Governing Public Sector Interorganizational Network Infrastructures
—The Importance of Formal and Legal Arrangements

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Abstract

Government agencies increasingly enter into interorganizational alliances to accomplish common goals. Alliances to create and maintain shared IT infrastructures for communication, coordination, and collaboration among agencies are an especially important phenomenon. This article examines three perspectives on the governance of interorganizational alliances (interpersonal interactions, financial ownership, and legal forms) and evaluates their applicability to interorganizational network infrastructures on the basis of theoretical arguments and the analysis of a single case study. Even combined, the three perspectives do not address the full range of issues involved in the case, because they do not pay sufficient attention to the varied formal and legal arrangements by which interorganizational network infrastructures are governed. The conclusion is that the conceptualization of governance for interorganizational network infrastructures remains problematic and that future theoretical development as well as empirical research is needed to resolve the open questions.

1. Introduction

Interorganizational arrangements increasingly characterize public sector activities, including mutual assistance activities among government agencies and outsourcing contracts to other public as well as to private sector organizations [6, 19, 25, 37, 33]. Interorganizational arrangements are especially frequent and significant in the area of IT-enabled coordination and information-sharing across agency lines, as in the public safety arena [7, 9, 11, 12, 13, 27].

Our substantive focus in this paper is on a particular kind of interorganizational relationship that we call “interorganizational network infrastructures” or INIs. INIs are cooperative arrangements in which several autonomous organizations come together to provide (or contract for the provision of) IT-enabled services that support communication, coordination, or collaboration among the member organizations. The particular question we address in the paper is: how should the governance of INIs be conceptualized? In other words, the aim of this paper is one of preliminary theory development.

Examples of the kinds of INIs of interest to us are Nlets and CapWIN in the public safety domain. Nlets, originally the “National Law Enforcement Teletype System,” originated in the 1960s as a means for public safety agencies in the US States to exchange information relevant to criminal investigations. Today, Nlets members include all 50 States plus US territories; federal government agencies and other types of organizations can also participate in Nlets, and the range of services offered by Nlets has grown considerably. CapWIN, originally the Capital Wireless Information Network, began as a communications interoperability initiative among federal, state, and local governments in the Washington, D.C. area, administered by a Center at the University of Maryland [9]. Today, CapWIN’s user base and service offerings are growing rapidly.

INIs can be found in the private sector as well as in the public sector. Examples include NEHEN in health care, SWIFT and MERS in financial services, and electronic marketplaces [32], such as Elemica in the chemicals industry. However, where governance is the topic, public sector INIs are likely to be more interesting theoretically than private sector INIs. Public sector INIs typically involve organizations of different kinds, for instance, e.g., agencies at different levels of government in addition to private-sector IT contractors. Because of differences among organizational goals and purposes, interorganizational conflict is more likely in public sector INIs than in the more homogeneous private-sector INIs, and one would expect public sector
INI governance to be more challenging and complex. Therefore, theoretical conclusions about public sector INIs are likely to be applicable to private sector INIs, whereas the reverse may not be true.

The plan of this paper is as follows. We first examine three theoretical perspectives on the governance of various kinds of interorganizational relationships, including some that share certain characteristics with INIs. These perspectives, which we label the interpersonal interactions perspective, the financial ownership perspective, and the legal forms perspective, offer strikingly different accounts of the governance options available to interorganizational arrangements, the factors that are most likely to influence the choice of a governance options for interorganizational relationships, as well as their overall conceptualization of governance. We assess the advantages and disadvantages of each perspective as it may apply to public sector INIs. Next we present a case study of the governance options considered and the factors that were weighed in the choice of governance for CapWIN, a public safety INI. This case study is based on the research and findings from the Public Safety Networks Project, funded by the National Science Foundation. The project is a collective effort to scientifically and methodologically collect and analyze the data on public safety issues.

We adopted the case study methodology because it provides rich and detailed insights into “how” and “why” questions about INI governance [39]. As a result, we are able to show that the governance choices and factors considered in the CapWIN case were more numerous and complex than those identified in the three theoretical perspectives. In discussing this case, we argue for a conceptualization of INI governance that includes legal forms, but also accommodates a range of additional considerations that may be formally documented or legally ratified, including voting rights and tax status. We conclude with some recommendations for future theoretical development and empirical research.

2. Theoretical background

Scholars in numerous areas of study have considered governance arrangements for interorganizational relationships, including relationships that emphasize the development or use of technology, as in INIs. Unfortunately, there is little convergence across these literatures in how governance is conceptualized. This lack of convergence can be attributed to two circumstances. First, the perspectives are found in different disciplines (e.g., organizational behavior, economics, and business strategy) and reflect the theoretical orientations of scholars in those disciplines (e.g., exchange theory, agency theory, and the resource based theory of the firm or evolutionary economics). Second, the perspectives were developed for specific kinds of interorganizational arrangements that differ substantively in their purposes, their activities, and some of their structural characteristics (e.g., whether or not the arrangements are focused on technology). For instance, governance theory has been developed for research and development alliances [28], IT outsourcing arrangements [19], Internet governance [20], open source software development projects [24], electronic marketplaces [32], and coordination among social services agencies [30]. Therefore, differences in conceptualizations of interorganizational governance may reflect differences in the substantive phenomena that are of primary concern to various theorists.

There is no a priori reason for assuming that any one perspective on interorganizational governance is inherently superior for INIs. A critical first task in the development of a theory of INI governance is to compare and evaluate existing conceptualizations to determine whether they fit the characteristics of INIs and, if not, to develop a conceptualization of governance that fits the unique substantive characteristics of INIs.

Below we describe and assess three conceptualizations of interorganizational governance that we label the interpersonal interactions perspective, the financial ownership perspective, and the legal forms perspective. The three perspectives differ considerably in their overall understanding of what governance is, in the specific governance choices they consider, and in the factors they pose as most relevant for the selection of a particular governance option.

2.1. The interpersonal interactions perspective

Provan and Kenis [30] developed a theory of interorganizational network governance that was an outgrowth of earlier empirical research on the relationships that emerge, or are constructed among, the multiple health and human service organizations that may serve the same clientele in a municipality. They discussed three forms of governance: participant-governed, “lead organization” governance, and governance by a “network administrative organization”. Participant-governed networks were described as either formal or informal, where “formal” was defined in terms of regular meetings (not, as commonly done, in terms of written and regulations, including legal contracts) and “informal” referred to “uncoordinated” personal contacts among agency members. (The emphasis on meetings and
communications led us to label this perspective “interpersonal interactions”). The lead organization form of governance was said to involve one organization in the network taking on the role of coordinating all the others. (See also Alexander [1]). The network administrative organization was explained as a new administrative entity established expressly to coordinate the efforts of others, but, importantly, this governance form does not itself provide services to clients. It is purely administrative. The factors that Provan and Kenis [30] argued to be most important in the choice of one of the three forms of governance were the number of participating organizations, goal consensus among the participants, the “density” of trust relationships among the participants, and the need for “network competencies.”

The advantages of this conceptualization of governance for the substantive phenomenon of INIs are two. First, it explicitly considers interorganizational relationships that do not have formalized governance arrangements. Second, it specifically allows for governance to evolve over time as members interact.

Its disadvantages for INIs include the following. First, the governance choice of “network administrative organization” precludes such organizations from providing services—but providing IT-enabled services is what INIs do. Second, this conceptualization does not explicitly take technology into account. Technology is important, because it increases the likelihood that governance will be legally formalized [15]. The central role of IT in INIs means that there will be a host of technology-related issues to be dealt with, including, but not limited to: sizable investments in fixed assets or contracts for technology services, multiyear financial commitments to IT products and services providers (e.g., hardware leasing agreements, software licenses, support relationships), intellectual property issues (e.g., ownership of, and rights to change, software), risk liability (e.g., for security breaches and privacy violations), etc.

A third disadvantage of the interpersonal interactions perspective for INIs is that the conceptualization does not address the possibility that apparently similar governance choices may have different legal statuses (e.g., the network administrative organization may or may not be legally incorporated or may be incorporated in one of several ways). Strategy researchers have argued that formalizing governance via legal arrangements has important consequences for the stability of interorganizational alliances [36], because they are essentially voluntary arrangements [14] and hence more vulnerable to dissolution without legal formalization. The benefit of conceptualizing INI governance in terms of legal forms is clear from research by Bethel and Liebeskind [5]. They argued that “variation in legal organization is observed [empirically] because legal organization can significantly affect firm value [by protecting stakeholders] from increases in bankruptcy risk and liability exposure” (p. 49). Exposure to liability is a significant concern for INIs because the use of IT entails sizable financial, operational, and security risks [4]. Bethel and Liebeskind also noted that different organizational forms have different costs and benefits that may change over time. As these costs and benefits change, so may perceptions of the preferred legal form(s). This observation reinforces the importance of an evolutionary perspective on governance, such as that offered by the interpersonal interactions perspective.

2.2. The financial ownership perspective

A second perspective on interorganizational governance may be termed the financial ownership perspective because of its emphasis on the economic incentives provided by different forms of ownership. The exemplar of this perspective is Hart and Moore’s [16] analysis of stock market governance. These scholars developed a theory of the “residual rights of control” (a variant of agency theory) to determine whether the best form of organization for stock markets would be “collective” (i.e., member-owned) or “investor-owned” (e.g., a stock-issuing corporation). The two factors they believed would be most influential in the choice of a mode of governance for stock markets were diversity among the member organizations and competition with other stock exchanges.

Today’s stock markets are interorganizational network infrastructures for financial services companies as well as for investors and companies that issue securities. “…. [F]or decades, even centuries, stock exchanges offered little more than a large room …. Today, however, stock exchanges provide their traders with high-end technology, state-of-the-art information systems, and trade settlement within seconds” [10] (p. 2575). These are precisely the same sorts of resources offered by public sector INIs like CapWIN and Nlets.

Hart and Moore [16] developed their theory to address a major historical shift in how stock markets are governed. Stock markets were traditionally organized as not-for-profit mutual (or collective) organizations, in which financial companies served three roles: as the sole or main customers (members) of an exchange, as its owners, and usually as its managers [10]. This situation began to change in 1993-94, when the Stockholm Stock Exchange was reorganized as a limited liability company and eventually began to issue...
shares to investors [10, 16]. Thus, the ownership of stock markets started to diverge from their membership (customer base), and changes in decision-making structures became possible as well. Subsequently, many major exchanges around the world and eventually in the US “demutualized,” and some of them became investor owned.

Starting with the “… central idea … that the authority to make decisions lies with the owner(s) of the exchange” [16] (p. 55). Hart and Moore compared outside ownership (the “more common form of governance” in commercial organizations) to the collective form (ownership by members) that was traditional for securities exchanges, and they inquired about the conditions under which one form of ownership would be more efficient than the other. They concluded that both forms were inefficient “but for different reasons and in different ways” (p. 56). Specifically, outside ownership would be more efficient when members were more diverse (promoting conflicts over goals) and when an exchange faced more competition (requiring fast decision-making and large investments in new technology).

Hart and Moore [16] were careful to note that their distillation of exchange governance into the two forms of collective and outside ownership was an oversimplification. They explained that exchanges differ in such details as voting structures, nonprofit status, and whether membership was open or closed. However, they argued that these details were “of less significance” (p. 54) than the ownership distinction, because collectives have disadvantages relative to investor-owned firms in terms of the ease of making decisions and sources of capital for new investments. Specifically, the requirement for decision-making consensus in cooperatives leads to greater difficulty of making major investment decisions, particularly when members differ considerably in their goals. In addition, cooperatives cannot sell stock (“standard voting equity” p. 68), thus limiting their sources of investment capital to retained earnings, membership fees, and the issuance of debt or non-voting equity. (In practice, cooperatives may also have difficulty raising capital via debt.) Consequently, Hart and Moore’s conclusion that outside ownership is best when members are diverse and when competition is keen makes good intuitive sense.

The advantages of the financial ownership perspective on governance for the substantive phenomenon of INIs are two. First, the basic governance options considered in this conceptualization, e.g., ownership by members and ownership by outsiders [16] are the two most basic choices available to INIs. INIs can own and operate the infrastructure collectively or they contract with (outsource to) another party that owns the resources. (That other party may a public or private sector organization or even one of the members (i.e., a lead organization in Provan and Kenis’ terms [30]). Second, the financial ownership perspective on interorganizational relationship governance has the advantage for INIs that it specifically emphasizes the importance of decision making related to investments in information technology.

The financial ownership perspective also has several disadvantages for the conceptualization of INI governance. First, residual control rights theory assumes that financial ownership and decision-making authority invariably go together. A number of scholars have argued against the validity of this assumption even as it applies to stock markets and other securities exchanges, and it is equally debatable for INIs. “The mere fact that an exchange can be partially owned by specific non-members does not itself suggest that the incentive structure guiding its behavior will be materially different from that of a wholly mutualized [collectively owned] exchange …. In many cases, outside ownership is limited to not-for-profit or mutualized entities such as the national centralized bank or the broker-owned securities depository, entities which have little or no incentive to challenge broker interests. … clearly there are huge differences in governance structures among demutualized exchanges” [34] (p. 66-67). These huge differences can clearly be seen in the models presented by Hughes [18]. Put differently, an exchange may be legally owned by non-members and still retain cooperative (member-oriented) decision-making. Similarly, we have found instances of “investor-owned” INIs that sell all or most of their shares to their own members and maintain cooperative decision-making about important operational matters.

Second, considerations related to taxes may be more important in the choice of stock market governance than Hart and Moore made out, and taxation is an important consideration in the choice of governance for many types of interorganizational relationships [38], including INIs. Taxation appears to have played a role in the original demutualization of the Stockholm Stock Exchange. Hughes noted that “in the ’80s trading on the exchange was low and primary market for key Swedish issuers moved to London due to a 1% turnover tax” [18] (p. 56). Furthermore, Fleckner [10] suggested that “tax reasons” played a role in the failure of a 1999 plan to demutualize the New York Stock Exchange. Under US tax code, mutual stock markets cannot be “nonprofit” organizations, but their tax status is unusual. Unlike private and publicly-listed corporations that are double-taxed on their revenues and on their investors’
shares of corporate profits, the earnings of stock markets (like those of cooperatives) are not double-tax: tax liability passes directly through to their members. Fleckner [10] explained that stock exchanges around the world were traditionally organized as “not-for-profit” (but not as legal nonprofit organizations), meaning that they did not set out to make a profit on their operations, but merely aimed to cover their operating expenses. The reason for this informal not-for-profit goal orientation was that, since the founding traders were the exchange’s primary customers, they “were less concerned with the stock exchange making money, because the profits mainly derive from transaction fees paid by themselves (from their viewpoint, it is no more than moving money from the[i]r own left into the common right pocket)” (p. 2552).

Tax considerations may factor prominently in the choice of governance for INIs more generally, in both the public and the private sectors. Under US tax code, legal nonprofits are not subject to taxes on their revenues and for many purchases. In addition, a particular class of legal nonprofit is the 501(c)(3) organization, commonly referred to as “charities,” is allowed to accept donations that are tax deductible for people who make charitable contributions to them. (Examples include Nlets, a public sector collective INI.) Thus, tax status as a nonprofit charity may provide collective INIs with an important source of funds that is not available to stock-issuing corporate INIs, possibly neutralizing the advantage that Hart and Moore claimed for the stock corporation form. Even INIs that do not qualify for (e.g., stock markets), or apply for, legal nonprofit status may benefit from having a not-for-profit goal (as do many, if not most, collectives). Potential members may be more willing to join a collective network infrastructure with a not-for-profit goal than they are to contract with a for-profit organization, because of fears that the for-profit organization would take unfair advantage via its pricing [35]. Therefore, as an inducement to members to join, INIs that are legally incorporated as for-profit companies are sometimes run on a not-for-profit basis [2].

A third disadvantage of the financial ownership perspective for the study of INIs is that it does not explicitly consider the evolution of governance. Although the focus of Hart and Moore’s analysis was the demutualization decision (a change in the form of governance), the idea that governance might change incrementally over time after an initial choice or a major change is not considered. That governance arrangements may evolve over time is clear from studies such as [23] and [5].

2.3. The legal forms perspective

A third perspective on the governance of interorganizational relationships might be termed the legal forms perspective because of its emphasis on the legal status of business alliances, including those that involve technology research and development (R&D). Gulati and Singh [15] described three forms of governance, which closely correspond to different legal forms [28, 38]: contracts, minority equity investments, and joint ventures. Contracts can be thought of as buyer-seller agreements, as in technology licensing arrangements. In minority-equity investments, one company becomes a part owner of another (often without legal decision-making authority). Joint ventures involve the creation of new legal entities, jointly owned by two or more organizations. (In related work, Pisano and Teece [28] discussed R&D consortia as a fourth legal form of governance of interorganizational alliances.) According to Gulati and Singh, the factors that would be most important in the choice of a governance form for interorganizational alliances were independence among the members (pooled, sequential, or reciprocal), whether or not the alliance involves technology (i.e., an R&D partnership versus, say, a joint marketing arrangement), and trust among the parties.

The advantages of the legal forms perspective for the study of governance in INIs are several. First, as discussed above, legal formalization of an interorganizational alliance promotes the stability of the alliance and adds value through protection against various liabilities. More generally, scholars in various literatures have argued that a focus on the legal nature of organizations (including interorganizational relationships) significantly enhances theorizing about organizational behavior. For instance, Edelman and Suchman [8] argued for careful sociological analysis of the “legal environments of organizations.” They noted that “even the basic distinctions between ‘private,’ ‘public,’ and ‘nonprofit’ are in part legal constructs. Moreover, the legal environment seems to have become more pervasive... with the passage of time, as organizations face increased levels of litigation, regulation, and certification in many areas of activity” (p. 80). Cultural perspectives, they explained, “see the law as a pervasive belief system that permeates the most fundamental morals and meanings of organizational life: Law constructs and legitimates organizational forms ... and even helps to constitute the identities and capacities of organizational ‘actors’” (p. 493, emphasis added). As another example, Hodgson [17] analyzed the history of the modern business corporation and argued that the current economic concept of the “firm” has become stripped of
legal content and hence empirical fidelity. Although the origins of the terms “company” and “corporation” are medieval, “the advantages of the corporate organization in raising and investing large amounts of capital became apparent” (p. 39) during the Industrial Revolution in Britain. “The word ‘firm’ derives from the Latin adjective firmus, meaning strong, powerful, durable and lasting.” (p. 40). Hodgson concluded that there is no good reason to abandon the formal, legal conception of the firm and replace it with abstract, ideal types such as “hybrid” (or networked) organizational forms, as are found in the organizational economics literature. Another advantage of the legal forms perspective is its explicit attention to technology as a major driver of legal formalization and of interdependence and trust among members.

Despite these advantages, the legal forms perspective suffers from a disadvantage common to the other two perspectives considered: With only four major governance choices, the perspective assumes away a great deal of potential variation within governance types. For example, joint ventures vary widely in the degree to which decision making is dominated by a particular member or members. Similarly, all contracts and all minority investments are not equivalent in their tax implications for the participants. Some business alliance scholars have argued that important information about alliance governance lies, not only in legal form per se, but also in the details of contract provisions [3] or in a variety of documents and agreements (e.g. a shareholder’s agreement) that are drawn up separately from the major articles by which a joint venture is incorporated [38]. In short, a nuanced perspective on INI governance would look not just at the overall legal form as an ideal type, but also at a set of governance rules and procedures that cover the spectrum of non-formalized (e.g., norms), formalized but not legally enforceable, and legally enforceable arrangements [36].

2.4. Summary

In this section we examined three, strikingly different, perspectives on interorganizational governance, each developed for a particular substantive domain. None of the perspectives fits the phenomenon of interorganizational network infrastructures perfectly. Each has some advantages and drawbacks, suggesting the need for a perspective on INI governance choice that is tailored to the characteristics of INIs. In the next section, we illustrate this theoretical point via an in-depth case study of CapWIN. The case study highlights the importance of several themes discussed above, in particular: the large number of governance options considered and the correspondingly large number of factors involved in governance choice, the variety of forms that governance arrangements take (e.g., legal organizational form, contracts, agreements, and other documents), and the evolution of governance arrangements (and assessments of their suitability) over time.

3. The CapWIN case

CapWIN offers a range of IT-enabled information and collaboration services to federal, state, and local governments in the Washington, D.C. area, administered by a Center at the University of Maryland [9]. We describe how governance evolved at CapWIN since its inception in 1999. Then we analyze the implications of the case study for the conceptualization of INI governance.

3.1. The evolution of governance at CapWIN

CapWIN originated at the University of Maryland’s Center for Advanced Transportation Technology in 1999 with seed funding from the federal government (and a Congressional earmark in 2002 following the September 11th attacks). Its goal was to develop the technical and institutional infrastructure for data sharing and communications interoperability among various local, state, and federal agencies concerned with public safety and transportation in the Washington, D.C. area [9].

As CapWIN worked with IBM to develop the capability for direct vehicle-to-vehicle communication (obviating the requirement for human radio dispatchers as communication go-betweens), CapWIN contracted with the International Association of Chiefs of Police to identify the “best practices” of five similar information integration projects across the US [29]. Although many topics were addressed in the report, considerable attention was paid to governance and funding.

With respect to governance, the report articulated a set of principles that CapWIN’s governance should be designed to support: 1) CapWIN should remain politically independent of all its governmental constituencies, so that no one agency would be more powerful than the others in CapWIN’s governance, 2) CapWIN should have clearly defined, formal, written organizational structure and operating procedures, 3) CapWIN’s governance should include user representation and input into decision-making, 4) CapWIN should have a service orientation, rather than a bureaucratic one, and 5) CapWIN should have a
Board with knowledgeable members selected by participating organizations. The Police Chiefs’ report considered the use of “a private management group” as a future option for CapWIN governance. Otherwise, the report recommended that CapWIN adopt a three-layer governance structure, comprised of executive, mid-level management, and technical and user committees.

The report also stressed the criticality of funding to CapWIN’s success. Although the report did not make a direct linkage between funding and a formal governance model for CapWIN, it noted that CapWIN would “make use of numerous vendors [that] include consultants, hardware and software firms, and perhaps outsourcing firms” (p. 14). Because vendors would be involved, contracts were key, and CapWIN was advised always to put contracts in writing and to include clauses detailing penalties for non-performance, the conditions under which the contract could be terminated, and provisions for ongoing technical support after initial implementation.

Two years later, in 2002, CapWIN contracted with scholars at George Mason University for a more detailed analysis of the governance options for CapWIN. (Their report was subsequently edited and published [22].) In the report, CapWIN’s current governance structure was described as consisting of an Ad Hoc Executive Committee, a Steering Group, and working groups, while the Center for Advanced Transportation Technology at the University of Maryland was charged with day-to-day administration. The report examined in detail thirteen organizational structure options for CapWIN, but, before presenting them, the report discussed three issues that CapWIN would have to deal with regardless of the choice of a governance structure. Two of those critical issues were: 1) voting—how consensus would be reached (e.g., one-member, one-vote or voting rights weighted by size) and 2) funding. The report argued that all governance options were closely tied to financing mechanisms, and that certain organizational structures would limit the funding options available to CapWIN because of the types of organizations that were legally allowed to participate in those structures.

The thirteen organizational models considered for CapWIN by the George Mason University research team included: a federal commission, a federal government corporation (with two different ownership options), an interstate compact, a joint powers agreement, an independent private corporation, a voluntary consortium, a university project, and what others have called the “lead agency” approach, in which a local jurisdiction acts as host. Among the considerations named in evaluating the options were the following: exemption from taxes and the ability to accept tax-deductible contributions, the fact that CapWIN’s constituents come from federal, state, and local agencies (excluding certain options), legal enforceability (or lack thereof), the need for organizational stability and a formalized structure, and the possible need for Congressional approval. After carefully weighing the “legal and structural issues” involved, the authors recommended that CapWIN be organized as an interstate compact (“or similar arrangement”)—preferable, because it would allow for funding from a variety of sources including federal grants, funding by multiple states, usage fees, and cost allocations. In addition, the authors proposed a proportional voting structure in which major jurisdictions had more votes than other agencies.

CapWIN continued to wrestle with its governance options. According to interviews conducted by Public Safety Networks Project team members in 2006, CapWIN executives had recently sought legal advice on formal operating models and funding structures that would help to ensure continuity for CapWIN. At that time, CapWIN was providing its services to participating agencies free of charge and still retained its management arrangement at the Center for Advanced Transportation Technology at the University of Maryland. Four organizational models were reexamined in depth: an interstate compact, an interstate administrative agreement, a government corporation, and a not-for-profit corporation. Among the considerations used to evaluate these options were: the ease or difficulty of creating enforceable obligations among government agencies at different levels of government (e.g., federal, state, and local), the possible requirement for ratification by the US Congress and state legislatures and executives, the possibility that a formal governance agreement among founding members might actually discourage participation by potential new members, the possibility that governance would fall to an independent board of directors instead of to CapWIN members, the governmental nature of CapWIN’s activities, and the fact that CapWIN provides operational services, not just policy making functions. All things considered, none of these organizational models was perfectly well suited to CapWIN, and pursuing any of them would take considerable time and money. It was clear, however, that continued reliance on federal government grants, though critical for technology development activities, would not be suitable for the on-going operation of CapWIN’s technology-based services.

Having considered this advice, CapWIN executives did not change its legal status, but they did formalize aspects of CapWIN’s governance and funding processes. In 2006, CapWIN drafted a
“memorandum of agreement” regarding access to the CapWIN system and to law enforcement databases accessible via CapWIN’s systems. This agreement was to be signed by all participating agencies, and it covered the need for certification of compliance with security policies, the allocation of responsibility for providing access to various databases, how user authentication and authorization would be handled, how transactions would be routed, and so forth. With the inclusion of legal boilerplate, this document is now “an agreement between the University of Maryland, Center for Advanced Transportation Technology and the [agency name] regarding participation in the Capital Wireless Information Net” (http://www.capwin.org/about/membership.html, accessed 6/14/10).

In late 2006, the CapWIN board instituted a subscription fee that was based on the number of devices on which CapWIN software was installed (an approach similar to that used by commercial software vendors); the subscription fee would cover software maintenance, upgrades, training, and user support (help desk). In 2007, the CapWIN Board formally adopted new Bylaws dealing with such topics as; board membership and selection, terms of office, CapWIN officers, voting, and meetings.

Today, CapWIN is operated “under the direction of a 21 member Board of Directors [including] five representatives from state and local agencies in Virginia and five in Maryland (two state agencies, three local); five agencies from the District of Columbia; and six At-Large agencies representing federal agencies, regional authorities and other relevant organizations. … The Board operates under a set of By-Laws that define the membership and operating procedures” (http://www.capwin.org/about/governance.html, accessed 6/14/10). Data sharing agreements and funding policies continue to evolve as CapWIN expands its services and clientele.

3.2. Implications of the CapWIN case for the conceptualization of INI governance

The case of CapWIN suggests, first, that INI governance is not chosen once and then frozen until or unless a new governance choice is made, as is suggested by the financial ownership perspective. Instead, INI governance evolves through a series of choices and non-choices over time. Evolution of interorganizational governance was emphasized in the interpersonal interactions perspective and has been discussed by some scholars of business alliances.

Secondly, INI governance is not just a matter of interpersonal interactions such as regular meetings and committee structures, as the interpersonal interactions perspective suggests. Rather, governance is also a matter of impersonal mechanisms: formal (documented) and/or legally ratified rules, organizational forms, and other arrangements. Formal and legal governance arrangements are pursued (if not always achieved), because they are seen as contributing to institutional legitimacy and thus to the future stability and continuity of the INI.

Moreover, INIs attend to a broader range of considerations in the design of their governance than is highlighted by any of the three perspectives we examined. Among the primary factors considered in the CapWIN case are:

- What experts outside the INI considered to be “best practices” or typical arrangements for governing entities similar to CapWIN. The notion that the selection of governance arrangements is subject to normative or cultural influences is an institutional argument that is not captured in the three perspectives on the governance of interorganizational relationships discussed above, despite the fact that institutional influences on IT-enabled collaboration and information sharing in the public sector context have been thoroughly discussed by a number scholars [11, 21].
- What a particular governance choice implies for the funding sources available to CapWIN. This factor was explicitly considered only by the financial ownership perspective, although it is implicit in some of the legal forms literature.
- Tax implications of governance form (tax exemption and ability to accept tax-deductible donations). This factor was mentioned briefly by exponents of the financial ownership perspective but not considered important enough to model.
- Legal authority to contract with technology vendors and protection from various risks and liabilities (e.g., security breaches). This factor is addressed only by the legal forms perspective.
- Difficulty of implementing certain kinds of governance arrangements (e.g., possible need for Congressional approval). This factor was not emphasized by any of the perspectives.
- The concern that certain forms of governance might actually discourage future participation, thus undermining stability and continuity. This factor was not considered by any of the perspectives.
- Autonomy (political independence and fear of external control) and the avoidance of domination by certain members (via voting rights). Voting rights were mentioned by exponents of the financial ownership perspective but not considered important enough to model. The related themes of goal consensus, member diversity, trust, and interdependence feature (but differently) in all three perspectives.
Lastly, there are important tradeoffs among the considerations in governance choice. These tradeoffs prevented CapWIN from changing its legal status as a University of Maryland project, but CapWIN compensated by drafting usage agreements and by-laws. This suggests that important aspects of INI governance are not easily capture by just a few broad ideal types (informal, lead organization, network administrative organization; collective or investor owned; contract, equity investment, joint venture, or consortium). Rather, in addition to a set of types reflecting legal organizational form (e.g., unformalized, formalized but not legally ratified, and legally formalized in any of a number of different ways), important rules of governance are reflected in a variety of different forms, such as norms, contract provisions, and by-laws. This observation suggests the value of pursuing a rules-based approach to the analysis of INI governance [23, 24, 26, 31].

4. Conclusions

All things considered, our theoretical review of perspectives on interorganizational governance and our analysis of the CapWIN case lead to the conclusion that the conceptualization of governance for interorganizational network infrastructures is by no means clear-cut or settled. Future theorizing and empirical research are needed to flesh out and test the provisional conclusions articulated above. A well-developed agenda is a topic for another paper, but a few lines of future investigation seem promising.

First, all INIs involve the development and/or use of information technology, and technology is important because of its implications for initial and ongoing funding, legal contracting authority, intellectual property protection, and various liabilities. At the same time, information technology is hardly a monolithic entity, which naturally raises questions about the relationship between different kinds of IT-enabled services offered by an INI and the form or rules of its governance. For instance, a database from which members draw information without contributing or interacting with each other entails (indirect) interdependence among members, whereas an INI like CapWIN involves reciprocal (two-way) interdependence. Recall that interdependence was a posed as factor in governance choice by the legal forms perspective. Therefore, one would expect to find variance in governance arrangements among INIs with different portfolios of technical service offerings.

A second clear direction for future research concerns the distinction between legal forms and governance rules. Is it possible to specify a sharply delineated and differentiating set of rules for INI governance, as Elinor Ostrom did for environmental commons [26]? How much variation in INI governance rules is observed within and across the different legal organizational forms? Do the different legal form types contribute to the explanation of INI governance choice or outcomes above and beyond that contributed by the INI governance rules?

A third area for research concerns public and private sector differences. Is a framework for analyzing the governance of public sector suitable for the private-sector also? Are there important governance differences between the sectors, or are the basic governance choices and considerations the same, regardless of sector?

And finally, perhaps the most important area of future research is the relationship between INI governance and INI effectiveness. The entire logic of the governance choice literature is that one form of governance is better than another given certain environmental characteristics and attributes of interorganizational relationships. But Ostrom [26] found that what matters in environmental commons is having rules of governance: much less important is what those rules are. Does the same apply to interorganizational network infrastructures? Only by additional theory development and empirical research can we hope to find out.

5. References