

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** 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 assessment to ensure that the capabilities held collectively by the network are relevant to and appropriate for the task at hand. To build this understanding, government leaders need a framework for assessing current capabilities and then using assessment results to guide capability development investment decisions.

A new model for assessing government interoperability maturity is presented in Table 4. This new model, comprised of three maturity levels, combines and simplifies the most relevant aspects of the maturity models presented earlier. These three levels of government interoperability are 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 developed to achieve the **desired** or **target** level of interoperability.

Table 4. Government Interoperability 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 can not 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 governmentwide 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.

As outlined earlier in the **Understanding risks and costs** section of this paper, government agencies seeking to create government interoperability maturity need capabilities in two key areas.

1. **Developing and managing interoperability initiatives.** This has to do with establishing government processes and structures to facilitate the development and management (i.e., planning, selecting, controlling, and evaluating) of government interoperability initiatives.
2. **Information sharing capability.** This has to do with the ability of a network of organizations participating in a government interoperability initiative to successfully share information.

Making smart investments in interoperability

In **Stage 2: Building the Investment Foundation**, basic selection capabilities are being driven by the development of project selection criteria, including benefit and risk criteria, and an awareness of organizational priorities when identifying projects for funding (GAO 2004, p. 11).

The ability to select projects based on well informed decisions is a governmentwide prerequisite for improving interoperability. Such well informed decisions require accurate and detailed information. The information necessary to guide these investments decisions is generated through two processes. The first is the creation of a business case for the project and the second is an agreed upon and standardized process for reviewing business cases and making decisions on which ones to fund. An example of these processes can be found in Stage 2 of the U.S. Government Accountability Office's (GAO) **IT Investment Management Framework (ITIM)**: "Building the Investment Foundation." In the GAO model, this capability is improved upon in subsequent stages, but Stage 2 is the baseline requirement. The importance of these types of capabilities is also supported in some of the other capability maturity models in their discussions of "business and technical architectures" and "enterprise architecture." U.S. and European models show increased incorporation of architecture approaches to address aligning government missions, strategic plans, goals, and processes with investments in technology (Guijarro 2007; GAO 2004; Athena 2004, Pardo et al 2005, Cresswell et al 2006).

Figure 1 below illustrates a business case development and evaluation process from the Center for Technology in Government's **Making Smart IT Choices: Understanding Value and Risk in Government IT Investments**. **Smart IT** was developed specifically for those types of government investments that involve organizations working in new ways and with new partners.

Figure 1. The Analysis and Evaluation Process (Dawes et al 2005)

In addition, to making well-informed decisions about which initiatives to invest in, government professionals must be trained in managing large, complex, and multi-agency and multi-sector projects. Recent research indicates that success in government interoperability initiatives can be attributed in part to the management of these initiatives by people with specialized project management skills specific to the network context. These individuals proved capable of working in the "seams" that hold multi-agency collaborations together (Cook et al 2004, p. 31).

Identify & test solutions This phase makes substantial use of the experiences of other government organizations, other governments, and even private sector companies who have attempted to achieve similar goals. It leads to the identification of alternative solutions and offers ways to test them in low-cost, low-risk ways. Tools to facilitate this process do not include actual IT systems design or implementation but rather focus on best and current practice research, technology awareness reviews, benchmarking, environmental scanning, and prototyping. (Dawes et al 2005, p. 25).

The capability to develop and manage interoperability initiatives

A set of nine dimensions of capability relevant to working in a network to develop and manage government interoperability, to working in the "seams," are presented in Table 5a. Developing capability along each of these dimensions in an appropriate and sustainable way provides government agencies and their network partners with the foundation for success in government interoperability initiatives.(4)

Table 5a. Capability Dimensions for Developing and Managing Government Interoperability

CapabilityDimension	Description
Governance	The existence of appropriate decision making rules and procedures to direct and oversee government interoperability initiatives that are planned or underway. Also, to ensure that government interoperability investments (in IT and other resources) align with priorities and goals defined in strategic plans or by legislative and executive leadership. Governance structures should support and work closely with legal frameworks to enable new ways of sharing resources including money and data.
Strategic Planning	The quality and comprehensiveness of strategic plans and strategic planning processes, including resources and integration of planning with other elements of governance and management.
Business Case Development	The existence of processes and tools to develop a well-reasoned argument designed to convince key stakeholders of the benefits of a particular investment. This includes a problem statement, mission or visions statement, stakeholder analysis, expected benefits and potential risks, cost estimates, and funding sources.
Project Management	The availability and use of mechanisms for goal and milestone setting, scheduling development and production activities, analyzing resource needs, managing interdependencies among activities and goals, and provisions to anticipate and respond to contingencies.
Resource Management	The extent of effective and sustainable use of financial, human, and technical resources through budgeting, strategic plans, financial analyses, and accepted financial management procedures and practices.
Stakeholder Identification & Engagement	The extent of awareness of and interaction with the persons or groups with an interest in the information sharing initiative and capacity to influence it. This dimension is based on stakeholder analyses, staff experience and knowledge, records or reports of participants in making policy and decisions, and membership of advisory or constituent groups.
Leaders & Champions	The involvement of leaders and champions. Leaders motivate, build commitment, guide activities, encourage creativity and innovation, and mobilize resources; they see the goal clearly and craft plans to achieve it. Champions communicate a clear and persuasive vision for an initiative, provide the authority and legitimacy for action, and build support in the environment.
Business & Technology Architectures	The degree to which government has developed business and technology architectures that describe the existing service and operational components of organizations and networks of organizations and how they are connected to each other through business processes and technologies.
Performance Evaluation	The presence of the skills, resources, and authority necessary to observe, document, and measure: (1) how

	well investments are developed and implemented, (2) whether goals are achieved, and (3) how the performance of the government is improved.
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Information sharing capability

Whereas the capabilities described in the previous section focus on a government's ability to make the case for, select, and then manage individual and multiple government interoperability initiatives, this section focuses on the capability dimensions needed by the network members to successfully share information. As mentioned earlier in this paper, information sharing across a network form of organization is at the core of interoperability and the ability of a network to deliver coordinated programs and services. Table 5b presents eight capability dimensions based on CTG's extensive research and practice in the development and use of capability assessment models in support of cross boundary information and knowledge sharing initiatives in government (see Pardo et al 2005 and Creswell et al 2006).

Table 5b. Information Sharing Capability Dimensions

CapabilityDimension	Description
Collaboration Readiness	The degree to which relationships among information users and other resources support collaboration. Examples include staff, budget, training, and technology that support collaboration as well as prior successes or failures in collaborative activities
Organizational Compatibility	The degree to which the work styles and interpersonal relationships, participation in decision-making, levels of competition and collaboration, and styles of conflict resolution support information sharing. Compatibility of cultures may be gauged by the degree of centralization, degree of conformity, deference to authority, adherence to rules, and symbols of status and power
Information Policies	The level of development of policies that deal with the collection, use, dissemination, and storage of information as well as with privacy, confidentiality, and security.
Change Acceptance	The extent of talk and actions expressing positive or negative attitudes toward workplace changes, trust of new tools and techniques, success or failure stories that are widely shared and believed, and enthusiasm for innovations.
Technology Knowledge	The levels of knowledge about current and emerging technology for information sharing, including technical qualifications and experience of staff, training, records and documentation of technology assets, and the actions of staff in compiling, storing, and sharing such knowledge.
Data Assets & Requirements	The extent of specification and identification of formal policies for data collection, use, storage, and handling, as found in documentation of databases and record systems; and in data quality standards and dictionaries. It may include procedures for and results of data requirement analyses and data models and modeling techniques.
Secure Environment	The degree to which appropriate security protocols for data, applications, systems, and networks as well as policies, training, and management practices are in place.
Technology Compatibility	The presence of agreed-upon standards for hardware and software, the extent of connectivity among the persons and organizations seeking to share information, and the experiences of staff with information sharing activities.

(4) There are a number of governments out there and at all levels (federal, state, and local) that have developed and instituted project management training programs for government employees. In a number of cases, government employees who are responsible for large ICT implementations and other large and complex projects are required to undergo project management training. For example, in New York State, the Project Management Mentoring Program (information found at www.cio.state.ny.us/Services/Training/SrvTRPMMP.htm) was designed in response to the state's increasingly complex and expensive projects necessary to support the government's business. There also are a number of internationally recognized project management focused professional organizations that offer training in this area. For example, visit the Project Management Institute's Web site at <http://www.pmi.org/Pages/default.aspx>.