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Chapter 2

Network-Level Task and the Design of Whole Networks: Is There a Relationship?

Patrick Kenis, Keith G. Provan, and Peter M. Kruyen

Abstract This chapter explores a key argument of structural contingency theory in the context of whole networks of organizations. Specifically, we examine the relationship between the task such networks perform and their design, which we operationalize as one of three forms of governance. Based on an extensive review of the literature on whole networks, we conclude that there is no clear relationship between network-level task and network design. We offer a number of explanations that might account for this finding. Our conclusions help to advance theory and practice on the design of whole networks of organizations.

Keywords Whole networks · Network design · Network governance · Network tasks

2.1 Networks as Production Systems

Recently, the idea of networks as production systems has gained attention in the literature on organizations (cf. Miles et al. 2005; Berkhout and De Ridder 2008). The focus of this perspective is on the level of the whole network, arguing that organizations collaborate in networks to produce joint or collaborative outcomes. These are different outcomes than those that individual actors in networks pursue. Network-level tasks include integration of critical services to vulnerable populations like people with AIDS or those with serious mental illness, regional economic development, developing or producing an expensive and highly complex project like building a bridge or making a major movie, or responding to natural or man-made disasters. Advocates of networks as production systems argue that networks are an innovative way of getting complex jobs done, especially those that are beyond the capacities of a single organization.

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The goal of this chapter is to contribute to the study of the design of such whole networks. From descriptive case studies (cf. Agranoff and McGuire 2003; Goldsmith and Eggers 2004; Huxham and Vangen 2005; Van Bueren et al. 2003), we learn that whole networks come in different forms. The question to be explored here is, why is this the case? What explains the form of whole networks?

From case studies we know that whole networks are a prevalent phenomenon, but conceptual, analytical or explanatory studies of whole networks are scarce. In a recent overview of the literature, Provan et al. (2007) identified only 26 analytical studies in which the whole network was the unit of analysis. Various reasons can be identified why analytical studies of whole networks are rare. One of the reasons may simply be that organizational scholars are used to and trained to study organizations rather than multi-organizational arrangements (Salancik 1995). In addition, developing a deep understanding of multi-organizational networks requires costly and extensive data collection. Moreover, the study of whole networks seems often to be confined to fields in which the obvious outcomes are collective or public goods (i.e., public policies, community health, emergency response to disaster, and the like). For instance, Provan et al. (2007) found that of the 26 whole network studies identified, 14 of them were in the health and human services sector. The assumption is that public and nonprofit organizations are supposed to produce collaborative or collective goods whereas private (for-profit) organizations have as their sole objective the maximization of individualistic benefits. The idea that customer value can also, and often only, be created through a whole network is still an underrated and under-explored idea (for exceptions see Prahalad and Ramaswamy 2004; Miles et al. 2005).

We start our thinking about whole network design from a structural contingency approach, given the dominance of this perspective at the organizational level of analysis. From this perspective a relationship between the tasks to be performed by the system and the work design of the system is expected.

Similar to what Woodward (1965), Burns and Stalker (1966) and Thompson (1967) did at the organizational level, we first introduce a typology of whole network governance. The logic is that one specific form of network design, operationalized here as the form of network governance, is better than another for accomplishing a particular type of task. Second, we describe our research methodology for examining this basic contingency argument. Third, after developing a typology of network-level tasks based on what we found in the empirical literature, we analyze whether there is a relationship between the main forms of network governance and network-level tasks. Finally, we discuss the consequences of our findings.

2.2 Forms of Network Governance

Our discussion of network governance design forms is based on two basic premises. The first is that whole networks are a form of governance different from either a market or a hierarchy (see Williamson 1973; Powell 1990; Castells 2000; Provan

and Kenis 2008). Second, network governance, as is the case with markets and hierarchies, can take wide variety of design forms. Our focus in this chapter is on the second point. Network governance is not a single approach but appears in different forms.

Whole networks, just like organizations, need to be structured in order to succeed in fulfilling their network-level task (Klijn 2005; Provan and Kenis 2008). For example, structures need to be in place to encourage network members to engage in collective and mutually supportive action, to address conflicts, and to ensure that resources are acquired and utilized efficiently and effectively. We draw on recent work by two of the authors of this chapter (Provan and Kenis 2008), who propose three basic network governance models: participant or shared governance, lead-organization governed, and network administrative organization governed. Each of these models differs in their basic structure.

2.2.1 Shared Governance Form

The simplest form of a network is one that has shared participant governance. Networks having a shared governance form consist of multiple organizations that work collectively as a network but with no distinct governance entity. Governance of collective activities resides completely with the network members themselves. In this model it is the network participants themselves that make all the decisions and manage network activities. There is no distinct, formal administrative entity, although when there are more than a handful of network participants, some administrative and coordination activities may be performed by a subset of the full network.

2.2.2 Lead Organization Form

In the lead organization model, network members all share at least some common purpose (as well as maintaining individual goals) and they may interact and work with one another. However, all activities and key decisions are coordinated through and by one of the members, acting as a lead organization. This organization provides administration for the network and/or facilitates the activities of member organizations in their efforts to achieve network goals.

2.2.3 Network Administrative Organization Form

The basic idea of the network administrative organization (NAO) governance model is that a separate administrative entity is set up specifically to manage and coordinate the network and its activities. Like the lead organization model, the NAO plays a key role in coordinating and sustaining the network. Unlike the lead organization model, however, the NAO is not another network member, providing its own set of services

or production tasks. Instead, the NAO is established with the exclusive purpose of network governance. It may be a government entity, or more likely, a nonprofit, which is often the case even when the network members are for-profit firms (cf. Human and Provan 2000).

NAO's may be relatively informal structures, consisting of a single individual who acts as the network facilitator or broker, or they may be much more formalized and complex, consisting of an executive director, staff, and board (consisting of network members) operating out of a physically distinct office.

2.3 Research Methodology

To build a systematic overview of network tasks and to study how the type of task is related to the network design/governance mode, a *systematic literature review* was conducted. According to Mulrow (1994), this is the best research method for identifying and categorizing the extant literature on a certain topic. It differs "...from traditional narrative reviews by adopting a replicable, scientific and transparent process, in other words a detailed technology, that aims to minimize bias through exhaustive literature searches. . ." (Tranfield et al. 2003: 209). Such a review includes the systematic collection, analysis and synthesis of data available in the extant literature.

We aimed at identifying as many studies as possible, and therefore, searched 10 established academic databases varying from ABI/Inform to Wiley InterScience. Because descriptions of network tasks and designs are not presented in a systematic way, we started by including all the literature that in some way referred to inter-organizational networks, even if no explicit reference was made to network task or network design. Search terms included: whole, (inter)organizational, (inter- and multi-) firm, public, policy, and business networks, consortia, clusters, alliances, partnerships, collaborative governance, and service integration. Moreover, the search in all databases was restricted to peer-reviewed journals to guarantee a minimal quality (Finfgeld 2003). We made an initial assessment on the basis of the abstract and continued only with those papers that had an explicit focus on inter-organizational networks. This first step resulted in a list of 436 articles.

In a second round, we read all the remaining papers thoroughly and kept only papers in which the central object of study was unambiguously on inter-organizational networks. Moreover, only those papers were included in which empirical evidence was provided to support the claims made by the researchers (Finfgeld 2003). We kept only those papers in our sample in which (1) a description was given of the task(s) conducted by the network(s) studied; (2) a description was given of the network design(s); and (3) a statement was made about the success or failure of the network in executing its task(s). This second round resulted in a final set of 55 papers, which forms the basis of the remainder of this chapter. (A list of the articles reviewed is available upon request).

2.4 Network-Level Tasks

In analyzing the literature we brought dispersed findings together, interpreted them and transformed them into a new whole (see for a description of this method Sandelowski et al. 1997; Finfgeld 2003). Thus, inferences are based on our own interpretation of the data rather than on what the authors said. From this exercise, two analytical dimensions emerged along which network tasks could be described. The first dimension differentiates between exploitation and exploration. Exploration can be defined as searching for new ways to tackle existing or new problems and challenges – the development of new products, services, policies, etc. Exploitation is the actual delivery or production of goods, services, policies, etc. This distinction is commonly used at the organizational level of analysis regarding organizational learning (March 1991) but it is also relevant at the network level. A second dimension that emerged from our research of the literature distinguishes between unambiguous and ambiguous tasks. In unambiguous tasks member organizations know with a high degree of certainty what is expected from them in order to accomplish the collective network task. In contrast, when tasks are ambiguous, member organizations are far more uncertain about how their actions might contribute to the collective task. Dichotomizing and crossing both dimensions lead to four broad categories of tasks (see Fig. 2.1).

Cell I. This category contains networks in which the production process is standardized and member organizations know what is expected as their contribution to the network task and how their part of the collective task should be accomplished. Examples include the production of standardized products such as timber (Gellert 2007), frozen meat (Hunter 2005), and automobiles (Dyler 1996). Also, the production of standardized services such as school curricula to educate nurses (Haas et al. 2002) and the provision of public network services providing electricity (Hughes 2005). Finally, the provision of standardized network services for network members fits cell I. Examples include sharing production capacity and skills in a surgical

	Unambiguous task	Ambiguous task
Exploitation task	I (e.g. auto manufacturing, electricity)	II (e.g. mental health care)
Exploration task	III (e.g. developing common standards)	IV (e.g. development of industry clusters; high tech innovation)

Fig. 2.1 Classification of network-level tasks

instruments cluster (Navdi 1999), disposal of polluted water in the production of leather (Kennedy 1999), or collecting, comparing, and sharing uniform data on infectious diseases (Parkinson et al. 2008).

Cell II. This category includes the delivery of network products in a predictable non-innovative way, but where outcomes are vague and difficult to measure and where the production process itself is unstandardized or has to be adjusted or adapted on a case-by-case basis. This includes the provision of a combination of social, mental, and physical health services to specific groups such as mental health clients (Provan and Milward 1995), adult, substance-abusing female offenders (Townsend 2004), or homeless people (Gordon et al. 2007). In the provision of these services, standard methods of treatment are usually applied but the specific needs of clients often vary and it is unclear whether and when the service is delivered successfully, can be terminated, or whether it has to be continued. As a consequence, it is unclear what specific contributions of member organizations are required to accomplish the collective task successfully.

Cell III. This category includes various types of tasks which have the ultimate purpose of developing one common outcome or standard. Examples include technical innovations, such as the development of a DVD-standard (De Laat 1999); the improvement of a whole national production chain (timber in South Africa: Bessant et al. 2003); or policy developments such as the regulation of specific financial products (Faerman et al. 2001). This category also includes (mutual) learning tasks which aim at finding a best practice solution with respect to core activities such as quality management systems in the production of mass-consumer goods (Altenburg and Meyer-Stamer 1999) or medical services to pregnant and nurturing mothers (Valadez et al. 2005).

Cell IV. This category includes network tasks that focus on the continuous development (Miles et al. 2005) of a broad field (e.g., an industry, policy area, or service delivery system). Examples can be found in the development of geographic areas or industry clusters, for example, the toy industry in Spain (Holström 2006), and the high-tech industry in Finland (Jauhiainen 2006). Also in this category belongs the development of a broad market-reform agenda (in Mexico, Salas-Porras 2005; and Western-Africa, Brinkerhoff 1999). Other examples include learning about strategies to fight multinational corporations by the anti-sweatshop movement (Connor 2004) and the provision of human and social services to HIV/AIDS patients (Altenstetter 1994). In these examples, the solution to the network task is not only difficult to define and measure, but the means to accomplish network goals are not clear and may not even exist. It is up to network members to work together to find both the methods to address complex problems and even to define the problem itself.

In conclusion, the literature review demonstrates that networks conduct different types of network tasks that can be broadly categorized in one of four ways based on the exploitation/exploration dimension and the degree of ambiguity. The question now arises whether effective task accomplishment is related to specific network designs, consistent with structural contingency argument developed for the organizational level (see Donaldson 1996).

2.5 Network-Level Task and Network Design

In what follows we explore whether working on a specific type of network-level task is related to a specific network design, as operationalized by one of the three distinct network governance forms described earlier.

Cell I. We found that the tasks in this cell are performed by networks having all three design forms. There were several instances of a lead organization. This was the case in the manufacturing of automobiles (Dyler 1996), aerospace products (Moffat and Archer 2004), and the provision of nursing education in a standard curriculum (Haas et al. 2002). In all these networks there was one member organization which conducted a large amount of the work flow. The lead organization assembled the products or provided a large amount of the schooling, while the other members delivered sub-parts (e.g., computer chips by manufactures or internships by hospitals). As Alter and Hage (1993) proposed, because this organization conducts a large part of the task, it dominates the network. The lead organization is able to measure or monitor whether the task of the network is fulfilled and, in turn, can give specific directions to other participating organizations when, for example, the quantity or quality of their output has to be adapted. As a consequence, member organizations know exactly what is expected of them. Moreover, the lead organization keeps an eye on other network members' output and may intervene when they underperform. As a result, the performance of the whole network output is strengthened, which in turn leads to the increased benefits for all participants.

The empirical literature also revealed, however, that in those cases where a large number of organizations are involved and where not one single organization conducted a central part of the work, a separate entity tends to be constructed in order to coordinate the network. Such a NAO governed network was found in the provision of nurse education through the collaboration of various schools and hospitals (Allen et al. 2007). A NAO was also present in the "canonical district" of Prato in which the *impannatore* governs the whole production process, from the purchase of raw materials from various producers, with which long-standing relationships were held, to the marketing of the final products. The NAO, however, owned no physical assets itself (Paniccia 1998). Moreover, it was also used in the production of frozen meat in New-Zealand (Hunter 2005) and by the Indonesian government in the case of timber production (Gellert 2007). Lastly, we found a NAO in the "production" of fair college sport competition in the USA (Stern 1979).

The reason for using a NAO in the production of these goods is probably because without such an entity the network would not exist in the first place. No organization conducts a central part of the work flow and every member is probably too small to have enough resources to coordinate the network as a whole. Besides, it is unlikely that other member organizations would allow their production to be coordinated by another network organization, which could be regarded as a potential competitor. Moreover, a shared governed network would not be effective in either of these cases. This is mainly due to the size of the network. It would be too time consuming to meet periodically and govern the network collaboration. In contrast, a

NAO can, as an independent entity, monitor the quantity and quality of the various network-members and prevent members from undermining the collective task and resolve conflicts. Examples of this might include supplying more wasted material than members had agreed upon, in the case of the common waste disposal factory (Kennedy 1999), or having disputes about the rules of the game in the college sport competition network (Stern 1979). In the case of the trade association in the surgical instrument cluster in Pakistan (Navdi 1999), the authors concluded that the network was unable to enforce quality standards, limit price competition, and apply sanctions against misbehaving members because it was self-governed by network participants and had no separate governance authority.

We did, however, find a number of shared governance networks in this task category. In all these cases the networks were small. For example, in the network in which three organizations collaborated to provide electricity (Hughes 2005), each member sent several representatives to periodic committee meetings where members negotiated the selling and buying prices that each would charge when supplying energy to the network. It was also the case in the collaborative buying of energy by 15 manufacturing firms in England (Hanna and Walsh 2004). It is probably because of the small size of these networks that monitoring each others' contribution could be based on multilateral observation and trust.

Based on our review, we conclude that when a network has an unambiguous exploitation task, the network can have any of the three design forms and that design is more likely to be affected by work flow and trust conditions.

Cell II. As with cell I, we found examples of all three design/governance forms. In four rural health care delivery networks in Nebraska, a separate organization (i.e., a NAO) was set up with official coordinators and a board, consisting of hospital administrators and which made strategic plans and managed the budget (Schumaker 2002). The same holds for health delivery networks in New Hampshire in which a variety of members were involved including hospitals, health and social service organizations, schools, police and fire departments, businesses, and municipalities. In these networks a designated coordinator oversaw day-to-day operations of site activities and kept in contact with coordinators of other health delivery networks (Kassler and Goldsberry 2005).

But examples of successful lead governed networks are also abundant in this category. For example, Townsend (2004) describes four networks that provided substance abuse treatment to adult, substance-abusing female offenders. Two of these networks were led by a court and two others by an adult probation department. Furthermore, Atkinson and Gonet (2007) described a network of five organizations that provided statewide post adoption services. This network was managed by a private, nonprofit organization which provided a wide range of adoption services across the state.

Theoretically speaking, it is reasonable to expect a NAO or lead organization in this task category. Because the network task is ambiguous, member roles, activities, and contributions are often not clear. The NAO or lead organization can develop a general mission and standardized procedures under which resources are shared

and exchanged and is at least able to monitor whether members follow the specified procedures. Moreover, this organization, can “sell” the network’s mission to the general world to acquire new collective resources.

The reviewed empirical literature does not, however, give a clear idea whether or under what conditions the NAO or the lead governed network is most effective. Both seem to have specific advantages. The lead organization is capable of providing a considerable part of the service it knows as well as additional services or products needed for a well functioning network. The NAO, on the other hand, has as an advantage in that it is an independent entity, allowing member organizations to feel that they are not dominated by a peer organization. Based on our review, the choice for a lead or NAO governed network seems to be made instead on historical grounds (i.e., which organization provided a large portion of the service before the network was established) and/or mandates from the funding agencies. On the basis of the article by Provan and Kenis (2008) we could argue that in networks in which trust is traditionally high, a lead organization is more likely and that in organizations with low or moderate trust between the network partners, a NAO is more likely.

But we also found that a number of successful shared, participant governed networks in this category. In the case described by Foster-Fishman et al. (2001), the human service network was managed by 32 organizations and the various service delivery teams had nearly twenty members. In another network described by Norman and Axelsson (2007), five organizations collaborated in a shared governance network to provide rehabilitation services. Finally, in a shared governance HIV/AIDS service-delivery network (Takahashi and Smutny 2002: 177–178), managers of the three member organizations frequently met and “discussed fundraising strategies, overall partnership goals, crises, conflict and miscommunication, and longer range plans for expansion of partnership membership.” According to the authors of these various studies the networks succeeded because of the development of high goal consensus and a feeling of trust among members. For example, the service network described by Foster-Fishman et al. (2001) developed procedures to deal with conflicts, while the three member organizations of the HIV/AIDS network (Takahashi and Smutny 2002) first engaged in a “honeymoon period” to get to know each other and build trust before the network was formally established. The rehabilitation project in Sweden was assisted by a third-party facilitator, joint seminars were held, and informal contacts were established to develop a common language and mutual-understanding.

Cell III. Tasks in this cell tend to be performed most often through a participant governed structure, but our review also found cases where a lead organization and NAO design was used. For instance, a shared, participant governed network was applied by the schools that formed networks in England to develop the curriculum, standardized appraisal procedures, preparation for inspection, and calendar coordination. They met regularly and these meetings were chaired on a rotating basis, usually by each school in turn (Busher and Hodgkinson 1995). These schools did not perceive each other as competitors, as was the original intention of the deregulation

policy of the government, but rather, saw cooperation as a better method to develop and implement improvements in the school system.

Although most cell III tasks were performed by shared-governance networks, we also found a number of lead organization networks. For example, the network described by McKenna et al. (2003: 384) of seven public safety and health organizations to develop "a reliable, easy to use electronic surveillance system for bioterrorism and other infectious mass disease emergencies" was led by the local health authority responsible for all public health activities, including communication and control. Also, Moffat and Archer (2004) described a network in which innovations in the production of mature electric goods were carried out successfully under the coordination of a design house. The same holds for the two networks presented by Miles et al. (2005) in which BMW and General Electric each collaborated with main suppliers and customers to improve car seats (BMW) or the whole production chain (General Electric). A final successful lead governed network in this category is the network in which eight organizations, two government agencies and six large financial institutes jointly developed regulations for an innovative financial product (Faerman et al. 2001). Although being governed by one of the involved government agencies, it was facilitated by an independent consultant, an attorney of a law firm. Because of his independence, his knowledge of the sector and institutions involved, and the participating institutions trusting him in keeping company information secret, he was able to keep the organizations together despite the existing internal disagreements. In contrast, both the development of the Bluetooth technology (Rice and Juniper 2003) and the initial attempt to regulate package waste disposal (Nunan 1999) failed, according to the authors, because they were coordinated (and dominated) by a small number of organizations.

Finally, we found several instances in the literature in which an unambiguous development/exploration task was governed by a NAO. For instance, Von Malm-borg (2007) studied a network in which 16 small and medium sized enterprises collaborated to find sustainable solutions to improve the production process. Four government agencies and 12 consultants were also involved and the entire network was coordinated by a member of one of the government agencies. This person organized thematic meetings each month, provided funding, and functioned as a communication channel without having any specific knowledge about the production processes of member firms. The network examined by Bessant et al. (2003) was also governed by a NAO. This network's purpose was to develop the whole timber production value chain in South-Africa by bringing together a number of timber growers, sawmills, timber production manufacturers, government agencies, the export council, and research institutes. Although sub-committees were coordinated by a person from a firm in the value chain, the network as a whole was coordinated by action researchers from a university.

Occasionally, such NAOs seem to fail, however. For example, the weekly meetings of a network in England directed at training new entrepreneurs, having approximately 50 organizations as members, was led by employees of a Training and Enterprise Counsel (Huggins 2000). This network was judged to be a failure by

member organizations because of, among other things, a lack of professionalism by these independent facilitators.

The arguments for having a shared, participant governed structure, lead organization, or NAO form run more or less parallel to the reasons given in the previously discussed cells. Whenever one organization conducts a large part of the development task, it knows which contributions are needed from other organizations and it is able to monitor the quality of the contributions. When there is not such an organization conducting a central part of the development process, however, it is more likely that a NAO or a shared governance network design form will be used. The choice between these two forms is probably most related to whether or not the participants see each other as competitors. When they do *not* regard themselves as competitors it is more likely that they will organize the network themselves and trust each other to govern collaboratively (i.e., shared, participant governed). When, on the other hand, they perceive each other as competitors, a NAO network becomes more likely.

Cell IV. Finally, in the cases where network tasks require exploration and are ambiguous, all three network design forms occurred. An example of a self-governed network within this category is the network in Mexico described by Salas-Porras (2005) in which a large number of business associations, charitable, religious, educational and right-wing political institutions advanced a market-reform agenda. Here, several sub-networks were formed in which member organizations with similar interests worked together closely to explore and exploit specific parts of the agenda. The full network of participating organizations did not meet collectively to discuss different matters or to develop a shared agenda.

Another example of a shared governance design is the international network of organizations which forms the anti-sweatshop movement (Connor 2004). The organizations involved in this network participated relatively equally, engaging in multiple, often temporary sub-networks. Collectively, they were able to facilitate innovation and adaptive learning for the network as a whole.

A lead-governed network was present in the Canadian network which opposed the Canada-US and North American Free Trade Agreements (Huyer 2004). This network was made up of labor unions and civil society groups (e.g., churches, women's movement, environmental movement, cultural and social justice groups). Although the network was based on equal participation, it was managed by "representatives or leaders of the key member organizations of which labor played a high-profile role" (Huyer 2004: 53). Although the network did not directly succeed, it nevertheless forced the ruling conservatives to call an election before NAFTA was implemented and members still collaborate in anti-free trade activities (e.g., joint demonstrations, provision of information). A lead organization governance design was also present in a local network of business organizations and government agencies to improve social and community issues, like cleanness, community safety, and policing (Rogers and Anderson 2007). Each month these firms met and were facilitated by a project manager who was an employee of the government agency responsible for community development.

Finally, a number of examples can be found in the economic cluster literature in which member organizations only interact with each other through a hub-organization, which acts as a NAO. This hub-organization provides technical expertise and administrative support to individual participants, and engages in co-innovation with a limited number of member organizations. What makes this type of network structure a joint production system is that the hub-organization disseminates valuable information acquired by some network members to other network members, which can be used to stimulate innovation, thereby strengthening the competitiveness of the entire cluster. For instance, in the Canadian automotive parts industry, the union, besides having its own research facilities, also kept manufacturers informed about what was going on in other firms and which innovations had been implemented (Rutherford and Holmes 2007). The same hub-function was fulfilled by the Institute for Toys in the Spanish town of Ibi, which, among other things, "offers market information, advice on product development and manufacturing" (Holmström 2006: 495) and represents the industry at trade fairs. In the Spanish ceramic tile district, there are a number of hub-firms (local university, trade associations) that connect the cluster with other industries, countries, and knowledge forums, while at the same also engaging in R&D activities with individual businesses (Molina-Morales 2005).

In conclusion, our review indicates that in this task category, as with the other cells of our model, no clear relationship could be found between network task and network design, operationalized as network governance form. Instead, it appears that trust plays a prominent role. In general, if trust is high between network members, they are able to function in shifting coalitions in order to perform the collective network task without the presence of a specific entity responsible for governing the network. However, when trust is only modest, which was the case in the cluster examples, a NAO becomes functional in order to govern the network. And when there is one organization (or a small number of organizations, as was the case in the NAFTA example) which already performs a large amount of the network task, this organization is likely to take the lead.

2.6 Discussion

This chapter has been an attempt to examine, based on a review of the literature on whole networks, the relationship between the tasks performed by networks and their design. An important conclusion appears to be that networks are used for a wide range of tasks. This contrasts somewhat with most of the network literature which often claims that networks are a new form of governance designed to accomplish a specific type of task, typically requiring the rapid transfer of knowledge and information across organizational boundaries (cf. Castels 2000). This is the type of task that fits Cell IV in our typology but it is clear from our literature review that a wide range of task activities are being accomplished through whole networks, reflected in the number of studies categorized in Cells I, II, and III.

Probably the most striking conclusion of our literature review is that there does not appear to be a relationship between type of task and network design. This is in contrast to what one would expect on the basis of structural contingency theory. In what follows, we will critically reflect on this finding and suggest possible explanations.

First, it could be that variables other than type of task are more important for explaining network design. The literature we reviewed provides some evidence for this assumption. While not the focus of our research, two critical factors regularly appeared to have some explanatory power; namely, the level of trust between network member organizations and whether the central work flow was already controlled and managed prior to network formation by and through one or a small group of organizations. The importance of these factors might be related to a fundamental aspect of organizational networks, which is the fact that they are production forms that consist of independent organizations. As a consequence, trust and the resolving of competitive tensions among network members may be more critical for success in accomplishing network-level tasks than the task itself.

Another variable that might help explain network design is the size of the network. Size has been widely discussed by contingency theorists as an important factor for explaining organization structure (cf. Kimberly 1976), but not for explaining network structure. We observed that the fewer organizations involved, the more likely it was that the network was self-governed. Shared governance leaves control over the functioning of the network to the network members themselves. In a small network it would be highly inefficient to have all communication and network-level decisions go through a lead organization or NAO. For example, for conflict resolution, face-to-face communication might be functional in a small network, while it could be a bureaucratic burden in a lead organization or NAO. In contrast, in larger networks, shared governance might lead to a situation where members start to ignore network management issues or spend too much time trying to coordinate across a large number of organizations. In such a case, a NAO renders collective decision making unnecessary. Members only have to interact with the NAO to coordinate network-level activities. These arguments are consistent with what Provan and Kenis (2008) have already proposed in their article on network governance.

Second, it is possible that network design parameters other than governance mode are related to the task of the network. These could be, for example, the frequency of interactions among individual members or the density of interactions across the whole network. It may be that the more ambiguous the task, the more network members must interact to accomplish the task successfully. However, the literature reviewed did not reveal sufficient information on the importance of such other design parameters.

Third, and in line with our previous point, we were completely dependent on the quality and extensiveness of reporting by the authors of the literature we reviewed. As a result, coding sometimes turned out to be quite difficult. Often it was not easy to understand exactly what task the network had to accomplish and whether or not the task was actually being accomplished successfully. In addition, since governance was not the focus of most of the studies surveyed, the exact form of governance

being used was sometimes difficult to determine. All these problems resulted in coding that was not always as objective as we would have liked. However, in the absence of a single large scale comparative study of whole networks utilizing a single and consistent method for data collection, the literature review approach we used is all that is available.

2.7 Contributions

Finally, we would like to formulate how our research can contribute to future thinking about organizational design. First, there is the question of the prevalence of whole organizational networks as a way to create value. More empirical research is needed to demonstrate how dominant this form of organization is and whether and why we can expect an increase in the prevalence of this governance form. We also need to know more about whether whole networks are really different from those organizational forms that previously have been described as “loosely coupled systems” (Weick 1976), political systems, network organizations, adhocracies, and the like. We think they are different because networks are goal-directed multi-organizational production systems organized to accomplish a task, rather than loose coalitions that are formed serendipitously. In addition, whole networks are composed of independent, sovereign organizations that can voluntarily leave the network. These systems require specific mechanisms for governance, which we have used here as our operationalization of design. But more research is needed to make explicit what these differences entail in terms of the functioning of these multi-organizational forms.

Assuming that whole networks are indeed becoming more prevalent and that they are a different, non-hierarchical form of organizing, the appropriateness of existing organizational theories for explaining networks becomes an important issue. For the most part, the organizational design literature has focused on individual organizations, while theories of networks and network structure have mainly focused on dyadic and ego-centric network ties, seldom focusing on whole networks as the unit of analysis. Thus, a new way of theorizing about networks based on the design of the whole system as a mechanism for accomplishing a collective task is needed. Our work has provided evidence that conventional theories, especially arguments based on structural contingency theory, do not have predictive value for whole networks. Our conclusions provide only limited evidence, however, concerning how network design might best be explained. Future research is needed to identify, through new empirical research or through systematic literature reviews like this one, those factors that do have predictive power for whole network design. Our findings provide suggestive evidence that network size (in terms of the number of participating organizations) and trust among the participating organizations seem to explain, at least to some extent, the organizational design of whole networks, consistent with recent conceptual work by Provan and Kenis (2008).

Another way of thinking about this issue could be to study whether the emergence and importance of whole networks and other “new” forms of organizing

means that classical organization design approaches are relevant any more. In particular, it may be that traditional design approaches and theories are “backward oriented,” focusing on what has worked in the past. The emergence of whole networks as a way of doing work could be an indication that having a more “forward orientation” is considered important by more and more organizations. If this is the case, then researchers might analyze if the orientation toward time (backward versus forward orientation) is predictive for the design of whole networks. This point appears to be consistent with what Huber (see Chapter 1) refers to as “designs looking ahead.” It may be that the design of whole networks is determined by the extent to which participating organizations need to be part of a system that has the capacity to anticipate future needs, rather than reacting to current task demands. One clear advantage of whole networks, as compared with more hierarchical forms, is that they are able to “shoot at a moving target.” Most organizations have a top-down structure with limited points of access for critical information, and thus, they have limited ability to recognize the need for change. In contrast, networks have many points of access to different sources of different information, which can be readily disseminated among members, allowing them not only to anticipate the need for change but even to shape the change itself (Burt 2005).

From a practice perspective, our findings demonstrate that network organizers and managers may not need to design network governance structures based on characteristics of the task the network is trying to accomplish. Networks must be governed if they are to be effective in achieving network-level goals. However, from a review of the literature on the topic, it appears that task characteristics may be far less critical than issues like network size, the trust level among participants, or the need to be responsive to change. Network managers and organizers must recognize these factors and respond accordingly.

These alternative conclusions are, of course, somewhat speculative, since they are grounded in the logic of networks discussed in the literature, as opposed to being based on our findings. It is obvious that more research is needed to test these assumptions directly. Despite this shortcoming, we hope that the analysis presented in this chapter provides some clear direction for future research as well as some motivation to initiate further study on the topic. We believe that there is a bright future for the study of network design, which has been a relatively neglected aspect of the important field of organization design.

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