

Technical advances make interoperability possible, but research and practical experience tell us that technology alone cannot solve the challenges of creating interoperability. The complexity of creating enterprise interoperability lies in the interdependence among policy, management, and technology capabilities and the gaps between the levels of capabilities required within an enterprise and the capabilities that exist. The broad view used here considers capability in terms of two closely related, but distinct components needed for creating new multi-organizational interoperable systems:

1. Capability to create effective collaboration across organizational and governmental boundaries.
2. Capability to develop new interoperable systems and procedures.

Making a distinction between sets of capabilities is critical to understanding the complexity common to many transformative efforts. For example, collaboration capability is about working together and making plans and decisions. This seemingly simple capability is often found to be lacking within a cross-boundary environment. Collaboration at the individual level, even at the unit and agency level is often within the skills and authority of government managers to arrange. However, creating capability for collaboration within the public health enterprise of a country, or across country lines to create regional programs, requires the unique attention and authority of government leaders.

Stovepipe funding models Stovepipe funding generally undermines work on initiatives that cut across disciplines and agency boundaries when those initiatives are forced to compete for financial support with individual agencies' operational needs. *Optimizing State Investments for Justice Information Sharing*, U.S. National Governors Association, 2002 <http://www.nga.org/cda/files/1102FINANCINGJUSTICE.pdf>

Creating two kinds of capability for interoperability

In 2004, the State of Oregon experienced its first case of West Nile virus (WNV). Interoperability was a central part of the response coordination effort and required new capabilities within the state and with federal agencies. One county-level communicable disease expert involved in Oregon's WNV response efforts found that for agencies to achieve interoperability on a more systemic and institutional level, they must understand each other's missions and needs. To achieve this level of understanding, she said, agencies go through several stages of collaboration. The first stage is "shake hands." Meet and get to know the people from agencies you will be working with. The second stage is to coordinate planning and training with agencies through exercises and routine responses. Only after going through these first two stages can agencies reach the stage of true interoperability. Building this collaboration capacity takes time and resources, and only with the support of top leaders can these separate organizations begin to work together and build interoperability when and where it is needed.

The second component contributes to the building of systems and inter-organizational processes used to share and integrate information. Leadership involvement is required here as well. Creating interoperable business processes and information systems builds on new agreements about how work will be done to actually create interoperable systems. This typically requires resources to be managed differently. Appropriate resource allocation and procurement strategies are necessary and as a consequence operating agencies, control agencies, and policy making bodies must also act in new ways.

Creating this capability within complex enterprises is constrained by many factors including technical issues such as data and technical incompatibility. But institutional and organizational factors present their own constraints on the ability of governments to create effective collaboration across organizational boundaries. These include:

1. A lack of experience leading in network forms of government.
 2. An insufficient or lacking cross-boundary governance structure.
 3. A lack of policies that allow new, innovative resource allocation models.
 4. A lack of policies that engender investments in the principles of scalability and sustainability of solutions.
 5. A focus on crisis-oriented response.
-