

## The Economics of Private Networks

### The *Filière Electronique*: Contributions of Public Networks to Private Networks

Sandra Braman

#### 1. INTRODUCTION

As we negotiate with each other the "material" of the network -- the fibers and the wavelengths, the standards and the protocols -- we are also negotiating with each other how to live as individuals, communities, societies, states, and as a global community. A telecommunications network is not only comprised of the lines and nodes of the physical infrastructure; it is also the very stuff of the organizations and societies that use it; network society is civil society as well.

Two things flow from this: First, in addition to the kinds of economic issues normally addressed in policy-making and -analysis processes, macro-level and society-wide matters are also pertinent to the question of what public investment in the telecommunications infrastructure means to private networks. It is important to look not only at the economic policy, but also at how the economy operates; and not only the economic, but the social, political, cultural, and ecological issues as well.

Second, while we have the habit of thinking about network issues as if they are stand alone, and can adequately be analyzed in that way, in today's environment this is not valid. The network is meaningless and cannot be understood separate from the web of social relations -- including those expressed in industrial form -- that is dependent upon, occurs within, and would operate quite differently without, the net. The Europeans have acknowledged this by using the phrase *filière électronique* to describe both the network and the institutions and web of social relations the net enables. (The term was coined in the 1982 Farnoux report to the French government and has since been taken up by a number of analysts.<sup>1</sup>)

Looking at the question of the relationship between public and private networks from this perspective, four macro-level effects of the use of the net provide a context in which to understand ways in which public support for the net contributes to private networks:

- (1) Evolution of organizational form.
- (2) Transformation of the law.
- (3) Emergence of the network economy.
- (4) Increase in complexity and turbulence.

This chapter examines these very fundamental and contextual contributions by public networks to their private counterparts. By examining each of these four characteristics of this stage of the information society, we get a sense of the self-reflexivity of the processes by

which we design, build, and regulate nets both public and private, and of the multi-dimensionality of the effort. In building the net, we are at the same time constituting our societies, our political cultures, our economy, and ourselves.

## 2. EVOLUTION OF ORGANIZATIONAL FORM

Over the past couple of decades we have come to understand organizations primarily as information systems.<sup>2</sup> From this perspective, it is clear why the introduction of new information technologies not only stimulates shifts in the nature of organizations, but actually makes possible the evolution of new organizational forms. Transnational corporations have been the most aggressive in taking advantage of the new possibilities, and it is from studying them that we are learning the most about what the emergent possibilities are.

Among the characteristics of organizations that the net -- whether funded privately or publicly -- makes possible are:

- Much more flexibility in determining how centralized and decentralized decision-making will be. While with earlier technologies, decisions about degree of centralization had to be made once, and for the organization as a whole, under network conditions such decisions need not be fixed in stone, nor fixed in one way for the entire organization. Some areas of organizational life can be made individually for each level of organization and communication.
- Increased capacity for collocation of general and local knowledge. Incorporating local knowledge -- knowledge of the particularities of circumstances into decision-making processes designed around taking advantage of more systematic, general knowledge.
- Boundary permeability. Historically relationships between corporations were largely across the transactional boundary of the marketplace. While these relationships between organizations may have been long-lived and significant to all parties involved, they were also fairly stable in form and generally involved interactions only at one point of the processes of production and distribution describing each party's activities. Today a multiplicity of types of relationships between organizations, long-term commitments over multiple dimensions -- what might be termed shared responsibilities for a single production process, and flexibility in reassignment of tasks -- make the boundary between organizations more permeable and harder to define than previously.
- Ability to control a higher level of articulation of the organizational and informational structures. The first stage of the information society,<sup>3</sup> which introduced the telegraph and telephone, made it possible to control agents at a distance, and therefore permitted existing types of organizations to grow larger, and to spread over greater distance. During the second stage, organizations took advantage of these types of possibilities to become global, and we saw, therefore, during the middle of the 20th century, the development of the multinational corporation, dependent upon the range of information technologies for functioning. With the addition of intelligence and greater capacity in the network, which we are seeing in this third stage of the information society, organizations now have the ability to control organizations with both high levels of internal differentiation as

well as geographic spread. This aspect of the network, of course, can also be problematic, as is discussed in the section on complexity and turbulence to follow.

Public investment in the telecommunications infrastructure enables private sector organizations to take advantage of the possibilities for organizational change that the net makes possible. Corporate networks that are closed to the public immediately limit their ability to participate in an information economy so significantly characterized by network relationships that it is coming to be known as the network economy. Placing such a horizon on the possibilities of organizational evolution will simultaneously damage competitiveness in a world in which, according to many network economists<sup>4</sup> cooperation and coordination are as important as -- and therefore critical to -- competition. Heavy public sector investment in the network, conversely, extends the range of possibilities available to all in terms of the range of organizational alternatives that become open.

One result of the evolution of organizational form is that the very boundary between what is public and what is private is shifting. In the policy making domain, this has been acknowledged in the emergence of the term "policy networks," describing the mutating interdependencies between the two.<sup>5</sup>

### 3. TRANSFORMATION OF THE LAW

The use of new information technologies has stimulated processes that have led to changes in the nature of the law as well. While some changes are due to the uses of new information technologies by the legal and judicial system itself, others derive from efforts to conduct business and other social activities in an environment to which the law rarely applies, and with which it with difficulty copes. Because of the convergence of technologies, often multiple, and potentially radically different, sets of laws or regulations may concurrently, though conflictingly, apply to the same message or communication process. The consequences include constant litigation in practice, frustration on the part of regulatory systems incapable of dealing with the subject of their regulation, judicial systems that acknowledge their inability to understand the empirical realities that provide the "facts" of the case, and national and international legal and regulatory systems that do not provide guidance or conflict resolution under today's conditions.

The law has responded to these problems in a variety of ways.

- 1) The law is moving away from the nation-state. Because so many of the information and communication processes and products in the information economy are international or global in nature, nation-state law is rarely sufficient. As transactions, agreements and conflicts move to the international arena, so does the law. Adding fuel to this process is the interest of large legal firms serving the interests of their clients, now mostly important transnational corporations, who are also less interested in serving the social, cultural, and political goals of national law than in pursuing their own goals, and thus, are happy to move to the international arena as appropriate.<sup>6</sup> A variety of theories to justify this move have been put forward, including the argument that international law -- ideally the General Agreements on Tariffs and Trade (GATT) -- is today our true constitutional venue, since the dangers that most threaten us are those that come from international trade, not from church and state (with the nature of the state itself undergoing radical changes).<sup>7</sup>



- 2) Laws of different jurisdictions are coming into harmonization. With the increase in the movement of information, goods, and people internationally, it has become clear that ease in transactions is facilitated when regulatory and legal systems are coordinated with each other, meaning their fundamental structures and the types of categories in use are the same. (It is harmonization of accounting systems that is one of the ultimate goals of the discussion of trade in services under the General Agreements under Tariffs and Trade [GATT]). Increasingly, as in the efforts to build the European Community and the North American Free Trade Agreement (NAFTA), regional and international law in effect supplants national or local law.<sup>8</sup>
- 3) Contract law is playing a more important role. Dezalay<sup>9</sup> brilliantly has pointed out ways in which contract law is beginning to lead to development of law in other areas. When there is no existing or appropriate national or international law for a particular situation in the information economy, or when existing law is so self-contradictory regarding the matter at hand as to be problematic, contracts provide far more flexibility and the capacity to tailor agreements to the particulars of the information economy. They also, of course, provide some additional privacy barriers.
- 4) Algorithmic decision-making procedures are increasingly replacing cognitive (that is, human) decision-making procedures within the law. The critical significance of this shift is indicated by the fact that several different types of cases have presented this as a constitutional problem to the US Supreme Court. Differences in the type of surveillance, and therefore of control, is the pertinent form of information collection for algorithmic decision-making procedures, with the interest on statistical probabilities rather than the particularities of individual circumstances. Tribe<sup>10</sup> argues that, by definition, constitutional decision-making in any context is NOT appropriate for treatment with algorithmic decision-making procedures. Algorithmic decision-making procedures work with established categories and relationships within and between them, while it is the very point of constitutional decision-making to establish categories and determine the relationships with and between them.
- 5) Katsh<sup>11</sup> has elaborated for us the ways in which the use of computerized databases has made it possible to be far more aggressive in constructing new lines of precedent -- and, therefore, of argument. Locating (or creating) a line of argument by tracing it through cases in which pertinent (or appropriate) positions have been taken has historically been an extremely time-consuming matter; as a consequence, lines of precedent become essentially boiler-plate as the significant streams of cases in particular areas emerge. With the enormous reduction in the cost of developing new lines of precedent, greater creativity is possible.
- 6) The use of new information technologies has also introduced some new alternatives to regulation, and a variety of legal techniques not previously available.<sup>12</sup> This is occurring at the same time that the study of the sociology of the law is becoming aware of the relationship between particular cultural and social features and the type of legal system that develops around them.<sup>13</sup>

It may well be here, in the reshaping of the legal environment, that public investment in the building of an information infrastructure means the most to the development of private networks, for it is here that the use of networks by those outside of, as well as within, specific organizations provides the flux through which and from which private networks variously resolve themselves as they constitute and reconstitute themselves.

#### 4. THE EMERGENCE OF THE NETWORK ECONOMY

Antonelli<sup>14</sup> argues that harmonized information flows have now replaced the market as the key coordinating mechanism for the market. Grabher and others today are exploring the nature of what has come to be called the network firm, as we explore what appear to be some qualitatively different characteristics of the information economy.

This is a particularly important area from the perspective of private networks, since the implication of the emergence of the network economy is that a greater number of types of information than previously have to be gathered, analyzed, and incorporated into decision-making processes. Judgments about when and how moves are successful operate under some different rules. Pertinent features of the network economy include:

- 1) Identification of the long-term project rather than the firm or industry as the basic unit of analysis. Complexity interdependent relationships among organizations -- both private sector and public sector -- mean that valid analyses of economic processes need to take networked groups of firms together. From the perspective of the individual organization, the implication is that the synergies generated through the networked activities should be incorporated into the valuation of a firm's worth, the economic benefits of particular processes, etc.
- 2) The addition of cooperation and coordination to competition as central economic dynamics. Because interdependence is a key feature of the network economy, prizing competition may not always be the most appropriate approach, and in many circumstances is even counter-productive.
- 3) An expansion of the types of capital available to include what has come to be called intellectual capital. Additional types of information resources appear through the lens of an information or network economy, rather than from the perspective of the emphases of an industrial economy. Currently this is most visible and publicly debated in the confoundingly difficult area of intellectual property rights.

In this area, the contribution of public investments toward private networks can not be overstated. Public networks enable the operations of the network economy, create the environment in which those involved in private networks work, and offer (and encourage) new modes of operation.

#### 4. INCREASE IN COMPLEXITY AND TURBULENCE

As with any other conceptual or material tool, we have begun<sup>15</sup> to find everywhere the concepts of complexity and turbulence. The number of linkages, possible routes, types of processing, and numbers of messages and bits of data being transmitted through the global information infrastructure have so increased that, in fact, the complexity of our activities has increased to the point that we experience many of our social processes as turbulent, and sometimes chaotic. Beck<sup>16</sup> describes our condition, as a consequence, as a *Risk Society*, in which we are more probabilistically concerned about dangers in the future than we are, as historically, we were driven by the past. Beck's work provides crucial insights into the social, political, and cultural effects of living in an environment in which the casual chains are so long both in terms of number of steps and, sometimes, in time, that we can no longer,

in many cases, validly determine casual relations. Among the consequences to which Beck points are impacts on morality when responsibility can no longer reasonably be assigned, and of the inclination to move towards non-rational modes of explanation when cause and effect no longer are determinable. Sabel<sup>17</sup> and Rosenau<sup>18</sup> have been looking at complexity and turbulence within the economy.

The study of complexity and turbulence has spread across the entire range of social sciences in recent years.<sup>19</sup> This work largely focuses on ways of coping with complexity and surviving turbulent and chaotic conditions. (This emerging discipline has been going under different names according to disciplinary home, choice of conceptual emphasis, etc.. It includes second order cybernetics, complex systems theory, self-organizing systems theory, chaos theory, and analyses of punctuated equilibria.) What has been learned that is pertinent to understanding the relationships between public support for the net and private networks includes:

- 1) Mutually beneficial processes and positive feedback are at least as important as competitive processes and negative feedback. This has implications for research, as well as linkages with the characteristics of the network economy. Ideally, systems are so characterized by their participation in and contributions to such processes that they may be described as co-evolutionary.
- 2) A focus on the deviation-amplifying effects of casual processes. Generally we have treated small differences in initial starting conditions for casual processes as trivial, but we are learning through the study of chaos that seemingly trivial differences at the beginning of processes can yield significantly different outcomes. In telecommunications terms, Antonelli<sup>20</sup> is talking about this when he describes the way in which random small events in networks can have significant and long-lasting effects.
- 3) An emphasis on process rather than on the product or the achieving of a fixed state. Healthy systems are today understood to be constantly undergoing self-renewal, or autopoiesis, rather than always seeking to achieve or return to an equilibrrious state. There are implications for organizations here as they define both their missions and their structures and working procedures.
- 4) Healthy systems are characterized by autopoiesis -- self-organizing -- activity by their constituent elements. For this to happen, two types of collocation are significant: collocation of general knowledge with specific, or local, knowledge; and collocation of knowledge with decision-making power. Both of these are made possible far more easily than ever before by the particular characteristics of the net.
- 5) In times of turbulence, there is both a need for deviance, experimentation, development of alternatives in all domains, and a higher likelihood of success for experiments that respond intelligently to shifts in the environment. The implication for the relationships between public and private networks is clear: the richer the network environment, the greater the opportunities for the experimentation that is most likely to identify the paths to success in this environment. To this end, participants in private networks -- or those who would like to be -- should appreciate as much public support for development of the information infrastructure as possible.



The increase in complexity and turbulence, and what we are learning about how to deal with them, are pertinent to the relationships between public support for networks and private networks because they provide policy guidelines -- for both the public and the private sectors. On the part of the public sector, it should be a goal to attempt to maximize interactions that take advantage of complexity and turbulence perceived as opportunities, rather than designing a system in which their now-endemic conditions are approached more sympathetically.

## 6. CONCLUSIONS

Taking a macro-level view of the nature of the net lets us see ways, beyond the most immediately visible economic contributions of public support, for the information infrastructure to benefit private networks. While less easily calculable, far more important contributions are in the shaping of an environment in which private networks may establish themselves, and develop the networked relationships within the net that will determine their long-term viability. These efforts are self-reflexive in that each effort itself alters the conditions under which economic activities operate. Simultaneously, they are the conditions under which communities and societies find themselves, and in which we carry out our political lives. While the emphasis here has been on the economic implications of the macro-level effects discussed, the intertwining with other areas of social life is key to understanding ways in which the public and private building of networks itself shifts the very social environment in which those networks are embedded. Thus, we are examining not the net, but the *filière électronique*; and through the *filière électronique* we are shaping ourselves as a civil society.

## REFERENCES

- Antonelli, C. (Ed), *The Economics of Information Networks*, Amsterdam: North-Holland, 1992.
- Archer, M., *Culture and Agency: The Place of Culture in Social Theory*, Cambridge: Cambridge University Press, 1988.
- Beck, U. (trans. Mark Ritter), *The Risk Society: Towards a New Modernity*, Newbury Park, CA: Sage Publications, 1992.
- Braman, S., "Harmonization of systems: The third stage of the information society," *Journal of Communication*, 43(3), pp. 133-140, 1993.
- Braman, S., "Trade and information policy," *Media, Culture, and Society*, 12, pp. 361-385, 1990.
- Cass, R.A., "The perils of positive thinking: Constitutional interpretation and the negative first amendment thinking," *UCLA Law Review*, 34(5-6), pp. 1405-1491, 1987.
- Degreene, K.B., *The Adaptive Organization: Anticipation and Management of Crises*, New York: Wiley Interscience, 1982.
- Dezalay, Y., "Putting justice 'into play' on the global market: Law, lawyers, accountants and the competition for legal services," *Tidskrift fur Rattssociologi*, 6(1-2), pp. 9-67, 1989.
- Dezalay, Y., "The BIG BANG and the law: The internationalization and restructuration of the legal field," *Theory, Culture, and Society*, 7, pp. 279-293, 1990.
- Dyson, K. & Humphreys, P. (Eds), *The Politics of the Communications Revolution in Western Europe*, London: Frank Cass, 1986.

- Grabher, G., *The Embedded Firm: on the Socioeconomics of Industrial Networks*, New York: Routledge, 1993.
- Guerin-Calvert, M. & Wildman, S.S. (Eds), *Electronic Services Networks: A Business and Public Policy Challenge*, Washington, DC: Annenberg, 1991.
- Haas, E.B., *When Knowledge is Power: Three Models of Change in International Organizations*, Berkeley: University of California Press, 1990.
- Jantsch, E., *The Self-Organizing Universe*, New York: Pergamon Press, 1989.
- Jordan, G. & Schubert, K., "A preliminary ordering of policy network labels," *European Journal of Political Research*, 21, pp. 7-27, 1992.
- Karpf, J., "Competition between types of regulation: The impact of computerization of law," 8th European Conference of Critical Legal Studies, Budapest, October 1989.
- Katsh, E., *The Electronic Media and the Transformation of the Law*, New York: Oxford University Press, 1989.
- Mattelart, A., and Cesta, Y.S. (trans. D. Bruxton), *Technology, Culture, and Communication*, Amsterdam: North Holland, 1985.
- Mitnick, R.M., *The Political Economy of Regulation, Creating, Designing, And Removing Regulatory Forms*, New York: Columbia University Press, 1980.
- Morgan, G., *Images Of Organizations*, Beverly Hills: Sage, 1986.
- Pekelis, A.H., "Legal techniques and political ideologies: A comparative study," In R. Bendix (Ed.), *State and Society: a Reader in Comparative Political Sociology*, pp.355-377, Boston: Little, Brown & Co., 1968.
- Petersmann, E., *Constitutional Functions and Constitutional Problems of International Economic Law*, Fribourg, Switzerland: University of California Press, 1991.
- Tribe, L.H., "Constitutional Calculus: Equal Justice or Economic Efficiency?" *Harvard Law Review*, 98, pp. 592-621, 1985.
- van Waarden, F., "Dimensions and types of policy networks," *European Journal of Political Research*, 21, pp.29-52, 1992.
- Zeleny, M.(Ed), *Autopoiesis, Dissipative Structures, and Spontaneous Social Orders*, Boulder CO: AAAS Selected Symposium, 1980.

## ENDNOTES

<sup>1</sup>See: Dyson, K. & Humphreys, P.(Eds), *The Politics of the Communications Revolution in Western Europe*, London: Frank Cass, 1986 and Mattelart, A., & Cesta, Y.S., *Technology, Culture, and Communication*, trans. D. Bruxton, Amsterdam: North Holland, 1985.

<sup>2</sup>Haas, E.B., *When Knowledge is Power: Three Models of Change in International Organizations*, Berkeley: University of California Press, 1990 and Morgan, G., *Images of Organizations*, Beverly Hills: Sage, 1986.

<sup>3</sup>Braman, S., "Harmonization of systems: The third stage of the information society," *Journal of Communication*, 43(3), pp. 133-140, 1993.

<sup>4</sup>See: Antonelli, C. (Ed), *The Economics of Information Networks*, Amsterdam: North-Holland, 1992; Grabher, G., *The Embedded Firm: on the Socioeconomics of Industrial Networks*, New York: Routledge, 1993, or Guerin-Calvert, M. & Wildman, S.S. (Eds), *Electronic Services Networks: A Business and Public Policy Challenge*, Washington, DC: Annenburg, 1991.



<sup>5</sup> Jordan, G. & Schubert, K., "A preliminary ordering of policy network labels," *European Journal of Political Research*, 21, pp.7-27, 1992; van Waarden, F., "Dimensions and types of policy networks," *European Journal of Political Research*, 21, pp.29-52, 1992.

<sup>6</sup> Dezalay, Y., "Putting justice 'into play' on the global market: Law, lawyers, accountants and the competition for legal services," *Tidskrift Fur Rattsociologi*, 6(1-2), pp.9-67, 1989 and Dezalay, Y., "The Big Bang and the law: The internationalization and restructuring of the legal field," *Theory, Culture, and Society*, 7, pp.279-293, 1990.

<sup>7</sup> See: Cass, R.A., "The perils of positive thinking: Constitutional interpretation and the negative first amendment thinking," *UCLA Law Review*, 34(5-6), pp.1405-1491, 1987 and Petersmann, E., *Constitutional Functions and Constitutional Problems of International Economic Law*, Fribourg, Switzerland: University of California Press, 1991.

<sup>8</sup> Braman, S., "Trade and information policy," *Media, Culture, and Society*, 12, pp.361-385, 1990.

<sup>9</sup> Dezalay, Y., "Putting justice 'into play' on the global market: Law, lawyers, accountants and the competition for legal services," *Tidskrift Fur Rattsociologi*, 6(1-2), pp.9-67, 1989, Dezalay, Y., "The Big Bang and the law: The internationalization and restructuring of the legal field," *Theory, Culture, and Society*, 7, pp.279-293, 1990.

<sup>10</sup> Tribe, L.H., "Constitutional Calculus: Equal Justice or Economic Efficiency?" *Harvard Law Review*, 98, pp. 592-621, 1985.

<sup>11</sup> Katsh, E., *The Electronic Media and the Transformation of the Law*, New York: Oxford University Press, 1989.

<sup>12</sup> Karpf, J., "Competition between types of regulation: The impact of computerization of law," 8th European Conference of Critical Legal Studies, Budapest, October 1989.

<sup>13</sup> Mitnick, R.M., *The Political Economy of Regulation. Creating, Designing, and Removing Regulatory Forms*, New York: Columbia University Press, 1980 and Pekelis, A.H., "Legal techniques and political ideologies: A comparative study," In R. Bendix (Ed.), *State and Society: A Reader in Comparative Political Sociology*, pp.355-377, Boston: Little, Brown & Co, 1968.

<sup>14</sup> Antonelli, C. (Ed), *The Economics of Information Networks*, Amsterdam: North-Holland, 1992.

<sup>15</sup> Fractal mathematics, the foundation of studies of complexity and turbulence, developed only recently partially because of the requirement for massive mathematical manipulations only made possible through use of a computer.

<sup>16</sup> Beck, U. (trans. Mark Ritter), *The Risk Society: Towards a New Modernity*, Newbury Park, CA: Sage Publications, 1992.

<sup>17</sup> See Sabel, C., "Moebius-strip Organizations and Open Labor Markets: Some Consequences of the Reintegration of Conception and Execution in a Volatile Economy," in P. Bordieu & J. Coleman (eds.), *Social Theory for a Changing Society*, pp. 23-54, Boulder: Westview Press, 1991.

<sup>18</sup> See Rosenau, J., "A Pre-theory Revisited? World Politics in an Era of Cascading Interdependence," *International Studies Quarterly*, 28(3), pp. 245-306, 1984.

<sup>19</sup> Archer, M., *Culture and Agency: The Place of Culture in Social Theory*, Cambridge: Cambridge University Press, 1988; Degreene, K.B., *The Adaptive Organization: Anticipation and Management of Crises*, New York: Wiley Interscience, 1982; Jantsch, E., *The Self-Organizing Universe*, New York:

Pergamon Press, 1989, Zeleny, M.(Ed), *Autopoiesis, Dissipative Structures, and Spontaneous Social Orders*, Boulder Co; AAAS Selected Symposium, 1980.

<sup>20</sup> Antonelli, C. (Ed), *The Economics of Information Networks*, Amsterdam: North-Holland, 1992.