to April 1 of each year. A

	copy of the approved budget shall be submitted to the Joint Select Committee on Information Technology and the Fiscal Research Division. (b) The Office shall report to the Joint Select Committee on Information Technology and the Fiscal Research Division on the Office's Internal Service Fund on a quarterly basis, no later than the first day of the second month following the end of the quarter. The report shall include current cash balances, line item detail on expenditures from the previous quarter and anticipated expenditures for the upcoming quarter, projected year-end balance, and the status report on personnel position changes including new positions created and existing positions eliminated. The Office spending reports shall comply with the State Accounting System object codes.

Administrator
Division of Technology Management
(http://www.doa.state.wi.us/dtm/)
Department of Administration
State of Wisconsin
(as of 03/20/00)

Statute	Language
16.971	Responsibilities of department. (1) In this section: (a) "Division" means the division of technology management of the department. (b) "Small agency" means an agency having fewer than 50 authorized full-time equivalent positions. m) The department shall ensure that an adequate level of information technology services is made available to all agencies by providing systems analysis and application programming services to augment agency resources, as requested. The department shall also ensure that executive branch agencies make effective and efficient use of the information technology resources of the state. The department shall, in cooperation with agencies, establish policies, procedures and planning processes, for the administration of information technology services, which executive branch agencies shall follow. The policies, procedures and processes shall address the needs of agencies to carry out their functions. The department shall monitor adherence to these policies, procedures and processes. (2) The division shall: (a) Except as provided sub. (2m), review and approve, modify or reject all forms approved by a records and forms officer for jurisdiction, authority, standardization of design and non-duplication of existing forms. Unless the division rejects for cause or modifies the form within 20 working days after receipt, it is considered approved. The division's rejection of any form is appealable to the public records board. If the head of an agency certifies to the division that the form is needed on a temporary basis, approval by the division is not required. m) Make as cost effective as possible the procurement and use of forms by agencies. p) Prescribe a forms management program for agencies. (b) Develop and maintain information technology resource planning and budgeting techniques at all levels of state government. (c) Develop and maintain procedures to ensure information technology resource planning and sharing between executive branch agencies. The procedures shall ensure the interconnection of information technology resources of executive branch agencies, if interconnection is consistent with the strategic

	plans formulated under pars. (l) and (m). (d) Develop review and approval procedures which encourage timely and cost-effective hardware, software, and professional services acquisitions, and review and approve the acquisition of such items and services under those procedures. (e) Collect, analyze and interpret, in cooperation with agencies, that data necessary to assist the information technology resource planning needs of the governor and legislature. (f) Provide advice and assistance during budget preparation concerning information technology resource plans and capabilities. (g) Ensure that management reviews of information technology organizations are conducted. (h) Gather, interpret and disseminate information on new technological developments, management techniques and information technology resource capabilities and their possible effect on current and future management plans to all interested parties. (i) Ensure that a level of information technology services are provided to all agencies that are equitable in regard to resource availability, cost and performance. (j) Ensure that all executive branch agencies develop and operate with clear guidelines and standards in the areas of information technology systems development and that they employ good management practices and cost-benefit justifications. (k) Ensure that all state data processing facilities develop proper privacy and security procedures and safeguards. (l) Require each executive branch agency to adopt, revise biennially, and submit for its approval, a strategic plan for the utilization of information technology to carry out the functions of the agency. As a part of each plan, the division shall require each executive branch agency to address the business needs of the agency and to identify all proposed information technology development projects that serve those business needs, the priority for undertaking such projects and the justification for each project, including the anticipated benefits of the project. Each plan shall identify any changes in the functioning of the agency under the plan. The division shall consult with the joint committee on information policy in providing guidance for and scheduling of planning by executive branch agencies. m) No later than 60 days after enactment of each biennial budget act, require each executive branch agency that receives funding under that act for an information technology development project to file with the division an amendment to its strategic plan for the utilization of information technology under par. (L). The amendment shall identify each information technology development project for which funding is provided under that act and shall specify, in a form prescribed by the secretary, the benefits that the agency expects to realize from undertaking the project. (m) Assist in coordination and integration of the plans of executive branch

	agencies relating to information technology approved under par. (L) and, using these plans and the statewide long-range telecommunications plan under s. 16.99 (2) (a), formulate and revise biennially a consistent statewide strategic plan for the use and application of information technology. The division shall, no later than September 15 of each even-numbered year, submit the statewide strategic plan to the co-chairpersons of the joint committee on information technology and the governor. (n) Maintain an information technology resource center to provide appropriate technical assistance and training to small agencies.

Information Technology Management Board
Division of Information Technology Management
(http://www.state.nh.us/das/ditm/index.html)
Department of Administrative Services
State of New Hampshire
(as of 03/20/00)

Statute	Language
21-I:66	Definitions. – In this subdivision: I. "Director" means the director of information technology management. II. "Information technology" means the equipment and software used in electronic data processing and in voice and data communications. III. "Information technology management" means the management of the equipment, software, personnel, budgets, and other resources involved in the operation of electronic data processing and voice and data communications.
21-I:67	Division Established; Functions. – There is hereby established within the department a division of information technology management, which shall be under the supervision of a director of information technology management, who shall be responsible for the following: Providing technical information technology consultation to any agency which requests it, including technical advice during the development or acquisition of information systems. I. Monitoring technological trends and informing all state employees and officials about state of the art information systems and management techniques. II. Developing a formal information technology planning process for approving agency information technology plans. III. Preparing and maintaining a statewide information technology plan based upon agency data processing plans. IV. Reviewing, assessing, and approving the feasibility of agency plans, including cost estimates and impacts on other agencies. V. Developing those standards necessary to assure that hardware, software, and telecommunications systems acquired or developed by the state are as compatible among themselves and with existing state systems as is necessary and practical. VI. Providing training and educational programs to technicians and managers. VII. Monitoring and reporting to the governor and legislature on the effectiveness of the use of information technology resources and on statewide progress in implementing technology plans. VIII. Coordinating information technology development efforts that affect multiple agencies or other levels of government. IX. Assigning to the various data centers throughout the state the data processing operations service responsibilities for those state agencies which do not have

	access to a data center and which request to be provided with such a service. X. Developing in concert with the commissioner of administrative services and the budget director the capital and operating budget requests for implementing each agency's information technology plan, including, but not limited to, appropriate standards for the uniform presentation of the general budget requests. XI. Developing in concert with the director of plant and property management specifications for the procurement of computer equipment and software.
21-I:68	Director; Qualifications; Compensation. I. The commissioner of administrative services shall nominate a director of information technology management as provided in RSA 21-I:2, II. II. The director of the division shall be qualified by reason of education and experience. The director shall possess a broad working knowledge, with demonstrated expertise and proven organizational skills in the field of information technology management. III. The salary of the director of the division shall be as specified in RSA 94:1-a.
21-I:69	Special Duties. – In addition to the powers, duties, and functions otherwise vested in the director by RSA 21-I:67, the director shall: I. Develop and implement, subject to approval by the governor and the legislature, a long-range information technology plan for the state of New Hampshire. II. Report to the governor and to the legislature on January 1 of each year as to the progress made in implementing the state information technology plan. III. Act as chairman of the information technology management advisory board. IV. Establish technical committees to advise division staff in the development of technical standards, procedures, and processes.
21-I:70	Rulemaking. – Notwithstanding any other provision of law, the director shall have the authority to adopt rules, pursuant to RSA 541-A, and to enforce such rules. (See excerpts from § 541-A below.) 541-A:1 XV "Rule" means each regulation, standard or other statement of general applicability adopted by an agency to (a) implement, interpret or make specific a statute enforced or administered by such agency or (b) prescribe or interpret an agency policy, procedure or practice requirement binding on persons outside the agency, whether members of the general public or personnel in other agencies. The term does not include (a) internal memoranda which set policy applicable only to its own employees and which do not affect private rights or change the substance of rules binding upon the public, (b) informational pamphlets, letters or other explanatory material which refers to a statute or rule without affecting its substance or interpretation, (c) personnel records relating to the hiring, dismissal, promotion, or compensation of any public employee, or the disciplining of such employee, or the investigating of any charges against him, (d) declaratory rulings, or (e) forms.

	541-A:3 Procedure for Adoption of Rules. – Except for interim or emergency rules, an agency shall adopt a rule by: I. Filing a notice of the proposed rule under RSA 541-A:6, including a fiscal impact statement and a statement that the proposed rule does not violate the New Hampshire constitution, part I, article 28-a; II. Providing notice to occupational licensees or those who have made timely requests for notice as required by RSA 541-A:6, III; III. Filing the text of a proposed rule under RSA 541-A:10; IV. Holding a public hearing and receiving comments under RSA 541-A:11; V. Filing a final proposal under RSA 541-A:12; VI. Responding to the committee when required under RSA 541-A:13; and VII. Adopting and filing a final rule under RSA 541-A:14.
21-I:71	Information Technology Management Advisory Board. – There is hereby established the information technology management advisory board. I. The board shall advise the division on policy matters, strategic direction, and emerging trends in information technology, and shall review the information technology management office plan and state information technology plans. II. The board shall consist of the following members: (a) The director of the division of information technology management. (b) The commissioner of administrative services. (c) The commissioner of transportation. (d) The commissioner of health and human services. (e) The commissioner of safety. (f) The commissioner of revenue administration. (g) The legislative budget assistant. (h) Two heads of departments, appointed by the governor. (i) Two senior information technology executives from the private sector, appointed by the governor.
21-I:72	Technical Committees. – The director shall establish technical committees to advise the director of the division of information technology management and staff on technical issues. Each technical committee shall include personnel from all 3 branches of government who are expert in the specific issue that is the focus of the committee. These issues may include but are not limited to: I. Hardware, software, and telecommunications standards. II. Information technology planning process. III. Development of statewide policies and procedures. IV. Emerging Internet and "intranet", or limited network, technologies.

Mr. HORN. Next is Mr. Gerald J. Knutson, vice president, communications and information services, U.S. West.

STATEMENT OF GERALD J. KNUTSON, VICE PRESIDENT, COMMUNICATIONS AND INFORMATION SERVICES, U.S. WEST

Mr. KNUTSON. Mr. Chairman and members of the subcommittee, this is a unique opportunity for someone of the private sector to follow three distinguished gentlemen from the government sector in discussing this subject. I have had the opportunity in the past few weeks to review the GAO study, and was interviewed as part of an input group into the study. I had not really looked at it for some period of time, and then I was asked to prepare a written statement for this subcommittee, and I did do that. And then I went back and reviewed the final version of the document, and I was very surprised to see that the thoughts of the document paralleled the thoughts in my statement.

Rather than being redundant with what you have heard out of David and out of Jim from the public sector perspective and the CIO perspective, which he does very well, and Otto from the State perspective, I really do concur with the points that they have highlighted and emphasized. They are extremely important points, and I would like to touch on four points, somewhat redundant, but I think they merit some further clarification.

As was stated, the government spends about $40 billion annually on technology. In the private sector, we spend generally in the range of 5 to 10 percent of our company's revenue on technology investments. When we focus on spending these significant dollars, I think it is very, very important that the CIO is positioned properly. This has been the case for successful CIOs and successful companies in the private sector that the CIO does, in fact, become a significant member of the lead team and report directly into the CEO. That has been proposed, I know, in government, and it is working in various ways in the government, but until the CIO is recognized and given that authority and accountability across whatever organizational entity you are dealing with, it will be very difficult for that CIO to be successful.

It is also important then in that process that the CIO participate in setting the visions for the company or the organization and in establishing strategies that are business-oriented. I am assuming the business entity does, in fact, set strategies, and that they know what direction they are going to go moving forward, and that the CIO is an active participant, and, as a result of participating, has an ability to go back and create the necessary strategies and set the priorities in spending the very scarce dollars that are required to do the work in technology.

Another area that is very important is in the area of partnership. There must be established a mutual trust and confidence level between the CIO and the members of the lead team, and an ability to demonstrate that the CIO and the IM organization is able to deliver on their commitments and to be responsive to the needs of the business. What I have seen many times in the private sector is that you don't get that sense of trust and confidence between what the CIO is responsible for and the IM organization and what the leaders of the corporation or the lead executives would expect.

Another area is in sponsorship. The CIO cannot be successful as an entity unto himself. He is very dependent upon having very strong sponsorship from the business side that is driving the requirements, driving the priorities, providing the funds and the people to make it successful. In what I have witnessed with the government is that there is a tendency to throw the problem over the wall and expect the CIO to pick it up and run within the confines of the technology community to make it successful, and you don't see an equal partner that has skin in the action and that is really involved and committed in supporting and sponsoring the work. Unless you get that type of partnership and involvement out of your business partner, it will be impossible for the CIO to be successful.

The other area is in a partnership with the leader of the business entity or the government agency to help set the priorities and determine within the constraints of the budgets that are established, how they want to spend the funds and get the work done through the assistance of the CIO. But again, there has got to be very strong leadership from the business side supporting the CIO to make that successful.

The last thing which was mentioned by Jim, and that is just the nature of the government and how it operates. The difficulty in getting funding; oftentimes the lack of continuity in leadership and political appointments make it difficult for a CIO to be successful. You need almost 3 to 5 years of involvement in turning things around and migrating legacy applications into future technology solutions. With the structure of the government, that becomes very difficult. Anything that can be done to create some continuity over the lifetime of that CIO, would be tremendously helpful in making the CIO position successful.

With that I will be glad to answer any questions.

Mr. HORN. Thank you very much, Mr. Knutson. We appreciate having you here.

[The prepared statement of Knutson follows:]

Gerald J. Knutson
Vice President – Communications & Information Services
U S WEST

Jerry Knutson is vice president of Communications and Information Services for U S WEST Information Technologies. In this current position, his organization of 3000 people is responsible for the internal technology operational and service infrastructure supporting U S WEST.

Prior to his current assignment, Jerry was the CIO responsible for all technology business systems and computer operations supporting the U S WEST Directory business. In 1996, 1997 and 1998 his organization received the Yellow Page industry's APPY Award for Technology Innovation.

Knutson joined U S WEST as the executive director of Applications Development in 1988 and was assigned his current position in August, 1999. He has been a corporate officer for six years.

Before joining U S WEST, Knutson spent 21 years with IBM and was a director in information systems. He was responsible for the development and maintenance of IBM's field administrative systems, supporting marketing, service and finance for the entire United States market.

Knutson graduated from the University of South Carolina with a master's of science degree in mathematics. He received his undergraduate degree in mathematics from Augustana University in Sioux Falls, South Dakota.

In 1990, Knutson was awarded the Distinguished Performance in Software Maintenance Award by the Software Management Association.

He is co-chairman of the Private Sector Council's Information Management/ Technology Group supporting federal government technology activities and is a member of the Private Sector Council's Board of Directors.

Statement for the Subcommittee on Government Management, Information & Technology: March 24, 2000 CIO Oversight Hearing

After reviewing the GAO CIO Report and based upon my personal knowledge related to the responsibilities associated with the role of a CIO, the following thoughts summarize my perspective of this position and its responsibilities.

During my 34 year career in the Information Management field, I have learned and experienced what I feel are the major considerations contributing to a successful Chief Information Officer (CIO). The success factor has been substantiated through the delivery of many development projects of extensive size and scope involving millions of dollars and business survival implications. In addition, I have had organizations where significant production service level expectations have been realized through the operations of large, multi-million dollar business applications in both large centralized and decentralized data centers. These operations have reached "best in class" ratings in industry wide measurements and have resulted in a positive business perception of our organizational capabilities. Based upon my experiences, most successful, proven CIO's have had the following factors included in their personal and organizational focus.

- Position – It is essential that the CIO is in a structure directly reporting to the CEO or the top executive of the organizational entity. Financial and human resource technology investments are significant today and can not be successfully planned, allocated, expensed and value realized without top management support and commitment.

- Partnership – There must be mutual trust and confidence between the CIO and top level executives. This includes total partnership in developing strategies, making business impacting decisions and establishing both business and technical oriented directions. The CIO must establish a mutual trust, confidence relationship with the business functions and executives the IM organization supports.

- Business Sponsorship – The business entity needs to commit to long term support and investment. Both money and business unit resources are required to team and sponsor successful technology programs. Programs without significant sponsorship and commitment will fail. The CIO is the provider of solutions. The business must promote the introduction of technology, own the requirement and make technology a highly supported priority.

- Financial Management – The justification for technology programs/projects must be a shared business/CIO responsibility. The funding source and value benefactor is the business. The solution cost belongs to the CIO. Prioritization of competing programs/projects for constrained resources is the role of the business with CIO support. The CIO is responsible for

managing/reducing costs, delivering commitment and quality solutions. The CIO should be able to demonstrate the significant "value added" contributions that are provided through technology solutions and the IM organization.

- Architecture – The CIO needs to ensure that an architectural framework is defined and upgraded to current industry technology capabilities. All programs/projects should adhere to the disciplines outlined in the architecture. This includes the need to define specific platforms, data migrations, development considerations, standardization, reusability, operations and maintainability. The CIO needs the authority to prevent business entities from violating the architecture and bypassing the CIO's organization for alternative solutions.

- Development Methods – A disciplined, documented and trained set of development methods and procedures must be sponsored by the CIO. The CIO needs to demonstrate leadership and total commitment to these fundamental development building blocks.

- Project Management – The CIO must create an effective set of project management capabilities including project offices where appropriate and outstanding project managers. All programs/projects will succeed based upon the quality of project management within the CIO's organization. Qualified Project Managers accept total authority for all aspects of a project, covering all contributing factors to make the program/project successful.

- Quality Focus – The CIO understands the value of quality driven versus date driven deliverables. Along with sound development methods, significant investment in all phases of testing is essential. This includes testing for design, programming, functionality, business usability, performance, operational readiness and total end-to-end implications. A measurement system is necessary to ensure that the performance of the IM organization is continuously tested to focus on areas of improvement.

- Operational Readiness and Production Management – The CIO is responsible for the operations of all technology programs/projects. This includes the creation of operational methods and procedures documentation, back-up and recovery capabilities as well as security and disaster recovery considerations. Special focus on environmental change control, release and configuration management are mandatory managed processes.

- Production Management – The CIO should work with business clients to formulate service level agreements for all major technology solutions in operation. This creates business satisfaction measurements and drives continuous improvement in meeting business expectations.

- Maintenance – The CIO will establish a maintenance philosophy by which all production technical environments are managed. This includes identifying,

fixing problems and communicating service results with business partners. The formation of "help desks" and other operational service groups is the responsibility of the CIO.

- Vendor/Contract Management – Very significant expenditures for technology solutions (application software, hardware, operating system software, leases, maintenance requirements, networks, etc.) require the attention of the CIO. There should be a partnership with a procurement/contract organization to ensure competitive costs and product alternatives are considered and are within the defined technology guidelines established by the architecture.

- Personnel – Recruiting, staffing, training and retraining exceptional talent is another CIO leadership role. All success related to the above factors will be the direct result of people and their capabilities.

The CIO has an awesome responsibility in managing all of these factors. It is not a role that can be done by one individual alone, but must include significant business partnership/sponsorship and an exceptional organization of highly skilled technical resources. The CIO also needs sufficient time (3 to 5 years) to implement significant change in a business and an organization. Technology is complex and difficult to change without sustained focus and investment.

Gerald J. Knutson
V. P. Communications & Information Services
U S WEST

Mr. HORN. The next member from the private sector is Ms. Susan Krupa, the chief information officer of the Rowe Companies. You might tell us a little bit about the Rowe Companies. U.S. West we know about.

STATEMENT OF SUZANNE KRUPA, CHIEF INFORMATION OFFICER, THE ROWE COMPANIES

Ms. KRUPA. Thank you, Mr. Chairman and members of the subcommittee and the other attendees here today, for the opportunity to present before you my testimony of my experiences in the private sector as well as some of my experiences in the public sector.

The Rowe Companies is a five operating subsidiary firm. We are largely in the area of home furnishings manufacturing, which consists of Rowe Furniture, Mitchell Gold, and the Wexford Collection, which is a case goods company.

In some of the challenges of CIOs in trying to attract talent, I grapple with those same challenges, having my manufacturing facilities that I am charged with managing the staff there, both engineering and technology staff, in the remote areas of the country, which is difficult to attract talent. We also have two retail subsidiaries, which are Storehouse Furniture, which is a national furniture chain, and Home Elements, which is a mid-Atlantic/Southeast, moving into the Midwest, home furnishing store as well.

In my capacity at the Rowe Companies, Mr. Chairman, Mr. Birnbach is the chairman of the Rowe Companies, who I report directly to, and I state that here in this session just to emphasize the importance of the role of the CIO and where they need to report in the organization. I have direct responsibilities of reporting to the board of directors on a monthly or quarterly basis on the status of IT initiatives. These are mandates within the Rowe Companies.

In my past experience, just to emphasize that point again, I was the CIO of KPMG Barons Group, which is the international consulting firm of the U.S. Firm KPMG Peat Marwick. There I reported to the chairman of KPMG Barons Group. I was part of that executive management team, and it is critical in both public and private sector to have the technology position leveraged within the business organization.

Mr. Birnbach has made a commitment to proactively managing information systems rather than continually building upon the current systems investments in a reactionary manner. This approach positioned the systems to support the growing requirements and strategic direction of our business. He has charged me with creating an environment that includes both best business practices and technology talent in the furniture industry; that is, our industry. He has required me to capitalize on the synergies of the operating subsidiaries as well as exploit the advantages that are embedded in the autonomy of these operating subsidiaries, much like the disparate agencies—looking at Mr. Doll's testimony, he has disparate agencies to manage within State governments that have their very different requirements.

I am sure the public area of waste and waterworks, if you will, is very, very different than the financial offices. So I am charged with the responsibility of meeting with those business unit heads, if you will, or agency heads, in Mr. Doll's case, and helping them

in defining their requirements and finding where the opportunities are that we can leverage technology to help drive their business forward.

We are a service organization. Information technology is a service organization. The Federal Government is a service organization in much of what it provides to the citizens of this country. That defines the criticality of the chief information officer within the Federal Government as well as the private sector.

Some of the things that we at the Rowe Companies and my colleagues in the industry look at are a couple of terms that I would like to share with you today, and I hope that we take away and look in the Federal Government as a passionate vision and mission that we should move forward with in this century. The speed at which today's business environment is moving and changing demands that information systems are not only seen as operational tools, but as strategic systems that are employed to achieve competitive advantage. And yes, there is competitive advantage in the Federal Government.

In this century it is a requirement to utilize technology to operate a global business with speed, efficiency and information. In order to effectively accomplish this business requirement, our information system strategies must communicate, interface, share, and be sustainable. In looking forward at the dynamic and evolving picture of what business represents, what we do, who we are, and where we are heading, we must continually ask ourselves what constitutes our core business. With that can be a process, our intellectual capital or property or business design. Nonetheless, it must always be aligned to where the market is, and that is directly translatable in the Federal Government. It must be aligned to what the business at hand is.

Our core business may evolve faster than we have ever envisioned. Therefore, it is absolutely critical that we have business systems that assist and facilitate the management of the strategic inflection points.

The mandate of all CIOs in this century is to motivate change to affect the way we fundamentally do business. Yes, this century we will change the way we do business both in the public and private sector. This century clearly represents the speed at which change can and will occur. CIOs should be committed to employing strategic technologies in the next 5 years that will define this new generation, not only in the private sector, more importantly in the public sector.

We will need to in our respective industries capitalize on the intellectual capital of our team members who are the market-makers of the past century. We must exploit the boundlessness of the new team members that see the invisible to achieve what was once thought impossible. The Internet, the tool kits available to us today and the various technologies will allow us to accomplish these objectives and this vision.

So I ask you today to empower the CIOs in the Federal Government to effect and motivate change as we have been empowered in the private sector to do so. I thank for your time and the opportunity to be here today. I would be happy to answer any questions.

Mr. HORN. We thank you very much also.

We are now going to begin the questioning, and I will start with Mr. Turner, the ranking member of the subcommittee, and if you have an opening statement, we will put that at the very beginning as if read.

Mr. Turner will ask the questions for 10 minutes, and then I will take 10 minutes until we have the questions out on the table.

Mr. Turner.

Mr. TURNER. Thank you, Mr. Chairman. The subject of this hearing is perhaps for our committee one of the most exciting subjects that we can discuss, because I think the utilization of information technology in government provides us with the best opportunity that we have had in the history of this country to reform government. The tools that can be utilized, that can be harnessed, will make government more efficient, much more cost-effective, much more consumer-friendly, and much more transparent and open.

In the long term, our ability in government to use information technology is going to be the thing that is the real challenge of this century. Because if we do it successfully, we will increase the public's confidence in government, which is at an all-time low. We will be able to increase the accountability and the cost-effectiveness in government, and we will be able to provide the things by and large which the public demands from government.

I understand we have 54 CIOs in Federal agencies currently, and I would assume, Mr. McClure, and you correct me if I'm wrong, that the emphasis that we have had on solving the Y2K problem has probably been the priority of CIOs throughout all of these agencies. And, of course, I guess many of these CIOs have not been in place for all that long, 2, maybe 3 years at the most, and this seems to be a critical time for this particular hearing because we know that the CIOs' role in helping solve the Y2K problem was all-consuming in many respects.

Government, we all know, always works better when there is a crisis. I think the chairman has rightly proceeded with our committee to emphasize the issue of computer security, which is a hot topic and comes about as close to a crisis as we can talk about. But those of us who have served in government for a while know that it is always better to have a crisis to make things happen. I am hopeful that what we can learn from this hearing and the work of this committee are ways that we can look at information technology and its applications in government in a broader sense so that we can accomplish the goals that each of you have stated, and that is to make sure that chief information officers in the public sector operate like the successful companies in the private sector. Clearly, in the private sector if you are not applying information technology, you are falling behind; and the same is true in the Federal Government.

I was interested in, Mr. Doll, and I am sure there are some examples of States in addition to your own that represent shining examples of successful implementation of information technology. Perhaps I can brag a little bit about the State of Texas, which was the leader, first in the Nation to promote the idea of using smartcards for electronic benefit transfer for the Food Stamp Program, which has saved millions of dollars, eliminated much fraud,

and made that program much more accountable and efficient to ensure that those who are entitled to the benefits receive them.

But in the early days of the State's efforts, from my experience in the State legislature, information technology officers or commissions, one of their first roles was to always review and make recommendations regarding the acquisition of computers and software for the various agencies so they would be sure that they were buying the right materials. Have we moved away in some of our better examples of State leadership—have we moved away from that to the broader role of actually suggesting ways and encouraging and implementing information technology?

Mr. DOLL. Most definitely. State CIOs are more in an analytical view of how do you align technology to, in essence, digitize government as well as solve its problems. I think there is an inherent understanding that the more technology we can apply to what has in the past been a very paper-intensive, process-intensive organization called government, the better off the States will be.

You are right, it is a very competitive environment out there. We are competing with each other on the State level as well. We kind of view ourselves much as private industry does. They compete with their competitors where we turn around and provide the best government possible to our citizens and our businesses within our State relative to applying technology as an enabler. So, yes, you will see us, whether it is South Dakota or whatever State, looking at how we take the technologies that are in existence, the ones that are on the horizon, and applying those to the process of governance.

Mr. TURNER. Are you in a position to have enough of an overview of the various States' activities to really be able to share with us what you think the best model is for chief information officer status at the State level?

Mr. DOLL. What we find in talking with my colleagues and the surveys that we have done, as I mentioned, we are quickly migrating to the chief information officer being at a Cabinet level; reporting directly to the Governor; having authority, at least from a visionary and a strategy standpoint, across all State government, executive branch for sure, and at times even over judicial and legislative branches; and we do not see that trend stopping. We feel that that is something that is just—in the future you will find all CIOs reporting to a Governor, and that is one thing for sure that I think is of the success model.

I think the other key aspect is that the CIOs themselves are probably also going to get more and more responsibility over operational matters. Take a look at standardizing technology.

I am lucky in South Dakota as the CIO because I have both operational and strategy. I set all standards for all State agencies. Most States have IT run by each of their State agencies, and so they have more of a coordination effort, whereas I have that direct line responsibility. I think that more States of the smaller and midlevel populationwise will be moving toward my model. Such States as Kentucky, that size of State is going to move more toward some of the operational responsibilities also now falling under that CIO.

So I think those are two basic trends and what people feel they need to have, that level of authority, as well as have that level of

exposure to what each of the State agency programs needs done, because with that level gives you access and input into decisionmaking about those programs.

Mr. TURNER. Mr. McClure, how does what we see going on in the Federal Government today match up with the models that Mr. Doll is talking about that he believes to be a successful model for CIOs?

Mr. MCCLURE. It has always been said that the States are the experimental stations for federalism, and I think what we see in the States is very reflective of what we see in the private sector. We actually spent time with the CIO in your State, Carolyn Purcell, a great example of a CIO focused on providing tremendous oversight and continuity to standards and to common approaches to systems being built across State agencies.

In all of the States that we visited, three others in the study, what we found were CIOs were focused on the unique problems, situations and opportunities confronting State government. Although they are common, many of them had different needs at the time. In one State the CIO was charged with bringing spending under control and making sure that dollars were being spent wisely. In another State, a State CIO was focusing on e-government and making sure that service initiatives were being sent electronically. So very much in line with private sector models in which you will find that the CIO is matched for the problem and the opportunity that is being presented to the organization at that moment. And finding someone that can actually hit that problem on the head is very critical. There is a lot of correlation between State CIO models and what you see in the private sector.

In the Federal Government we have a very mixed implementation with, again, the same story, but not nearly as much focus as we see in the States, where State CIOs are partnered with Governors and really participating at very high executive levels in decisionmaking for IT. Again, it is not across the board in the Federal Government. Mr. Flyzik sits in on some of the most important decisions made at the Treasury Department. He sits at the table. That is simply not uniform across all of the Federal agencies at this time.

Mr. TURNER. I yield back the balance of my time.

Mr. HORN. Mr. McClure, let me pursue a couple of things here. Your testimony raised several challenges about Federal CIOs and what they face that may not be common in industry, including the nature of the Federal budget process, the lack of involvement of top management in key IT projects and human capital constraints.

In your opinion, do you think we should look more toward what the private sector CIOs do in their entities, and try to make those opportunities for the Federal agencies, and particularly looking at the CIO management frameworks that would work and wouldn't work in government as to what you see out in the States and the major cities of America?

Mr. MCCLURE. I think there are some great opportunities for Federal CIOs to learn tools, techniques, and practices being used in the private sector that are clearly applicable in the Federal setting. I think Jim raised some very good points about differences in the Federal sector, that being mainly that our executive management levels at the Federal level are focused mostly on policy, less

so on operations and management. We have a budget process that allows multiple entry points for funding streams to be changed. We have inflexible personnel systems compared to most private sector organizations. However, and I think Jerry will back me up on this as well, the private companies are faced with the same problems. There is high turnover in corporate executives, uncertainty in funding streams at many points in time, and there is a competitive hiring and retention market for all of us.

So these are not insurmountable barriers for Federal CIOs. It just means the speed, the pace, and the direction in which you are going to see the reform in government might not parallel what you would see in the private sector.

Mr. HORN. In your survey did you take a look to see if the CIOs were simply fully devoted to the CIOs? I had a problem about 5 years ago with a few agencies, one of which was the Treasury Department, where the Assistant Secretary for Management seemed to want to take over everything, and that is not what we did when we passed those laws. We want full-time CFOs and CIOs. They are big jobs, and they should not be diverted. That is why a lot of these agencies were not doing very well either.

What did you find out in your survey? Do we have too many people under one hat, or do we get an independent CIO in the Federal Government?

Mr. MCCLURE. In the private sector and in the States, you see CIOs focused exclusively on IT issues. The reporting relationships may vary. You see CIOs in private sector reporting to CFOs, to the heads of the corporations. There is not a consistent model, but there is a clear difference.

I think there has been tremendous improvement in the Federal sector in that the majority of CIOs in the Federal Government now are focused on IT. We have relatively few dual-hatted or multihatted CIOs.

Mr. HORN. How many do we have? Can we get them for the record?

Mr. MCCLURE. I think there are approximately three CIOs among the 24 CFO agencies that are dual-hatted where they are either the CFO as well as the CIO, or they have another significant responsibility. That is a marked improvement from the years prior to the Clinger-Cohen Act.

Mr. HORN. Do you remember the three?

Mr. MCCLURE. I believe I can. It is at HHS, at Justice, and there is one other. I can provide it for the record.

Mr. HORN. As I remember, the lowest grade that we gave in the Y2K exercise was the Justice Department. That might explain something.

Mr. MCCLURE. The other is Department of Defense.

Mr. Money at Defense is a multihatted CIO.

Mr. HORN. Maybe we are just going to have to put it in the appropriations bill. They will probably get the message that way.

The Federal Government, would they benefit from a Federal CIO, and would they act in the capacity role that Mr. Koskinen had? He wasn't really a CIO, he was a coordinator to get the job done, and he did a fine job. What is the General Accounting Office's sort of findings in that regard?

Mr. MCCLURE. We have been in favor of the concept of a Federal CIO. When the Clinger-Cohen Act was debated in its early stages, we were supportive of the creation of a national CIO, as it was being called at that time. I think there is a great deal of value that can be gained from having a person that can focus full-time attention on IT issues across the agency and department lines. Continuity, direction, and attention to issues could be ensured by that kind of position.

We are spoiled. We have had a unique individual named John Koskinen serve in that capacity when he was Deputy Director for Management and did an admirable job; and as the Y2K Coordinator another very, very stellar job.

I think what one has to look at is what person with what characteristics do you want in that position? Where do you want the position housed? Who should that person report to, and where should that position be housed? There was debate in the early years about putting it in OMB or making the Deputy Director for Management in effect the national CIO. As you know, that person also serves, in essence, as the national CFO and has focused a great deal of attention on financial management issues.

So there is a great deal that can be gained from it. There can be a great deal gained from an individual serving in that capacity focusing only on the most pressing IT issues, whether that is critical infrastructure protection, security in general for IT, or for electronic government. We have shown the model can work, particularly if it is supported by both the Congress and the administration.

Mr. HORN. What are the downsides of this? Do you know what might be wrong about it?

Mr. MCCLURE. Well, I think there are always pros and cons. If this person does not have the support from both Congress and the administration, if this person cannot work across the organizational lines of the government effectively and is not empowered to make things happen, and held accountable for making things happen, then I think we are fooling ourselves about the impact. In all situations where Mr. Koskinen has served in that capacity, he had those traits going for him.

Mr. HORN. Just as a matter of history, I might say the Deputy Director of OMB for Management didn't really do anything at that point. He retired. And it's a good choice when he came out of retirement, but while he was in that job nothing much was happening on the year 2000. They should have been 10 years ahead of that. And the danger I see with a central CIO, is there's a tendency in bureaucracies for the counterparts in the agencies to say, well, we want to be on the good side of the OMB or whatever and pretty soon Secretaries lose their own people to the center of the operation because it's very heady. You go over there and you're in the White House complex in a way and they sort of get out of sight, and I say that based on a lot of experience, 18 years in the biggest education system in this country. And that's exactly what always happened when you had, say, 19 to 23 campuses and you had a headquarters type that didn't know a campus from a headquarters frankly but he was the headquarters type. So you'd find your top people just picked off and going to nothing but meetings usually

and not much happening. But that's what makes me a little dubious about how you do it on a centralized basis.

I think the key to Mr. Koskinen was his personality. When we got him out of retirement, and he did a superb job, he put the burden on the networks the CIO counsels and others that got the job done rather than create a whole permanent bureaucracy on the subject, and I think that's why the success came there.

Do you have anything else on the pluses and the minuses?

Mr. MCCLURE. I think the same issues we talked about in the appointment of any CIO would apply to the national CIO. There has to be an understanding of what that position is needed for, where that position would be, and how you're going to hold a person accountable and make it a credible position. Those are really key factors that if we create that position need to be worked out so we're again not misleading anyone about what the intention or the purpose of the position is.

Mr. HORN. Mr. Doll, I understand and to the private sector too where a lot of measurements are being developed by CIOs and that fascinates me because we frankly haven't done very well at the Federal Government in terms of measuring things and when we had a hearing a few years ago, we found that in South Carolina, in Minnesota, in Oregon, very exciting things were occurring in terms of the measurement of the effectiveness of the programs. This town is still too oriented on simply the finance side of it and I think they are struggling with how do you get an efficiency, an effectiveness measurement.

What can you tell us about what the private sector and what the States are doing in that regard because that's exactly the kind of information a Governor needs, a chief executive officer needs, and which basically we haven't really had in this town because it's been so fiscally oriented.

Mr. DOLL. What we find in the States is not only a drive to account for IT resources and how they are used, but also on the outcome measures and that's probably the largest area of study that we see the States doing right now. An example will be look at how people have tackled education. All the States are doing an awful lot with education, whether it be South Dakota, and the fact that we measure not how many schools are connected to the Internet but how many simultaneous teachers, administrators, and students can be on-line, not just technology. So one thing that we find is that we still have to rely on measurements that may be taking place today at a programmatic level but ensuring that from the technology standpoint, we also have our set of measures that we're starting to drive those metrics into some of the base established metrics of our programs and that starts to give Governors a real view what are we getting for our money and also just how quickly are we evolving because we all understand unfortunately you cannot do these things overnight usually and that adoption and adaption of technology, whether it be by a citizen, a schoolchild, whomever, takes time. And so what we look for is the base measurements so that Kentucky, South Dakota, as I mentioned, Texas, even—I've seen some examples in California, Minnesota, Michigan, ones that I'm familiar with are really driving to metrics that allow

people to understand when they make a decision, what's the impact. And that ultimately drives a lot of future decisions.

Mr. HORN. Mr. Doll, has your association, the National Association of State Information Resource Executives, have they put out any compilation of these measurements? It seems to me you would have a best seller there. That's what people are searching for.

Mr. DOLL. We haven't to date. What we have established is we have an organization, and I know the acronym. It's SITC and I forget what is stands for. It's a State information technology consortium which is tackling those issues. They started with risk management and now they've moved into metrics and maybe through that effort we're going to be able to compile what's—and maybe even do case studies of what's working in the States. But at this point unfortunately I'm not able to give you a document.

Mr. HORN. How about it, Mr. Knutson and Ms. Krupa, what do you feel on measurement standards besides the finance one?

Mr. KNUTSON. We struggled over time to come up with meaningful measurements in the field of technology, but I think over recent years we have done a very good job, been able to measure things that are operationally oriented and we can pretty much demonstrate what the impact is to the business as a result of our success with those measurements. Things like availability and response time are things that people deal with on a day-to-day basis in using technology. The one where we've been having more difficulty with is in the area of how well do we deliver programs and projects and demonstrate quality relative to the work that's done in those areas. Now, the thing that we have found to be most successful is where we've been able to tie measurements to impacts, to customers, to employees, to shareholders, things of that nature where there's something real tangible that you can relate to in terms of what your performance might do in dealing with those people.

The other thing we have found is you can measure, measure, measure, but unless the measurements drive the behavior that you want, they are very little value. We really focus on what are the key measurements that drive the behaviors within the company and within the organization that will give us the outcomes that the business expects in terms of service, in terms of dealing with products and services and more. Most importantly in terms of the impact on our customers, we try to tie the behavior-related measurements to what will be the impact on our customer.

Mr. HORN. Ms. Krupa.

Ms. KRUPA. Thank you, Mr. Chairman. One of the things that we have embraced and I have brought a copy of today with me that I will share with my colleagues in the public sector, traditionally in the industry, most of the metrics were based on our Y return on investment or cost-benefit analysis. Today we have a new model. It's called return on opportunity. This model includes not only leveraging the technology that's out there and taking that into consideration, there are factors of the human side of it.

Mr. Doll spoke to the adaptability and adoptability of the citizens, whether it be a schoolchild, a schoolteacher, or the Governor himself in the State of South Dakota. There is that factor that needs to be calculated. There's a cultural shift that needs to be

measured and taken into consideration. Some of the metrics we are beginning to adopt in the Rowe Companies is this return on opportunity because we too are in an industry and in an environment where we have intellectual capital and human capital within our organization that has been with us for 40 plus years and sometimes it is quite difficult to take these individuals and bring them forward and have them adopt and adapt to these technological changes.

So what we do is when we do put programs in place that help them adopt and adapt to these changes, we do have a metrics. This metrics, if I can just list off some of the things that it takes into consideration and it's the perfect metrics. Obviously everything can be improved upon for the electronic government or electronic business aspect of our industries today. It takes into consideration the decreasing of time to market. In translation into the Federal Government. That means the decrease in time it takes to deliver different and more quality services to the citizens within the State of the Federal Government. It also takes into consideration what is the overall value, what are the value propositions? The ROY really never took into consideration the value propositions, the ones that are the intangible, the feel good value propositions, which make people want to use the technology and leverage it in what they do every day, which clearly translates into reducing our operating costs both in the public and private sector. And I will leave copies of this. I'll make some copies today and ensure that my——

Mr. HORN. Thank you. We'll put it into the record at this point without objection.

Mr. Flyzik, can you tell us what the CIO Council is working on when it comes to measurement standards that might be ideal across the whole Federal Government?

Mr. FLYZIK. Mr. Chairman, I acknowledge the fact that the government a few years back with Governor Clinger in the Government Performance Results Act that we weren't accustomed to doing good measures and working measures, and at the time we did create a committee called our capital planning and investment committee which was to look at that very issue. As opposed to each independent Governor agency trying to figure out how to do things, we decided we'd have a committee that would be able to look at best practices in the private sector, work being done by GAO.

The committee has been working on new types of investment tools that we're looking to proliferate across government to be able to do a better job. The tools that we've been looking at focus on performance measures as a first step. What do we get in terms of measures for the investment. I also agree quite a bit with Ms. Krupa's statement that we not only need to look at quantifiable ROYs but in government we've got other qualitative aspects that need to be taken into account. In the case of Treasury where I have law enforcement bureaus, it's very difficult to put a quantifiable number on what is better public safety or better law enforcement. We have those unique issues, yet we all know they are important issues to the citizens of the country, so we need to find ways to use these investment tools to standardize across government.

We've actually worked with members of your staff in the past of the subcommittee on some of the capital planning tools that we're

looking to use and perhaps proliferate across government to standardize in what we're doing.

Mr. HORN. Is that very helpful? Does the GAO have any comments now having listened to this discussion?

Mr. MCCLURE. Mr. Chairman, in 1998 we put out yet another best practices study on this very issue, performance measurement for IT. I would be glad to make a copy available to you. It argues for using a balanced set of measures, both quantifiable and qualitative that looks at the impact of IT on strategic directions of the organization, financial, customer and innovation and learning. It's very much a balanced basket of measures. That's really what we saw industry doing. We did the same thing looking at private sector and four State governments who had also put in these kinds of balanced, measured approaches. We can certainly make that available to you and have shared that with the CIO Council and have been very supportive of it.

[NOTE.—The GAO report entitled, "Executive Guide, Measuring Performace and Demonstrating Results of Information Technology Investments," may be found in subcommittee files.]

Mr. HORN. Thank you. My turn has long since gone and I'm giving Mr. Turner 20 minutes for his questioning.

Mr. TURNER. Thank you, Mr. Chairman. I have come to the firm conviction that we do need a Federal Chief Information Officer. I noted, Mr. Chairman, your concerns about the pluses and the minuses. There's no question that if not structured properly, it could be ineffective, but it does seem to me when we look at some of the best State models, the CIO is a cabinet level, and I don't mean to necessarily say that our CIO, Federal CIO, you'd call him a cabinet officer. That implies, as the chairman feared, that somehow there's a big bureaucracy under him because that's the nature of Secretaries at the Federal level. The CIO at the Federal level needs to have direct access to the President, and he needs to be at the table so that his ideas can be shared as issues of government are discussed. And if a Federal CIO is properly empowered, it seems that he would then have the ability, Mr. Flyzik, to chair that CIO council that you're the vice chair of and when discussions occur about ideas for the implementation of new technology and trying to move toward an e-government, then the President and the Federal CIO can make the decision that we're going to choose this particular agency as the pilot program to see if it's going to work.

For example, there's no reason in the not too distant future that every performance-based budgeting activity of every Federal agency should be real time where Federal managers can see at any moment what the status of those performance measures are. Now, if that's correct, obviously the way to proceed in that direction is to pick out one agency and direct that agency to do it so we can see how it works. It seems like where we are today is that, Mr. Flyzik, I would gather when you meet with your counterparts and the CIO Council, there's probably a room of very frustrated people not only because they struggle with their role within their agencies but because there is a lot of good ideas floating around and somebody has got to try it but nobody has any direction about who is supposed to jump first.

If we could have a CIO at the Federal level who had direct access to the President where these ideas could be implemented on a pilot basis within the Federal agencies, we'd have our best opportunity to see meaningful information technology utilized in the Federal Government.

Am I misstating the attitude, Mr. Flyzik, of those who gather—I guess you meet monthly?

Mr. FLYZIK. We meet as a full council every other month. We have an executive committee, which I also chair, which meets monthly, and we have six committees based on what we have identified as the key subject matter, such as we've talked about here today, the work force effectiveness, critical infrastructure, security privacy and so forth. They meet in some cases several times per month and they have working groups working with them. And you make some excellent points, Mr. Turner, and I think it's a mixed group. There are some CIOs that feel that they are empowered. There are others that I guess the term frustrated would pertain.

Again I believe we're evolving in a positive direction. I think that term empowerment is the one I've heard this morning over and over again, and the feeling is that we do need some empowerment to do, as you talk about the central authority that has the ability to do intergovernmental, interagency coordination or as you talk about a kind of an executive agency approach. Some feel the CIO Council can rise to that role. Today I believe the Council lacks some authority to control resources to be able to rise to that level.

The John Koskinen model had associated with it funding that was set aside for that particular program with some control over that funding. What we do not have as a Federal CIO Council is authority to control funding to that degree to be able to effectuate the kinds of change that you are referring to. I agree with the chairman's remarks that those are, so to speak, who would determine how it is implemented.

I was also involved with the early days of Clinger-Cohen working with Members up here on that and the discussion at the time was downsizing, streamlining. We didn't want more bureaucracy. We wanted to do away with layers and layers of authorities and so forth that we felt needed to be.

So if implemented incorrectly, we could wind up again with more layers of approval processes as opposed to streamlined empowerment of individual agency CIOs. Nevertheless, I do agree with your points that we need some authority that can put in place the kind of things we need to do on a governmentwide basis because the business cases are compelling, that it makes sense to do that from a customer perspective.

Mr. TURNER. Mr. McClure, I'm going to ask you this question. We don't have anybody on our panel today from OMB but in my investigation into the issue of a Federal CIO, one of the things that comes up is that the Office of Management and Budget is reluctant to support this kind of approach and obviously it's an infringement or perceived to be an infringement upon their turf. Address that issue for me and kind of get that out on the table because obviously we pursue this idea. That's one of the hurdles we're going to have to overcome. How do you view that issue?

Mr. MCCLURE. Well, I think the Office of Management and Budget, since the passage of Clinger-Cohen, along with the key players that helped put that legislation together have taken the position that accountability for IT has definitely been pushed to the agencies. You remember Clinger-Cohen eliminated the Brooks Act model in which it was really a tail-end look at procurement and acquisition by a central authority and instead we wanted focus at the front-end for planning of IT projects.

In that spirit, I think OMB has pushed more of the accountability for planning of IT and results of IT into the agencies, agency heads, agency CIOs and that certainly is their interpretation of the spirit of that legislation.

OMB's role is very key in this whole process. OMB reviews agencies' IT budget submissions as part of the process of constructing the President's budget and using the tools that are available under Clinger-Cohen, which is effective data and analysis showing a business case, effective cost estimates, and some estimates of return whether it's tangible or intangible, and improvements are some things that OMB has a role in examining and asking questions about it in the formulation of the budget.

So I think their push back is that the accountability model has shifted under Clinger-Cohen more to the agencies. They do recognize the role they play in reviewing agency IT submissions and in that regard, again they play a critical role.

Mr. TURNER. Am I correct in sharing my concern that the suggestion of a Federal CIO is going to at least be met with some skepticism by some in OMB or am I misreading that concern?

Mr. MCCLURE. I don't know what the current position of OMB is on the topic. In the past they were not supportive of it for many of the reasons that I stated in the discussions on the debate of Clinger-Cohen up on the Hill before Mr. Cohen's committee. So I don't know what the current position is in terms of favoring or disfavoring the creation of the national CIO.

Mr. TURNER. Well, I guess that's an issue we're going to have to study further, obviously if there are legitimate concerns that need to be taken into account. But if I'm hearing you correctly, it sounds to me that the responsibility has been moved to the agency CIOs and therefore there may be less interest in providing leadership from the top than there should be and I guess in effect for me reinforces the idea that a Federal CIO who is near a cabinet level official might have an opportunity to provide the kind of leadership the executive branch and the President should be providing to the implementation of information technology. So I'd like to work with you on that because I want to pursue this. Mr. Flyzik, do you have any thoughts to offer on this subject?

Mr. FLYZIK. As I mentioned before, the empowerment issue comes to mind and the need for someone or somebody or some group to have the empowerment to do governmentwide and intergovernmental kinds of programs. The Koskinen model, as we talked about, worked in many ways because we were viewing government not as by agency by agency but as functional sectors of our country, and I think that is something that needs to be done because I think there are some tremendous opportunities.

You mentioned smart cards in Texas for food stamps, obviously a very, very effective program, and if you step out and look at government from the point of view of the customer of government, they don't see a Department of Treasury and a Department of Justice and a Department of Agriculture, nor a Federal, State, local. To them there is one government. Therefore, we have this need and let's stay with your entitlement example.

Today in this country we have people receiving SSA, SSI, Food Stamps, Medicare, Medicaid, Aid for Family with Dependent Children, and so forth and so forth. They are all dealing with independent government processes, entities sometimes filling out forms redundantly over and over and over again. There is this need for someone or somebody, some group to begin focusing on what we can do from that customer point of view.

In my mind I have the virtual department of entitlements coming to the forefront here. That does not mean we need to reorganize the government. What it means is we need to take advantage of the inherent infrastructure and IT capability to coordinate what we're doing so we can deliver that one face to the customer. So someone applying for one entitlement program finds about all the other entitlement programs that are available on one smart card. We not only deliver those food stamps but we deliver SSA, SSI, or any other entitlement payments.

I think we cannot only improve service but we can probably eliminate a lot of fraud, waste and abuse in these programs because we would have better capacity to identify those kinds of problems. I think all of us see these kinds of activities and the need for again a person or a group or someone in power to be able to work so we can fund these intergovernmental approaches where I think some of the real big payoffs in the government's use of technology in the future will come from.

Mr. TURNER. Thank you. Mr. Doll, when you surveyed the States, what sector of government has been the best example of the utilization of information technology? For example, are we seeing more progress made in agency-to-agency transfer of information? I suppose in Texas we have on our mind of course the success of the food stamp program and elimination of fraud in it. The issuance of licenses would seem to be an area which would be an easy one for State government. I don't see why anybody anymore would have to go to any State office and get a driver's license renewed. You ought to be able to look forward to the day when you can fill out the information and take the visual test and at some point you ought to be able to have your picture made right there and have that transferred to the office and printed out on that card that comes back to you.

Where are the real areas that we've seen significant progress in terms of the out decision of information technology?

Mr. DOLL. I think you find utilization of technology in a number of the major programs. You mentioned food stamps. The whole welfare arena, social services activities, most definitely in the financial side of government. Obviously that's a natural progression to technology, early adopters they were. So in the past I think you'd see some of those major—where you find, though, everybody's focus, even though I can't say that the majority of States are there be-

cause we're not in the areas of digital government where any and all permits are on-line. You will find today of course probably any form that you need to fill out in most States is physically available for you to download, fill out, and mail in or fax or what have you, maybe even e-mail but a true interactive on-line association between the citizen and State government. That's what everyone is working for and that's the hottest area of development currently.

You find Arizona with some of the things they've done in the driver's license world, some of the permits in South Dakota, you can get your birth certificate, a copy of that on-line without having to talk to anybody, et cetera. Just as in South Dakota we're probably only down around 15, 20 percent of the transactions in South Dakota can be done on-line at this point. We have a project to turn that up to about 80, 90 percent over the next 18 months. We just started at the beginning of this year.

So I think you will find that there is a quick shift to again automating the processes of government so that the citizen can do it from home, a business can do it from work, et cetera.

Mr. TURNER. Thank you. Mr. McClure, give me the best example of a Federal agency that has utilized information technologies to improve its efficiency, cost effectiveness, and consumer friendliness. What is the best example of an agency that's doing that, of course present company excepted?

Mr. MCCLURE. It's hard to point to the best, Mr. Turner. I think what we have and what we continue to find are pockets of excellence in government, as you would expect. We've seen and the CIO Council is very good at every year recognizing a handful—when I say a handful, anywhere from a dozen to two dozen successful IT projects in government where there have been specific, tangible, and recordable outcomes of improvement in service delivery or cost effectiveness.

In the last year, the Council identified many projects dealing with e-commerce oriented activities, buying and paying of services on-line, similar to what Mr. Doll was talking about a moment ago. There have been examples of personnel systems that have been enhanced to be much more user friendly and much more dynamic rather than the old paper processes.

Where we really need to focus our attention in the government, despite these successes, are on the large, large modernization projects where we are spending enormous sums of money with high expectations, and we have several of those that have been ongoing for years. Many of them are beginning to turn around that GAO has focused on and worked now collaboratively with the agencies to try to improve those successes.

Mr. TURNER. What agencies are you referring to? Internal Revenue Service?

Mr. MCCLURE. Certainly TSM modernization at IRS has been a turnaround. The Commissioner and new CIO have put in place many leading practices similar to what we have talked about today. Again, the story is not complete but the turnaround picture is quite promising. Decisions are being business led. There are business cases. There's attention to architecture. These are things that in the years past we didn't pay attention to.

The same is true in some of the other modernizations, including FAA and the National Weather Service, where we have pointed out problems in the past but we're starting to see more and more management attention to standards, to good software practices, and to adequate management attention to the project outcomes.

I think those are itself areas where we need to focus a great deal of our attention because of the vast sums of money that are being spent.

Mr. TURNER. Thank you, Mr. Chairman.

Mr. HORN. Thank you, Mr. McClure, Mr. Doll, Mr. Knutson, I think you have flying arrangements before problems occur in the Midwest. If you have some parting words we'll be glad to have them and we'll keep the record open if on the plane you have nothing else to do except try to find a flight, why we'd be glad to put it in the record at this point without objection. So if you have any summation, we'd certainly welcome it.

Mr. KNUTSON. The one thing I would say relative to a Federal level CIO is it appeared in the discussion there's a lot of expectation that by just naming that individual in that position certain things would happen. That may or may not be true. I think putting someone at the highest level possible in the area of technology is a very good decision. You can't assume by just doing that that the types of things that Jim was talking about will happen by default. You need very strong sponsorship from the agencies and the buy-in from those agencies and their willingness to give the authority to make things happen. Unless you have the complementary structure around that position from government as a whole, that position will not be successful.

Mr. HORN. Mr. Doll, any parting comments?

Mr. DOLL. As I mentioned in my talk, we in the States have found and I believe it's a general consensus across the States that we looked hopefully that a national CIO will emerge in some form. Because we really saw the value. Year 2000 was the best example, but also in some of the things that are happening in the justice world. Security is another major concern for us as who do you have to go to right now. We know what it's like to going to all the agencies within State government. For us also to turn around and go from one to many within the Federal Government makes our lives harder, and so I would encourage you to consider that model because as we're moving to that model ourselves, I think we would say that it's been very successful in the States that have accomplished it and most of the States that are not there yet are talking or actually in the process of getting there and having that level of person within the organization.

Finally, I'd say that that individual is not only key but very difficult to fill. We understand that. We get a lot of folks from the private industry these days into that role. And in my comments one of the things I mentioned was their ability to act within the political and civil service theater is very important. I come from the private sector myself even though I have some government service under my belt with GSA. At least I had exposure and some orientation to governance from that level and that is really key. If someone cannot operate within that realm, you're going to find it very, very difficult to succeed.

Mr. HORN. One of the problems, obviously, on getting CIOs into the Federal Government and also at various levels is simply the financial situation, and what have you found in the private sector on that and how has that changed in the last 5 years? A lot of good people from the Federal Government have left for the private sector.

Ms. KRUPA. Mr. Chairman, I myself share the same sort of experience as Mr. Doll. I have worked both in public and private sector. And one of the, I think, challenges and opportunities for those of us who have been in the technology arena for quite some time is not to jump ship, and that also the same challenges occur in the private sector, not to jump ship, if you will, from one organization to the other.

I think, as Mr. Doll said, it is difficult but what we have to look for in that individual in the Federal Government, the person coming into that position understanding the value that they are going to bring to that position and not so much a monetary driver and there are those people out there. It is going to be a search.

It is going to be somewhat difficult, but I feel there are those senior level executives out there. Today I think sitting at this table is representative of the senior level executives that are out there that have made commitments to their organizations. I agree that the position needs to be structured and clearly defined, but I concur there needs to be a position at the national level that helps define strategy and vision and helps go to the different agencies and different State levels with those CIOs and collaborate. The one thing we don't do a good job in this country is, and Mr. Turner has cited over and over again in his questions, is who is doing what is communicate. We don't leverage the synergies and exploit the successes that we have from State to State, from agency to agency. And the private sector has grappled with that for years and we're just coming into that light. We've scratched the surface of how important communication is.

I have five different operating subsidiaries, and I know in the order of magnitude in the Federal Government, it is small but the model I think is important to what you're trying to accomplish. They each have five different requirements. I have VPs and director of ITs so, if you will, CIOs in those operating subsidiaries, so I sit in that position in the private sector reporting at, if you will, the cabinet level, the executive level to the chairman to define strategy, to define a vision, to define missions to capitalize on the synergies in these operating subsidiaries. That's what we need to do I believe in the Federal Government.

Mr. HORN. That's very well said and that reminds me that we are going to keep the record open. If you have some more good ideas on the way, please ship it to the staff here and we will be glad to put it in the record because what we want to do is get people talking just as you're talking about the communications among levels of government and private sector and nonprofit sector. Universities, some of us had chief information officers 20 years ago, so it isn't new to a lot of us.

Would the gentleman from Texas have any more questions? If not, we're going to thank the staff that put this together and that's J. Russell George, staff director and chief counsel. I don't see him

here right now. Matt Ryan is to my left, your right, senior policy director on these matters, Bonnie Heald, director of communications, sitting in the back there. Bryan Sisk, clerk, Ryan McKee, staff assistant. And for the minority we have Trey Henderson, counsel on behalf of Mr. Turner and the subcommittee minority; Jean Gosa, minority clerk; and we had two people deciphering all of our languages today and one was Doreen Dotzler. The other is Laurie Harris and we thank you both.

With that we're adjourned.

[Whereupon, at 11:42 a.m., the subcommittee was adjourned.]

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