

TAKING INFORMATION POLICY BEYOND INFORMATION SCIENCE:

APPLYING THE ACTOR NETWORK THEORY

for

CONNECTEDNESS:
INFORMATION, SYSTEMS, PEOPLE, ORGANIZATIONS

CAIS/ACSI '95
Canadian Association for Information Science
23rd Annual Conference
Edmonton, Alberta, 7-10 June 1995

by

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Abstract

Information policy (IP) as it is presented in the literature of library and information science (LIS) suffers from some limiting assumptions that obscure central policy issues concerning power over information. A more promising approach to information policy may be found in the actor network theory (ANT). ANT's rich methodology embraces scientific realism, social constructivism, and discourse analysis in its central concept of *hybrids*, or "quasi-objects", that are simultaneously real, social, and discursive. The advantages of conceiving information policy as a network of hybrids are explored, with examples drawn from radio broadcasting and the "information superhighway".

Information science and information policy

The literature of library and information science (LIS) suggests that not all is well with information policy (IP) studies. Peter Herson complains that "[p]iecemeal development of information policy may continue to occur unless a more developed theoretical and research base for government information emerges" (Herson 1989, 5). Victor Rosenberg, restricting his comments to scientific and technical information (STI) policies, laments the absence of a unified policy-making structure in the United States (Rosenberg 1982, 4). His review of debates on national information policies suggests that there are only debates, since he finds no indication that any of the policies he studied were implemented. The complaint that American STI policy is virtually non-existent was emphasized more than twenty years ago by Aines and Day, who then described the growth of information systems as "random and disparate" (Aines, Day 1975, 4). Almost fifteen years later, STI policy was described as "uncoordinated, fragmented, and often ineffectual" (Doty, Erdelez 1989, 56). Comprehensive reviews of policies beyond STI tell the same story; thus Bishop and Fellows (1989) reported that none of the major policy instruments of their study had any influence on policy makers. In the estimation of

contemporary analysts, the situation has not improved. Thus Robert H. Burger, after reviewing several different conceptions of IP, can only conclude, rather lamely, that the “disarray of approaches, circular definitions, and quasi-analyses” indicate “that information policy, whatever it is, is exceedingly complex” (Burger 1993, 90).

Although a greater body of literature than can be presented here would be needed to establish conclusively the claim that LIS imposes specific limitations upon IP studies, the disciplinary culture of complaint exhibited in these few examples is nonetheless suggestive. First, much LIS literature interprets IP as a species of government policy and often, even more restrictively, as government policy for government documents. Second, due to the high proportion of STI policy documents, many writers restrict IP studies to problems of federal (usually American) production, organization and dissemination of scientific and technical information. This narrow institutional and disciplinary focus restricts the range of those who enact or are affected by information policies to government agents, such as ministries, departments, agencies, committees and the federally-supported disciplinary élites implicated in STI.

Pausing for a moment at these two limitations imposed by much LIS literature on IP studies, we can easily understand the reasons for complaint. Indeed, we need only pursue the implications of some of the important insights readily available in the literature. Even in 1975, for example, when they wrote that it “is important to get more in return for this investment”, Aines and Day recognized that information, specifically STI, is a commodity. But if information is a commodity, then there is an obvious answer to the question of why North American government information policy is so ineffectual. Rationalization, planning and management of commodities to maximize return on investment does not, especially in North America, take the form of direct government control, but is instead left to appropriate commodity markets. Information systems may appear to operate without national planning when: (i) information is a commodity; (ii) the private sector, not the government, controls commodity exchange; and (iii) national planning is defined as government planning. If information policy is defined as a

species of federal government policy, then, in the prevailing context of political and economic arrangements in which the state is little more than a facilitator of private capital accumulation, the absence of rational, independent, coordinated, national information policies should come as no surprise.

This naïveté about the political economy of information surfaces in a third limitation imposed by LIS thinking about IP studies: its narrow epistemological focus. Formulating information policy that works, and that policy makers respect, is often defined as the epistemological problem of establishing the proper knowledge base for a specific academic discipline. Thus much LIS literature is fixated on the problem of clarifying the conceptual basis of IP, and getting the right disciplines involved. To no one's surprise, information science keeps turning up as central to the new field.¹ But the political realities of the state's role in commodity exchange relegate to merest fantasy such musings about the salience of sound research to policy development and implementation.

A fourth limitation of LIS thinking is its fixation on instrumental issues. Much of the literature proposes studies in aid of technology implementation, improving communication between government departments, increasing access to government documents, facilitating STI transfer, and similar problems related to the engineering concerns of government information management. This focus on technical and managerial maximizations of information flow efficiencies reaches its apogee in Hernon and McClure's enumeration of over 300 policy issues setting research problems pertaining just to questions about government provision of public information (Hernon, McClure 1987, Appendix H). Research proposals such as these are

¹ Burger, for example, devotes a book to the problem of identifying the proper disciplines that can offer the appropriate knowledge to evaluate information policy recommendations (see his 1993). Exhibiting the faith that slides easily into an academic occupational hazard, Hernon thinks that with our eyes firmly fixed on a totemic diagram depicting an "overlapping set relationship" between information science, public policy and government information, the "field develops its theoretical base, and research becomes central to the development and maturity of the field" (Hernon 1989, 22).

submitted, however, in a context of conflicting tendencies: on the one hand, a clear recognition of the impotence of policy recommendations and on the other, a touching faith that logical, epistemological and disciplinary rigour will set things right.

A fifth, and perhaps the most important limitation imposed by LIS on IP studies is occlusion of issues concerning the relations between information and power.² The focus on instrumental problems and epistemological issues concerned with establishing and policing borders between disciplines deflects attention from questions of how power is exercised in and through the social relations mediated by information, how dominance over information is achieved and maintained by specific groups, and how specific forms of dominance — especially those of race, class, sex and gender — are implicated in the exercise of power over information. Perhaps it is more important, before becoming fixated on how to improve a carburetor, to ask where the car is going, or even whether we should be driving cars in the first place.

Régimes of information and the actor network theory

In an important remark, Aines and Day noted that “there has been a long period of incubation and development of information systems throughout the world, even though national planning has been minimal” (Aines, Day 1975, 4). Their comment suggests that somehow, somewhere, even without direct government action, sufficient power and control is exercised over the constituents of information systems that discernible, more-or-less well-defined networks nonetheless emerge and stabilize. And when we think about the information flows swirling around us, whether cultural, academic, financial, industrial, commercial, institutional, or their many hybrids, we realize that they do have specific forms and structures. Let us therefore call any more-or-less stable *system* or *network* in which information flows through determinable channels — from specific producers, via specific

² It would be wrong to say that political issues are completely ignored. Herson and McClure devote almost two pages to them in their 1987 (see pp. 188-190).

organizational structures, to specific consumers or users — a *régime of information*. Radio and television broadcasting, film distribution, academic publishing, libraries, transborder data flows, the emerging infobahn: these are all nodes of information networks, or elements of specific régimes of information.

A legitimate and pressing objective of information policy research is the perspicuous representation of régimes of information: how they originate and stabilize; how they determine social relations, and how specific forms of power are exercised in and through them. The description of an *information policy* therefore becomes the description of the *genealogy* of a régime of information. Because it recognizes that information policy is made and unmade every day in complex, interacting social practices, research of this kind transcends LIS's narrow disciplinary conceptions of IP. It also de-centres the study of policy instruments and their effects, because specific IP instruments or documents are but one kind of element in a régime of information, and one whose relations to the others may not be taken for granted, but instead become objects of investigation. The complexities of régimes of information suggest that they are rarely, if ever, adequately represented by smooth flows from one discrete stage to the next, e.g. from perceptions of issues to explicit policy formulation, followed by implementation feeding back to perceptions. Instead, describing a régime of information means charting the agonistic processes that result in tentative and uneasy stabilizations of conflicts between social groups, interests, discourses, and even scientific and technological artifacts.

The theoretical framework for IP studies must be sufficiently rich to comprehend the complexities of these interactions. The actor (or actant) network theory (ANT) of Latour and Callon (see, e.g. Latour 1988, 1992, 1993; Callon 1986) offers a promising set of analytical resources for this purpose. Developed as an analysis of scientific and technological artifacts, ANT's theoretical richness derives from its refusal to reduce explanations to either natural, social, or discursive categories while recognizing the significance of each (see, e.g. Latour 1993, 91). Following the work of Hughes, ANT insists that “the stability and form of artifacts

should be seen as a function of the interaction of heterogeneous elements as these are shaped and assimilated into a network” (Law 1990, 113). The construction, or “association of unhelpful elements into self-sustaining networks that are . . . able to resist dissociation” (Law 1990, 114) involves the hard work of negotiating and resolving conflict:

Elements in the network prove difficult to tame or difficult to hold in place. Vigilance and surveillance have to be maintained, or else the elements will fall out of line and the network will start to crumble. . . . there is almost always some degree of divergence between what the elements of a network would do if left to their own devices and what they are obliged, encouraged, or forced to do when they are enrolled within the network. (Law 1990, 114)

The complex, network-dependent nature of artifacts is captured by ANT’s conception of them as *hybrids*, or *quasi-objects*. They are hybrids because they are simultaneously real, discursive, and social. Latour’s point is that the properties attributed to social and natural elements (he adds discursive elements in his later work; see Latour 1993) are the products of practices of construction and maintenance of a network. It follows, therefore, as Pickering explains, that “those properties cannot count as the explanation of practice” (Pickering 1992, 21). For example, if nature, or the “real world”, is distinguished from the social or the discursive only as a consequence of practice, then the properties of “reality” are unavailable in explanations of those practices. Thus, taking a specific example from Hughes, if the “natural” properties of Edison’s incandescent lamp are the consequence of the construction of the American electrical light network, then they can not explain its construction; the American electrical light network is not the way it is due to the properties of the incandescent lamp.

In addition, “nature and society are intimately entangled” in the practices of network construction. “Practice is where nature and society and the space between them are continually made, unmade, and remade” (Pickering 1992, 21). Thus, not only are an artifact’s

properties unavailable in explanations of network construction, but the lines between the artifact's natural, social and discursive aspects are themselves continually redrawn in the processes of network construction. Neither nature, nor society, nor language can provide explanatory closure for scientific or technological artifacts, because the distinctions between their natural, social and discursive properties are the tentative and shifting outcomes of the practices whereby the network that determines an artifact's stability and form is constructed.

Two hybrids: radio and the infobahn

Radio broadcasting and a régime of information currently under construction — the “information superhighway”, or the infobahn — are hybrids, or quasi-objects. They are simultaneously discursive, real, and social. What does this mean, and how does it help us study information policy?

Radio

From ANT's perspective, the form and stability of what we now call *radio* is a function of practices of enrolling heterogeneous elements into a network. The analysis of radio therefore opens out onto a régime of information. The description of this régime will include natural elements, such as tubes, transistors, wires, and transmitters. It will include social elements, such as class differences between producers and consumers, the interests of large corporations, the concentrations of capital available for accumulation of profit in broadcast media. It will also include the many ways radio was imagined, discussed, and represented. The properties of radio are the outcomes of practices that stabilized the lines between radio's natural, social and discursive properties. Radio is therefore a *hybrid*: it is a real, social and discursive artifact.

The study of radio broadcast policy, an example of a specific IP study, involves the description of the régime of information, or the network, of which the artifact of radio is an element. Relevant questions are: Why did radio not take the form of a many-to-many

noncommercial medium of communication, something like yesterday's CB radio? How did it stabilize as a commercial, few-to-many broadcast medium?

According to ANT, neither reality, society or language can by themselves provide explanatory closure. The real, objective, scientific properties of radio fail to account for radio's final form because they may be easily deconstructed by appealing to the social relations among scientists and engineers, and to the social practices that delegated the construction of a passive audience for advertising and popular culture commodities to just one among a variety of competing assemblages of wires, transistors, and technological artifacts. The properties of radio, taken to be real and natural, are the products of practices determined by the social relations imposed by commodity production and consumption. A naturalistic, scientific reductionism also ignores the many discursive practices that create and maintain specific meanings in support of the few-to-many, broadcast form.

Yet specific scientific and natural facts are invoked, and the lines between nature and society are redrawn, when the reality of these social relations are at stake. What are the true interests of corporate capital, and how are they decided? Have late twentieth-century societies transcended class antagonisms? Does radio empower consumers by providing important information about consumer products, or does it position consumers as passive recipients of a corporate message? Settling the instabilities of the social relations mediated by radio is also part of its construction. The realism about nature so readily revoked by social constructivist accounts of scientific and technological artifacts is just as readily invoked in the construction of social structures. Thus the problem of establishing the real and objective social relations implicated in broadcast radio is delegated to the real properties of specific assemblages of scientific and technological artifacts. Explanations that fail to extend scepticism about the reality of nature to the reality of society easily overlook the crucial role of scientific and technological elements of networks.

Discourse is also crucial, but it too occupies no privileged theoretical position. Many discursive elements are mobilized to manufacture consent for broadcast radio as a régime of

information, and to construct the radio audience as a network element compliant with network structures already in place. Discursive practices contend to represent radio as a locus of consumer desires, dreams, longings and fantasies, and to position radio as indispensable to culture and daily life. But the instabilities of these discursive properties are settled by invoking stable properties of nature and society. Thus to speak about rhetorics, texts, and representations is not to inhabit a realm purified of nature and society, excluding all but signifiers and their relations. The discursive properties of radio are the products of the practices involved in constructing and maintaining the network in which radio as we know it today — a hybrid, a quasi-object simultaneously real, social, and discursive — emerges as a distinctive, more-or-less stable element. ANT's insistence on the interpenetrations of the discursive, the social and the real avoids a discursive reductionism in which reality and social relations disappear, as Brian Palmer puts it, in a “descent into discourse” (Palmer 1990).

The infobahn

The “information superhighway”, or the infobahn, is a régime of information currently in the making. Although not yet fully stabilized, the amalgam of social relations, science and technology, and discourses implicated in it is perhaps already too familiar. The political economy of information which, as Golding and Murdock explain, is “interested in the ways that communicative activity is structured by the unequal distribution of material and symbolic resources” (Golding, Murdock 1991, 18), provides an indispensable analysis of the social relations governing the infobahn's construction. Recognizing that the value of information “stems uniquely from its transformation into a commodity — a resource socially revalued and redefined through progressive historical application of wage labour and the market to its production and exchange” (Schiller 1988, 41), political economy directs attention to the role of capitalist social relations in stabilizing the form of the infobahn.

Social relations, however, are not the only elements of the network comprising this régime of information. In the terminology of ANT, all elements of the network, even the

nonhuman, are *actants*, since all exercise some form of agency.³ Thus scientific and technological artifacts are enrolled to delegate some of its crucial aspects. For example, the decisions between merely downstream versus both upstream and downstream communications capabilities, on which so many of the social and cultural characteristics of the network depend, are delegated to the properties of telephone wires, coaxial cables, and fibre-optic cables. The differences between the social properties of (i) an infobahn deploying coaxial cable feeding into a single fibre-optic cable from some 500 households, (ii) one deploying one fibre-optic cable for every six homes, and (iii) one adding Integrated Services Digital Network (ISDN) technology to standard telephone lines are analogous to the differences between few-to-many versus many-to-many radio broadcast systems (see Piller 1994). In both cases, the régime of information, thus an information policy, is built by practices in which nature and society are intertwined.

Discursive interventions further contaminate the already impure practices that draw and police the infobahn's uneasy borders between nature and society. These include the mountains of text, graphics, video and film — including legislation, committee minutes, special interest position papers, Prime Ministerial and Presidential press conferences and speeches, Web sites, articles in newspapers, *Wired*, *Mondo 2000*, *Future Sex* and their sister periodicals, television programmes, and much more — that together generate a degree of sympathy for the radical conclusion that the infobahn is a pure simulacrum, a mere signifier *sans* referent, floating freely through the degenerated hyperreality emanating from the implosion of the real. Although this régime of information indeed depends upon settling discursive relations between “infobahn” and other signifiers articulating consumer wishes, hopes, fears, fantasies and desires, the practices of its construction are not purely discursive. They are contaminated by those designed to stabilize the position and agency of specific social actors and specific scientific and technological artifacts.

³ In two paradigmatic papers of ANT, Callon attributes agency to the scallops of St. Brieuc Bay in France (Callon 1986), while Latour insists on the agency of doors (Latour 1992).

Conclusion

ANT has been vigorously debated in the research community of the social studies of science and technology (see, e.g. Collins, Yearly 1992; Callon, Latour 1992). But debates about the theoretical questions that currently remain open — the possibilities of antifoundational theory; scepticism about realism; the possibility of a symmetric metalanguage transcending realism, social constructivism and discourse analysis — should not prevent IP studies from taking advantage of ANT's benefits. Its rich analysis of the real, social, and discursive factors that are implicated in the construction of any scientific or technological network supports the interpretation of IP as the set of practices that stabilize and maintain a régime of information. It therefore brings within the purview of IP a wider range of issues and actors than are disclosed by the LIS perspective. Its explicit methodological recognition of the ways in which science and technology, social relations, and discourse are confounded and mutually implicated supports analyses beyond those of a naive instrumentalism concerned merely with information flow efficiencies. Its treatment of network elements as hybrids or quasi-objects embodies a methodological rigour which refuses to reduce explanations to either the natural, social, or discursive realm. Its acceptance of impure practices which intermingle these categories shifts the analytical focus away from the objects currently populating IP studies, whose reality is taken for granted and whose "effects" are charted by causal analyses. The object of analysis becomes the processes by which these objects and their relationships are constructed. Such an analysis widens the scope of IP studies, because it includes the assemblage of agonistic power relations that constitute a régime of information.

One of the reasons for studying information policy is to make intelligent and socially responsible interventions in the exercise of power and control over information. ANT's rich analysis of the complex and tentative nature of the policies — whether implicit or explicit — that result in the stability and maintenance of régimes of information can identify multiple

points of intervention. It is not limited, like much LIS writing in this area, to the narrow range of actions available to a mode of analysis that takes prevailing régimes as given, closed, and natural.

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