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Challenges to Organizational Change: Multi-Level Integrated Information Structures (MIIS)

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Introduction

Governments are extraordinary information creators, users, and disseminators. I-government focuses attention on the flow and structuring of information within government (Mayer-Schoenberger and Lazer, this volume). Government actors engage in knowledge work, specifically, in the creation, sharing, and communication of information. They design and redesign processes by which information flows according to legislative mandate, organizational practice and public need. Recently, they have sought to rethink information flows in order to leverage benefits from information and communication technologies. When public sector actors seek to change these information flows at any appreciable level of complexity, they inevitably engage in complex organizational and interorganizational change.

This chapter presents a multilevel integrated information system (MIIS) to describe and explain how information is structured at three interrelated levels. Each level follows a different internal logic. First, at a microlevel, individuals share and make sense of information in small groups through ongoing social relations within and across organizations. Second, at organizational and interorganizational levels, actors design and use processes and systems to codify and structure information in order to routinize repeated behaviors, transactions and information processing sequences. Third, at an institutional level, highly codified and regularized information flows are produced through the enactment of property rights, laws, regulations, contracts and other overarching formal rule systems. Interactions among these three levels suggest that when information flows change at one level, the other two levels typically are affected. The trilevel nature of change renders it complex to implement and unpredictable to predict the effects and path of organizational change. The MIIS framework synthesizes findings drawn from recent research streams in network analysis, neo-institutionalism, and public management. It complements an emerging body of empirical research on public-sector interorganizational networks by filling gaps in theory and by offering prescriptive advice to public managers.

Governments try to use new technologies to rethink information, to increase responsiveness to citizens by lowering search and other transactions costs, and to gain efficiencies through business process redesign in which redundancies are removed by restructuring process flows (Fountain and Osorio-Ursua 2001; King and Konsynski 1993 a, b; Neo, King, and Applegate 1993; West 2005). Similarly, innovative firms in nearly every economic sector have sought to develop effective supply chain and business process management (Litan and Rivlin 2001; Abernathy et al. 1999; Shapiro and Varian 1999; Cash et al. 1994; Hammer and Champy 1993).

The types of organizational change enumerated here assume the ability of public managers to work across agency boundaries in a more integrated way than most governments have imagined (Cash et al 1994; Fountain 2001; Hammer and Champy 1993). It is now eminently clear that the chief challenge for government is not the implementation of new technologies; it is organizational change required to develop more productive information flows. Yet the failure rate of efforts to restructure and integrate

information flows remains high in the private and public sectors because information flows and structures are the result of complex social, economic, and political relationships built up over time. In many cases, the reason for presumed technology failure lies in inadequately conceptualized and managed organizational change efforts meant to build collaborative interorganizational capacity (Cohen and Prusak 2001; Davenport 1995; *The Economist* 2002). The knowledge base for analyzing, much less predicting, collaboration remains highly varied, fragmented and empirically weak (Fountain 2001; Milward and Provan 2000; Oliver 1990).

Why is integration problematic? Approaching the problem through the lens of a rational choice perspective, an agency may view integration of information as a public good, which is paid for by agencies through the development of and a commitment to shared goals and procedures, consistent protocols, and the like. Rational agencies, therefore, will tend to underinvest in the public good. A rational agency would prefer that other agencies use resources for such learning and adjustment. Yet this model ignores the value to an agency of its engagement in joint knowledge creation. A free riding agency may be disadvantaged because it will not gain value from the negotiations and learning processes in which decision makers develop shared goals, procedures, and standards around a new information regime. By contrast, integration might be viewed as a club good whereby members gain benefits only when they are part of the club, here meaning that they develop compatible standards and practices.

Viewing the problem of integration differently, through a Hobbesian lens, a rational agency might prefer that an overarching entity, an honest broker with authority, create an integrated system. Such an approach might ensure that all agencies and their interests will be treated fairly. But the honest broker may lack the in depth, tacit knowledge and varied experiences that reside in each agency and that, if brought to bear on integration, would ensure realistic, useful results. Thus, it is difficult to ignore the need to develop joint participation and communication.

Rational choice perspectives offer insights into the structure of incentives that either inhibit or encourage collaboration. But neoclassical economics as an underlying theory of integration ignores noninstrumental sources of motivation for collaboration, possesses weak explanations for the emergence of informal norms, and treats preferences and important elements of the environment as given. These processes have been the province of sociology. To illuminate organizational change, researchers must be able to explain contextual and emergent variables that are inside the “black box” of most rational choice perspectives.

The next section of this chapter considers in turn recent streams of research focused on each of the three levels in the MIIS framework in order to examine underlying structures and processes in organizational change. The third section presents a brief case study of Grants.gov, a U.S. federal government project undertaken to improve information flows across agencies and organizations that manage federal grants. The case illustrates the three levels of the framework and some of the relationships among the three levels.

Individuals, Organizations, and Institutions: How Information Is Structured

Government information flows can be conceptualized across three levels of analysis. Interactions at the individual and small group level constitute ongoing social relations and form the locus of shared information and sense making. For example, civil servants regularly contact colleagues to make sense of new policies, to compare notes on implementation successes and failures, and to ask or give advice, support, and referrals. In the process of these interactions, they decide who to trust, with whom to communicate, and with who to share knowledge.

Moving up a level of analysis, organizations and interorganizational arrangements, or networks, codify and routinize information through systems and processes. Routinized information is, in part, what is meant by organization. Individuals and small groups are constrained by these organizational processes. Innovators in governments have focused on rethinking and modifying these processes.

Proceeding to an overarching level, institutions further codify and structure information via formal norms and rules. Institutional mechanisms, largely outside the control of any particular agency or ministry, include property rights, laws, regulations, and fundamental governmental processes such as accountability, oversight, and budgeting. Thus, this MIIS influences behavior directly and indirectly. Organizational change often perturbs all three layers, producing unanticipated effects.

Individual and group level influences on information

The basic actors in networks are individuals and small groups. In this chapter, I refer to networks of individuals as “social networks” and networks of organizations as “interorganizational networks.” Some overlap exists between the two types of networks, but the distinction is important. In the conventional meaning of a collaborative social network, actors must successfully develop joint production processes without recourse to strong overarching authority. Public managers who are important actors in such networks typically play critical linking roles. An array of empirical social network research provides evidence for this observation. Applied case study research on public-sector networks corroborates the importance of brokering and linking roles.

Researchers have found that network brokers require strong interpersonal skills—specifically, the ability to work with other professionals whose perspectives differ from theirs. Other needed skills include the capacity to build interpersonal relationships and to communicate openly, flexibility, a propensity to envision new ways of operating, and the ability to take risks (Cohen and Mankin 2002; Hoban 1987; Hoel 1998; Huggins 2001).

The initial development of collaborative effort depends critically on the interpersonal skills of individuals. Huggins (2001) notes: “It is primarily the facilitators and brokers, rather than the firms participating in network initiatives, which initially hold the key in the crucial outset period to producing interaction that can subsequently lead to the formation of embryonic networks. The most successful network initiatives are those that

have facilitators or brokers who act as community or civic entrepreneurs” (447). In fact, some researchers have suggested that the selection of public managers with such skills is critical to the success of networked organizational projects. Other researchers focus on dyadic relations and have recommended that organizations foster formation of “collaborative pairs” by linking key individual brokers across organizations (Cohen and Mankin 2002). In networked arrangements, individual-level incompatibilities translate to structural weakness.

A challenge to restructuring information flows within organizations stems from what organization theorists have called position bias, or subunit goal optimization, the tendency of managers to attend to goals that relate directly to their position rather than to broader, organizational goals (March and Simon 1993.) Heintze and Bretschneider (2000) found that public program managers involved in organizational restructuring were more likely to view information technologies and the organizational change project in which they participated as successful if the managers also reported that restructuring supported their positions.

But Ketokivi and Castañer (2004) studied 164 organizations in five countries, a subset of which engaged in participatory strategic planning processes. They found that participatory planning processes reduced the incidence and strength of position bias. By extension, it may be that the development of joint production rules across agencies also requires participation and communication in the process of strategic planning to enhance integrative potential. Bardach (2001) offers a conceptualization he has termed “managerial craftsmanship” and argues that the creative opportunity provided by joint projects is itself one of the attributes that facilitates collaboration. Desire for professional development and creative, important work can, therefore, be balanced against views of individual behavior based on narrow self-interest and subunit goal optimization.

The commitment and skill of key individuals, or champions, remain important throughout the duration of collaborative efforts. Their importance is noted in studies of networked firms in the biotech and pharmaceutical industries where individuals who act as “network managers, ‘marriage counselors,’ and honest brokers” sustain coherence when interests and intentions conflict (Powell 1998). Other researchers have observed the adverse impact on projects when a champion moves on (Kernaghan 2003).

Middle managers play key roles in interorganizational arrangements, often sustaining interactions with decision makers at other levels, in their own organization, and across organizational boundaries (Doz 1996). And “radical,” or creative and far-reaching, innovations tend to be championed by managers and executives at the lower levels of a corporate hierarchy (Day 1994).

Having briefly noted the attributes and behaviors of individuals that are associated with collaboration and network sustainability, I turn to research results from social network analysis that point to attributes of collaborative networks themselves.

Ongoing social relations

In his seminal article (1985), Granovetter establishes the centrality of embeddedness which, he argues, is constituted through ongoing social relations. Granovetter (2005) summarizes the many effects of social networks on information, trust, and norms and states that “social networks affect the flow and the quality of information. Much information is subtle, nuanced and difficult to verify, so actors do not believe impersonal sources and instead rely on people they know” (33). Rewards and punishments are magnified in social networks because the source of the reward or punishment is likely to be known. Trust emerges in situations where individuals have incentives to exploit others in the context of a social network. These structural features of networks imply the importance of interpersonal skills and the efforts of champions and network brokers to model trusting behavior and to use social rewards and sanctions, via group approval and disapproval, to strengthen an emergent network.

Applied researchers observe the importance of open and effective communication for the development of interorganizational arrangements. This finding resonates with one of the more frequently replicated results of social network analysis: Network density is proportional to the influence of norms in the network. That is, the more connections there are as a percentage of all possible connections among individuals in a network (in other words, the higher the network density), the more powerful is the influence of norms. Conceptions of appropriate behavior are clearer, reinforced more often, and sanctioned more quickly in case of deviance in high-density networks (Granovetter 2005: 34). Thus, frequent and open communication among actors in a network leads to higher network density and, thus, more influential network norms of behavior.

Larger groups, which tend to have lower network density, would have to have champions and brokers willing to work harder to encourage communication or who have the ability to establish effective communication systems to overcome the disadvantages of network size in order to realize similar gains from trust and internalized group norms.

Trust

Rational choice theorists who have tried to model the emergence of cooperation in Prisoner’s Dilemma games have found that an iterated Prisoner’s Dilemma, in which actors engage in repeated interactions over time, increases the probability of cooperation among parties by increasing the expectation that others can be trusted not to defect (Axelrod 1984; Fudenberg and Maskin 1986; Ostrom 1990). Milward and Provan (2000) have applied these findings to frame solutions to collective action problems in networked governance.

Repeated interactions allow reciprocity, and thus trust, to emerge. Oliver (1990) found that “a considerable proportion of the literature on [interorganizational relationships] implicitly or explicitly assumes that relationship formation is based on reciprocity” (244). Students of collaboration have found that trust is a critical element of successful collaborative teams, that it varies directly with team flexibility and adaptability, and that

it is correlated with the ability of actors to work together and with project outcomes (Bardach 2001; Biedell et al. 2001; Zaheer, McEvily, and Perrone 1998).

According to Huggins (2001), “although networks are a group endeavor, the ‘on-the-ground practicalities’ of ‘networking’ necessarily consists of behavior that is often dyadic in nature” (449). Similarly, Zaheer, McEvily, and Perrone (1998) distinguish between interorganizational and interpersonal trust. Interpersonal trust affects interorganizational trust which in turn has a significant influence on relational exchange.

Applied public management researchers observe that organizational actors require time to build relationships across boundaries and that allocation of time signals commitment (Hoel 1998; Huggins 2001; Johnson et al. 2003). It is not clear whether time in these studies is equivalent to repeated interaction. But the conceptual and behavioral clustering of variables such as “repeated interactions,” “time,” and “commitment” suggests that they are related to the robust findings that network density is positively related to the strength of norms and that repeated interactions are positively related to the development of trust.

Social capital

Trust, norms, and networks are constituent elements of social capital, a construct that provides a solution to collective action problems (Bourdieu 1979; Coleman 1988; Putnam 1993). Following Coleman (1988, S98), social capital indicates “social structures” that “facilitate actions within that structure.” By the same logic, individuals who develop collaborative joint production capacity have developed social capital.

Social capital indicates cohesion and is correlated with innovative capacity. Nahapiet and Ghoshal (1998) argue that “structural social capital”—formal ties between roles—promotes trust, which fosters cooperation, an antecedent to the production of intellectual capital, or innovation. They present a model of the relationship among social capital, intellectual capital, and the innovative capacity of organizations. Fountain (1998) also found a relationship between social capital and innovation in science and technology operating chiefly through the knowledge gains and novel combinations of ideas made possible by joining disparate networks.

Large, cross-agency networks across organizations do have to overcome coordination costs and possibilities of defection. Yet they possess advantages over high-density networks due to what Granovetter (1973, 1983) called the “strength of weak ties,” which is the propensity of new information to flow through weak, rather than strong, ties between individuals. So a perspective on government that emphasizes information and innovation would emphasize not only trust and group coherence but also the need for innovation, new ideas, and critical thinking, all of which rely on weak and bridging ties. For example, the Bush administration launched twenty five cross-agency e-government projects. The initial impetus for a cross-agency approach was consolidation and standardization of government processes via integration across the enterprise. Yet actors in the networks developed for each project have brought together ideas from several sources, thereby increasing opportunities for innovation during project development. In

some of the projects, weak ties have led to innovative developments that were unanticipated in the original standardization strategy.

A focus on information in government will therefore have to attend, to the effects of ongoing social relations on information flows. Interpersonal skills, trust, and small group cohesion are necessary but not sufficient for sustainable cross-agency collaboration. The complexities and scale of information flows in government require structures and processes embedded in organizations and institutions in addition to ongoing social relations at the level of individual and group-level interactions. As Nee and Ingram (1998) observe: “When structural sociologists reify ongoing social exchanges, they assume a ‘harder’ image of the fabric of social life than may be warranted. The imagery of network ties as a ‘hard’ structural arrangement, for example, can lead an analyst to overlook their ‘softer,’ more elusive and contradictory qualities” (22). In other words, social networks can rarely, if ever, fully replace regular organizational or interorganizational structures and processes as carriers of information.

Organizations and interorganizational networks

Organizations are information processing units, and the central means of understanding and analyzing organizations is by illuminating the structures and channels organizational actors develop to regularize information collection, storage, use, and flows (March and Simon [1958] 1993). Complex organizations develop to overcome the cognitive limitations of individuals (i.e., bounded rationality). They do this by routinizing large swathes of organizational life including communication, performance, reporting, and planning. Organizations typically develop routines, standard operating procedures, and performance programs that can then be matched against situations and deployed. As March and Simon ([1958] 1993) formulated: “Organizational actors deal with each other by creating and using systems of rules, procedures and interpretations that store understanding in easily retrievable form” (2). When we consider interorganizational networks in the context of a web of existing complex organizations, we assume that individuals in those networks are located within an organization.

Organizational actors generally try to change routines and operating procedures at the margins, rather than whole cloth, because of interdependencies across routines. Many unanticipated consequences of organizational change stem from second-order effects on routines, procedures, and communication channels. Disjunctive change, occasioned by new technologies, makes change at the margin less feasible because these technologies enable fundamental changes in information flows. Stock markets operate by computer. International standards and monitoring support global organizations. Periodic communications from an organizational leader are replaced by an organizational website, or e-mail, that communicates information in almost real time. Cisco, a global firm, uses the same web interface and corporate communications for every location as a means of unifying disparate offices, cultures, and country settings. The United Nations has experimented with knowledge management systems that link experts worldwide, for example, in clean water technologies or mosquito-borne diseases. Field workers can

query one another and transfer expertise through a global system of communication that works in real time.

Social networks fill gaps in formal organizational channels. Yet formal organizational channels carry a heavy freight of information without which complex production requiring division of labor and specialization would be impossible. Similarly, interorganizational networks use routines to regularize information flows. Such networks differ from ongoing social networks. Interorganizational networks in government, in particular, rely on formal processes and structures due to their accountability and oversight requirements (Isett and Provan 2005; O'Toole 1997). When individuals in interorganizational networks develop shared goals, systems, and procedures, they regularize and codify information. The challenge for network actors is to build and operate such structures without the overarching, formal authority present in hierarchies. Formalization and codification of interorganizational structures and processes lends a degree of stability and relative permanence not present in social relations.

Among the key structures network actors must build are those for governance, communication, and task performance through division of labor and specialization. The sustainability of such networks depends strongly on task significance and clarity as well as adequacy of resources. Researchers have found that successful cross-agency networks develop and effectively manage a variety of governance and coordinating groups, including a steering committee, advisory groups composed of technical or special staff such as legal or financial experts, external stakeholder groups, and cross-departmental work teams. Singapore, long a leader in the development of networked public-private-nonprofit governance, relies extensively on cross-sectoral, quasi-governmental boards as coordinating and governance instruments for several information-based projects.

Applied public management researchers note the importance of effective communication structures for prospective network partners (Bardach 2001; Cohen and Mankin 2002; Johnson et al. 2003). Communication is not simply a means to build group coherence and identity, it is a vital tool of coordination, particularly when network actors are building something new and thus do not have established operating routines with clear means of coordination.

Actors are more likely to identify with and commit to significant tasks. Thus the task, goal, or mission of the network must be important enough to justify the risk and effort of building new processes and specific enough to communicate it clearly to those in different organizations. Researchers recommend that parties clearly articulate the joint goals and anticipated outcomes of a collaborative effort (Biedell et al. 2001; Chiat and Mickiewicz 1999; Hoel 1998; Johnson et al. 2003.) Brown et al. (1998) observed that project complexity had a negative effect on government agency collaboration based on a case study of a shared geographic information system. Project complexity is correlated with—or synonymous with—lack of clear goals, objectives, and criteria for performance.

Moving beyond goal agreement, researchers similarly argue that partners articulate and formalize roles, tasks, and responsibilities. Division of labor and decision-making

authority must be clarified. Some researchers suggest that parties develop “formal agreements that clarify roles, responsibilities, expectations and relationships as early as possible in the project” (Cohen and Mankin 2002). Isett and Provan (2005) demonstrated that such agreements in government networks typically are formalized through contracts that remain in force even when repeated interactions over time might warrant less formality. This is not due to lack of trust, they argue, but to government oversight and accountability requirements. Their finding stands in contrast to research on interorganizational networks in markets where Gulati and Singh found that formalization in successful network partnerships tends to decrease over time (Gulati 1995; Gulati and Singh 1998).

Kernaghan (2003) states that “getting the ‘pre-nuptial’ agreement right is extremely important to getting the partnership arrangements right” because specification of roles, tasks and responsibilities clarifies expectations forces discussion of division of labor, dispute resolution mechanisms, and decision-making authority. Crawford (1994) found that clarification of organizational objectives mitigates negative effects on collaboration of power differentials among agencies. Similarly, interorganizational network partners require shared performance evaluation processes and measures (Cohen and Mankin 2002). Leach, Pelkey, and Sabatier (2002) found a positive effect of evaluation criteria on length of partnership in the case of interstate partnership to improve watershed management. Brown, O’Toole, and Brudney (1998) found that formality including formalized procedures improved performance and customer service in a government project to promote shared development and use of geographical information systems.

The Treasury Board of Canada Secretariat—the Government of Canada’s Management Board—has developed detailed and comprehensive guidelines for managing collaborative arrangements that call for documentation clearly detailing requirements for the interorganizational processes described here (Treasury Board 2003). The guidelines even include sample Memoranda of Understanding (MOUs) for establishing funding, staffing, and other flows across departments. In the U.S. federal government, cross-agency collaborative systems and processes are typically codified and formalized through the use of MOUs, which must be developed, reviewed, and approved by each governmental body. The commitment to develop MOUs is itself an act of integration and part of a strategic planning process. The act of specifying joint goals, processes, and systems implies commitment to a network and necessarily involves learning and joint problem solving rather than simply negotiation and bargaining.

Adequacy of resources, notably budget and staff, are critical to network sustainability (Brown, O’Toole, and Brudney 1998; Johnson et al. 2003; Kernaghan 2003; Moon 2002). During the initial stages of a network, staff and budget constraints may pose considerable challenges to core network actors as they try to regularize resource flows and develop equitable networked arrangements. For example, the U.S. Congress passed the E-government Act of 2002 and authorized substantial funding for e-government initiatives. But much of the funding was not appropriated, and agencies were required to find and share funding within their budgets. Lack of funding and staff have hampered network development and the progress of the twenty five cross-agency e-government projects by

reducing the time that staff can spend on projects, reducing the ability of agencies to contract for technical development, and, more generally, making it difficult for agencies to maintain “old” processes while simultaneously building new ones.

Crafting collaborative arrangements implies that interorganizational network partners can learn collectively. Doz (1996) examined a wide range of strategic alliances and found that the initial alliance conditions and interorganizational design either “facilitate or hamper the partners’ learning about the environment of their alliance, how to work together to accomplish the alliance task, their respective skills, and each other’s goals” (64). Thus, just as social capital tends to accrue as the carrying out of productive tasks leads to experience and learning, interorganizational network actors continue to learn iteratively as their base of knowledge and experience grows over repeated interactions.

Information in networked organizations is structured internally through routines and systems, as I have just described, and through the results of ongoing social relations, which formed the first part of this discussion of levels. An important source of information that constrains action remains to be examined. Institutions specify and formalize a large number of overarching and important information structures including legislation, regulations, accountability systems, budgeting processes, and oversight mechanisms. It is to these that we now turn.

Institutional arrangements and information in government

A critical function of government is development of institutions that confer legitimacy, credibility, and trust. Government institutions cannot “go out of business” for performance failures. A government agency may be dissolved; a constitution cannot readily be modified. Institutional stability, meaning resistance to change, implies that institutions represent broad societal agreements.

Nee and Ingram (1998) refer to institutions as a “*web of interrelated norms*—formal and informal—governing social relationships.” They argue that institutions influence behavior in ongoing social relations in two ways. First, institutions directly affect the formation of preferences because they are core constituent elements of context. Examples in this case include the U.S. Constitution and other enduring features of government that contribute to a citizen’s identity and norms of behavior. Second, institutions constrain organizations that, in turn, shape individual and group behavior in social networks. Examples here include laws and regulations. For example, sunshine laws require government organizations to make information available to the public via channels and documents that citizens can understand and access. Formal contracts usually specify performance criteria, dispute resolution mechanisms, and some of the ways in which actors will be expected to interact, including written disclosures, notices of intent, verbal representations, and the like. In short, contracts describe and prescribe information flows.

At a macrolevel, institutions define national and global structures of incentives, and thus influence cultural and national levels of trust and norms that influence processes of

exchange. A robust set of findings in a broad stream of research provide evidence for the correlation between government institutions that support interfirm networks in an economy and the presence of such networks (Lane and Bachmann 1997; Fountain 1998; Piore and Sabel 1984; Rooks et al. 2000; Saxenian 1994).

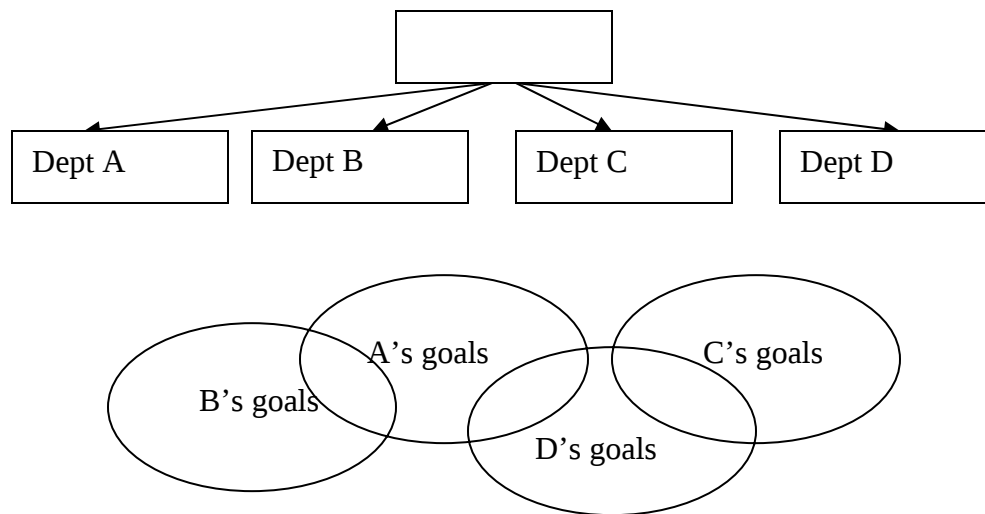
Four types of institutional structures that characterize most industrialized democracies require discussion: the vertical structure of bureaucracy, which is the fundamental form of the executive branch of government, and three central governance processes that flow from it—accountability, legislation, and budgeting.

The vertical structure of bureaucracy

Max Weber, one of the twentieth century's most influential sociologists as well as a public intellectual, sought to delimit the power of government leaders by specifying the "modern" bureaucratic organization as one with clear jurisdiction and authority relations ordered through superior-subordinate relationships. Weber argued that bureaucracy was the only form of organization capable of coordination and control in industrializing societies. This form of organization is deeply institutionalized in most industrialized political economies. Evidence of it is found in the dominance of relatively autonomous government agencies, which are accountable to the legislature, and the linear, vertical logic of accountability, budgeting, and legislation.

The past twenty five years of management and organization theory and practice has been largely devoted to breaking down the dominance of this model in theory and practice, to conceptualize and allow information flows that vary greatly from it. Markets provide one alternative; networks another. Yet in agency autonomy, budgeting, legislation, and accountability, the basic structure of the bureaucratic form persists and is strongly reinforced by interdependencies among these systems and by precedent.

In the schematic depiction in figure 4.1, the traditional hierarchical model is sketched with boxes representing autonomous departments. Cross-agency collaboration is sketched using slightly overlapping ovals. To move from one model to the other, an agency must decide to achieve at least some of its goals through cooperation, in a positive-sum calculation, rather than conceptualizing decisions as zero-sum calculations in which one department's gain forms another's loss. But a more important implication is the need for accountability, budgeting, and legislation systems that are better aligned with the second sketch in which some jurisdiction, resources, and operations overlap.



The main structural barrier to collaboration is the departmental model. While central oversight agencies can use control measures to promote interdepartmental collaboration, such an approach counters current trends toward decentralization, particularly in traditionally centralized ministerial governments. For example, the government of Canada has recently devolved greater authority to departments. Thus central agencies have proceeded cautiously, providing advice and incentives rather than forcing integration. Similarly, the U.S. Office of Management and Budget (OMB) has moderated its relationship with twenty five cross-agency projects from one of controller to one of facilitator and knowledge broker in an effort to catalyze, rather than to order, horizontal collaboration. If oversight units could order cooperation, they would do so. But the information and incentive structures to support cross-agency initiatives are too complex to yield to simple fiat.

Accountability Processes

Accountability flows directly from the vertical structure of bureaucracy. In U.S. federal government, an agency director is directly accountable to Congress for the actions of his or her agency. A recent, vivid example of agency accountability followed the response of the Federal Emergency Management Agency (FEMA) to Hurricane Katrina and the accountability of its former director, Michael D. Brown, a presidential appointee. Brown was forced to resign due to the poor performance of his agency in demonstrating accountability and its consequences for leaders. In parliamentary systems, ministers are the principal link between the parliament and the public service. The minister is legally responsible for the policies, programs, and administration of his or her department and is required to resign in the event of serious departmental error.

Behn (2001) follows a long line of public administration researchers in his observation that behind the traditional concept of organizational accountability is the implicit

assumption that one organization is responsible for one policy—or that at least every policy is the responsibility of just one organization. It is another beauty of bureaucracy and hierarchical accountability. The law assigns the clear and full responsibility for implementing each policy to one organization... And for each component of the organization, one individual is clearly in charge. Thus one individual is clearly accountable. (65)

Networked arrangements blur lines of authority and accountability. Thus public servants are challenged to maintain vertical accountability while supporting horizontal initiatives for which lines of accountability are unclear. The risk in networked arrangements is not the same as the risk involved in contracting out. With respect to the later, a contract clearly delineates the requirements imposed on the contractor and the penalties for failure to perform. Cross-agency arrangements rarely clarify division of labor, authority, and responsibility in such stark terms. Moreover, the emerging stages of cross-agency collaboration entail experimentation, trial and error, and provisional systems as a network of actors negotiates and learns.

For nearly twenty years, public managers in several countries have accrued practical experience with the development of sustainable cross-agency operations, particularly in human, social, and environmental policy domains. Although practice has developed, theory and government systems and policies to support networked agency practice have lagged behind practice. The problem is not one of developing individual incentives for cooperation but of reformulating governance principles and practices—that is, institutions—in light of increased coordination across agency boundaries (Allen et al. 2005; Lenihan, Godfrey, Valeri and Williams 2003; Fountain 2001; Millar and Rubinstein 2002; Wilkins 2002).

Legislative Processes

In recent years, legislators have increasingly mandated multiple entities to cooperate to achieve public ends. In these cases, legislation is not problematic—unless other challenges prevent mandated cooperation. Much legislation mandates without providing needed resources or even authority for the mandate. In other cases, much existing legislation reinforces departmental autonomy. Kernaghan (2003) reports in the results of a study of integrated service delivery projects in Canada that “legislative and regulatory barriers are of the show-stopper variety and require political consent for their removal. It is clear, for example, that privacy acts restrict the sharing of some kinds of data” (17-18). The point here is not to ignore privacy issues, but to point to the structural barriers to interagency collaboration. Dawes and Prefontaine (2003) point to relationship between law and legitimacy; new models of collaborative service delivery, they contend; “need to establish a new kind of institutional legitimacy. Most often, legitimacy begins with a basis in law or regulation” (42). Yet in many cases of collaboration, informal negotiations and planning proceed long before formal authority and arrangements change to accommodate new practices.

Budget Processes

Shared resources are a significant source of cohesion for cross-agency networks, in part because they change the nature of the relationship from multiple exchanges to a shared system (Hoel 1998). Brown, O'Toole, and Brudney (1998), in their study of the role of partnership in a government information technology project, found that the amount of resources shared by the group is one of the determinant factors for partnership effectiveness. Bardach and Lesser (1996) argue that the U.S. federal funding system confines interorganizational collaboration by placing undue restrictions on the use of funds. Yet they do not articulate how to remove restrictions and maintain accountability. In most industrialized democracies, the budget process appropriates funds to individual departments for department-specific programs. The budget process reinforces the vertical structure of government. The challenges of obtaining joint funding are political and structural because shared funding streams blur lines of accountability (Allen et al. 2005; Kernaghan 2003).

Institutions function in the background when organizational actors carry out regularized routines. But during periods of organizational change, particularly when changes in information flows are involved, public management innovations collide with deeply entrenched institutions. When government actors innovate and change information flows, they may find that their actions create a lack of alignment with formal rules in their environment. Eventually, they may have to address these tensions or may be reprimanded or find their activities prohibited by formal rules. The tensions produced by this mismatch pose challenges to key participants. But when such tensions can be resolved, possibilities for new institutional forms may be developed, gain legitimacy, and, subsequently, become new constraints for decision makers (Giddens 1976, 1984). Institutions can and do change, but the logics by which they change differ from those of fairly fluid ongoing social networks or from routinized organizational routines.

A Framework for Multilevel Integrated Information Structures

A focus on information in government invites researchers and practitioners to consider the distinctions, as well as the similarities, discussed so far in this chapter among informal norms of collaboration, organizational systems that might help coordinate cooperation, and, not least, institutional structures that provide the overarching context and rules within which collaboration might develop. Organizational change efforts, as I have argued previously in the chapter, require strategies to manage all three levels in the government environment. Actors involved in organizational change sometimes neglect one level while focusing on others. For example, some managers rely almost exclusively on interpersonal skills to establish collaboration and may neglect developing the interorganizational structures of communication and coordination that will be necessary to regularize information flows. In other cases, a champion might focus on the need to modify legislation needed for an interorganizational project to move forward and may, in the process, neglect the emerging social relationships that will sustain commitment and trust. In still other cases, astute operational managers might fail to communicate adequately and to build appropriately participative systems. Not all actors have to participate all the time. The point is that collaborative networks require that actors

perceive that their interests and goals are being furthered equitably in the joint process. Thus, MIIS offers considerable promise to illuminate the challenges of organizational change when actors seek to rethink information.

Nee and Ingram (1998) adapted a framework developed by Williamson (1994) to model the interactivity among small group interactions, organizations, and institutional frameworks. Their objective, an important one for our purposes, was to specify differences between informal norms, typically the chief constraints in ongoing social relations and formal norms, encoded in institutions. In brief, the purpose here is to account for constraints on information flows posed by institutions, organizational routines, and ongoing social relations.

The MIIS framework adapts and extends the Nee and Ingram model in three ways. First, it assumes that individuals and small groups not only interact in face-to-face interactions but develop and sustain informal norms through a variety of mediated interactions, including e-mail, listservs, blogs, web conferencing, and other shared information and communication spaces and channels. There is no claim here that these modes supersede face-to-face interactions, particularly with respect to the early development of trust. Yet their ubiquity and importance can hardly be ignored. They are flagged but not elaborated.

Second, Nee and Ingram follow other economic sociologists in assuming that networks of firms are the primary actors and that these networks are embedded in markets regulated by states. Our focus on interorganizational networks within government allows us to consider in a different context relationships among government actors and institutionalized governance structures offering a finer-grained view of “the state” than is typically drawn. Third, the empirical referent in Nee and Ingram is the interorganizational arrangement. The role of the single organization in the original model is extended to include and explain interorganizational arrangements as these emerge from informal social networks of public servants.

The arrows connecting the boxes that depict the three levels in the following figure represent interrelationships across the three levels. Individuals develop informal norms through social interaction. These informal norms affect the level of compliance and opposition to formalized organizational routines and rules. Informal norms and emergent innovation may come to be formalized themselves and adopted at the interorganizational and organizational levels. Flowing in the opposite direction, organizational and interorganizational rules constrain behavior in informal networks.

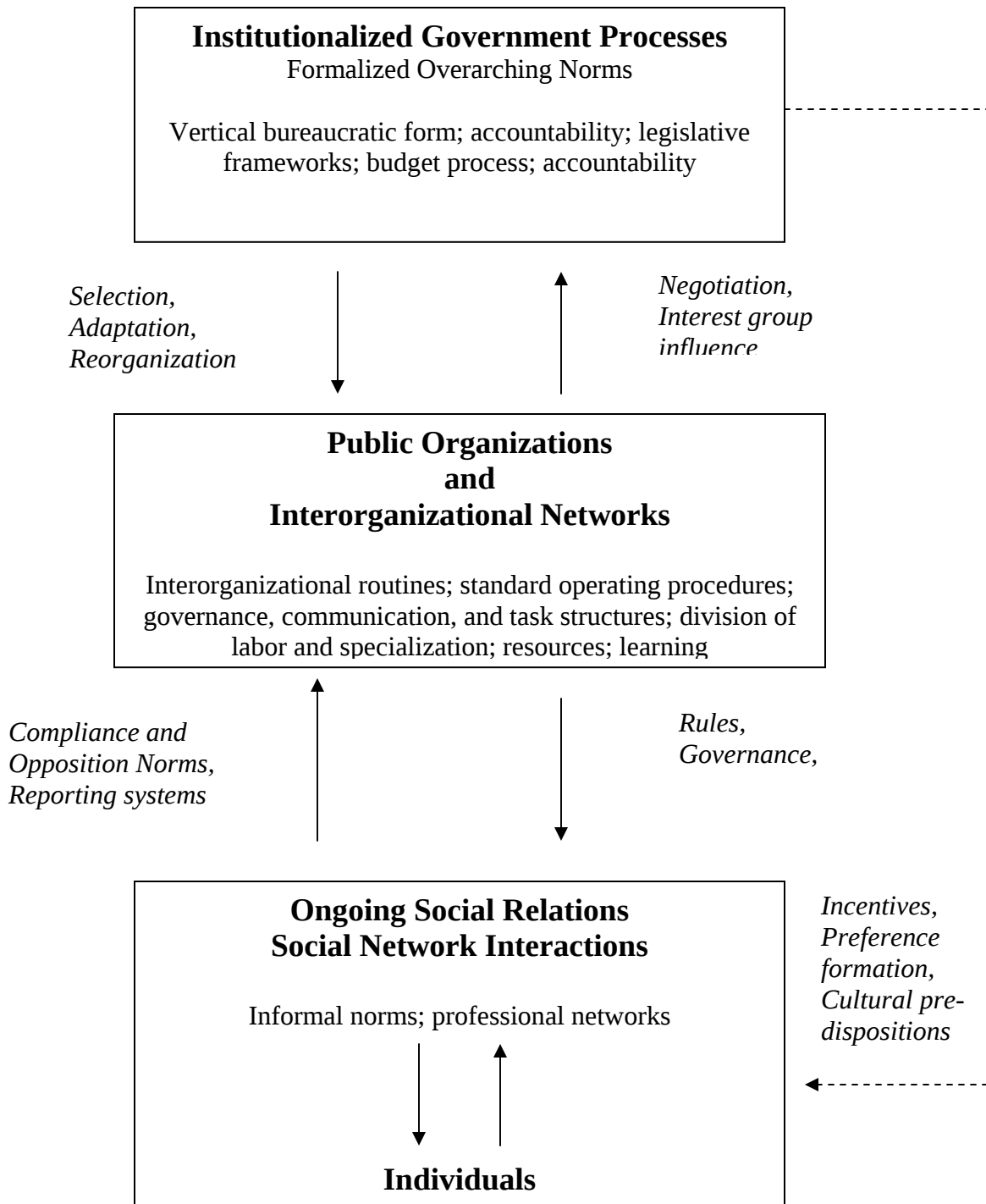
Moving up to sketch some of the relationships between organization and institution in government, public agencies can rarely influence legislation. But working with external stakeholders, typically interest groups, they can influence Congress and sometimes wrest decisions that Congress would prefer not to make (Carpenter 2001). But such influence is rare. In general, agencies submit budget requests and may have input into legislation that affects their programs. Institutions, on the other hand, work powerfully with respect to agencies and agency networks. Budgets and legislation can eliminate or create programs at the stroke of a pen. And the generosity of budgets and the requirements of

legislation make the difference between programs that hobble and those well able to carry out their mandates.

Thus research at all three levels is needed to encompass the complexities of social, operational, structural, and political elements of organizational change.

The next section illustrates the MIIS framework (figure 4.2) by means of a brief case study of an interagency network, Grants.gov, developed to streamline the complex process of managing federal grants. The development of Grants.gov exemplifies the interplay of behavior and process at multiple levels of analysis and the interplay of differing internal logics that operate at each respective level.

Figure 1: A Multi-level Integrated Information System (MIIS)



Adapted from Victor Nee and Paul Ingram, "Embeddedness and Beyond: Institutions, Exchange, and Social Structure," in Mary C. Brinton and Victor Nee, eds., *The New Institutionalism in Sociology* (New York: Russell Sage Foundation, 1998), figure 2.2: A Model for the New Institutionalism in Sociology, p. 31.

Grants.gov: Challenges of Information Integration

In February 2002, the Grants.gov project was launched, part of the Presidential Management Initiative, a modernization effort including twenty five cross-agency initiatives.¹ Years of discussion and development efforts meant to standardize grants administration across agencies preceded Grants.gov. Thus, a network of grants professionals in the federal government had been established and had built communication channels and a set of informal norms around a shared, important task.

The goal of the first phase of Grants.gov was to build and deploy one cross-agency, web-based interface to consolidate search and application for federal grants. The first project phase did not seek to standardize grants processes across agencies but to build a standard, web-based interface to which all agencies would connect. It has been assumed that the virtual integration would create a path to deeper integration across agencies that might be pursued in future phases. Thus the project participants understand the need to build commitment incrementally and over time as network actors learn more deeply about one another's processes and the challenges of integrating them. The initial product—a centralized, web-based “storefront”—was launched by then Secretary of the Department of Health and Human Services Tommy Thompson in November 2003. From its inception, the cross-agency network has benefited from high-level political support from the White House, OMB, and the secretariat of the Department of Health and Human Services (HHS).

Approximately \$360 billion in federal grants are offered annually by twenty six federal agencies through approximately eight hundred programs and comprising more than 210,000 individual awards. Grants are disbursed to state, local, and tribal governments, educational institutions, and nonprofits. The grants process is relatively mature, having developed during the past twenty five to thirty years. Thus grants processes, although challenging to integrate, are clearly specified and well understood. But strong autonomous cultures for grants processing and idiosyncratic agency data requirements have also evolved over time.

As agencies began to automate their grant processes, it became clear that hundreds of stovepiped, computerized grants systems would result. Ironically, customer service strategies and decentralized approaches to innovation and computing led to hypercustomization, further fracturing grants processes across the government. The net result for the public was cacophony, not greater responsiveness. In the culture of decentralized agency computing during the 1990s, attempts to use emerging technologies to integrate grants processes had been attempted several times, particularly during the Reinventing Government reforms of the Clinton administration, but without success. Thus, although the goal of integration was rhetorically attractive, the context and incentives that would allow actors to collaborate were not in place.

An integrated grants administration system would benefit internal agency operations through simplification of myriad complex processes. For the public, lowering search and

application costs would reduce barriers to entry for those organizations without the resources to find programs and maneuver through arcane application processes. The cross-agency initiative is part of a larger effort to disintermediate the relationship between corporate and individual citizens and their government by simplifying information.

Mark Forman, former director of the OMB Office of E-Government and Information Technology, led a participatory meeting in February 2002 that included constituents, users, and agency team members. They decided upon shared phase one objectives: First, they agreed to develop a single web interface “storefront” to enable potential applicants to find appropriate grants and to apply for them. Second, they agreed to standardize grants application information and processes, develop unique identifiers for applicants that would be used by all agencies, and link their agency to the unified web interface. Thus the network participants clarified and agreed upon a shared goal, related objectives, performance measures, and an ambitious timetable and milestones for completing the “storefront.” This was done in a participatory meeting to signal open communication, joint problem solving, and an equitable voice for agencies. Forman used his position and credibility as the nation’s first chief information officer (CIO) to begin to establish a rigorous, collaborative culture for the project with systematic project management systems.

The largest federal grantor, the HHS was designated by the OMB, in concert with public managers, as the managing partner agency for Grants.gov. Other partner agencies include the Departments of Transportation, Education, Housing and Urban Development, Justice, Labor, Agriculture, Commerce, Defense; the National Science Foundation; and FEMA. The initial program manager, Charles Havekost, is a career civil servant with considerable professional experience managing IT projects, including a brief period in a private-sector dot.com startup. Havekost became the CIO of HHS during the first phase of Grants.gov. Rebecca Spitzgo, the former deputy program manager, Succeeded Havekost. As one of the champions of the project, Havekost, and later Spitzgo, established and sustained relationships with counterparts from other agencies by building a strong network among managers and executives.

Project goals, participating agencies, and oversight in an OMB program office were agreed upon during the first weeks of Grants.gov, but key resources—funding, staff, and space—were the responsibility of the program manager. It was decided that agencies would jointly fund the collaborative projects. Lack of funding forced Havekost and Spitzgo to spend considerable time during the first year of the project developing interagency budgetary MOU’s and tracking budgetary transfers between agencies. Agency participants set project staffing at fifteen people and the budget at \$20 million over the first two years. Managers jointly developed a funding algorithm, dividing partner agencies into three groups—large, medium, and small—according to the proportion of grants processed annually. The shared funding approach became a model for other cross-agency projects. The development of an interorganizational system for funding is indicative of the need for routinization of key management elements in networks.

Havekost and Spitzgo had to convince agencies to contribute staff to the project. They focused on the professional development benefits and the advantage to departments of having “eyes and ears” on the project. By the end of 2002, Grants.gov was staffed at prescribed levels with career civil servants, largely on six-month details to the project. The team structure promoted cross-fertilization of ideas from different agencies. But the use of six-month details required staffing to be addressed continually. Program team members persuaded HHS senior management to approve designated space for the project. This was not an easy process, but the shared space, and regular informal team gatherings, contributed strongly to an esprit de corps, a sense of shared identity and commitment, among project members. Thus resource decisions aligned with social network building and cohesion.

One of the key issues involved in working across agencies is governance. While senior government management may agree in principle to collaborate, in practice middle managers from separate agencies carry out the work of integration and often have goals that are not aligned with those of the cross-agency project. To address this challenge, Havekost created a governance structure including an executive board and a steering committee. Senior agency representatives with authority to speak for their respective agencies were appointed. The simple structures proved valuable for conflict resolution and political support. The shared governance structure also has been adopted as a “best practice” by other cross-agency projects and lends support to the importance of interorganizational systems to support networks of actors.

According to Havekost, there was little disagreement among agency representatives over the concept of the program; that is, almost all agreed that the project was a good idea.ⁱⁱ That the program was *possible* was harder. The program team focused on four main tasks in order to build momentum.

First, the team demonstrated to agency partners that their objective had already been accomplished in another form by a related project. Federal Business Opportunities—the FedBizOpps.gov project—is similar to Grants.gov in concept and functionality. Second, the team actively engaged the agencies’ clients and constituents, which persuaded grants applicants that the program team was committed to building a truly interagency process. It also signaled to agencies that their external stakeholders were aware of the project and would exercise their voices if the progress was delayed by an individual agency. The project team looked for creative ways to work around lack of cooperation and noncompliance of some partner agencies by introducing flexibilities and multiple variations into the shared system.

Third, early on the project team forced agreement on an issue that had previously proved a stumbling block in prior efforts to streamline federal grants processes. In July 2002, well ahead of the stated October deadline, partner agencies agreed on the standard data to be collected by grant applicants. The adoption of standard data collection was operationally important and psychologically significant. The early accomplishment reportedly built a strong reputation for the project and the seriousness of intent of its

participants. It also reinforced the reputation of Havekost as an entrepreneur who could deliver results.

At the institutional level, it has been interesting to observe adjustments in the relationship of newly integrated agency activities and Congress. The development of a shared approach to budgeting for cross-agency projects offers a pointed example. Many of the cross-agency e-government projects have developed innovative, shared funding mechanisms that rely on formulas worked out by the agencies participating in an initiative. Large agencies would fund a greater proportion of project expenses than smaller agencies, for example, or agencies that process larger numbers of grants would fund more of Grants.gov than agencies with smaller grant programs. These funding mechanisms, while emergent, were until recently becoming formalized and diffused to similar joint projects throughout the federal government. It is not yet known whether they characterize a new form of funding or the proliferation of an ad hoc solution to a seemingly intractable structural problem (Fountain 2006). In response to these innovations in budgeting, Congress has passed a provision within a much broader appropriations bill—the 2006 Transportation, Treasury, Housing and Urban Development, Judiciary, and other related agencies appropriations bill—that prohibits the use of these shared funding mechanisms without prior congressional approval (Miller 2005; Skrzycki 2006). This development provides a surprising and vivid example of the power of institutions to constrain the behavior of networked actors. The strong reaction of Congress to the emergence of an integrative approach to budgeting offers a striking example of lack of alignment between the institution of the legislature and the collaborative projects that have been under development with White House approval since the beginning of the Bush administration.

In summary, the Grants.gov project has built an interagency interface to integrate the process of finding and applying for federal grants. Project participants agreed on the importance of the goal, although they doubted its feasibility. They developed governance and funding structures that have become models for other cross-agency projects. The entrepreneurship and skill of the project leader proved critical to building trust and project management systems that would work within the institutional environment. A shared perception of equity in terms of agency contributions has been a vital element of success. The interorganizational network built new systems and was able to continue its work until it ran aground on institutional budget processes that Congress, at this time, has not allowed to change. It is expected that in the negotiated process between the Senate Appropriations Committee, OMB managers and cross-agency program leaders, a new consensus, and possibly the beginnings of a modified institution will emerge.

Conclusion

In a traditional view of government, public servants are agency-centric actors who face a set of perverse incentives as they make decisions regarding the possible benefits of new information uses, sharing, and flows for their programs and agencies. In most adversarial democracies, public executives learn to try to accumulate larger budgets and more staff in order to increase the power and autonomy of their agency. They also learn to negotiate

skillfully for appropriations for their program and agency. In fact, in adversarial democracy, such conflicts among programs and agencies are assumed to force public servants to sharpen their arguments and rationales for programs, to produce results in order to sustain resources. This view of adversarial democracy dates at least as far back as J. S. Mill and the theories of neoclassical economics. But the adversarial model of democracy does not align well with new possibilities for structuring information in government.

For this reason, public executives face perverse incentives. If public managers implement new information flows and uses that are horizontal in nature, they may not gain greater agency resources in terms of dedicated agency budget: They are likely to have their budget decreased. If they implement new ways of using information that reduce redundancies across agencies and programs, again, they are likely to lose resources rather than gain them. If they develop interagency and enterprise-wide systems with their colleagues in the bureaucracy, they will lose autonomy rather than gain it. If the goal to be achieved is better governance, then the decisions are clearly in the direction of collaboration across boundaries. But when the proximate goal is to increase, or maintain, agency budget and authority, the criteria for decision making are vastly different and tend toward the agency-centric. So the traditional incentives by which public executives have worked are “perverse” incentives for networked governance.

The case of Grants.gov illustrates the multilevel integrating information system within which organizational change takes place. The MIIS framework explains events that are otherwise categorized as “unanticipated consequences” or second-order effects of change. Informal interactions, carried out by individuals on behalf of their organizations, when handled with respect and some measure of interpersonal skill, can create trust across boundaries and the beginnings of a shared sense of purpose. At a more formal level, interorganizational relationships require strong governance, coordination, communication, and control systems that must nevertheless be implemented in a collaborative way to sustain the participation of actors. Projects require governance bodies as much for the legitimacy and authority they confer on fledgling projects as for their substantive decision making. Cross-agency collaborations in government tend to develop within institutional environments designed to work in highly vertical, command-and-control organizational settings. Entrepreneurs and innovators in government learn to work within, and, when opportunities arise, to modify these institutional arrangements.

Notes

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References

- Abernathy, Frederick H., John T. Dunlop, Janice H. Hammond, and David Weil. 1999. *A Stitch in Time: Lean Retailing and the Transformation of Manufacturing*, New York: Oxford.
- Allen, Barbara, Luc Juillet, Gilles Paquet, and Jeffrey Roy. 2005. "E-Government as Collaborative Governance: Structural, Accountability and Cultural Reform." in *Practicing E-Government: A Global Perspective*, ed. Mehdi Khosrow-Pour, 1–15. New York: Idea Group.
- Axelrod, Robert. 1984. *The Evolution of Cooperation*, New York: Basic Books.
- Bardach, Eugene. 2001. "Developmental Dynamics: Interagency Collaboration as an Emergent Phenomenon." *Journal of Public Administration Research and Theory* 11, no. 2: 149–164.
- Bardach, Eugene, and Cara Lesser. 1996. "Accountability in Human Services Collaboratives—For What? And To Whom?" *Journal of Public Administration Research and Theory* 6, no. 2: 197–224.
- Behn, Robert D. 2001. *Rethinking Democratic Accountability*, Washington, DC: Brookings Institution Press.
- Biedell, Jeff, David Evans, Daniela Ionova-Swider, Jonathan Littlefield, John Mulligan, and Je Ryong Oh. 2001. "Facilitating Cross-Agency Collaboration." Unpublished paper, Robert H. Smith School of Business, University of Maryland.
- Bourdieu, Pierre. 1979. "Les trois états du capital culturel." *Actes de la Recherche en Sciences Sociales* 30: 3–5.
- Brown, Mary Maureen, Laurence J. O'Toole, and Jeffrey L. Brudney. 1998. "Implementing Information Technology in Government: An Empirical Assessment of the Role of Local Partnerships." *Journal of Public Administration, Research and Theory* 8, no. 4: 499–525.
- Carpenter, Daniel P. 2001. *The Forging of Bureaucratic Autonomy: Reputations, Networks and Policy Innovation in Executive Agencies, 1862-1928*, Princeton: Princeton University Press.
- Cash, James I., Nitin Nohria, and Robert Eccles, eds. 1994. *Building the Information-Age Organization: Structure, Control, and Information Technologies*, Boston: Irwin.
- Chiat, William S. and Michele Mickiewicz. 1999. "Collaboration for Success: Facilitating Large Group Interventions." *Annual Quality Congress* 53, No. 0: 142–148.

Cohen, Susan G. and Don Mankin. 2002. "Complex Collaborations in the New Global Economy." *Organizational Dynamics* 31, no. 2: 117–133.

Cohen, Don and Laurence Prusak. 2001. *In Good Company: How Social Capital Makes Organizations Work*, Boston, MA: Harvard Business School Press.

Coleman, James S. 1988. "Social Capital in the Creation of Human Capital." *American Journal of Sociology* 94 (supplement): S95–121.

Crawford, Adam. 1994. "Social Values and Managerial Goals: Police and Probation Officers' Experiences and Views of Inter-Agency Collaboration." *Policing and Society* 4: 323–339.

Davenport, Thomas H. 1995. "The Fad that Forgot People." *Fast Company* 1 (November): 70.

Day, Diana. 1994. "Raising Radicals: Different Processes for Championing Innovative Corporate Ventures." *Organization Science* 5, no. 2: 148–172.

Dawes, Sharon S. and Lise Prefontaine. 2003. "Understanding New Models of Collaboration for Delivering Government Service." *Communications of the ACM* 46, no. 1: 40–42.

Doz, Yves L. 1996. "The Evolution of Cooperation in Strategic Alliances: Initial Conditions or Learning Processes?" *Strategic Management Journal* 17, Special Issue: 55–83.

The Economist. 2002. "Getting IT." *The Economist* 365, no. 8295: 16–16.

Fountain, Jane. 1998. "Social Capital: A Key Enabler of Innovation in Science and Technology." *Science and Public Policy* 25, no. 2: 103–115.

Fountain, Jane. 2001. *Building the Virtual State: Information Technology and Institutional Change*. Washington, DC: Brookings Institution Press.

Fountain, Jane E. 2006. "Central Issues in the Political Development of the Virtual State." In *The Network Society: From Knowledge to Policy*, eds. Manuel Castells and Gustavo Cardoso, 149–181. Center for Transatlantic Relations, Johns Hopkins University, School of Advanced International Studies and Brookings Institution Press.

Fountain, Jane, and Osorio-Urzua, Carlos. 2001. "Public Sector: Early Stage of a Deep Transformation." In *The Economic Payoff of the Internet Revolution*, eds. Robert Litan and Alice Rivlin, 235–268. Washington, DC: Brookings Institution Press.

Fudenberg, Drew, and Eric S. Maskin. 1986. "A Folk-Theorem in Repeated Games with Discounting and with Incomplete Information." *Econometrica* 54: 533–554.

Giddens, Anthony. 1984. *The Constitution of Society: Outline of the Theory of Structuration*, Berkeley: University of California Press.

Giddens, Anthony. 1976. *New Rules of Sociological Method*, New York: Basic Books.

Granovetter, Mark. 1973. "The Strength of Weak Ties." *American Journal of Sociology* 78, no. 6: 1360–380.

Granovetter, Mark. 1983. "The Strength of Weak Ties: A Network Theory Revisited." *Sociological Theory* 1: 201–233.

Granovetter, Mark. 1985. "Economic Action and Social Structure: The Problem of Embeddedness." *American Journal of Sociology* 91, no. 3: 481–510.

Granovetter, Mark. 2005. "The Impact of Social Structure on Economic Outcomes." *Journal of Economic Perspectives* 19, no. 1: 33–50.

Gulati, Ranjay. 1995. "Does familiarity breed trust? The Implications of Repeated Ties for Contractual Choice in Alliances." *Academy of Management Journal* 38: 85–112.

Gulati, Ranjay, and Harbir Singh. 1998. "The Architecture of Cooperation: Managing Coordination Costs and Appropriation Concerns in Strategic Alliances." *Administrative Science Quarterly* 43, no. 4: 781–814.

Hammer, Michael, and James Champy. 1993. *Reengineering the Corporation*, New York: HarperCollins.

Heintze, Teresa and Stuart Bretschneider. 2000. "IT and Restructuring in Public Organizations: Does Adoption of IT Affect Organizational Structures, Communications and Decision-Making?" *Journal of Public Administration Research and Theory* 10, no. 4: 801–830.

Hoban, Thomas J. 1987. "Barriers to Interagency Cooperation." *Journal of Applied Sociology* 4: 13–29.

Hoel, James L. 1998. *Cross-System Collaboration: Tools That Work*. Washington DC: Child Welfare League of America.

Huggins, Robert. 2001. "Inter-Firm Network Policies and Firm Performance: Evaluating the Impact of Initiatives in the United Kingdom." *Research Policy* 30, no. 3: 443–458.

Isett, Kimberly Roussin, and Keith G. Provan. 2005. "The Evolution of Dyadic Interorganizational Relationships in a Network of Publicly Funded Nonprofit Agencies." *Journal of Public Administration Research and Theory* 15, no. 1: 149–165.

Johnson, Lawrence J., Debbie Zorn, Brian Kai Yung Tam, Maggie Lamontagne, and Susan A. Johnson. 2003. "Stakeholders' Views of Factors That Impact Successful Interagency Collaboration." *Exceptional Children* 69, no. 2: 195–209.

Kernaghan, Kenneth. 2003. *Integrated Service Delivery: Beyond the Barriers*. Report prepared for the Chief Information Officer, Government of Canada.

Ketokivi, Mikko, and Xavier Castañer. 2004. "Strategic Planning as an Integrative Device." *Administrative Science Quarterly* 49: 337–365.

King, John L. and Ben Konsynski. 1993a. "Singapore Leadership: A Tale of One City." Harvard Business School Case 191-025, Harvard Business School: Cambridge, MA.

King, John L. and Ben Konsynski. 1993b. "Singapore TradeNet (A): A Tale of One City." Harvard Business School Case 191-009, Harvard Business School: Cambridge, MA.

Lane, Christel, and Reinhard Bachmann. 1997. "Co-Operation in Inter-Firm Relations in Britain and Germany: The Role of Social Institutions." *The British Journal of Sociology* 48, no. 2: 226–254.

Leach, William D., Neil W. Pelkey, and Paul A. Sabatier. 2002. "Stakeholder Partnerships as Collaborative Policymaking: Evaluation Criteria Applied to Watershed Management in California and Washington." *Journal of Policy Analysis and Management* 21, no. 4: 645-667.

Lenihan, Donald G., John Godfrey, Tony Valeri, and John Williams. 2003. "What Is Shared Accountability?" *Policy, Politics and Governance*, vol. 5, Ottawa, Ontario: KTA Centre for Collaborative Government.

Litan, Robert E., and Alice M. Rivlin, eds. 2001. *The Economic Payoff from the Internet Revolution*, Washington, DC: Internet Policy Institute and Brookings Institution Press.

March, James, and Herbert Simon. [1958] 1993. *Organizations*. 2nd ed. New York: Wiley.

Millar, Craig and Daniel Rubenstein. 2002. "Government Response to the Fourth Report of the Standing Committee on Fisheries and Oceans "Report on the Oceans Act."" Fisheries and Oceans Canada, Government of Canada, March.

Milward, H. Brinton and Keith G. Provan. 2000. "Governing the Hollow State." *Journal of Public Administration Research and Theory* 10, no. 2: 359–379.

Miller, Jason. 2005. "OMB Delivers Report to Better Sell E-Government." *Government Computer News*, January 18, Available at: http://www.gcn.com/vol1_no1/daily-updates/37953-1.html, (accessed January 18, 2005).

Moon, M. Jae. 2002. "The Evolution of E-Government Among Municipalities: Rhetoric or Reality?" *Public Administration Review* 62, no. 4: 424–433.

Nahapiet, Janine and Sumantra Ghoshal. 1998. "Social Capital, Intellectual Capital, and the Organizational Advantage." *The Academy of Management Review* 23, no. 2: 242–266.

Nee, Victor and Paul Ingram. 1998. "Embeddedness and Beyond: Institutions, Exchange, and Social Structure." In *The New Institutionalism in Sociology*, eds. Mary C. Brinton and Victor Nee, 19-45. New York: Russell Sage Foundation.

Neo, Boon-Siong, John L. King and Lynda Applegate. 1993. "Singapore TradeNet (B): The Tale Continues." Harvard Business School Case 193–136, Harvard Business School, Cambridge, MA.

Oliver, Christine. 1990. "Determinants of Interorganizational Relations: Integration and Future Directions." *Academy of Management Review* 15: 241–265.

Ostrom, Elinor. 1990. *Governing the Commons: The Evolution of Institutions for Collective Action*, New York: Cambridge University Press.

O'Toole, Laurence J. 1997. "Treating Network Seriously: Practical and Research-based Agendas in Public Administration." *Public Administration Review* 57, no. 1: 45–52.

Piore, Michael J. and Charles Sabel. 1984. *The Second Industrial Divide: Possibilities for Prosperity*, New York: Basic Books.

Powell, Walter W. 1998. "Learning from Collaboration: Knowledge and Networks in the Biotechnology and Pharmaceutical Industries." *California Management Review* 40, no. 3: 228-240.

Putnam, Robert D. (1993) *Making Democracy Work. Civic traditions in modern Italy*, Princeton, NJ: Princeton University Press.]

Managing Collaborative Arrangements: A Guide for Regional Managers. Treasury Board of Canada Secretariat, Ottawa, 2003. Available at http://www.tbs-sct.gc.ca/rc-cr/guide_rm/index_e.asp (accessed January 20, 2006).

Rooks, Gerrit, Raub, Werner Selten, Robert and Tazelaar, Fritz. 2000. "How Inter-Firm Co-Operation Depends on Social Embeddedness: A Vignette Study." *Acta Sociologica* 43: 123–137.

Saxenian, Annalee. 1994. *Regional Advantage*, Cambridge, MA: Harvard University Press.

Shapiro, Carl and Hall R. Varian. 1999. *Information Rules: A Strategic Guide to the Network Economy*, Boston: Harvard Business School Press.

Skrzycki, Cindy. 2006. "Document Portal Sticks on Funding." *Washington Post*, January 10, p. D01. Available at <http://www.washingtonpost.com/wp-dyn/content/article/2006/01/09/AR2006010901702.html>. (accessed January 18, 2006).

West, Darrell. 2005. *Digital Government: Technology and Public Sector Performance*, Princeton: Princeton University Press.

Wilkins, Peter. 2002. "Accountability and Joined Up Government." *Australian Journal of Public Administration* 61, no. 1: 114–119.

Williamson, Oliver E. 1994. "Transaction Cost Economics and Organization Theory." In *The Handbook of Economic Sociology*, eds, N. J. Smelser and R. Swedberg, 77-107. Princeton, NJ: Princeton University Press.

Zaheer, Akbar, Bill McEvily, and Vincenzo Perrone. 1998. "Does Trust Matter? Exploring the Effects of Interorganizational and Interpersonal Trust on Performance." *Organization Science* 9, no. 2: 141–159.

ⁱ Case study data were gathered through archival research and face-to-face, tape recorded interviews with the program manager, assistant manager, project staff, OMB officials and stakeholders. At its inception, the project was known as "E-Grants" and changed officially to "Grants.gov" in 2003. The name "Grants.gov" will be used throughout.

ⁱⁱ E-Grants Stakeholder Opinions, p. 3.