

IT Governance Capability:

Laying the foundation for government interoperability



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This report is available online at:

www.ctg.albany.edu/publications/reports/it_gov_capability

October 2009

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Introduction

Interoperability in the governmental context enables organizations to share information and other resources as necessary to serve the needs of citizens and society. Creating this interoperability requires government leaders to take responsibility for improving the capabilities of government agencies to effectively partner with other agencies and governments as well as the private sector, non-profit groups, and research institutions.

Governance—defined as the existence of appropriate decision making rules and procedures to direct and oversee government interoperability initiatives that are planned or underway—is a foundational capability for creating and improving government interoperability. In the context of interoperability, building effective governance is both more critical and more difficult because it involves multiple organizations and levels of government.

Having the necessary governance capabilities across the boundaries of organizations is necessary to ensure government interoperability investments align with priorities and goals defined in strategic plans or by legislative and executive leadership. Recent research conducted by the Center for Technology in Government draws on a comparative case study of *IT governance* to illustrate that while effective governance structures include a consistent set of elements or capabilities, there are also a wide range of context specific issues that must be responded to in the governance design, development, and implementation processes.

New Capability for Coordinated Action Required

The potential of information technology for transforming government is widely recognized. There are many available strategies for achieving these transformative effects, such as increasing transparency by making data about the process of governing more available as well as improving service quality through more integrated service programs. In most cases the strategies themselves require significant changes in the way governments and government leaders operate; in particular, they often require new levels of interoperability. In terms of improving government operations and providing services to citizens, interoperability, like technology, is not an *end* but a

means to an end. Citizens do not demand interoperability; rather, systems must be interoperable in most cases for governments to deliver what citizens do demand. Exploiting the potential of information technology for government

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transformation through the creation of new levels of interoperability requires new forms of coordinated action across the boundaries of government agencies, national boundaries, and with partners outside the formal institutions of government.

Governments are creating this new capability for coordinated action by operating in new network forms, i.e., networks of persons and organizations that are capable of working together, sharing information, and exchanging knowledge in order to solve problems and provide services to citizens (Dawes, Cresswell, and Pardo 2009, Pardo and Burke 2008, Christensen and Lægreid

2007, Ikenberry and Slaughter 2006, Agranoff and McGuire 2003, and UNDP undated-a). Government interoperability is at the core of enabling these new networks to deliver on their promised benefits by making it possible for network members to share knowledge and other resources in addition to creating interoperable technological infrastructures (Pardo and Burke 2008). To leverage the power of a network form of organization, government leaders must understand that not all organizations involved in a network need to have the same capabilities or the same level of capability to achieve interoperability. They must understand the complementary and multi-dimensional nature of capabilities among the organizations in a network. They must also understand that while capability is specific to a setting, it is also dynamic and requires ongoing assessments to ensure that the capabilities held collectively by the network are relevant and appropriate for the task at hand.

Table 1. Government Interoperability Framework Maturity Levels				
Level 1	There may be evidence of interoperability within individual government organizations, but there is little to no evidence of any interoperability across agency or organizational boundaries. At this level, government agencies work independently and do not share information with other organizations; government or private sector. In addition, there is little evidence of the decision making, strategic planning, and resource and project management structures and processes needed to develop and manage ongoing or future initiatives requiring improved government interoperability.			
Level 2	There is evidence of interoperability in specific policy or program areas. However, there is little evidence of interoperability across multiple networks (e.g. criminal justice networks cannot share information with public health networks). In addition, while interoperability initiatives in these areas may be planned and managed in a consistent way, the process for selecting, controlling, and evaluating initiatives is not consistent or standardized across networks or at a government wide level.			
Level 3	There is evidence of interoperability across multiple networks. For example, public health and criminal justice networks can effectively share information across their two networks in support of the larger policy goal of public safety. In addition, consistent and standardized processes and structures are in place to develop and manage government interoperability initiatives regardless of policy domains. As a result, existing networks can scale and apply resource sharing and process integration across multiple policy and program areas as needed, essentially creating new networks.			

The Government Interoperability Improvement Framework was developed to support the efforts of government leaders to build understanding of this capability-based view of interoperability and to guide capability development investment decisions. The Government Interoperability Improvement Framework is comprised of three maturity levels (see Table 1) considered most appropriate for guiding a government in understanding and assessing its existing level of government interoperability in order to determine what additional types of capabilities need to be

¹ Examples of recent terms that are being applied to cross-boundary and collaborative forms of governing include: network form of organization, whole-of-government approach, collaborative public management, joined-up government, and democratic governance.

developed (See Table 2) to achieve the *desired* or *target* level of interoperability (Pardo and Burke 2008).

Table 2. Capability Dimensions for Improving Government Interoperability

- Governance
- Strategic Planning
- Business Case Development
- Project Management
- Resource Management
- Stakeholder Identification & Engagement
- Leaders & Champions
- Business & Technology Architectures
- Performance Evaluation

- Collaboration Readiness
- Organizational Compatibility
- Information Policies
- Change Acceptance
- Technology Knowledge
- Data Assets & Requirements
- Secure Environment
- Technology Compatibility

Many governments are facing problems that require coordinated action not only within government, but also in the networks that involve private sector companies, non-governmental organizations, and academic institutions (Goldsmith and Eggers 2004, MercyCorps undated, and UNDP undated-b). As they seek to work together in this new way, public managers find that engaging in coordinated action across the boundaries of organizations to create interoperability requires new models of decision making; in essence, new governance capability. Governance capabilities provide the appropriate decision making rules and procedures to direct and oversee related initiatives that are planned, underway, or implemented to create new capability for interoperability (Pardo and Burke 2008).

Research and practice have begun to identify governance as a foundational capability for improving government interoperability. Overall capability for interoperability should be viewed as a set of multidimensional, complementary, and dynamic capabilities that are specific to both a defined network of organizations and achieving a particular goal (Burke and Pardo 2008, Cresswell,

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Pardo, Canestraro, and Dawes 2005). An examination of the maturity levels themselves shows an increasing need across the levels for formalized cross-boundary decision making. Moving from Level 1 to 2 requires evidence of explicit investments in decision making processes to support coordinated action and information sharing with other organizations. Moving from Level 2 to 3 requires the creation of processes for selecting, controlling, and evaluating initiatives across networks or at an enterprise level. Level 3 maturity requires the use of governance capability to create consistency and standardization among processes and structures in a network.

Differences in characteristics such as the size of government, institutional structures, and political priorities make it difficult to apply IT governance structures from one government directly to another (Pardo and Hrdinová 2009, Weill and Ross 2004). For those seeking to

enhance existing governance capability as a building block for developing government interoperability, there is no "one size fits all" IT governance model. This lack of a simple

solution is explained in part by the reality that the governance of IT in any government environment is intimately embedded in the policies, problems, and structures of that government. This embeddedness contributes to the complexity of creating effective cross boundary governance; the

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greater the diversity of the organizations involved, the more complex the process of creating new governance capability can be. Regardless of this complexity, a number of governments around the world are making substantial progress in this area. Progress is being driven in large part by an increasing realization that new forms of governance are needed if governments, at any level, are to be successful in creating the interoperable systems necessary to deliver on the transformative potential of technology.

Findings from a research project conducted by the U.S.-based Center for Technology in Government, University at Albany, New York (CTG) with New York State government provide valuable guidance for governments interested in understanding the IT governance development process and building the IT governance capabilities necessary for improving government interoperability. To support this research project, CTG conducted a current practices review of IT governance in the public sector (Hrdinová, Helbig and Raup-Kounovsky 2009) and interviews with state-level IT leaders from U.S. state governments. These findings inform a new yet important perspective for governments attempting to improve their IT governance capabilities. This perspective recognizes that while effective IT governance structures include a generic set of components, the design, development, and implementation of these components, as well as the processes used to create new governance capability, must take context into account. This discussion is framed first in a definition of IT governance itself, followed by an introduction to IT governance in the context of public value creation. The paper concludes with the New York case example and a set of lessons from the field for creating IT governance capability. This paper contributes to the efforts of governments working to create new capability for interoperability by outlining the critical role of IT governance. It does so by building on the details of the Government Interoperability Framework (see Table 1), in particular the framework dimension of IT governance.

Understanding IT Governance

One significant challenge facing governments in developing governance capabilities for improving interoperability revolves around creating a shared understanding of what is meant generally by "IT governance." This section lays out a set of definitions for IT governance, presents a mechanism for making design choices about governance structures, and outlines the five general components of governance.

One of the most widely cited definitions of IT governance is from Weill and Ross (2004). They see IT governance as "specifying the decisions, rights, and accountability framework to encourage desirable behavior in the use of IT (Weill and Ross 2004, p.8). Governance, in their view, should address four questions: "What decisions must be made? Who should make these

decisions? How will decisions be made? What is the process for monitoring results?" (Weill and Ross 2004, p.10). In other words, IT governance is about determining who is in charge of each type of decision ("decision rights"), who has input to decisions ("input rights"), and how those people are held accountable for their decisions.

Establishing effective IT governance through the creation of a framework which makes clear the decisions rights, input rights, and accountability mechanisms is key to helping governments develop and implement ICTs effectively, including improving interoperability (NASCIO 2008a, 2008b, 2009a, 2009b, EU 2008, p. 13, UNDP 2007, p. 27). In the European Government Interoperability Framework, IT governance is characterized as implying "mastery of the technology, systems and organizations in question, ensuring that their combined activities serve the strategic goals and objectives set out by the organization, in a

IT Governance

IT governance is specifying the decisions, rights, and accountability framework to encourage desirable behavior in the use of IT.

Governance answers the questions:

- What decisions must be made?
- Who should make these decisions?
- How will decisions be made?
- What is the process for monitoring results?

Weill and Ross 2004

continuous manner, and not the other way around" (EU 2008, p. 13). The National Association of State Chief Information Officers (NASCIO), a U.S.-based association of state-level chief information officers (CIOs), defines IT governance in the public sector.

"IT Governance is about ensuring that state government is effectively using information technology in all lines of business and leveraging capabilities across state government appropriately, to not only avoid unnecessary or redundant investments, but to enhance appropriate cross-boundary interoperability. The term 'appropriate' is used because in many cases state government has existing statutory constraints and bounding that can often limits as well as empowers proper governance." (NASCIO 2008a, p. 1)

The early focus of IT governance was on cost savings and consolidation of infrastructure and other services such as procurement and purchasing. More recently many organizations, including governments, are looking to *enterprise IT governance* as a capability to support portfolio management, closer business-IT alignment, prioritization across projects and across agencies, and other goals.

IT Governance as a Sorting Process

How IT governance operates at a more detailed level is complex. Primarily, it is a sorting process (see Figure 1) used to respond to an ongoing stream of demands and opportunities for IT development and use. IT governance structures in any given context should be designed to respond to these demands and opportunities as necessary to achieve the desired outcomes by identifying the issues to be resolved. These issues are then distributed for decision making at different levels of government: individual agencies, federations of agencies acting in consort, or

a central state-level organizational unit. The normal conduct of IT use in government generates a constant stream of decision requirements and responses to changes in the environment. Sorting through issues, demands, and opportunities requires (1) knowledge of a set of process questions related to decision and input rights and (2) accountability mechanisms such as those laid out by Weill & Ross. These two elements are complemented by the questions about context and value that emerged from the CTG project as critical to successful IT governance development initiatives.

The answers to these questions generate action at the relevant levels, which in turn produces

results that flow back into the environment in the form of services, benefits, policies, resources, or other products of government action. Figure 1 shows three levels of distribution of the issues, roughly reflecting a generic governmental governance process. Similar representations could include different levels, but would follow the same

While IT governance structures include a generic set of elements or capabilities, there are also context specific issues that must be responded to in the design, development and implementation processes.

basic principles (Pardo, Canestraro, Hrdinová, Cresswell, and Raup-Kounovsky 2009).

This representation is useful in identifying the kinds and locations of actions and decisions that make up a governance framework. It is also useful in defining working relationships that are necessary for value to be gained. How each organization implements governance varies to some degree; however, our research supports previous assertions (Weill and Ross 2004) that there are three primary structures for enterprise IT decision making:

- 1. A *centralized IT governance structure* distributes authority and decision making power solely to a central body (or a state-level CIO).
- 2. A *decentralized IT governance* structure distributes all authority and decision-making power to individual business units (or state agencies).
- 3. In a *federated IT governance structure*, authority over decision-making is distributed between a central body and individual organizational units (or a state-level CIO and state agency CIOs).

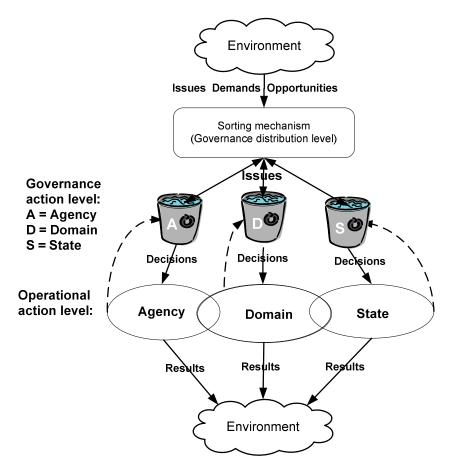


Figure 1 - Enterprise IT Governance as a Sorting Mechanism

Ideally, governance structures make clear five key aspects of governance: scope, authority, organizational structure, membership, and process.

The *Scope* of governance at any particular level refers to the range of issues covered by a governance structure. A broader scope of governance might include all of the possible IT issues in a particular setting, i.e., procurement, standards, architecture, policies, business-IT alignment; a more narrow scope might focus solely on standards development or procurement.

Authority arrangements refer to how power, rights, roles, and responsibilities are distributed between and among the related entities. Examples are the national, state, and local governments of a single country involved in a coordinated human services program or the three countries involved in a joint air quality management initiative.

Organizational structure refers to the operating structures of governance. It includes the specification of the entities that will be created, including their placement within a hierarchy and their reporting relationships. For example, a government-wide body might report to the top elected official, while a governance body created to support decisions about standards across a set of municipalities might report to a multi-organizational advisory body.

Membership refers to those individuals and organizational representatives who ought to be making decisions relevant to specific interoperability initiatives. It should recognize both formal relationships, such as established legal and statutory appointments, and informal ones established through various coordinating mechanisms such as communities of practice. A governance structure might include both a statutorily established enterprise-wide advisory body and a group that has appointed members from domain level informal collaborative efforts such as communities of practice.

Process refers to how the governance structure is implemented and used. It should identify specific coordination mechanisms and articulate the decision making rules and procedures. Ultimately, process clarifies the specific actions and behaviors that support the individual governance structures.

Integrating the New with the Old

One of the key challenges governments face in improving interoperability is the need to identify and address existing bureaucratic, political, and hierarchical structures and policies that make cross-boundary decision making about priorities, resources, and systems difficult. Regardless of this difficulty, whole scale replacement of these traditional bureaucratic and vertical governance structures with new cross-boundary, horizontal governance structures is neither a feasible nor desirable approach. Division of labor and specialization—inherent in bureaucratic and hierarchical structures—are intentional features of modern governments and exist for good reasons (Page 2005, Christensen and Lægreid 2007). In addition, the political risk as well as the financial cost of attempting to push through such drastic changes limits them to political rhetoric and idealistic calls for reform. Hierarchy and authority cannot and will not be replaced (Kettl 2002). Therefore, it must be understood and worked with when improving government interoperability.

Efforts to improve government operations and services to citizens through cross-boundary collaborative efforts have shown that traditional government structures do not disappear. Rather, "they are penetrated by both formal and informal information sharing and work relationships that cut across jurisdictions and program structures" (Pardo and Burke 2008, p.1). While the traditional structures do remain in place, a different type of governance capability is needed to help guide these new groupings of persons and forms of organization as they learn how to make decisions, share information, exchange knowledge, integrate processes, use technology, and respond to demands in new ways—to become interoperable. As such, governance capabilities for improving government interoperability must include a combination of exercising formal authority *and* negotiating and collaborating that allows a network of organizations to collectively manage traditional boundaries and constraints rather than replace them (Pardo and Burke 2008).

The CTG current practices review of IT governance in the public sector revealed a variety of IT governance coordination mechanisms currently in use (Pardo et al. 2009). A coordination mechanism is defined as "any administrative tool for achieving integration among different units within an organization" (Martinez and Jarillo 1989). CTG's examination of existing IT governance structures in the U.S. states found a range of mechanisms that integrate and coordinate diverse stakeholder views (see Table 3) (Helbig, Hrdinová, and Canestraro 2009).

These coordination mechanisms all exhibit structural, functional, and social integration capability (Peterson, Callaghan, and Ribbers 2000). A set of state profiles as well as a state-by-state comparison (Hrdinová et al. 2009) identified that some states were found to use only one or two types of these mechanisms, while others used a variety of interrelated coordination mechanisms.

Table 3. Examples of IT Governance Coordination Mechanisms			
Coordinating Mechanisms	Description		
External committees, councils, and boards	Physically located outside of the control of the state level IT office; however the state level CIO or agency level CIOs have roles in these bodies – either as a chair or participant. These are generally created for a host of different reasons and all have different levels, authority, scope, and responsibilities.		
Community of Practice (CoP)	Instances where people with like needs come together to solve problems relevant to the community. Some of these CoPs have formalized their own IT governance activities, and some have been recognized as part of the larger state IT governance picture. However, it is surmised that the majority of them are informally created and thus not necessarily reported.		
Enterprise oriented offices, divisions, or units within the state level IT office	Have as their sole responsibility to look across the state for opportunities where individual agencies or the state as a whole can benefit from an enterprise approach to IT.		
Agency liaisons	Used to elicit the needs of the state agencies and to be able to gather their feedback. The state level IT office creates agency service units with liaisons to each state agency or a cluster of agencies perceived as being part of the same domain.		

One key lesson learned from our discussions with state CIOs and their staffs was that creating and implementing successful coordination mechanisms is very much an emergent process. While a number of the CIOs we interviewed told us that their initial strategies involved selecting one type of mechanism and trying to make it work for their state, they learned that political, financial, organizational, and other environmental issues often impeded the success of that approach. As described in this paper, building effective governance capability requires an initial focus on the five key aspects of governance (i.e., scope, authority, organizational structure, membership, and process) and then determining which mechanisms are most appropriate within the existing context and will achieve the desired goals. For the long term, effective IT governance capability also requires acknowledgement that conditions change, and so sustaining an effective structure requires regular examination of the fit between IT governance and the changing context.

Identifying the Public Value of IT Governance

Creating new IT governance capability, as discussed above, is complex and often problematic.

As a consequence, when considering creating new enterprise IT governance capability, public managers should first identify the public value they expect to create through enhanced IT governance. In this case, having explicit

What public value must be created to make the enhancement of enterprise IT governance worthwhile?

knowledge of the value now achievable through newly interoperable systems will support the business case for investments in IT governance.

Three questions, in particular, should be asked:

- 1. What value must be created to make the enhancement of enterprise IT governance worthwhile?
- 2. What changes have to occur for that value to be created?
- 3. Do we have the capability to make and sustain the necessary changes?

The public value approach is unique among IT governance efforts. The uniqueness of this approach rests in the public value framework developed by the Center for Technology in Government. In this framework public return on investment (PROI) is defined as a measure of the delivery of specific value to the people, and the improvement of the value of government as a public asset. The framework identifies five types of public value that extend beyond financial considerations: political, social, strategic, ideological, and stewardship.² For each value type there are three possible value-generating mechanisms: increases in efficiency and/or effectiveness, enabling of otherwise infeasible but desirable activities, and intrinsic enhancements to the stakeholders, such as improved transparency. The value focus also helps maintain awareness of the technical and political context of IT governance and avoid simplistic generic strategies that do not take context into account.

The task of assessing value is challenging because not every aspect of public value is relevant for a particular governance structure or investment. Table 4 presents a way to map value creation in terms of the recipients of value and the various governance structures you might find in a multilevel, multi-unit government. Included in the table are examples of how each scope of governance can achieve different value propositions for the individual recipient groups. Engaging in a mapping process allows networks of organizations to more specifically identify what value must be realized through enhanced IT governance to justify the investments necessary to create that enhanced capability. The mapping process was designed to ensure that multiple stakeholder perspectives are incorporated into the value discussion. In the use of this mapping in New York State, participants learned that an enhanced enterprise IT governance structure (with the enterprise being the State of New York) created the greatest value when developed as a complement to, rather than as a replacement for, multi-level IT governance.

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² A more detailed description of these five types of public value can be found in The Center for Technology in Government. (2007). *Advancing Return on Investment Analysis for Government IT: A Public Value Framework*. Available at http://www.ctg.albany.edu/publications/reports/advancing_roi.

Table 4. Mapping the Value of IT Governance					
		IT Governance Structures			
		Agency Level	Domain Level	Enterprise Level	
e	Agency	Better alignment with agency business, improved sharing of services within agency, simpler standardization.	Ability to benefit from the collaboration by allowing smaller agencies to have a voice in a larger forum.	Benefit from aggregate buys such as with e-licensing and PC contracts.	
Recipient of Value	Domain	Ability to coordinate resources.	Leverage skills and technology. Ability to create a "domain vision" that represents the whole versus individual silos.	Economies of scale.	
	State Government	Statewide cost savings.	Better alignment within the policy domains of the State.	Multi-year planning and ability to weather the changes in political swings.	
	Public	Customer centric focus of agency mission and vision.	Provides a streamlined perspective of a policy domain. Better customer service. sswell, and Raup-Kounovsky 2	Overall cost savings and improved customer service.	

A Case Example: Creating Enhanced Enterprise IT Governance for New York State

The project, conducted by the Center for Technology in Government in partnership with the New York State (NYS) Office of the Chief Information Officer and Office for Technology (CIO/OFT) and the NYS Chief Information Officer Council, 3 generated a set of recommendations for improving enterprise IT governance for NYS government. The resulting recommendations focused on outlining a new enterprise IT governance structure for NYS. While the recommendations were developed specifically for New York State, the overall findings drew not only on insights gained in NYS, but also from public and private sector IT governance experiences nationwide and around the world and from previously published research in this area. In the NYS project, one of the early and repeated engagements with enterprise IT stakeholders focused on answering the question, What value must be delivered in order to make enhancements to IT governance in New York State worthwhile? Stakeholders identified four primary value propositions for enhanced enterprise IT governance:

Reduce redundancy and establish prioritization mechanisms. Value is created by complementing and not usurping the missions and goals of individual agencies. Prioritization is

³ See CTG's *Creating an Enterprise IT Governance Framework for New York State Government* project page at http://www.ctg.albany.edu/projects/itgov?proj=itgov&sub=summary.

a difficult, but potentially powerful process. Where prioritization occurs—at the agency, domain, or national level—is an important consideration for any IT governance structure.

Reduce political directions and swings. A well-designed governance structure cannot eradicate political swings, nor should it. What a governance framework can do is provide a continuity plan for when political leadership changes. It can serve to support a consistency of vision for IT projects, especially for large infrastructure initiatives which are often multi-year endeavors that span more than one political administration.

Establish standards. Through common technological standards, collaboration and interoperability become achievable goals for the state's many departments and units. A governance framework for New York State should set out clear rules for developing statewide standards, including capability for ongoing review and refinement of those standards to respond to new and emerging needs, technologies, and priorities.

Foster sharing of services and information through agency collaboration. Effective enterprise IT governance should provide a space for greater coordination and collaboration among agencies, authorities, and local governments. Although government is diverse, there are many shared goals and constituents, which make cross-boundary collaboration a worthwhile and necessary goal.

Align IT with business of the state. Aligning IT with business needs is a commonly accepted goal of IT governance, yet it is universally difficult to achieve. Programmatic needs are what drive government organizations and IT governance should strive to provide avenues for the alignment between IT investments and programmatic priorities. This alignment has potential value at the agency level as well as the state level.

These value statements provide both a justification for pursuing enhanced IT governance in New York State and a framework for evaluating any IT governance strategy pursued by the state. In terms of developing governance capabilities for improving interoperability, we propose a similar approach: a focus on identifying the public value of investments in interoperability and the threshold capability of IT governance.

IT Governance and Interoperability

Developing appropriate IT governance capabilities for interoperability is an iterative and dynamic process. Depending on the scope of the interoperability initiative and the organizations involved, the appropriate governance design may involve multiple governance bodies and be developed in an iterative fashion over time, or it may involve one body and be created through one piece of legislation. Regardless of the numbers and types of organizations involved, the components of IT governance must be assessed in terms of what is necessary to achieve the goals of improved interoperability. Investments in the development of new IT governance capability must be informed by a clear understanding of the value it will create. The focus must first be on the value of interoperability in terms of specific strategic objectives: What new kinds of interoperability are necessary to achieve those strategic objectives? Then, the focus must be on what decisions must be made to create the desired interoperability. Finally, governments must

determine the adequacy of existing IT governance structures. If new IT governance capability is necessary, then governments must decide what scope of concern a new IT governance body must have to ensure the decisions that must be made will, in fact, be made, acted on, and reviewed. They must decide what bodies will be created, where will they be placed, and what authority each one will have. Governments need to identify which organizations are in some way involved in that decision making area, which organizations should specifically be members of these bodies, and how the bodies will actually work, both internally and in concert with other bodies, once the members convene. Then governments must actually create a governance structure that has the necessary power and authority to enable the coordinated action necessary to achieve those objectives.

Acknowledgements

The authors would like to thank Microsoft Corporation for their support in the development of this white paper. In particular, we would like to acknowledge Lorenzo Madrid, Director of Microsoft's WW Public Sector Government Interoperability Engagement Program.

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