

## **Modeling the Social and Technical Processes of Interorganizational Information Integration**

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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 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 improving understanding of how information integration and sharing can be developed and implemented. In addition, it is providing critical experience and lessons learned in the use of research methods that deal with context and complexity such as case studies, experimental test beds, field research, longitudinal studies, evaluation studies, and multidisciplinary studies.

This study provides a benchmark for implementing multiple analytical strategies, improved understanding of the way IT systems and artifacts emerge from social and technical interactions, and contributes to improved IT development and implementation in the operation of public agencies. The research addresses 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 two-year multidisciplinary research program is concentrating in two critical policy areas: justice and public health since they include a full range of functions across all three levels of government. These are also areas in which significant integration initiatives are underway and available for study. Federal and state government agencies are collaborating in the research, as are organizations of government professionals concerned with the role and use of information technology. This study is producing both practitioner and empirical products.

Our academic partners reflect the multidisciplinary nature of the project. The team, comprised of researchers from the University at Albany and the University of Montreal, contribute expertise in Communications, Computer Science, Management Science and IS, and Public Administration and Policy. Each partner brings a particular theoretical frame and data collection, analysis, and reporting traditions.

The team regularly invests in knowledge sharing across disciplines to support the development of robust interdisciplinary models.

The New York State Public Health and Criminal Justice communities are lead government partners in this study. The research team was provided access to high profile and politically charged organizational change initiatives in both program areas.

An action research approach is being used in our partnership with the state's Criminal Justice agencies to design the infrastructure necessary for a one-stop shopping portal for integrated justice information. In particular the team focused on the development of recommendations for a statewide integrated justice governance body. The recommendations were submitted to the NYS Director of Criminal Justice in December 2003 with the first meeting of the recommended Criminal Justice CIO Council occurring in January 2004. The development of the governance framework is a "first of its kind" cross-agency decision process in support of a new initiative of the governor and the director of criminal justice. Data collection for this action research effort is complete and analysis of over 100 meetings, workshops, debriefs, and interviews is ongoing.

In the public health component of the research, we are producing a case study of how New York State responded to the 1999 West Nile Virus (WNV) outbreak and planned for reemergence of the virus in 2000. Of particular interest to our research is the role of the existing information sharing infrastructure. We identified approximately 50 possible informants. To date, we have completed approximately 20 interviews with public health professionals involved in the development and utilization of the statewide electronic disease surveillance system. The interviews are expected to provide new insights into the nature of the social and technical processes between and among organizations involved in information integration efforts related to WNV.

The analysis of these social and technical processes will take place using an interdisciplinary theoretical framework developed to guide data collection and analysis. The framework includes attention to organizational and institutional factors that influence information integration, and how those interact with characteristics of the technology. The framework suggests the dynamic nature of some of these interactions that will be explored using system dynamics methods. Group modeling sessions have produced preliminary dynamic models of the emergence of the governance structure for information integration across government agencies. Preliminary analysis of the data has also produced a set of theory-based propositions about how social processes generate or influence the nature of and technical and social artifacts. Both the dynamic models and the propositions are being refining with additional case study and field site data.

A number of previous projects conducted by the Center are contributing to this most recent study. "New Models of Collaboration for Delivering Government Services" supported by the NSF Digital Government Program, "Knowledge Networking in the Public Sector" supported by the NSF Knowledge and Distributed Intelligence Program, "Increasing Information Sharing Effectiveness: A Capability Assessment Model for the Justice Enterprise" supported by the United States Department of Justice, Office of Justice Programs, and "Gateways to the Past, Present, and Future: Practical Guidelines for Electronic Records Access Programs" supported by National Historical Publications and Records Commission.