

Knowledge sharing in cross-boundary information system development in the public sector¹

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Abstract The success of information system development involving multi-organizational collaboration can depend heavily on effective knowledge sharing across boundaries. This paper reports on a comparative examination of knowledge sharing in two separate networks of public sector organizations participating in information technology innovation projects in New York State. As is typical of innovations resulting from recent government reforms, the knowledge sharing in these cases is a critical component of the information system development, involving a mix of tacit, explicit, and interactional forms of sharing across organizational

boundaries. In one case the sharing is among state agencies and in the other across state and local government agencies. Using interviews, observations and document analysis, the longitudinal case studies follow knowledge sharing and other interactions in the inter-organizational networks of these two distinct settings. Results confirm the difficulty of sharing knowledge across agencies, and further reveal the influences of several relevant factors— incentives, risks and barriers for sharing, and trust— on the effectiveness of knowledge sharing. The results contribute to theory on knowledge sharing processes in multi-organizational public sector settings and provide practice guidance for developing effective sharing relationships in collaborative cross-boundary information system initiatives.

¹The research reported here is supported by the National Science Foundation grant #SES-9979839. The views and conclusions expressed in this report are those of the authors alone and do not reflect the views or policies of the National Science Foundation.

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Keywords Knowledge sharing · Interorganizational information systems · Technology innovation · Communities of practice · Public sector

1 Introduction

Attention to interorganizational information systems has grown substantially in both theoretical and practical terms in recent years. Environmental factors of globalization, increased security concerns, rapid technological change, government reforms, and the demands of knowledge work have created pressures for organizations to improve information sharing and integration capabilities across organizations. In the government

sector these forces are recognized in analyses of security needs [1], enterprise architecture developments [2], government information studies [3], intergovernmental information sharing programs [4], and in disease prevention efforts, such as the international response to the SARS epidemic [5]. In the private sector, explorations of strategic technology alliances [6–8], supply chain integration efforts [9, 10] and other forms of information sharing enhancements are also prominent.

In the public sector, many social and regulatory problems are the jurisdiction of multiple agencies. Interorganizational systems seek to increase the value of information held in multiple government agencies by integrating information across organizations and improving the potential of technology to make that information more accessible and usable. Well-designed and executed information systems has the potential to streamline data management, improve information infrastructure, facilitate the delivery of integrated services, and enhance relationships among participating organizations [20, 40–43].

To be successful, however, effective knowledge sharing needs to be carried out effectively throughout the development stages, particularly, in the efforts of planning for and implementing information integration technologies. In the two cases that we examined in this study, for example, designing and implementing the necessary new tools, developing and administering new policies, as well as managing the changing relationships require accurate and comprehensive knowledge about the highly diverse and scattered practice domains. Successful interorganizational information systems development, therefore, depends heavily on understanding the factors that influence cross-boundary knowledge sharing.

Notwithstanding the critical roles knowledge sharing play in interorganizational information system development, it has not been adequately examined. The research thus focuses on knowledge sharing in efforts to develop interorganizational information systems and examines factors that are important for the effectiveness of knowledge sharing. Since this particular aspect of knowledge sharing is of considerable importance and it involves complex organizational interactions, especially in multi-level or federal systems such as the US, they represent important opportunities for research and theory development. Examining the knowledge sharing provides a rich opportunity to inform our understanding of one of the complex interactions that occurs between

organizations as they invest in effective interorganizational information systems.

2 Knowledge sharing and practices across organizations

2.1 The problem of knowledge sharing across organizations

The problem of sharing knowledge among individuals and organizations has been the focus of a wide range of research; from early work focusing on communication and direct relationships [11, 12] to more recent work focusing on cultural and socially embedded factors affecting knowledge exchange and learning [13–16]. Some of the attention to this problem is reviewed in [17] and in [18] (see also [19]). Knowledge sharing in interorganizational information system development projects, in particular, may involve large numbers of organizations with diverse missions, goals and priorities, and thus, can be constrained by the technological, organizational, and institutional situation in each participating organization, as well as the existing interorganizational relationships [20, 21]. When these difficulties are intertwined with the tacit, elusive, and embedded nature of knowledge, knowledge sharing can be a formidable task demanding management innovations that recognize the facilitating or impeding roles of a variety of interrelated factors. In a sense, the results of knowledge sharing often initiate a new set of working practices across organizational boundaries, and require substantial process, behavioral, and structural changes from both participating individuals and organizations. The cases presented here provide insight into how a set of organizational factors impact knowledge sharing in cross-boundary information system development.

2.2 Knowledge and practices

Prior study of knowledge sharing has placed considerable emphasis on examining the various forms of knowledge, particularly in terms of what processes, technology, and organizational structure enhance or impede the sharing of different forms of knowledge in these multi-organizational collaborations. The most basic distinction, between *tacit* and *explicit* knowledge, is directly related to the ease and effectiveness of sharing [13, 22–24]. *Explicit* knowledge is the elements of

knowledge that are recognized and expressed by formal techniques, such as a recipe. It can be therefore more readily and directly observed, captured, or transferred. *Tacit* knowledge, by contrast, is not directly expressible or captured in formal ways, but is used to apply the explicit knowledge in practice. This basic distinction between tacit and explicit knowledge is not enough, however, to capture the range of knowledge of interest in these cases.

The particular kinds of knowledge of interest in this research concern the specific areas of practice in government agencies necessary to inform interorganizational information systems development efforts, i.e., knowledge about *practice* that forms the basis of information requirements and analysis of such systems. Knowledge may be held by individuals or groups, such as communities of practice [25, 26], as well as embedded in organizational routines and procedures [27, 28].

As mentioned earlier, in both cases, the focal leading agency is attempting to develop cross-boundary information sharing and integration capabilities. In one case the new tool is necessary due to a change in policy, and in the second, the new tool was intended to be a catalyst for a change in policy. In both cases, sharing knowledge about the two highly diverse and scattered practice domains—real property assessment and financial management—is essential for managing the new technological tools development, policy implementation, and interorganizational relationship changes. The two domains are a mix of highly detailed rules and procedures requiring expert judgment and interpretation. Even in areas of practice where procedures are highly formalized and specified, how practitioners make sense of and interpret the meaning of directions and rules can be difficult to fully capture or communicate [26]. For less routine areas of practice, such as developing an innovative new system or making complex, unstructured decisions, acquiring the necessary knowledge may be even more difficult. As Brown and Duguid [29] note: “These are . . . areas where making sense, interpreting, and understanding are both problematic and highly valued—areas where, above all, meaning and knowledge are at a premium” (p. 95).

Knowledge sharing in these kinds of collaborative contexts is comprised of several forms of knowledge. Some of the knowledge is explicit, formal, and stored in readily accessible media or artifacts, such as formal policies, procedures, standards, and data bases. The transfer of this knowledge results in interorganizational

learning that fits well with models of rational analytical thinking and traditional psychological models of learning [15, 16, 30]. Knowledge, from this perspective, can be studied and understood relatively independently from the social and cultural context in which it is developed. Other elements of the knowledge of interest and importance in these cases are likely to be tacit, embedded in the social context, and much more difficult to transfer. The meaning and significance of such knowledge is embedded in social relationships and practices, which cannot be separated from the work culture and the social construction of the work processes [13, 15, 25, 31]. These work cultures and social settings are characteristic of communities of practice in the sense used by Wenger [26].

Since the knowledge to be shared is deeply embedded in practice and thus in the work cultures of the organizations, to be effective, the process of sharing must bridge the different work cultures and practices of the participants from the various agencies and organizational units. Simply identifying the formal knowledge about work procedures and policies will not capture the necessary depth and nuance of knowledge embedded in practice [32]. The cases presented illustrate this point; sharing deep knowledge of practice grounded in multiple communities or in a new collaborative practice community is needed to understand information requirements and eventually develop effective cross-boundary information systems to respond to those requirements.

3 Influences on interorganizational knowledge sharing

The sharing of knowledge among different communities of practice can be influenced by many factors [33]. Achieving an understanding about how these factors influence knowledge sharing is difficult because knowledge in practice is intimately linked to its context. Examining knowledge sharing processes requires attention to how particular factors present in different contexts. One prominent factor, taken as a central focus by organizational economists from the transactional cost perspective, is the incentive problem—“[t]o the extent that agents’ human capital investments consist in the gathering and building up of specialized knowledge and skills, they are not likely to be willing to share the relevant knowledge and skills with other agents, unless

they are properly compensated” [34](p. 83). Decisions by individuals or organizations to share knowledge can thus be seen as based on calculations of risk and reward. Knowledge sharing will occur if the reward is sufficient and the risk of exploitation is sufficiently low. Therefore, incentives for knowledge sharing or acquisition become important factors, as well as mechanisms for controlling risk. Moreover, trust has been viewed as a critical concept that provides insights into how culture, values, and personal and organizational relations influence the process and outcomes of knowledge sharing [35–37]. In the following subsections, incentive, risk, and trust are discussed. Each is considered in terms of its influence on the effectiveness of knowledge sharing.

3.1 Incentives for knowledge sharing in the public sector

The assumption driving collaborative actions is that each participating party will achieve greater benefit as a result of a collaboration than it can achieve by acting alone or competitively. Advocates of collaboration, including knowledge sharing as a form of collaboration, often direct attention to the possibility of creating a bigger pie so that each participant can be better off by engaging with others [7, 38]. Knowledge sharing and the resulting new information tools across organizations offer substantial benefits in the form of effectiveness, efficiency, and responsiveness [20, 40].

The initiation of knowledge sharing is motivated by the need to gain access to valuable resources or know-how. From an organizational learning perspective, no organization possesses all the resources necessary to perform every possible activity internally, and so they need to build connections and learn from others’ experiences [6, 39, 86]. Sharing knowledge can help organizations improve their ability to react to the uncertainty and complexity of the environment. In addition, interorganizational knowledge sharing is a major source for innovation. Powell [6] pointed out that the “locus of innovation is found in networks of learning, rather than in individual firms” (p. 229), because collaboration raises the entry barriers for those who behave opportunistically or restrictively, accelerates the speed of innovation, and transforms the perception of competition and necessity of having exclusive ownership of knowledge. With regard to its impact on the performance of govern-

ments, sharing knowledge and establishing information integration routines may be a viable approach for service integration, a concept parallel to the notion of value chain integration that has been actively but not very successfully pursued in government operations and services [20]. For multiple government agencies that deal with the same group of clients, knowledge sharing in interorganizational information systems development has the potential to result in an effective way to reduce duplicate data collection and data handling [20], and streamline collection, organization, maintenance, and distribution of data and information. Sharing also facilitates integrated functions [40] that provide clients with convenient access to diverse information and services [44]. With more consistent and comprehensive information about clients and programs, organizations responsible for services could better define and solve joint problems and better coordinate programs, policies, and services. In addition, such system development projects also provide government an opportunity to improve both technology infrastructure and information quality [20]. Furthermore, positive sharing experiences can help government professionals build and reinforce professional networks and communities of practice, which can be valuable resources of information about programs, best practices, politics, and environmental changes [6, 45–47].

3.2 Risks and barriers in knowledge sharing

Knowledge sharing across organizational boundaries can involve considerable risks. Risks and barriers often arise in interorganizational relationships that involve differing goals and competing interests. Overcoming these risks and barriers require negotiation and the development of commitment [48–51]. The strength and value of resources and assets involved in these cases, including knowledge, committed to the relationship are central issues in interorganizational relationships [37, 52]. Knowledge can be a key organizational asset, used in producing goods or services, or in maintaining an advantage in a competitive environment. Sharing knowledge can diminish the value of the asset and cause the original owner or possessor of that knowledge to lose competitive advantage [53, 54]. This can apply equally to a competitive market for private firms or a competitive political environment for government [39, 55]. Sharing knowledge can also risk loss of autonomy

or sanctions for poor performance, particularly in a multi-level government or organizational setting.

Formal management and policy structures introduce barriers that prevent government agencies from achieving the organizational and political benefits of knowledge sharing [20, 41]. Some barriers involve law and policy about program boundaries and goals [56, 57]. Agency staff develop deep knowledge and expertise in their respective programs and protect their ability to act with discretion and autonomy [58]. Within the confines of programs, public agencies share decision making and implementation powers with other powerful actors ranging from legislative committees [59], interest groups [60, 61], to other public officials with responsibility for program operations and funding [62, 63]. This web of relationships leads agencies to focus on discrete programs rather than on cross-boundary issues or linkages with organizations outside the usual network. A number of other policy and legal barriers in information sharing among government agencies have been recently documented by [20, 40]. These include privacy concerns, ambiguity about statutory authority, openness to public scrutiny, and lack of resources.

In addition, recent studies of existing intergovernmental information systems as cases of interorganizational collaboration in New York State [18, 20] showed that certain key environmental factors limit the success of information systems that attempt to integrate work and information flow between state agencies and local governments. These factors include widely different roles and functions at the state and local levels, enormous variation in local conditions, inconsistent technical infrastructure, and diverse and competing missions within the same jurisdiction.

3.3 Trust

Trust is a critical factor in the development and maintenance of the interorganizational relationships on which knowledge sharing depends. [7, 50, 64–67]. Some level of trust is both an initial condition for the formation of the relationship as well as a result of positive interactions over time [49, 52, 65, 68, 69]. Dyer and Singh [70] maintained that goodwill trust is the most effective and least costly means of facilitating complex exchange. When the task is to share tacit knowledge embedded in practice, market contracts and authority become inferior means of coordination. In the interorganizational

relationship literature, trust is often theorized as the major governance mechanism for network forms of organization [7, 71–73]. Norms of reciprocity and equity can be the most efficient social control mechanism for coordinating a wide range of transactions among partners in a network, including knowledge transfer [35–37]. The role of trust in interorganizational relationships is related to transaction costs as well [74, 75]. The more trust, generally the lower the transaction costs resulting from provisions or controls to prevent exploitation. There is little research on transaction costs in the public sector, but private sector studies do suggest that transaction costs can influence both the nature of relationships and performance [76–78].

3.4 Summary

The literature provides insight into many aspects of and influences over knowledge and knowledge sharing in cases of cross-boundary information systems development. The two cases provide the opportunity to examine these aspects and influences in the same time frame and to better understand the impact of each factor, as well as the effect of their interaction in a knowledge sharing situation. The leading research question is how do incentives, risks and barriers, and trust influence knowledge sharing processes embedded in cross-boundary information systems development efforts. To develop this broader and more integrated insight, the cases will be examined in terms of the three themes discussed above: *incentives, risk and barriers*, and *trust*. Each theme will be used as a lens to view the knowledge sharing processes and situations of interest in these cases: the development and sharing of knowledge across program and agency boundaries. The cases are analyzed in terms of the three factors followed by a comparative analysis of the influences of the factors on knowledge sharing in these cases.

4 Use of the comparative case method

This study compares two cases of interagency efforts to plan and develop new information sharing capacity, and examines how knowledge sharing processes are influenced by incentives, risks and barriers, and trust in the context of interorganizational information systems innovation. The cases fit the criteria described by Yin in which “case studies are the preferred strategy

when ‘how’ or ‘why’ questions are being posed, when the investigator has little control over events, and when the focus is on a contemporary phenomenon within some real-life context” [79] (p. 13). Using case studies reflects the need to capture the longitudinal complexities involved in both process and structure [80]. The two cases were chosen from seven being examined in a larger study underway at the Center for Technology in Government (CTG) at the State University of New York at Albany.¹ The specific cases were chosen for study “to maximize what we can learn” [80] (p. 4). The logic underlying this multiple-case study design is to select cases to produce a range of results for predictable reasons, where dissimilar results are expected [79]. Using the same time period, state location, and the public sector, allows a focus on how the cases vary along a more limited set of dimensions.

The research data were collected as part of an *in vivo* examination of two actual public sector innovation projects as they were being developed. CTG’s technical staff collaborated with the government agencies in planning and developing the innovation projects. The members of the research team, as part of this collaborating organization, had exceptionally frequent and intimate access to these agencies, their staff, their partners, and their customers. This level of access allowed for intensive participant observation as well as interviews with individuals and groups, related field observations, surveys of participants, and examination of policy and project documents.² In addition, regular debriefing interviews were conducted with CTG’s technical staff working with the agencies (see Appendix I for an example of the Interview Protocols).

This approach provided for the necessary level of detailed data and observations, as well as the examination of multiple conjunctural causation [81, 82]. A key method is the use of long-term participant observation (see Appendix II for Observation Protocol) to collect data on important processes, sequences of events and their context, as well as participants’ understandings and the construction of meaning [79, 83]. In these projects, Center staff were active participants who developed long-term working relationships with the research subjects. This provided opportunity to ob-

serve closely how project participants perceive, interpret, and react to the factors that impinge on their ability to form collaborative relationships, adopt new technologies, and share information and knowledge across program and agency boundaries (see Appendix III for Liaison Protocol). The resulting case descriptions provide a basis for examination of embedded organizational events and the development of so-called middle-range theory, which are a major focus of current theory development [84, 85].

5 The cases

Before introducing the case, it is necessary to note that in New York, local government entities are independent of state government in much of their operation. This decentralization of power is an important part of the political culture and is highly valued. Local assessors, for example, as local government officials, are not directly responsible to any state agency. The role of CTG in relationships with state and local government is related to this political culture. CTG’s reputation as a neutral facilitator is well known among state agencies. However CTG, as part of state government, is not necessarily seen as neutral by local government and had to establish that as part of the work with localities.

5.1 The New York State Central Accounting System

The Central Accounting System (CAS) for New York State is operated by the Office of the State Comptroller (OSC). The Comptroller is a separately elected constitutional officer, making OSC an executive agency separate from the Governor and the legislature. OSC is responsible for all disbursements of state funds, maintaining state accounts, managing investments in the employees retirement system, and generally supervising financial management in state agencies.

The current central accounting system, launched in 1982, provides budgetary controls, accounting, and reporting service to all State agencies. However, there is an increasing gap between what CAS can do and the accounting and financial management needs of State agencies and other stakeholders. This case grows out of a project initiated between the staff in charge of CAS and the research Center to learn about the information needs of CAS stakeholders. The OSC CAS team and the agency leadership saw the imminent redesign of

¹ Further details on the larger study can be obtained from the authors by request.

² Survey results are not reported here because the returns are incomplete at the time of writing.

CAS as the ideal opportunity to pursue emerging interest in access to financial information. As a result, the project was designed to explore the commonalities and differences in agency information needs and in the business processes designed to manage financial processes so that new information sharing objectives could be pursued. From September 1999, the project team, composed of OSC and CTG staff, engaged in a set of activities designed to learn about the current situation, potential solutions, and specific needs of CAS users. Activities included identifying CAS stakeholders, strategy meetings with strategic partners in government, and conducting a series of workshops to collect feedback from the primary CAS stakeholders. Through the regular meetings and stakeholder workshops, the project team collaboratively identified a broad set of user information needs, the commonalities and differences among those needs, and a vision for financial management capabilities for State agencies.

5.2 New York State Office of Real Property Services

The Office of Real Property Services is an executive agency responsible for administering programs to support local assessors and maintaining equity in real property assessments.³ Local *ad valorem* property taxes in New York generate over \$25 billion in revenue for local governments. These taxes are based on the assessed value of property as determined by local assessors in over 900 municipalities covering the state. The assessed value of real property is one of a small number of factors in a formula that determines how billions of state financial aid is disbursed across the state. Consequently, assessment practices are highly important matters at both state and local levels. The project reported here was initiated to examine strategies for implementing a new annual reassessment program. Annual reassessment, which uses statistical modeling on a yearly basis, rather than physical inspections every five years, to set assessment values, requires new procedures and technologies. The new procedures need to use information about assessments drawn from across the state to inform the development of those statistical models.

In 1999 the New York State legislature passed a new law promoting annual reassessment of all prop-

erties in the state. The proposed technique for avoiding numerous and expensive annual reappraisals of property involved sophisticated statistical methods and a new network-based data repository. The law left considerable discretion to the executive agency (ORPS) to implement the program, and provided additional state financial support for localities that complied. To succeed in implementing the program, ORPS had to: (1) design a program with very difficult technical components, that (2) accommodates the extreme diversity in local assessment situations across the state, (3) promotes voluntary compliance of the assessment community, and (4) spend the appropriated funds within four years (a very short time frame for work of this scope). This was to be done while the agency was working to change its relationship and style of working with the assessment community from a monitoring and supervisory function to a collaborative assistance role.

Because the agency had a long history of dealing with the technical aspects of assessment, its original approach was to see the problem in those terms. So the initial knowledge seeking plan involved three efforts: employing a consulting firm to design new information technology tools to support the assessment process, another consultant to design a mathematical model to predict the cost implications of various implementation scenarios, and CTG to design a state-wide repository for assessment data to support the statistical modeling necessary in annual reassessment. ORPS staff saw the combination of effective technology, an accurate planning model, and a financial incentive for compliance as the necessary elements for successful implementation. They expected these efforts to accomplish the first-year goal of a 60 percent (of localities) in compliance.

ORPS worked with CTG to facilitate a series of discussions with local assessors and county real property directors. The discussions were designed to elicit detailed descriptions of the resources localities required to implement annual reassessment and reactions to how the new program would impact local practices.

6 Results

The results confirm the difficulty of sharing tacit and interactional knowledge across agencies, especially where participants in the sharing represent different communities of practice. The cases differed in the existence of institutional structure, policy and legal

³ In New York law real property consists of land and improvements on it: buildings, utilities, infrastructure, etc.

constraints on action, and in alignments of cultures and the nature of practices. These produced different dynamics of incentives, risks and barriers, and trust, which in turn had exerted important influences on the interorganizational relationships and the knowledge sharing that occurred in these cases. The nature of the influence of these three factors on knowledge sharing in each of the cases is presented below, followed by the comparative analysis of these influences.

6.1 Incentives

Often incentives to share knowledge may not appear to stakeholders or are insufficient to overcome perceived threats. Incentives to sharing knowledge among the OSC CAS stakeholders, however, were made clear to all participants and consistently supported. OSC, for its part, had been creating an environment that encouraged and rewarded collaborative approaches to problem solving both within OSC and with other agencies, local governments, and the private sector. Other participating agencies, in particular, for their own interests, recognized CAS as a critical shared resource and as the authoritative source of financial data.

OSC had been successful in creating an environment in which transforming tacit knowledge into explicit form and sharing it with colleagues and users was encouraged and rewarded. OSC leadership openly supported this collaborative approach. Staff were rewarded for working with users and providing information and knowledge that resulted in new collaboratively developed procedures and techniques. Participants in the 13 workshops were generally eager to participate and discuss problems of practice. Having the opportunity to shape decisions about the new system provided incentive for participation in the knowledge sharing activities. An OSC staff member commented in particular about what he had learned in this process,

The importance of asking people, our stakeholders what their thoughts and ideas were. People... I was very surprised and learned a lot about their willingness to answer honestly.

OSC also has ample legitimacy vis-à-vis other agencies to turn to staff in those participating agencies for their insights about the future of the CAS. It was generally recognized in other state agencies that the CAS was a mission-critical, highly visible statewide system and that OSC was a leader in financial decision making in

the state. These factors contributed greatly to securing participation of knowledgeable staff at the workshops.

In addition to legitimacy, OSC has wide-ranging authority over many financial matters. Its decisions affect many agencies and offices. The structure of state government puts the OSC in a sufficiently powerful position to make collaboration with it attractive to other key officials and agencies. Further, in the several years leading up to the CAS project OSC had engaged in two large scale system redesigns. Agency staff knew that this project, like these others, was likely to move forward to a “real project”. Agency staff knew if they did not come to the table they would miss out on the opportunity to influence new systems by sharing their knowledge and experiences.

These incentives may have been sufficient to generate full attendance and active engagement at the workshops, but the perceived mutual learning benefits elevated participation in those workshops even further. One issue faced in the project was how much financial management capacity to design into the new CAS. This answer depended in part on the needs and desires of the users, as well as on the alternative Financial Management Systems (FMS) resources otherwise available. Learning about these issues was central to the knowledge seeking objective of the work with the user community. The users also discovered new knowledge about how other workshop participants used the CAS and their own FMS applications. The workshops produced unexpected benefits in uncovering broad use of a common financial vocabulary across agencies, and users learned techniques developed by their colleagues in other agencies to deal with their own business challenges. Finding a common ground of financial management terms and techniques enabled workshop participants to share tips and techniques, without a need for lengthy explanations. Many participants were delighted to discover that they could use techniques developed by an agency in a completely unrelated business area. The response to an offered tip or technique was typically discussion about enhancements based on a particular perspective. Often it came in the form of support from the group that the tip, with modifications as suggested by the group, would be the most “sensible” way to take care of that type of transaction.

By contrast, the interorganizational structure and culture among ORPS and the assessors had over time resulted in limited incentive, and had even generated disincentive, for open information and knowledge

exchange. Assessors are locally appointed, and in a few cases, elected, officials. They are, generally, highly resistant to state and county infringement on local prerogative. The annual reassessment program was seen by local assessors in terms of the challenges they would face in developing the local technical infrastructure to share data. Further, it was seen as a threat to their work processes and political independence.

ORPS, however, did not respond to these disincentives with a clear and consistent interpretation of the implications of the practice changes to annual reassessment at the local level. With predisposition of dealing policy matter in technical terms, OPRS staff presumed that the combination of effective technology and financial incentives was enough to generate the momentum. Even after many meetings with the ORPS leadership, discussions about how to describe annual reassessment and what it would mean for localities continued. As a result ORPS determined they needed to talk to localities in order to get a full understanding of the complexities of the knowledge required to design an information repository and an analytical tool to support statistical modeling of property assessments. Further, they needed to explore the implications of developing and deploying this system in assessment offices across the state. The challenge that ORPS faced in expanding their effort to include the local assessment community rested in a long and consistent history of contentious relationships.

Two major changes in the policies governing state-local relationships could be seen as prompting or facilitating the sharing process: (1) the provisions of the annual reassessment law that gave ORPS wide discretion in implementation, and (2) the release of a technical policy from the State's Office for Technology that required state agencies to work in a more collaborative way with localities. The style of planning and implementation, including efforts at involving assessors and using incentives for participation, reflect this move from bureaucratic to collaborative relationships. Nonetheless, the effectiveness of the state financial aid as an incentive to participate was also diminished by the structure of local government. The per parcel payment that goes to municipal governments for participation in the annual reassessment program does not always pass through to assessors. Thus, it wasn't always the case that the payment for participation would in fact defer the cost of implementing the annual reassessment program. As a participant commented,

Or they may be upset because their supervisors are after them to get that five dollars per year, and maybe the supervisor doesn't understand that all that five dollars ought to remain in the assessors office, and it might required more (than \$5) at first to do an annual reassessment.

Assessors were facing a program that would mean a certain increased cost, due to increased work and disruption in practices, with a very uncertain benefit.

6.2 Risks and barriers

Risks of both projects emerged from the nature of innovation and the concomitant changes, and the tangle of existing state and local relationships. Each project team drew on their resources, their capacities and their relationships in their efforts in responding to these risks and barriers.

Both risks of and barriers to knowledge sharing were influenced by the scale of the existing CAS system. Millions of transactions and billions of dollars affecting all state agencies, local governments, state business partners, and the public, annually pass through the 22 year old system. Being the workhorse of NYS government financial transactions, CAS is a reliable and robust main-frame application. The strength of CAS lies in its handling of structured financial transactions. It was not designed to support analytical processing of financial information. This design limitation had over the years caused many state agencies interested in analytical capability to invest in local FMS. These agency-level FMS ranged from home-grown systems tailored to specific offices and departments, to large commercial systems, to a system locally developed by one of the more advanced agencies that was then adopted in several other state agencies. In each case the systems were designed to run in concert with CAS. This diversity of systems both created a set of barriers to integration and necessitated a high risk task—learning enough about the needs and problems in this practice environment to plan for the integration of information and functionality into a single system. The existing technical infrastructure and highly diverse FMS capacity in state agencies were potential barriers to collaboration and knowledge sharing about information needs.

OSC sought to mitigate the risk of such a high visibility project by sharing the risk. To do this, they formed

a high-level advisory board for the project. The project team invited leadership from OSC, the legislature, the governor, and the division of budget to form a “strategic partners” group. The Strategic Partners Group included representatives from key offices in the executive and legislative branch that would ultimately decide on the status of a new system. The project team met regularly with the strategic partners to capture their practice knowledge and to report on the progress of the project. Each meeting with the strategic partners provided an opportunity to address both the need for and the challenges to cross-agency information sharing and systems design. The strategic partners were able to share their knowledge about their own agencies in terms of interest in and support for this very expensive undertaking, and, given their oversight roles, they were able to share knowledge about activities within and across specific agencies. The formal strategic partners meetings also generated the foundation for more knowledge sharing about the project. According to two members of the OSC team,

... very often we would go to meetings and it's our chance to communicate. But if I bumped into any of them I would talk about the project. ... I have had these incredible ‘bumped in to conversations’ with OFT and legislative staff

ORPS also undertook a number of public activities to mitigate the risks they faced from engaging with local assessors on this new project. One of the barriers assessors faced in the direct adoption of the annual reassessment model is the link with local tax calendars. The issue of disconnect and in some cases conflict among calendars was raised during a number of meetings. A separate meeting was held to focus exclusively on the calendar issues. The goal of this meeting was to identify the source of these conflicts in the calendar and to develop a plan for removing them as barriers to participating in annual reassessment. The meeting clarified the fact that many individually developed and locally mandated calendars govern the activities of local assessors and limit the flexibility they have in adjusting processes to a single statewide calendar. The implication of these non-synchronized calendars is that even when assessors agreed to share information through the repository so that statistical models could reflect the fullest data set possible, the cycles of activity governed by local calendars limit the integrity of those models. Participants regularly identified that they would be willing to

change but the burden of advocating change in their county tax or municipality tax calendar would be too great for them to carry. This meeting clearly illustrated the constraints placed on information systems innovations even where full and effective knowledge exchange occurs because the practice changes and learning can not be fundamentally carried out. The results of the “calendar meeting” were fully documented, conflicts were identified and agree upon. Then it was generally agreed that it would take monumental change across all local governments to resolve the conflict.

The meeting effectively communicated to ORPS leadership a different aspect of the complexity of the local environment. The local assessors and county directors knew about the complexity of the calendars as many of them were governed by multiple calendars or had to assist their counterparts in managing their responses to conflicting dates. However, the ORPS leadership had heard about the meeting, stated their awareness of the issue, but did not, according to assessors, really “get it.” This meeting resulted in the acknowledgment of the difficulty of managing these calendars specifically and of considering new information sharing innovations more generally. New appreciation for the complexity of the real property tax system emerged from the formal sharing of calendars and the telling of stories about individual struggles in dealing with these calendars. Yet, the meeting results were safely stored under in the facilitator’s office for possible, but unlikely, future use.

6.3 Trust

OSC’s centrality in the network of state agencies proved to be an important factor in building familiarity and trust. The agency staff who participated in the workshops had a long history of working with the CAS staff. Many were on a first-name basis with the OSC staff. They had worked together over the years to improve the CAS and to support the development of local financial management systems. The level of interpersonal trust, and to certain extent, similar mental sets provided a solid foundation for knowledge sharing. Consistent efforts of OCS staff to support agencies and their reputation for listening and responding to agency concerns also contributed to the trust necessary for full participation.

There is a potential inhibitor had to be addressed in each workshop. Participants wanted assurances that

the *Request for Proposal* (RFP) wasn't already written and that the workshop was not just "for show." Both the CAS staff and the Center staff provided assurances that the RFP did not exist and that the workshops were authentic requests for input. These assurances together with the mitigated risk associated with participation and the incentive of participating at the ground floor in the development of recommendations for a new integrated CAS contributed to full participation.

Knowledge sharing in the OSC workshops was further influenced by the approach and the tone of the project overall. The approach was considered by OSC and most participants to be innovative. The question asked of participants was to consider their "ideal system," and they were regularly assured that top leadership supported this open discussion and wanted to hear what users wanted. At several workshops participants pointed out that OSC had the statutory authority to do whatever they wanted. But OSC regularly pointed out in response that they had "no intention" of exercising that authority, and that in fact they felt the new system should result from the best ideas of those who used the system to access the information and functionality necessary to do their jobs. One OSC staff member characterized their effort to build trust by exercising good faith collections of perspectives,

...we really didn't have a preconceived notion, but we were pretty open and honest. I think in some of those discussions here we really said we don't know what was gonna happen. We don't know what the outcome is going to be, or what the response are that we are going to bet back. Pretty honest, and I think if you go another way that could come back to haunt you.

System users were given broad opportunity to participate. Using the research center in a facilitation role, rather than CAS staff, was part of the design to encourage knowledge sharing from the workshop participants. CTG, as a neutral outside agent, was seen as enhancing the legitimacy, objectivity and thoroughness of the knowledge gathering process. The regular sharing of the workplan which specified several open presentations to OSC as well as participating agency leadership assisted in building trust in the process and among the players.

In contrast to the high level of trust among participants in the CAS project, mistrust prevailed in the ORPS project. Due to a long history of adversarial re-

lationships with ORPS, local assessors were largely unwilling to assume that ORPS would act with the best interests, or at least a balanced interest on behalf of local assessors. Leadership at ORPS saw their challenge as convincing assessors of the intention of the program. The greatest challenge according to one top executive at ORPS was:

Well, the biggest challenge, I think right now, is to try and convince the assessment community that our intentions here, of course our intentions here are just. . . are not any other, we are interested in equity in its broadest sense. In the fact that we want people to do. . . , we just want people to be treated equally, fairly, and that's all.

Local assessors, however, saw three potential outcomes of the implementation of annual reassessment—negative political response to changes in assessments that could shift local tax burdens, increased workload and costs to the assessors, and erosion of local autonomy. The burden of each of these outcomes, they felt, would be borne by the municipal assessment community, and as a result, they were distrustful of any conversation.

Some assessors were reluctant to share their concerns due to a lack of trust in ORPS. Others felt that revealing their confusion about how the program would operate might cause ORPS to limit their involvement. Although participation at the workshops was used by some as an opportunity to share their concerns about the real property tax system overall, generally, participants shared their perspectives and experiences in the context of annual reassessment. Their expectations for real innovation, however, were guarded. A number of times, the CTG staff were asked if the participants would ever see a copy of the results, or if the results were really going to be used by ORPS or just filed away.

The political and organizational implications of the proposed implementation technology were important factors in accumulating mistrust. ORPS's implementation model suggested that collaboration between local assessors and county directors would be the best way to implement these methods. But the necessary skills and equipment were beyond the reach of many local assessors, and a substantial departure from existing practice even in the better equipped localities. Thus the technology strategy reinforced the appearance of a "back-door" approach to an ultimate county take-over of assessment. According to one local

assessor, the appearance of the words “county-led” in any implementation model would result in a lack of support from the local assessors:

I’m going to tell you right now, any place in this program, . . . because it’s not going to happen. (Name of ORPS staff member), you disagree with me, but I know my people and it’s going to go away.

A second local assessor supported this perspective while trying to assist ORPS in developing a strategy for working with local assessors to share knowledge.

A lot of the assessment communities think that this is the underlying purpose here, to begin with, so I don’t think you want to reinforce that.

Some of the technical components of the plan, relying on access to analytical tools and remote data bases, reinforced this threat. Although most county offices had Internet access, less than 30 percent of local assessors had similar capability.

Overall, the high stakes, time sensitive, and politically charged nature of the problem interacted with the prior history of distrustful and adversarial relationships. The result was a contentious and unfavorable setting for exchange of even basic information, let alone complex knowledge about practice. This was perhaps best indicated by actions that inhibited knowledge sharing by both assessors and ORPS. Some assessors were reluctant to disclose their needs and problems for fear of appearing incompetent, while others brought detailed complaints about problems of practice that had previously been brought to the attention of ORPS leadership without satisfactory response.

7 Comparative analysis

In both cases, activities, specifically meetings and workshops, were conducted to facilitate knowledge sharing within and across practice communities. The activities were designed to produce a shared understanding of the problem and a vision for a solution, to generate goal alignment, to capture specific practice knowledge for use in design and implementation, and to inform the selection of a solution strategy. Both focal agencies recognized that the knowledge held by communities of practice, other than their own, had to be captured and integrated into design and devel-

opment efforts. The new systems, it was understood, would only be successful if they reflected the needs of and effectively served multiple practice communities. As a result, both project teams employed open and highly participatory strategies to bridge the communities of practice. In both cases the focal agency initiated the activities with high expectations for the sharing of knowledge about practice specifics for use in the system development efforts. The cases highlight the different outcomes they experienced. The knowledge captured in each case differed significantly and was not equally useful in informing system requirements. Knowledge sharing in the OSC case generated clarification about stakeholder information sharing needs. In the ORPS cases, knowledge about the environment was shared across the communities, however, the knowledge shared did little to clarify information needs. It focused primarily on challenges faced by assessors in the assessment process generally, and on the compounding effect that a new “high-tech” approach to reassessment would have on these challenges.

The outcomes were particularly influenced by incentives, risks and barriers, and trust. The level of incentive made a difference to the effectiveness of knowledge sharing in these two cases. Collaboration with OSC had a natural appeal for participating agencies due to OSC’s recognized legitimacy as the authority in state financial affairs. In addition, the way that OSC historically engaged with users of the CAS also created incentives for engagement. Further, participants knew that if they did not take this opportunity to shape the meaning, routine, and policy embedded in a new CAS, they would have to follow the rules developed without consideration of the nature of their practices.

In contrast, there were very few incentives for local assessors in the knowledge network ORPS sought to establish. Indeed, disincentives for participation were apparent because the new assessment approach would potentially lead to infringement on local authority and cause disruption to existing practices. Even with changes in legal and policy frameworks in establishing incentives for local reassessment, there remained uncertainties in the implications of the change in terms of rewards that would finally materialize to local assessors. Drawing experience from these two different instances, it became apparent that a higher level of incentives for participation and engagement has a positive influence on the effectiveness of knowledge sharing.

In these two cases, the level of risks and barriers also had a substantial bearing on the development of knowledge sharing and learning. Both cases have high risks due to the size, scale, and ambiguity of the project goals. Risks in the ORPS project resulted from technical difficulties of the program and the extreme diversity of local assessment situations, as well as the limited implementation time frame. In CAS, risks related to the sheer scale and complexity of integrating practices in a distributed and diverse environment level challenged full and open knowledge sharing. The risks in the CAS project, however, are relatively lower than ORPS project due to the similarity in institutional structure, shared identities across communities, and relatively clear project structure.

The heterogeneity of the local assessment community created barriers too difficult for local assessors or for ORPS to address. Annual reassessment based on statistical models requires one statewide tax calendar. A significant barrier to the adoption of a single system of assessment based on a jointly developed statistical model was the existence of many different local tax calendars. Despite efforts to communicate to ORPS about the politically charged issue of changing local tax calendars, assessors sensed that ORPS did not “get it”. ORPS was seen as not recognizing the challenges to establishing a single tax calendar. The consequence of this lack of understanding was the compounding of previous problems of misalignment of goals and mistrust between local assessors and ORPS.

Heterogeneity was not as much of a factor in CAS as in ORPS. Although in different communities of practice, the participants in CAS were from state agencies and they operated within similar administrative and organizational frameworks as the team from OSC—state employees responsible for accounting and financial management of state-level government agencies. Local assessors on the other hand had quite dissimilar experiences and operated in different frameworks from the staff of ORPS. According to one local official, the regular career progression used to be to work as a local assessor, then as a county director, then finally, at the height of ones’ career, move to ORPS. This ensured that those on staff at ORPS understood the local property issues from an experiential perspective. However, recent years had found more and more staff coming to ORPS through other channels; resulting in less depth

of knowledge about the issues facing local assessors and county directors.

Third, there was less disagreement in the project structure in CAS—participants understood their role as framing the scope of the replacement effort. However, in ORPS, there was basic disagreement on the nature of the project: to ORPS it was a technical problem of building a data repository and changing program design; while to the assessors it was largely a problem of forced changed, political threats, and disruptive costs. In fact, excessive focus on a search for technical solutions to fundamentally political and organizational problems was a strong inhibitor of knowledge sharing in the ORPS case.

Furthermore, the approaches undertaken by the focal agencies to mitigate these risks further differentiated these two projects. OSC invested heavily in building alliances with “strategic partners” from executive and legislative branches to share the knowledge and risks as well as to obtain buy-in and support. ORPS, however, did not invest in new relationships with executives and legislators to lower the risks. They continued to participate in existing conferences using the same methods they had for many years: standard presentations with invitations for formal comment.

Trust also played a key role in knowledge sharing development in these cases. First, as indicated in the case of OSC, interpersonal and identity based trust serve as the foundation for forming shared mental sets and establishing an unobstructed channel for communication. In addition to the reputation of openness and respect in the past, OSC also built up trust with the participants in this project by demonstrating goodwill and adopting non-coercive approaches. Conversely, ORPS and participating local assessors had a long history of mistrust. This mistrust was further confirmed and even exacerbated by the uneven distribution of risks to local assessors, uncertainty of the changes, and unresponsiveness from ORPS to address the concerns raised by local assessors. Thus, limited exchange of messages occurred between ORPS and local assessors with no substantial results of learning from such exchange.

Trust also had an indirect impact on knowledge sharing by interacting with incentives and risks. The existence of a high level of trust appeared to amplify the perception of incentives and reduce the perception of risk; and the lack of trust, the opposite.

For example, local assessors downplayed possibilities that any reward, politically and financially, would accrue to them. Instead, they expected that the risks, such as negative response from local officials and citizens, increased work load, and the erosion of local autonomy would be borne by them without support and compensation from ORPS. Mistrust is reciprocal by nature. ORPS, similarly, responded to local assessors' input with suspicion: they did not trust that local assessors had goodwill and would behave on behalf of collective interests. Thus, mistrust, interacted with a lower level of incentive and high risks, resulted in a downward spiral that deterred true progress in knowledge sharing. Prolonged and dedicated intervention of trust building such as occurred in OSC over the years might have made a difference in ORPS, but the time pressure created by the legislation created boundaries around the effort. The time necessary to align views of the problem and overcome distrust and suspicion was not available. These circumstances precluded smooth or reliable knowledge sharing and collaboration.

8 Conclusion and recommendations

In conclusion, this case analysis provides new insight into the influence of incentive, risks and barriers, and trust on cross-boundary knowledge sharing in support of interorganizational information system development. Both the CAS and ORPS cases indicate that the traditional control strategies used in intraorganizational information systems were considered insufficient in cross-boundary efforts. New strategies had to be employed to create and in some cases re-create the environment for the necessary knowledge sharing to occur. In the OSC case, the new strategy worked due to prominent incentive alignments, low barriers and mitigated risks, and a long standing history of positive relationships and trust; in ORPS, the new and openly collaborative strategy did not work, largely because of incentive misalignment, high risks and barriers, and a long history of conflicts and mistrust, with new collaborative efforts considered be too little and too late for full trust and engagement from the local assessors. The case comparison extends our understanding of the factors and how they influenced the effectiveness of knowledge sharing in particular in regard to the following four conclusions:

1. The higher the level of incentives for participation, the more likely that knowledge sharing will be initiated and developed.
2. The higher the level of risks and barriers or the less effectively risks are mitigated, the more likely knowledge sharing will be inhibited or interrupted.
3. The higher the level of trust and the lower the level of mistrust in the relationship, the more knowledge sharing will provide a basis for consensus building, learning and practice changes.
4. The higher the level of trust, the more positive the perception of materializing the incentives and the more optimistic the perception of overcoming risks and barriers, which in turn results in more effective progress in knowledge sharing.

Although the comparison is made based on experiences in two cases, the longitudinal accounts have the advantage of considering each factor as a process in development and allow for mapping the influences of factors on variances and changes across the cases and for examining how the changes in one factor are interrelated to outcome and to other factors. The conclusions bear theoretical and practical significance to a set of problems encountered in large scale information technology innovations in state and Federal governments and large non-profit organizations where sharing knowledge and practices with other organizations is critical for system development, yet difficult to achieve. The research advanced theory by exploring how and why factors—*incentives, risks and barriers, and trust*—that have been repeatedly addressed in literature, actually exerted important influences on the dynamic development of knowledge sharing and learning. Information systems development requires knowledge sharing. When that knowledge sharing must occur across the boundaries of organizations, across levels of government, and across communities of practice, particular attention, this study concludes, must be paid to incentives, trust, and risks and barriers.

As Stake pointed out [80], “[q]ualitative research uses these narratives to optimize the opportunity of the reader to gain an experiential understanding of the case” (p. 40). The case comparison gave a solid base for practitioners to learn from these two cases. It derives lessons that transfer live experience to IT managers, system developers, and executives in understanding the dynamics occurred in IT innovation projects. First of all, it appears that in both cases, the technology

advancement was irrelevant to the success of knowledge sharing and system development. Instead, innovations in managing interorganizational relationships and implementation processes are key to the success of interorganizational information systems. Furthermore, the cases highlight the importance of aligning incentives through stakeholder analysis, consensus building, and goal alignments; reducing risk through user involvement and effective implementation processes, as well as legislative and policy reform in lowering institutional barriers to collaboration; and finally, fostering trust development as long term investment for inter-governmental knowledge sharing and collaboration.

Appendix I: Knowledge networking in the public sector

Executive sponsor interview protocol

Structure

- Informal taped executive-sponsor interview, lasting approximately 1 hour, conducted by the case manager alone.
- The protocol is divided into issue sections with one big question followed by probes.
- The first two questions, A1. and B1., will be sent to the sponsor (if the case manager thinks this is necessary and/or if the interviewee is unfamiliar with the interviewer) before the interview so she/he has time to consider answers to these general questions.
- It must be remembered that each project is different and consequently each interview must be tailored by the case manager and assistant to the needs and vocabulary of the sponsor being interviewed.
- It may be necessary to interview more than one sponsor for a case. For instance, there may have been a change in positions in the agency which resulted in a change in sponsor since the beginning of the project; in such a case, we would want to get information from both original and current sponsors.

Objective

Interviewing sponsors should provide the answers to the following questions:

- What is sponsorship?
- How, if at all, do the activities of the sponsor make a difference to the project?
- What is the nature and direction of the information flow between the team and the sponsor about the project?
- Why did this sponsor or this project or allow this project to happen?
- How does the project fit into the agency's agenda?

Second interview needed [but not as important as 2nd team interviews]

It is the opinion of those working on the Interview Protocols that we need to do 2nd interviews with each team's current sponsor a year or so after the first. These interviews would allow us to intensively gather data:

- To check on changes in answer to the same questions: changes in the role of the sponsor.
- To discover more about the relationship between the network and the agency.
- To probe about any areas of failure.

Appendix II: Knowledge networking in the public sector

General guide for observations

5/25/00

This is a guide for how to do KDI observation notes and write ups. It is intended to cover the full range of things that could be important. As such, **it is more than anyone can do completely in any one observation period.** Ordinarily, the observer will gather as much in their notes as possible.

Pre-observation preparation:

1. Review this General Guide before each observation.
2. Review the latest version of the Conceptual Model before each observation.
3. Become familiar with what is pertinent to the case you are to observe—both historical and current issues. Read, and ask the case manager and others questions about the case.
4. Ask the case manager and the centrally-involved ISU member what the three main issues are in this case at this time.

5. Be sure that you are expected at the meeting and have general approval for this observation, at least from the key people in the case team you intend to observe.
6. If more than one observer is to be there, make a joint decision about the aspects of the model that each observer will focus on for this observation.
7. If planning to tape, check on how to set up the equipment a day or two before going, and make sure to have enough tapes and extra batteries.
8. Plan to spend a number of hours within the two days following the observation on writing up your notes.

Observation note-taking

1. When necessary before the event gets under way, ask verbal or get written consent to observe the event, to take notes, and to tape where relevant.
2. Only tape meetings where all participants have agreed. (NOTE: Do not tape BSS meetings when DHS reps are present.)
3. Place yourself in the room to observe, not to participate. Make as few distracting noises and movements as possible.
4. Make sure to have plenty of paper and pens. Some researchers like to keep all notes about a case in one spiral notebook; others prefer loose-leaf sheets stapled together after and kept in file folders.
5. Always write the date, the event/purpose, the participants, the place, and your name at the top of the first page.
6. Drawing a map of where participants sit can be helpful.
7. Note the time occasionally, as topics change or people move in/out, to give an indication of the speed/flow of the event's activities and to make comparisons with other's notes and/or with tapes.
8. Record events in such a way that the notes "provide a relatively *incontestable description*" which can be analyzed later. In other words, just observe. Don't try to observe and analyze or interpret at the same time.
9. When insights ("ah hahs") come or you think of new questions, note them on a clearly separate part of the page.
10. Collect copies of all documents made available to the group.

11. Always build in post-observation time to go over notes, to add to them (helps to do this in another color), and to begin to interpret them and explore additional questions.
12. Write up notes into the computer within two days whenever possible, according to the principles and steps below.

General points for observations in any setting

- *What people say*: statements that are related to one or more of the questions, particularly about what seem to be:
 - important elements of knowledge or shared information
 - important issues or problems related to the project or other work; constraints, incentives
 - strongly felt attitudes or beliefs
 - interpersonal relationships; history or anecdotes about good or bad relationships
 - points of conflict or high stakes concerns.
- *How and to whom people say things*: patterns of communication that indicate relationships, i.e., who talks to whom, about what, in what sequences, with what attitude or affect, with what effect on the group.
- *Where they sit, stand, move around*: physical location and proximity, i.e., who sits with, stays with, stays away from whom, leaves the room, answers beepers.
- *How they feel* about things and other people and organizations: indicators of emotional dynamics—tension/relaxation, hostility/friendliness, good humor/anger, etc.—such as tone of voice, gestures, facial expressions, posture, movement.
- *Lack of involvement*: who, and how you know.
- *Level of formality*: indicators of propriety, agendas and other documents shared, need to check with home office before able to answer questions and so on, clothing.

Specific variables to look for evidence of in KDI observations

Part 1. Formation and effectiveness of KNs

- Examples of knowledge sharing: What info is shared? What is/is-not taken up by group? What is rejected or ignored?
- Risk Taking: Examples: What is at risk? How is risk treated?

- **Low Hanging Fruit:** Do the participants pursue “quick wins” as a way to make early progress? If so, what are they?
- **Inclusiveness:** Do all present participate in the discussion; are quiet people drawn out? Are new players identified and brought into the project?
- **Confrontation:** How are problems and issues confronted? What conflict resolution mechanisms are used? Are they effective?
- **Costs:** Does the group understand the full range of costs? Are they able to estimate them with fair accuracy?
- **Cost Sharing:** Are the costs (of all kinds) distributed fairly among the participants? Are there free riders? Are available resources adequate? If not, how are resources acquired?
- **Use of expertise:** Does the group make use of all the kinds of expertise represented in assigning work?
- **Promotion:** How does the group describe and promote its efforts to outsiders?
- **Institutionalization:** Is the project becoming institutionalized through law, regulation, agreements, formal relationships or other formalizations? Does it have a name? Is it identified with particular organizations or leaders?
- **Tools to encourage participation:** Has the group developed any tools, mechanisms or structures that make it easier for members to become and stay involved?
- **Enough Time:** Does the group have a realistic sense of the time it will take to produce meaningful results? Do they think their sponsors have the same view?
- **Incentives to Participate:** how are different players encouraged to take part? How are they encouraged to remain involved?
- **Learning and Change:** How has the group changed in its structure, methods, relationships, understanding of the problem, strategy, goals as a result of its work so far? Have there been changes in acceptance or resistance to change, evidence of spillover to other projects or arenas? Changes in goals/expectations?

Part 2. Organizational structure, mgmt tools, & philosophy

- **Having a champion:** Person identified? What do they do?
- **Communication:** what are the methods and effectiveness of communication; what network topography is

evident from the patterns of communication? (web, star, etc.)

- **Nature of leadership;** Skill of leaders and facilitators
- **Institutional home:** does the project have a “home” organization?
- **Plan of Action:** does a plan exist? How is it implemented & managed?
- **Collaboration:** how do participants pool their expertise and resources to accomplish their goals?
- **Leadership:** what is nature of leadership? how effective is it?
- **Number of network members:** size & density of network, # of participants, number of linkages, strength of ties
- **Diversity of network members:** how different are the members from one another?

Steps for writing up

1. Bring back your notes, any documents you collected from the event, and any tapes you made.
2. Write up your notes in Word using the template found at: +General \Forms & Protocols \Obs Protocols \Template for Observation Write Up, listening to the tape(s) and checking against any documents as necessary.
3. Type your personal analytical commentary and questions inside square brackets. The additional use of italics is optional and will be eliminated in Atlas, but it does make it visually clearer in Word.
4. Save your work in the Working folder for the case, until the write up is complete.
5. Give tapes to Fiona for inventory and discuss with her the need for transcription.
6. Give documents to the case manager for inventory and analysis.
7. Epiphanies or other conceptual/analytical thoughts resulting from an observation should be written up, however briefly, in the Working folder with your initials and the date in the filename. When you are ready, tell the CM to move it to the Conceptual/Analytical folder within the case folder or to the one in + General if it has overall KDI implications.
8. Complete the write up by following the protocol for moving from Working to the relevant locked folder. You will find this protocol at: +General \Metadata \Final Versions \KDI Doc Move Protocol.

General principles for writing up

- Consider the computer write up as a necessarily time-consuming process in which you are taking your hand written notes to the next level by adding your first pass at an analysis.
- The handwritten notes will be kept as the baseline.
- The write up is very valuable as an early analysis, when compared to analyzing notes months or years after the fact and with intervening experiences shaping the later analysis.
- Computer write ups need to follow the template in order to facilitate coding, analysis and interpretation across many data collection methods, researchers, and cases, and across time within cases.

Appendix III: Knowledge networking in the public sector

Liaison protocol

Meaning of liaison

- Liaison calls will be **initiated by the case manager** after the CTG project intervention work has come to an end.
- This relationship will be **established through the KDI Roadshow** (which will describe all the ways in which a team will be involved in this study), where the **case manager will be introduced** as the central CTG contact person for that team. (The Roadshow will make it clear that the ISU people the team is already familiar with are part of the KDI study too, meaning that whatever they communicate to ISU members may be passed along to the case manager; this may reduce the need for lengthy liaison phone calls.)
- At the Roadshow, the relationship between the case manager and the contact person will be set up as a **reciprocal** one, in which the case manager will offer to provide any information the contact would like about CTG and will personally send any CTG reports that are made public.
- It **may be** important to have a **short meeting** between the case manager and the team's contact person after the Roadshow to maximize the possibilities of a cordial and informal relationship between them.

- **Informal phone calls** will be made to each team's contact person **every month** to keep up with developments, with new relationships involving the KN, and with how the KN is being used.
- These calls will be made at non-critical points **to make sure that no seemingly-small changes are missed** because of the lack of meetings or other events bringing teams and researchers together.
- **Field notes** will be made during and after these contacts, and conversations will be **tape-recorded** with the informant's permission.
- We should keep in mind that **every agency is different** and we will need to manage these relationships differently in order to get comparable data.
- **Emailing** may be indicated for a particular contact person, though this should not be allowed to become the only method of contact.
- It is possible that we may need to change personnel if there is any difficulty with personality differences, misunderstandings or misinterpretations; it is very important that we have a regular friendly and informative liaison relationship with our chosen informant.

Liaison issues for ad libbed conversations

[Note: These liaison conversations will be ad libbed and not scripted.]

- *The following issues need to be kept in mind during such conversations and may be checked off as they come up during the conversation; whatever has not been raised in the natural course of conversation must be asked in a more direct but still informal fashion to make sure that we get as full a picture as possible.*
- *We should pick up their concerns and re-use their words as much as makes sense in shaping our questions to result in the answers we need.*

Is it okay if we tape this conversation? [turn on tape recorder]

So, what's been happening with the project since I last talked to you?

- Reasons for developments
- Views of others on the team
- Changes in team membership
- Changes between the team and others, such as sponsors, other stakeholders

- Political issues affecting the project
- Economic issues affecting the project
- Coming events

Write up

- The case manager will make a recommendation as to whether the tape should be transcribed based on the content of the conversation.
- During a phone liaison or after a face-to-face liaison notes should be made in answer to the above questions and entered into the I: drive folder for that case.
- These notes should also be emailed to everyone else involved in that case (Res Unit & ISU), making sure not to send the notes to anyone outside of CTG.
- Any coming events raised through a liaison conversation should be brought to the attention of the Research Unit to help in planning data collection.
- As with all data collection, epiphanies or other conceptual/analytical thoughts resulting from these liaison events should be noted and placed in the “Conceptual/Analytical” folder within the case folder.

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