

### Summary

Integrating and sharing information in multi-organizational government settings involves complex interactions within social and technological contexts. Organizations must establish and maintain collaborative relationships in which knowledge sharing is critical to resolving numerous issues relating to data definitions and structures, diverse database designs, highly variable data quality, and incompatible network infrastructure. These integration processes often involve new work processes and significant organizational change. They are also embedded in larger political and institutional environments which shape their goals and circumscribe their choices. The purpose of this research is to develop and test dynamic models of information integration in these settings.

Interorganizational information integration was chosen as the focus for this research because of its central place in the design and implementation of many advanced information technologies, such as data mining, visualization, and GIS. It also involves phenomena and theoretical frameworks in several disciplines, and is a linchpin of IT use in many critical public policy areas. The research will contribute to the National Science Foundation's Information Technology Research Program objective to "enable research and education in multidisciplinary areas, focusing on emerging opportunities at the interfaces between information technology and other disciplines." The research setting recognizes that governments at all levels are centrally important actors in the social transformations taking place with, and because of, growing computational and information sharing capabilities. This work is intended to improve understanding of how information integration and sharing can be developed and implemented in this and other sectors of society.

### Scope of Work

#### Current Progress

With the completion of the final data collection phase of the MIII project, CTG is currently analyzing the results from our national survey and continuing to develop various results-oriented academic and practitioner publications. These publications are drawing from this analysis along with the rest of the extensive research data collected throughout this project. Please visit the MIII Results & Publications page to view existing papers, articles, and other publications and check back periodically for future products.

#### Project Background

Integrating and sharing information in multi-organizational government settings involves complex interactions within social and technological contexts. It also involves new work processes and significant organizational change. Initiatives to improve the integration and sharing of information in these settings are embedded in larger political and institutional environments that shape their goals and circumscribe their choices. The purpose of this research is to develop and test dynamic models of information integration in these settings.

The research set out to address three basic questions:

1. What are the critical factors and processes involved in integrating information across levels and agencies in government? In particular, how do IT and social factors interact to influence the effectiveness of interorganizational information integration?
2. How do the factors and processes vary for different types and degrees of integration?
3. Can the processes of integration be modeled in ways that improve understanding of information system development and of interorganizational collaboration? Do these models contribute to new theoretical insights for developing and implementing advanced information technology?

The multi-year research program has concentrated on integration activities in two critical policy areas:

justice and public health since they include a full range of functions across all three levels of government. These also are areas in which significant integration initiatives are underway and available for study. Federal, state, and local government agencies are collaborating in the research, as are organizations of government professionals concerned with information technology.

Understanding and supporting information integration is a multidisciplinary undertaking. The project therefore combines perspectives from organizational behavior, computer and information science, and political science. Two forms of modeling are being used: system dynamics modeling that emphasizes the temporal and feedback aspects of the process, and social process modeling that emphasizes the way collaboration and shared meanings are developed. These methods build on prior work of the investigators in interorganizational knowledge sharing, collaboration, and government technology innovation. The result will be new models of interorganizational information integration processes that can support system development, and lead to further research and education in the related disciplines.

The research was conducted in three overlapping phases:

1. Phase one included two intensive integration projects: one with the leading state-level criminal justice agencies in New York to help them develop a governance structure for statewide criminal justice information sharing initiatives; and one with the New York State Department of Health and related state and local agencies involving a retrospective study of the state's response to the 1999 West Nile virus outbreak and planning for the reemergence of the virus in 2000. This work was conducted starting in the summer of 2003 and continued through the spring of 2004.
2. Phase two included six additional case studies to observe ongoing integration initiatives and to interview key actors; still within the public health and criminal justice policy arenas. This work was conducted in the first half of 2004 and involved the states of Colorado (public health and criminal justice), Connecticut (public health), North Carolina (criminal justice), Oregon (public health), and New York City (criminal justice).
3. Phase three included a national survey designed to test the models of integration developed based on the results of phases one and two. The model development work began in summer of 2004 and the final survey was administered in early 2008.

## Publications & Results

### Reports and Working Papers (1)



#### Factors Influencing Government Cross-Boundary Information Sharing: Preliminary Analysis of a National Survey

Tue, 01 Sep 2009

This report summarizes the results of a national survey of cross-boundary information sharing in the public sector conducted by the Center for Technology in Government (CTG). This national study, conducted by CTG and supported by a grant from the National Science Foundation, was designed to understand how effective information integration and sharing occurs within and across boundaries of organizations. The purpose of the survey was to test the generalizability of a preliminary theoretical model of how policy, organizational, social, and technical factors interact to create criminal justice and public health information sharing capabilities. CTG developed this model based on the data collected and analyzed during earlier phases of the research project.

### Journal Articles and Conference Papers (15)



#### Clarity of Roles and Responsibilities in Government Cross-Boundary Information Sharing Initiatives: Identifying the Determinants

Wed, 21 Oct 2009

Research has shown that clarity of roles and responsibilities (CRR) influences the effectiveness and performance of individual organizations as well as cross-boundary or interorganizational group efforts. Role clarity increases job satisfaction, commitment, and involvement and reduces tension and anxiety among organizational members, which results in lower staff turnover rates in organizations. In addition, CRR has been found to enable other important determinants of success in cross-boundary information sharing (CBI), such as building trust among members of CBI initiatives. However, few studies attempt to understand the determinants of CRR in a CBI initiative. Using data from semi-structured interviews from eight U.S. state and local government public health and criminal justice information sharing cases, this paper seeks to fill this gap by examining these determinants.

#### Governance structures in cross-boundary information sharing: Lessons from state and local criminal justice initiatives

Fri, 4 Jan 2008

Governments are increasingly using collaborative, cross-boundary strategies to face complex social problems. Many of these cross-boundary initiatives have at their core the use, and in many cases, the sharing of information and communication technologies. In fact, government managers and researchers alike are now recognizing the value and great opportunities offered by cross-boundary information sharing, in particular. Current research has identified important factors that affect these cross-boundary information sharing initiatives. Governance structures are among those factors found to be important in cross-boundary information sharing. However, there is little research about the determinants of an effective governance structure in these multi-organizational settings. Based on semistructured interviews with participants in four state and local government criminal justice initiatives, this paper systematically identifies the determinants of governance structures for cross-boundary information sharing initiatives. By doing so, this study contributes to theory, but also supports the development of more specific guidelines for public managers and other individuals involved in crossboundary information sharing.

#### Informal leadership and networks: Lessons from the response to the West Nile Virus outbreak in North America

Fri, 19 Oct 2007

Sharing information across organizational boundaries in support of a governmental response to crises requires intergovernmental collaboration and information sharing. Examining these efforts provides an opportunity to explore questions about the role of various actors in such response efforts; in particular, informal leaders. This paper, based on a comparative case analysis of the response to West Nile virus (WNV) in two US states, New York and Colorado, extends what is known about leadership by providing new understanding about how informal leadership affects collaborative information sharing. The case analysis contributes to current knowledge about government leadership in complex networked environments such as a public health crisis. A set of propositions drawn from the analysis provides a preliminary model of the mechanisms through which informal leadership affects

intergovernmental information sharing in crisis response. The findings also provide lessons about the role informal leaders play in cross-boundary information sharing and, consequently, in generating government capacity to respond to complex public problems as well as the foundation for a set of recommendations for practitioners.

### Government leadership in multi-sector IT-enabled networks: Lessons from the response to the West Nile Virus outbreak

Mon, 02 Jun 2007

Government leaders at all levels are realizing that sharing information across organizational boundaries is essential to effectively respond to the most pressing public problems facing governments. A public health crisis, such as the outbreak of the West Nile virus in the United States, represents one of these pressing public problems. Sharing information across organizational boundaries in support of a governmental response required intergovernmental and multi-sectoral collaboration and information sharing. Examining these efforts provides an opportunity to explore questions about various actors in such response efforts; in particular, executives and informal leaders. This paper, based on a comparative case analysis of the response to West Nile virus (WNV) in two US states, New York and Colorado, extends what is known about leadership by providing new understanding about the mechanisms through which executive involvement, and formal authority, informal leadership affect multi-sector collaborative information sharing. The case analysis contributes to current knowledge about government leadership in complex, multi-sectoral network environments such as a public health crisis. A set of propositions drawn from the analysis provide a preliminary model of the mechanisms through which leadership variables affect intergovernmental and multi-sector information sharing in crisis response. The findings provide new insight for practitioners about the mechanisms through which executives and informal leaders influence cross-boundary information sharing and ultimately the capability of government organizations to respond to complex public problems.

### Emergence of the governance structure for information integration across governmental agencies: A system dynamics approach

Fri, 25 May 2007

The purpose of this paper is to describe a dynamic theory of the socio-technical processes involved in the definition of an Integration Information problem in New York State (NYS). In April 2003, the Criminal Justice Information Technology (CJIT) group of NYS was tasked with developing a framework to give users of criminal justice data and information systems “one-stop shopping” access to information needed to accomplish their mission. CJIT collaborated with the Center for Technology in Government (CTG) for an eight-month period during 2003 to accomplish this task. The theory consists of a system dynamics model for understanding the dynamics of the collaboration involved in the problem definition stage of a project. The model was developed in facilitated group modeling sessions with the CTG team. The model is capable to generate interesting scenarios that show the importance of social accumulations in project management. Moreover, the model illustrates a powerful way to use modeling and simulation as theory-building tools.

### From Agency to Structure: Analysis of an Episode in a Facilitation Process

Fri, 16 Mar 2007

In recent publications in organizational communication, the phenomenon of nonhuman agency has been highlighted as a key element whose recognition might allow researchers to better account for the nature and functioning of organizations. This approach consists of showing that the roles machines, tools, documents, architectural elements, and artifacts more generally play in collectives tend to be neglected in social sciences in general and organizational studies in particular, and that recognizing the active contribution of these elements might help us solve both theoretical and analytical problems.

### Multi-method approaches to understanding the complexity of e-government

Fri, 18 Oct 2006

Electronic government is a complex phenomenon which involves technical, organizational, institutional and environmental aspects. Researchers from different disciplines are increasingly finding that using multiple methods can help to deal with complexity and obtain more comprehensive explanations. This paper argues that multi-method approaches can be useful for e-government research. A set of advantages and challenges to multi-method approaches are introduced and then used to frame a case analysis. Two case studies involving multi-method approaches to e-government research are presented to illustrate strategies for responding to implementation challenges in both large-scale and small-scale projects. This case analysis contributes to the discussion about multi-method research designs and their role in digital government research. Insights into management strategies specifically designed to respond to the digital government context and the adoption of relevant methodologies drawn from the experiences of the authors are provided.

### Building response capacity through cross-boundary information sharing: The critical role of trust

Mon, 02 Oct 2006

Governments around the world are increasingly turning to information sharing and integration to help solve problems in a wide range of programs and policy areas. These complex interorganizational efforts face not only the technical challenges of many information technology initiatives, but also the difficulties derived from interacting among multiple and diverse organizations. Trust has been identified as one of the most important organizational factors for cross-boundary information sharing and integration. However, more research is needed regarding the determinants of trust building in this multi-organizational contexts. This paper highlights the relevant role of trust in cross-boundary information sharing initiatives and provides evidence about three of its most important determinants.

### Multi-Method Approaches to Digital Government Research: Value Lessons and Implementation Challenges

Tue, 31 Jan 2006

Digital government is a complex organizational and social phenomenon. It involves technical, organizational, and policy elements, as well as their complex and recursive interactions. Multi-method approaches have been shown as capable of presenting more comprehensive explanations of complex situations. This paper argues that multi-method approaches are valuable alternatives for e-government research.

### Understanding the Complexity of E-Government: Multi-method Approaches to Social Phenomena

Mon, 07 Oct 2005

This paper contributes to the ongoing debate about multi-method approaches to studying social phenomena; in this contribution e-government is the social phenomenon of interest. A set of advantages and challenges to multi-method approaches are introduced and then used to frame a case analysis. Two case studies involving multi-method approaches to e-government research are presented to illustrate strategies for responding to implementation challenges in both large-scale and small-scale projects. The case discussion provides new insight into how the challenges to multi-method approaches can be managed.

### Interorganizational Information Integration in the Criminal Justice Enterprise: Preliminary Lessons from State and County Initiatives

Sat, 31 Jan 2005

Traditional governmental structures have organized the capture, use, and management of information along agency lines. These "information silos" are not very useful in a dynamic environment. Information integration is considered one of the most significant ways to change the structure and function of public organizations. It has the potential to support the transformation of organizational

structures and communication channels between and among multiple agencies working in different locations. This article contributes to this knowledge-building effort by examining the factors that influenced the success of selected criminal justice integration initiatives. Useful integration strategies are also identified.

### Criminal Justice culture in the United States: A context for understanding aspects of organizational change

Mon, 06 Oct 2004

As statistics show, violent crime is more prevalent in the US than in Hungary. Consequently, U.S. law enforcement, and a wide range of criminal justice agencies, are seen as an important part of government. These agencies embody characteristics that make them similar to and different from their counterparts in other areas of government. The research reported on here unveils some of these characteristics as it looks at interactions among criminal justice agencies in their efforts to develop structures within which to share and integrate information across organizational boundaries in order to reduce crimes.

### Emergence of the governance structure for information integration across governmental agencies: A system dynamics approach

Mon, 06 Oct 2004

The purpose of this paper is to describe a dynamic theory of the socio-technical processes involved in the definition of an Integration Information problem in New York State (NYS). In April 2003, the Criminal Justice Information Technology (CJIT) group of NYS was tasked with developing a framework to fulfill the goal of giving users of criminal justice data and information systems "one-stop shopping" access to the information needed to accomplish their mission. The research team of the Center for Technology in Government (CTG) collaborated with the CJIT group for an eight-month period during 2003 to accomplish this task. The CJIT-CTG team went through a series of conversations to specify the business problem and its context, and to identify feasible solutions and alternatives. This paper reports on a system dynamics model for understanding the dynamics of the socio-technical processes that took place during this project. This model building effort is looking for the development of a theory of interorganizational collaboration. The model is being developed in facilitated group model building (GMB) sessions with the team at CTG. Although the model presented in this paper is still preliminary, the model is capable to generated interesting scenarios with reasonable changes in the initial values of some parameters. Moreover, the model illustrates a powerful way to luse group model building and simulation as theory-building tools.

### Scripts for interrupted group model building: Lessons from modeling the emergence of governance structures for information integration across governmental agencies

Mon, 06 Oct 2004

The system dynamics group at Albany has been developing approaches to decision conferencing using a combination of group facilitation techniques linked to projected computer models in the room for more than 20 years. Over the years, the group has developed a series of pieces of small group processes to build system dynamics models with groups, i.e. scripts. The Group Model Building (GMB) process reported here has several characteristics that make it different from most other experiences in the group. While the common setting involves managers interested in tackling a specific problem, this work involves a research team interested in building theory about the complexity of intergovernmental information integration. Additionally, the reported GMB process took place in small sessions of two to three hours, while the common practice at Albany involves intensive one or two-day meetings. In this way, the paper will include general thoughts about the implications of these differences for the GMB process.

### Modeling the social and technical processes of interorganizational information integration

Sat, 31 Jan 2004

Government leaders and IT executives increasingly recognize that interorganizational information integration (III) is a critical and complex process. Due to the need for integrated information at all levels of government, interorganizational information integration can no longer be pursued through ad hoc approaches that primarily rely on intuitive understandings of the way government operates. This paper presents an effort currently underway to model the social and technical processes of interorganizational information integration to improve our understanding of information system development and of interorganizational collaboration. This research seeks to enhance both the conceptual and practical models of III by building new understanding of the interaction among the social and technical processes in interorganizational information integration.

## Results

### Solving the Integration Puzzle

*CIOs play a key role in creating the right kind of environment for information integration to succeed in government.* > [Download Article](#)

By Theresa A. Pardo and Brian Burke

Public CIO Magazine

Summer 2005 Issue

## Partners

### Government Partners

- New York State Criminal Justice Information Technology Group
- New York State Department of Health

### Academic Partners

- David Andersen, Distinguished Service Professor, Department of Public Administration and Policy, Rockefeller College of Public Affairs and Policy, University at Albany, SUNY
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## Funding Sources

The project is funded in part through a grant from the National Science Foundation, grant number ITR-0205152.

## Press Releases & News Stories

### Press Releases

UAlbany Center Partners with European Union  
Thu, 28 Oct 2004

UAlbany's Center for Technology in Government Leads Study of Government Information Integration  
Wed, 05 Mar 2003

### News Stories

CTG Study Models Organizational Behavior dgOnline News, September 2003

## The International Information Sharing Research Network



The first organizing meeting brought together the CTG MIII research team with doctoral students from the University at Albany's Rockefeller College of Public Administration and Policy and College of Computing and Information.

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The International Information Sharing Research Network (IISRN), launched in 2007 at the Center for Technology in Government at the University at Albany, State University of New York, is focused on building knowledge about information sharing in an international context and making that new knowledge available to researchers and practitioners around the world. This innovative program brings together doctoral students and faculty in a coordinated research network dedicated to examining key questions of information sharing theory and practice within the domain of government. This innovative

network is leveraging present research findings from three U.S. National Science Foundation grants to the Center for Technology in Government by supporting comparative studies of these findings in the form of doctoral research on information sharing conducted in US and non-US contexts. Future plans for IISRN include: creating a repository of culturally sensitive data collection instruments; creating a secure, accessible, and usable data repository; creating a set of resources to inform comparative information sharing research designs, and building a sustainable international research network focused on information sharing in a governmental context.

Dissertation studies are underway in China, Jordan, and Taiwan, with additional studies being planned in Mexico and Saudi Arabia. In their dissertation research, students are drawing on findings from CTG's Modeling Interorganizational Information Integration (MIII) and Knowledge Networking in the Public Sector (KDI) research studies and working to contribute to the development of new theory in cross-boundary information integration and sharing through testing these findings in an international context. In addition to meeting regularly with IISRN, each student works with his or her dissertation committee at the University at Albany and with academic and practitioner partners in the host country.

IISRN currently involves faculty mentors from the University at Albany, staff from the Center for Technology in Government, and five doctoral students from China, Jordan, Mexico, Saudi Arabia, and Taiwan who are part of the Public Administration and Policy and Information Science programs at the University as well as one student from the U.S. located at the University of California at Santa Barbara. IISRN meets once a month to discuss network goals, key challenges in comparative information sharing studies, dissertation progress to date, and future opportunities; as well as to share knowledge about relevant topics such as comparative research design and issues related to human subjects.

An overview of key activities of the Network to-date are provided below:

### **Guest Speakers**

Guest speakers have provided IISRN with a series of presentations on design issues in comparative studies and information sharing theory and practice issues. Speakers have included:

- Terry Maxwell: Associate Professor and Chair of the Department of Information Studies at the University at Albany
- J. Ramon Gil-García: Assistant Professor and Director of the Data Center for Applied Research in Social Sciences at Centro de Investigación y Docencia Económicas (CIDE) in Mexico
- Alan Wagner: Professor and Chair of the Department of Educational Administration and Policy Studies at the University at Albany
- Sharon Dawes: Associate Professor in Public Administration and Policy at the University at Albany, and Senior Fellow at the Center for Technology in Government

### **Knowledge transfer - Building capability for comparative and international studies**

Members of the Network have created a wiki to support the sharing of documents such as human subjects applications for studies conducted in a non-US context as well as the related attachments to these applications such as letters of support from academics or practitioners in the country of interest, as well as relevant papers and presentations written by group members.

### **Invited presentations**

IISRN was invited to present at the Third Annual Informatics Spring Research Conference (NTIR) held by the College of Computing and Information at the University at Albany. The Network was also invited to present its most recent efforts in an invited session at the Second International Conference on Theory and Practice of Electronic Governance (ICEGOV) in Cairo, Egypt in December of 2008.

### **Publications**

Mulki, F., Zheng, L., Yang, T., & Pardo, T. A. (2008). International Research Program in Cross-Boundary Information Sharing. In Proceedings of the 2008 International Conference on Digital Government Research (pp. 409-410). Montreal, Canada: Digital Government Society of North

erica.

### Network Founders and Organizing Team

1. Theresa A. Pardo: Deputy Director, Center for Technology in Government
2. Fawzi Mulki: Research Assistant, Center for Technology in Government and Informatics PhD. Student
3. Lei Zheng: Research Assistant, Center for Technology in Government and Public Administration and Policy PhD. Student
4. G. Brian Burke: Senior Program Associate, Center for Technology in Government
5. Anna Raup-Kounovsky: Program Staff Assistant, Center for Technology in Government

### Network Members

1. David Andersen: Distinguished Service Professor in Public Administration and Policy, University at Albany
2. Sharon Dawes: Associate Professor in Public Administration and Policy, University at Albany, and Senior Fellow at the Center for Technology in Government
3. Terry Maxwell: Associate Professor in Information Studies, University at Albany
4. Rey Koslowski: Associate Professor in Political Science, University at Albany
5. Tung-Mou Yang: PhD. Student, University at Albany, Department of Informatics
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