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# Communications infrastructure regulation and the distribution of control over content

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**Convergence renders problematic continued application of traditional concepts like universal and public service to address democratic values through communications regulation. The paper proposes an alternative approach based on assessing the impact of regulatory choices affecting communications infrastructure on social distribution of communicative capacities. It offers an approach to developing descriptive models to assess how law, in technological and organizational context, concentrates or distributes control over production and exchange of information in society. Normatively, it suggests how these distributive effects on the flow of information in society affect both individual autonomy and public discourse. © 1998 Elsevier Science Ltd. All rights reserved.**

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The technological, organizational, and market convergence of the two central models of remote communications in the past century—broadcast and switched point-to-point telephony—have led to a regulatory reshuffling.<sup>1</sup> One question that must be addressed in this transition is the role democratic values should play in shaping the new regulatory environment, and how these values should be incorporated into the emerging regulatory regime. In traditional telecommunications regulation, the democratic impetus found its primary expression in the effort to provide universal access to a minimal level of communications services. In traditional broadcast regulation, democratic values were pursued through the imposition of content regulation aimed at assuring that broadcast provide the diverse information necessary for an informed citizenry.<sup>2</sup> Neither universal service-type regulation nor public trustee/public service regulation have traditionally been imposed on the quintessential means of democratic expression, newspapers.

The challenge posed by convergence for policy makers concerned with serving democratic values is how to take these values into consideration in context of the transformation of communications infrastructure law. The cross-subsidization under girding universal service is difficult to sustain in the face of growing competition. Transposition of the intensive content regulation typical of broadcast to the Internet or a future broadband network raises significant concerns of governmental overreaching.<sup>3</sup> The question is what alternative approach might regulators take to incorporate democratic values into their regulatory choices concerning communications infrastructure regulation. This paper suggests that the most important social effects of communications regulation are to be found in the impact it exerts on the distribution of control over the flow of information in a society, and in the way in which that distribution affects individual autonomy and political discourse. The core claim is that communications infrastructure regulation should be focused on accentuating

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<sup>1</sup>See Blackman, C., Convergence between telecommunications and other media: how should regulation adapt? *Telecommunications Policy*, 1998, 22 (3), 163–170; Townsend, D., The changing role of government in an era of telecommunications deregulation, Briefing Report on Regulatory Implications of Telecommunications Convergence, Geneva, 1997. *The National Information Infrastructure Agenda for Action*, US Department of Commerce, Washington, DC, 1993.

<sup>2</sup>In the United States, this approach found its most prominent expression in the fairness doctrine endorsed in *Red Lion Broadcasting Co. v. FCC*, 395 US 367 (1968), and later abandoned by the FCC in 1985 Fairness Doctrine Report 102 F.C.C.2d 145. In Europe, the operative concept of public service has focused regulation on assuring that broadcast provide the diverse information necessary for the development of informed personal and public opinion. For example, the *Television III* case of the German Constitutional Court. 57 BVerfGE 295 (1981).

<sup>3</sup>See De Sola Pool, I, *Technologies of Freedom*. Harvard University Press, Cambridge, MA, 1984. The United States Supreme Court recently adopted this position when it invalidated the Communications Decency Act of 1996, *Reno v. ACLU*, No. 96-511 (26 June 1997).

<sup>4</sup>The fountainhead of the literature on the political economy of communications is the work of Canadian economist Harold Innis. Innis, H., *The Bias of Communications*. University of Toronto Press, Toronto, 1951; Innis, H., *Empire and Communication*. Clarendon Press, Oxford, 1950. For an excellent brief description of Innis's work, see Carey, J., *Communications and Culture*. New York, 1989, pp 142–169. Some detailed studies have offered insights into the process by which a technological shift interacts with institutional choices and organizational arrangements to effect the pattern of communications in society. Eisenstein, E. *The Printing Press as an Agent of Change*. Cambridge University Press, Cambridge, 1979; Barnouw, E., *A Tower in Babel*, Oxford University Press, New York, 1966; Beniger, J., *The Control Revolution*, Harvard University Press, Cambridge, MA, 1986. Others working in this tradition since Innis, most notably Innis's student Marshall McLuhan, have evolved in the direction of what has been termed 'medium theory', which focuses more on the inherent biases of the technology, and less on the social institutions for its deployment. Meyrowitz, J., Medium theory. In *Communications Theory Today*, ed. D. Crowley and D. Mitchell. Standard University Press, Stanford, CA, 1994, pp 51–52. The approach in this paper follows the former of the two strands spawned by Innis's work.

<sup>5</sup>The term 'institutional economics' is ambiguous, in that it refers to both 'old' and

those attributes of digital information technology that make it a potential vehicle for achieving a broad distribution of access to, and participation in, the social processes of knowledge production. The objects of this paper are therefore (1) to outline how it is that power over knowledge is distributed by communications regulation; (2) to suggest that regulators prefer regulatory alternatives that tend to encourage technical and organizational diffusion of communicative functions in society over alternatives that tend to encourage centralization of the production, processing, storage, and transmission of information; and (3) to alert regulators and the publics affected by their regulations to the implications of decisions that are too often perceived as technical and boring, rather than intensely political and crucial to the democratic life of the societies that make them.

## Theoretical framework

### *Communications technology, law, and the distribution of control over knowledge*

The confluence of three lines of theoretical writing: the political economy of communications,<sup>4</sup> institutional economics,<sup>5</sup> and the economics of path dependency,<sup>6</sup> suggests a feedback effect among technology, institutional framework, and organizational adaptations, that produces a historically contingent, but robust, distribution of power over the knowledge environment of a society. Different societies, introducing the same technology at different times and within different institutional parameters, are likely to experience different social distributions of the capacity to affect information flows.

The technologies a society uses to produce, process, store, and communicate information affect the pattern of information flow in that society. While technological attributes do not determine patterns of communication, there are patterns that are more easily attainable with one technology or another. In this sense, it could be said that communications technologies have 'biases' that affect the patterns in which societies that utilize those technologies interact with and around information and knowledge. Script recorded on parchment codex, for example, is biased towards high concentration of information storage and reproduction and a close tie between reproduction and the production, processing, and communication of the knowledge stored. These biases contributed to a relatively conservative (conservationist) approach to knowledge, centralized in the hands of copyists;<sup>7</sup> hence, the monastic knowledge monopoly. Print on paper has different biases. Its primary advantage over parchment-based manuscript was its capacity to produce relatively large numbers of consistent copies in a relatively light medium. These attributes are closely linked to the displacement of the monastic knowledge monopoly by the social practices of authorship and personal comparative study, the concept of originality, and the spread of vernacular literacy.<sup>8</sup>

Technological biases interact with social patterns for using a communications technology, one of whose determinants are the formal institutional constraints on how the technology is used—the laws regulating that use. The availability of small printed volumes, for example, made possible the spread of literacy and the standardization of the vernacular through widespread reading of identical texts,<sup>9</sup> but the timing and geographic pattern of the spread of literacy implies that legal and religious rules supporting vernacular Bible-reading were a significant element in this development.<sup>10</sup>

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'new' institutional economics. Old institutional economics refers to a loose clustering of scholarship rooted in the work of John R. Commons and Thorstein Veblen, which rejects the neoclassical assumptions of exogenous preferences and technology, and hence the possibility of unique equilibria, as opposed to the possibility of multiple equilibria, each of which can be stable given a set of institutional constraints. This rejection leads scholars in the old institutionalist vein to a broad range of studies into how institutions get determined, and how that determination affects the pattern of distribution of preferences and choice sets, and, hence, equilibrium allocations. A focus of the old institutional economics that is particularly pertinent to the analysis offered here is the focus on how legal rules distribute the capacity to control outcomes of transactions, and hence distribute freedom and the capacity to exert mutual coercion among actors in society. Commons, J. R., Institutional Economics. *American Economic Review*, 1931, 21, 648-657. Within this tradition, a particularly valuable conceptualization of the relationship between legal institutions for economic exchange and the distribution of power/freedom in society was developed by Robert Lee Hale, Hale, R., Coercion and distribution in a supposedly non-coercive state. *Political Science Quarterly*, 1923, 38, 470-479; Samuels, W. J., The economy as a system of power and its legal bases: the legal economics of Robert Lee Hale. *University Miami Law Review*, 1973, 27, 261. The new institutional economics refers to an equally loose association of scholars, who challenge neoclassical economics largely from a more sympathetic stance, but are nevertheless concerned to describe economic progress from the perspective of the reality of imperfect markets or imperfectly rational actors. These scholars usually focus on some, though not all, of the challenges posed by transaction costs, political economy and public choice, quantitative economic history, and the role of path dependence or of behavioral limitations on rationality. Drobak, J. N. and Nye, J. V. C., *The Frontiers of the New Institutional Economics*. Academic Press, San Diego, 1997, pp xv-xx. The present paper draws heavily on the more recent work of Douglass North, one of the central figures of new institutional economics, in which he develops a framework for positive or descriptive institutional analysis that integrates all of these challenges to neoclassical economics, and hence forms what seems to be the closest bridge between the analytic power of the new, and the fullness and political clairvoyance of the old institutional economics. North, D., *Institutions, Institutional Change, and Economic Performance*. Cambridge University Press, Cambridge, 1990.

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Law affects social patterns of behavior through the viscous medium of adaptations that organizations and individuals make to the institutional framework that applies to them.<sup>11</sup> The social consequences of a law that affects use of a communications technology are therefore not to be found in tags such as 'infrastructure regulation' or 'content regulation'. Rather, to determine those consequences it is necessary to identify the direction and amplitude of the impact of the rule on the social patterns for use of the technology. When, beginning in 1922, the US Department of Commerce allocated clear channels to broadcasters who used high-powered transmitters (infrastructure rule) and did not program by playing phonograph records (content regulation), for example, the two components of the policy worked in tandem to favor the development of networked commercial broadcasters at the expense of stations operated by educational and religious organizations.<sup>12</sup> These networks, in turn, came to occupy a central role in producing public perceptions of the world whose communicative environment they dominated.

Through a reflexive relationship with the institutional framework to which they respond, individual and organizational adaptations entrench incumbent social relations and the institutional arrangements that facilitate them. There is, in other words, a phenomenon of institutional and adaptive lock-in, whereby an incumbent institutional framework resists changes made possible by technological shifts, and organizations operating within a model developed with an old technology will attempt to interpret and fit the new technology into the old patterns of use.<sup>13</sup> In response to technological and institutional constraints, including law, organizations and individuals develop a way of doing things within these constraints. The constancy and predictability of this 'way of doing things' is valuable to everyone who similarly adapts to the framework, because it facilitates coordination among actors whose behavior is thereby made more predictable. The more people adhere to this way of doing things, the more valuable it is to all those who so behave. In this sense, an institutional framework and organizational adaptations to it can be said to have network effects.<sup>14</sup> Furthermore, institutional frameworks involve significant learning effects. Once individuals and organizations have expended time and resources to optimize their behavior given a set of rules, they are well tailored to fit the existing institutional framework. A shift entails new learning costs. Finally, perceptions of what is efficient or desirable are shaped over time to reduce the perceived opportunity cost of the stable condition in which a society exists. As an institutional framework persists over time, people who live in it develop better justifications for its continuation, and filter out information whose assimilation could require the expenditure of resources on institutional transformation and involve the risk of uncertain patterns of redistribution.<sup>15</sup>

The persistence of social behavioral patterns has a feedback effect on the path of technological development. Organizations invest in technology that has the highest value within a given pattern of use. The pattern is then reinforced by the availability of the technology to facilitate it. The path of development of high definition TV, and the insistence (in the face of digitization) of Congress and the FCC on replicating the traditional NTSC broadcast environment in digital TV, is a quintessential instance of this effect.

The result is a positive feedback mechanism whereby technology, institutional framework, and organizational adaptation reflexively reinforce each other's development. Combined, these factors produce a historically

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<sup>6</sup>Path dependence explains economic outcomes, under certain ubiquitous conditions, as products of historically contingent processes. A classic source for understanding economic performance in path-dependent terms rather than as the necessary outcome of economic logic is Piore, M. and Sable, C., *The Second Industrial Divide: Possibilities of Prosperity*. Basic Books, New York, 1984. The historical insight of path dependency offered by Piore and Sable was formalized, primarily in context of technological development, by W. Brian Arthur and David Paul. Paul, D., *Understanding the economics of QWERTY: the necessity of history*. In *Economic History and the Modern Economist*, ed. W. N. Parker. Basil Blackwell, Oxford, New York, 1986; Arthur, W. B., *Competing technologies, increasing returns, and lock-in by historical events*. *The Economic Journal*, 1989, 99, 116.

<sup>7</sup>See Innis, *op. cit.* Ref. 4; Eisenstein, *op. cit.* Ref. 4; McLuhan, M., *The Gutenberg Galaxy, the Making of Typographic Man*. University of Toronto Press, Toronto, 1962.

<sup>8</sup>Eisenstein, *op. cit.* Ref. 4; McLuhan, *op. cit.* Ref. 7; Innis, *op. cit.* Ref. 4.

<sup>9</sup>McLuhan, *op. cit.* Ref. 7.

<sup>10</sup>Eisenstein, *op. cit.* Ref. 4.

<sup>11</sup>North *op. cit.* Ref. 5.

<sup>12</sup>Barnouw, *op. cit.* Ref. 4; Archer, G. *History of Radio to 1926*. The American Historical Society, New York, 1938.

<sup>13</sup>The attributes of institutional lock-in are similar in some respects to the attributes of technological lock-in. North, *op. cit.* Ref. 5. Arthur, *op. cit.* Ref. 6. Paul, *op. cit.* Ref. 6.

<sup>14</sup>For a comprehensive discussion of network externalities, see Economides, N., *The economics of networks*. *International Journal of Industrial Organization*, 1996, 14, 673-699.

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contingent pattern of information flow in society, which, once set, acquires a robustness to change through familiar mechanisms of path dependent development.<sup>16</sup> These factors determine, for a given society, on a given path, who can produce information, and who may or must consume, what type of information, under what conditions, and to what effect.

### Institutional constraints, organizational adaptation, and communications models

Through the process described in the preceding section, laws regulating communications affect the distribution of functions involved in the production and exchange of human communications. Organizations and individuals operating in a given institutional framework adapt their behavior—their investments of time, money, thought, action—to assume different clusters of these functions, based on their perceived utility given the conditions created by the institutional framework. The pattern of distribution of these functions will, in turn, affect the distribution of power over the information environment in which these actors operate.

Figure 1 represents a simplified model of the communications functions comprising one channel of communications connecting two individuals.<sup>17</sup> Assume that each individual is situated at the center of a web of such channels, that the strands of the web connect to others, and that each individual is sometimes at the production end and sometimes at the reception end. The communicative environment of a society is the aggregation of all these individual webs.<sup>18</sup> Institutional (including legal) constraints on communication and organizational adaptations to these constraints affect who fulfills which of the functions involved in the communications process, and hence the location of control over the various communicative functions that make up a channel. Figures 2–4 describe three different communications models, each defined by how these functions cluster into different organizational patterns.

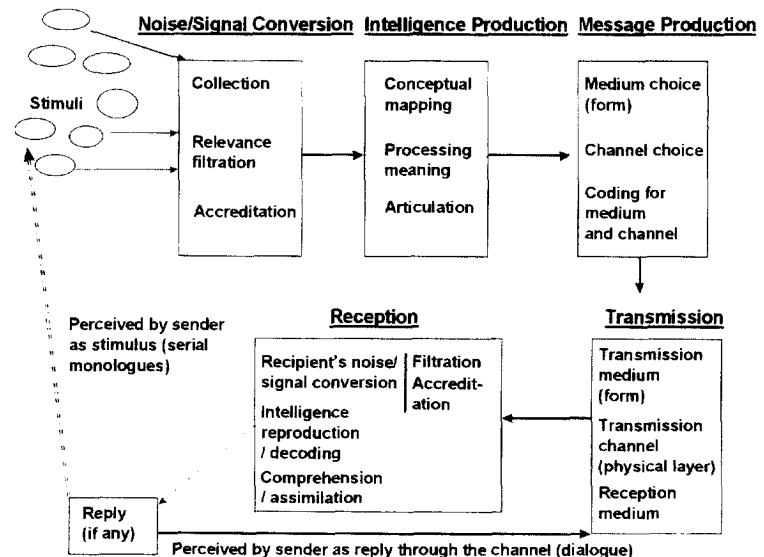


Figure 1. Communicative functions in a communications channel.

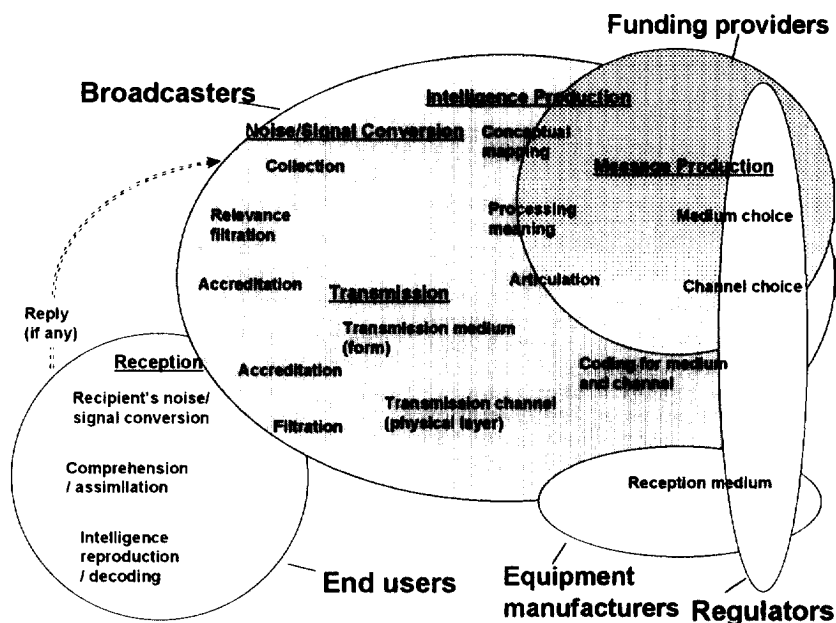


Figure 2. Communicative functions in a broadcast model.

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<sup>15</sup>See North, *op. cit.* Ref. 5. It is rational for organizations well adapted to an institutional framework to invest in developing perceptions of the existing institutions and their alternatives that stabilize the existing institutions, as long as the cost of producing these perceptions is lower than the cost of an institutional transition (transition cost plus value reallocated away from the organization in the new framework)

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The broadcast model described in Figure 2 arises from a series of regulatory and organizational choices that led to adoption of the roles of producers and consumers of information in this model. The technological state of radio in the third decade of this century created an advantage for a model based on asymmetry between few broadcasters and many listeners. The other alternatives for using radio communications at the time: wireless telegraphy in a common carrier model and end-to-end low-power transmitter-receivers on the amateur model, could not sustain a mass market in radio equipment, since equipment capable of transmission was expensive and controlled by a patent-based oligopoly. The broadcast

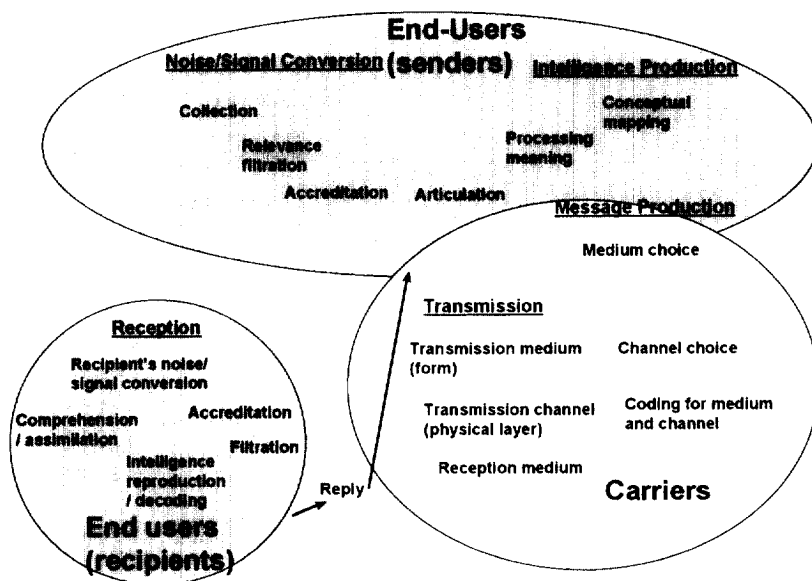


Figure 3. Communicative functions in a telephony model.

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discounted by the change in the probability of its occurrence as a result of the investment.

<sup>16</sup>North, *op. cit.* Ref. 5.

<sup>17</sup>The concept of modeling communications processes through linear diagrams leading from transmitter to receiver in order to identify potential failures in the transmission is based on the classic work of Claude Shannon. Shannon, C.E. and Weaver, W., *The Mathematical Theory of Communication*. University of Illinois Press, Urbana, 1949. Process models developed thereafter to consider the act of communication more generally were vulnerable to the critiques of the linguistic tradition. The strict separation of subject (information source) from object (recipient); the assumption that meaning preexists communication, and that the individual produces meaning self-referentially, and the absence of power in the process of the production of meaning, combined into the statement that process modeling was 'the vulgar packaging theory of communication'. Fiske, J., *Introduction to Communication Studies*, Routledge, London, New York, 1990, p 26 (The statement is attributed to I. A. Richards). More recently, there has been some attempt to revive the use of process modeling to track the effects of social behavior on communications flows. Leiss, W., *Risk communication and public knowledge*. In ed. D. Crowley and D. Mitchell, *op. cit.* Ref. 4. The present paper draws on this neglected (at least in social analysis) tradition of process theories of communications, because these models can provide a helpful, though admittedly crude, map of the communicative functions involved in social communications. With this map, however crude, it

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model made possible the sale of millions of simple receivers and the rapid distribution of access to centrally produced information. This initial advantage was significantly enhanced in the United States by regulatory policies that favored high-powered, expensive transmitters operated continuously, over low-power part-time transmitters, like those used at the time by universities, religious groups, unions, and some amateurs, that could have facilitated a less centralized model of content production. These regulatory policies were expressed as licensing preferences for commercial broadcasters affiliated with networks.<sup>19</sup> In Europe, the possibility of decentralized production was foreclosed by the ubiquity of national broadcast monopolies.<sup>20</sup> The asymmetry between broadcast licensees and putative end-users creates different incentives for investment in human and machine resources for the collection and processing of information that could flow over wireless communications facilities.<sup>21</sup> These incentives have favored concentration of most of the communicative functions in the hands of broadcasters.<sup>22</sup> Broadcasters therefore produce programming and transmit it to end-users. End-users have relatively little control over those components of their personal knowledge environment that operate on a broadcast model. Their control is limited to deciding whether to participate in the model at all, and if so, to which among a defined range of incoming messages they will pay attention. To the extent that a society's knowledge environment is composed in significant proportion of channels operating on a broadcast model, control over social knowledge in that society is located to a great extent in organizations that have the 'broadcaster' role or the 'funding provider' role (be they advertisers or government sponsors) in these channels.

The telephony model described in Figure 3 arose primarily from organizational decisions regarding, and the technical limitations of, wireline voice telephony at the turn of the century. These choices were later solidified by legal constraints imposed to ratify the model.<sup>23</sup> The common carriage attributes of this model provide end-users greater incentives to collect and process information than does the broadcast model. The telephony model therefore reflects a broader distribution of the capacity to

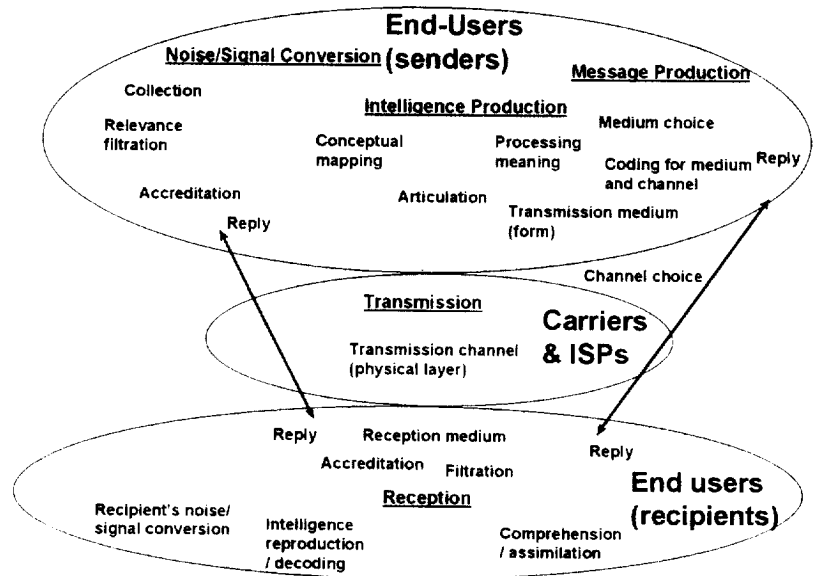


Figure 4. Communicative functions in an internet model.

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becomes possible to track, as Figures 2-4 attempt to do, the patterns of the effects of infrastructure regulation. The model is intended as a starting point for that exercise, rather than a claim that the linear depiction exhaustively describes the complex reflexive relationships that make up a communicative act, and its components are intended to reflect some of the complexity brought in by the recognition of the situated and constrained nature of communicative acts.

<sup>18</sup>The assumption is based on the absence, as yet, of artificial intelligence capable of reflecting organizational preferences, leaving, for the time being, all decision-making power in society in the hands of individual human beings, acting alone or in concert.

<sup>19</sup>Barnouw, *op. cit.* Ref. 4; Archer, *op. cit.* Ref. 12.

<sup>20</sup>Pool, *op. cit.* Ref. 3.

<sup>21</sup>Benkler, Y., Overcoming agoraphobia: building the commons for the digitally networked environment, *Harvard Journal of Law and Technology* (1998), 11 (forthcoming). The primary attribute of the asymmetry is that licensees decide how wireless transmissions will be used, by whom, and when; while users decide whether to use wireless transmissions within the parameters set by the licensee. To exploit this asymmetry, licensees will attempt to calibrate their unilateral decision so as to entice users who, in the aggregate, will pay the most for the privilege of using wireless transmission in the manner chosen by the licensee. Users of spectrum, on the other hand, cannot control the use of spectrum. Expenditures on their part towards obtaining full information about how wireless communications might be used, developing and articulating their own utility function with respect to the full range of possible uses, and processing that information to identify their own first-best uses of wireless communications, would be irrational. They would not be able to impose their preferences if they did make the expenditures and accurately articulated their preferences. Unless their preferences happened to coincide with those of many others, or unless they incurred further costs to coordinate their preferences with those of others through mutual persuasion, the costs of articulating a preference order would be wasted. The most likely benefit of their investment would be an increased capacity to identify which, among the menu of options offered by the owner, is the closest second-best. The likely outcome of the asymmetry is therefore that individuals will attempt to shift the costs of articulating the menu of potential uses of wireless communications to the owners of transmission rights, and will limit their expenditures to those associated with choosing from the menu arrived at by owners, after the universe of options is defined. The cost-benefit analysis of transmission rights holders

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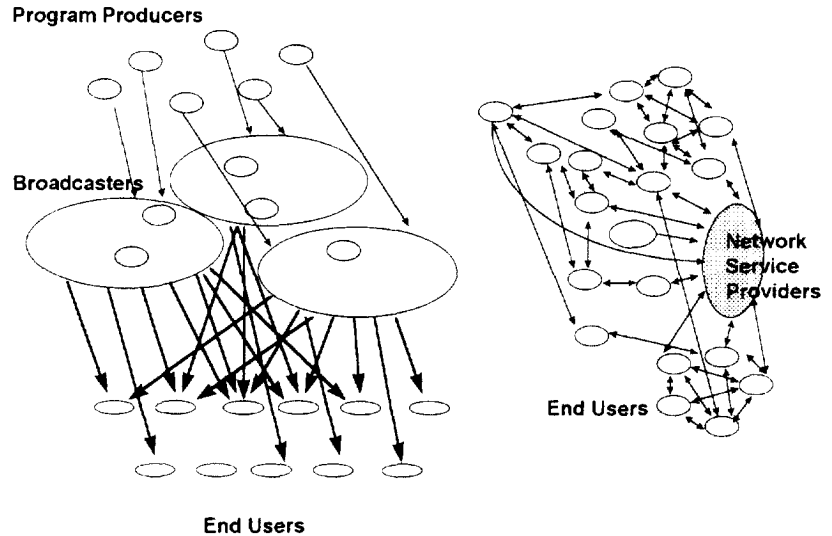
originate the intelligence flowing over the channels. But because machine-processing power in the telephony model is centralized in switches controlled by carriers, many of whom were traditionally regulated or state-run monopolies, this model is typified by a high concentration of the functions involved in transmission. This concentration radiates back to define and limit the options available to express the intelligence a sender wishes to convey.<sup>24</sup> It was the introduction of sophisticated customer premises equipment that made possible use of telephone lines for broadcast-like transmissions, many-to-many conferencing, or other communications forms that require transmission capabilities different from one-to-one, real-time voice communication, and began the shift of telephony towards what is described below as the Internet model.

The two models, broadcast and telephony, have defined the range of options for remote communications in our society throughout most of this century. Most contemporary discussions of convergence in the communications industry speak in one form or another about the convergence of the technologies, organizations, and institutions that gave rise to, and evolved around, these two communications models. The most prominent model contemplated to inherit their place as a result of the digitization of communications technology is the Internet model described in Figure 4. Like the telephony model, it reflects a high degree of individual control over the intelligence flowing over the channel. But it also distributes broadly many of the other communicative functions. The difference between the telephony model and the Internet model is due in large part to the reliance of the Internet on broadly distributed machine-processing capacity, which can be used to decentralize many of the communicative functions that are centralized in either or both of the older models.

Each of the preceding descriptions outlines the implications of each model for a single channel of communication. Aggregating the effects of each model at a society-wide level suggests that, whether one or another of the models is predominant can lead to quite different patterns of distribution of control over the communicative environment within which a society lives. A society that relies heavily on communications in the broadcast model will tend to have a concentration of the functions of content production, relevance filtration, accreditation, form/medium shaping, and carriage management. The organizations fulfilling these functions will play a relatively large role in controlling knowledge and public discourse in that society, and will play a central role in producing and clearing information flows in the society. Conversely, a society that operates on an Internet model will have more broadly distributed control over these same functions, and utilization of that model will result in quite different information flow patterns. Figure 5 depicts the difference in information flow patterns likely to result when a broadcast model or an Internet model is the dominant model for the communications channels of most individuals.

### Present regulatory choices affect the pattern of communications in the information society

One should be wary of predictions that digitization, or technological convergence, will inevitably result in the displacement by the Internet model of both the broadcast and telephony models. As explained earlier in this paper, the best available studies of previous shifts in communications



**Figure 5.** Broadcast vs. internet models: aggregate effects.

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entails maximizing captured payments from users, and minimizing production costs (including content production, if any, as well as flow management) plus transaction costs (including initial costs to identify the best use of the transmission right and continuing costs of obtaining information feedback, measuring value to end-users, negotiating appropriation of that value, and enforcing negotiated agreements). This determination, in turn, would tend to constrain the menu of choices available to end-users to those that cluster around the peak of the normal distribution curve of expected user preferences.

<sup>22</sup>Centralization of the communicative functions has made regulation seem both more necessary and simpler to implement than in communications models where the functions related to content production and structuring are more broadly dispersed. Similarly, the dispersion of end users in the broadcast model has created an important organizational subcategory that overlaps with some of the broadcaster functions, funding providers. These include primarily advertisers and government patronage, which have fulfilled this role both as to audiovisual radio broadcasting and modern print publishing, the two prototypical information industries operating on the broadcast model. Channel owners have traditionally been subsumed under broadcasters, either by direct ownership of distribution facilities or because the relative concentration of communicative functions by broadcasters has made them more powerful *vis-à-vis* their distribution channels—broadcast stations or bookstores.

<sup>23</sup>Wireline communications need not necessarily have developed into a point-to-point

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technology, like the introduction of print, telephony, or radio transmission, suggest that technology alone does not determine the path of development for its use. Rather, the dominant communications model of a society is determined by a complex interaction among the attributes of the technology a society uses, the regulatory framework affecting its deployment, and organizational adaptations to the technology and the institutional constraints.

There is, then, no reason to think that digital technology will ‘force’ society to pattern its communications channels in the Internet model, anymore than radio transmission ‘forced’ the development of the broadcast model, or wireline telephony forced a point-to-point switched model. To the extent, therefore, that a society reaches the political judgment that one model is better (in a political, economic, or other relevant dimension) than another, it must pursue the development of that model through deliberate regulatory action intended to create the conditions likely to lead to the evolution of that model. Conversely, a society acting without taking account of the pattern of communications its actions will foster may find itself locked in to a path that it would not have chosen had it considered its implications *ex ante*.

Two contemporary institutional choices in the United States illustrate the point. The first choice concerns two orders issued by the FCC in early 1997 that work at cross purposes in terms of their effects on how digital technology will affect information flow patterns: the DTV and U-NII Orders. The second choice involves the institutional framework for introducing telephone companies into the video programming delivery market.

#### *DTV versus U-NII*

In January 1997, the FCC identified a 300 MHz band of radio frequencies in which it permitted devices capable of high-bandwidth, high-speed data transmission rates, and capable of multiplexing—sharing spectrum without exclusive transmission rights—to operate without an individual license. This decision (the U-NII Order)<sup>25</sup> effectively creates a spectrum



commons, available as unowned infrastructure for anyone who buys equipment capable of using it. The U-NII Band would allow individuals and organizations to purchase computers with radio communications capabilities, with sufficient bandwidth to support voice and video communications as well as much higher data transmission rates than those available from most facilities today (up to 20 Mbps). Because the institutional constraints on use of this spectrum are symmetrical for all users; because there is no obvious central organization that will provide the role of infrastructure manager, and no technical need for one; and because both spectrum sharing techniques and the definition of equipment eligible for using the spectrum require broadly distributed machine-processing capabilities in a network based on unlicensed wireless devices, the U-NII Band all but requires that its uses be patterned on the Internet model of communications.<sup>26</sup>

In April 1997, the FCC allocated spectrum for a different set of uses, with radically different implications for the development of information flow using digital communications technology. This decision (collectively, the DTV Orders) was the allocation of 270–300 MHz of broadcast spectrum for digital television services.<sup>27</sup> Based on an express commitment to preserve the broadcast model of communications for video programming, the FCC replicated in its allocation decision the current market structure in terrestrial television broadcast. First, each existing broadcaster received an allocation for digital television transmission that covers the same market it serves by analog television transmissions.<sup>28</sup> In addition to this ‘infrastructure regulation’ decision, the FCC imposed a ‘content regulation’ by defining the basic service that licensees of these allocations are required to provide as: ‘free digital video programming service the resolution of which is comparable to or better than that of today’s service and aired during the same time periods that their analog channel is broadcasting.’ The FCC also applies to these licensees the same public interest obligations—i.e. content requirements—applicable to analog broadcasters.<sup>29</sup> Construction and ‘spectrum recovery’ requirements in the Order will force broadcasters to construct the capabilities for digital television transmission within two to five years, and will require all analog television broadcasts to cease within 10 years. The combined effect of the DTV Orders is that all American households that wish to receive over-the-air video programming will have to purchase expensive new equipment capable of receiving high definition television signals, and all licensees will have to transmit at least some programming in the traditional broadcast model of communications.

The U-NII Order and the DTV Orders push in diametrically opposite directions. The former would encourage the development of an Internet model of communications for the digitally networked environment, if end-users invest hundreds of dollars in home equipment capable of operating in a distributed, high-bandwidth data-transmission environment. The latter would encourage development of a broadcast model of communications for digitally encoded information, if end-users invest hundreds of dollars in buying equipment whose primary design specification is that it can passively receive high-resolution video images. Each institutional arrangement—the U-NII Order and the DTV Orders—is biased towards one model or the other, and unless American consumers will invest in both pieces of equipment during the same time period, one, quite likely the DTV option, will dominate.

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switched medium. AT&T’s initial decision to develop its telephony on a point-to-point model was a self-conscious organizational choice to forego what some at the time thought of as an equally valuable use of telephony—broadcast. This decision was thereafter solidified by a commitment made by AT and T to the US Department of Justice in order to avoid antitrust liability, and a decade later by contractual agreements with RCA, GE, and Westinghouse, that kept AT&T out of broadcast and left wireline communications separate from the production of content. See Barnouw, *op. cit.* Ref. 3. In the planned economy of the Soviet Union, on the other hand, wireline technology was for a significant period used in a broadcast model. See Pool, *op. cit.* Ref. 3.

<sup>24</sup>Because in the telephony model the primary concentration occurs at the layer of communicative functions performed in the transmission channel, the power relationship between distribution channel owners and content producers is reversed relative to the broadcast model. An important reason for the clashes between the cable industry and the over-the-air television broadcasters in the United States in the past two decades can be traced to the intermediate position that cable systems occupy between these two models, due to the absence of a clear center of gravity for communicative control in this new channel for distributing audiovisual programming.

<sup>25</sup>The abbreviation stands for ‘Unlicensed-National Information Infrastructure’, and reflects the Commission’s aspiration that the U-NII Band could provide a part of the local infrastructure for the information infrastructure, either replacing LANs or providing a potential local loop for community networks.

<sup>26</sup>For a more complete discussion of the U-NII Band and its implications for spectrum management policy, see Benkler, *op. cit.* Ref. 21.

<sup>27</sup>Fifth and Sixth Report and Order, *In the Matter of Advanced Television Systems and Their Impact Upon the Existing Television Broadcast Service*. MM Docket No. 87-268, FCC 97-115, 97-116 released 21 April 1997.

<sup>28</sup>Sixth Report and Order, *op. cit.* Ref. 27.

<sup>29</sup>Fifth Report and Order, *op. cit.* Ref. 27, paragraph 28.

*Video dialtone versus open video systems*

In 1992 the FCC adopted its Video Dialtone Order (VDT Order).<sup>30</sup> This order would have expanded a variant of the telephony model of communications into the market for video programming. The VDT Order would have allowed telephone companies to provide conduit services for video programming produced by others. Because the institutional structure would have completely separated conduit from content production, income for the telephone companies would have increased with bulk, irrespective of content. To create bulk, the model of communications that would have been most lucrative would have assured carriage services for the greatest number of programming producers possible (to tap the greatest transmission demand), and enabled viewers the greatest degree of control over the content entering their home (to tap the broadest reception demand). Furthermore, the VDT Order created an additional profit center for carriers by permitting them to provide non-carriage services oriented towards giving viewers greater control over the presentation, storage, and manipulation of the video signals received. These institutional decisions would likely have resulted in some hybridization of the telephony and Internet models for a type of communication—video programming—that had traditionally been dominated by the broadcast model.<sup>31</sup>

In the Telecommunications Act of 1996 Congress adopted an institutional framework for telephone company entry into the video programming market that does not similarly separate content production from conduit ownership.<sup>32</sup> First, the Act gave telephone companies the option to adopt any business model, and hence communications model they chose (including common carriage and broadcasting), and be subjected to the regulatory framework applicable to that model. Second, telephone companies were given the option to adopt an institutional framework newly created by the Act, the open video system.<sup>33</sup> The primary difference between the two approaches is that the open video system allows telephone companies to provide their own programming, whereas the VDT Order allowed them to provide only carriage services. Only if demand for video carriage services exceeds system capacity must the telephone company, under the Act, limit its own programming to make room for that of others.<sup>34</sup>

Incentives created by this linkage of content and conduit are quite different from those of a common carriage framework like the VDT Order. A common carrier increases profits by increasing bulk, irrespective of the content carried. Programming providers, on the other hand, prosper by concentrating attention on their own programs at the expense of programs offered by competitors. To the extent an operator of an open video system can configure its system to limit access for competing video programmers and to limit the capacity of viewers to avert their attention from its own programming, that operator will increase its revenues from content production. If the increased income exceeds the lost income from carriage of competing programming, the system operator will have an incentive to limit the carriage services it offers competing programming. For example, the 1996 Act does not clearly prevent a system from offering fully programmed channel allocations on a nondiscriminatory basis, but refusing to offer capacity for individual programs by providers who cannot fill a 24 h programming schedule. This choice alone would significantly increase entry barriers for programming producers. It would provide a more hospitable environment for organizations that concentrate the functions of

<sup>30</sup>Second Report and Order, Recommendation to Congress, and Second Further Notice of Proposed Rulemaking, 7 F.C.C. Rec. 5781, 1992.

<sup>31</sup>The VDT Order was not implemented, however, because federal courts of appeals found that it unconstitutionally prevented telephone companies from controlling the content of programming on infrastructure they owned. *Chesapeake and Potomac Tel. Co. v. United States*, 42 F.3d 181 (4th Cir. 1994); *U.S. West, Inc. v. United States*, 48 F.3d 1092 (9th Cir. 1994). Both decisions were vacated and remanded by the US Supreme Court after the passage of the Telecommunications Act of 1996, for consideration of whether they were rendered moot by the Act. 116 S. Ct. 1036-1037.

<sup>32</sup>Telecommunications Act of 1996, Pub. Law 104-104 Section 302.

<sup>33</sup>Telephone companies who adopt this model will be rewarded by removal of some regulatory burdens associated with cable operations.

<sup>34</sup>In no event is the operator of an open video system required to reduce the portion of its capacity occupied by programming of its own choosing below one-third of capacity.

originating video programming and defining a menu of options available to viewers, than for organizations that originate programming without similarly packaging viewing options. Similarly, facilities that allow users to manipulate programming, for example 'fast forward' (to skip commercials) or replay, are facilities that transfer value from the programming provider to the viewer. A conduit operator that garners much of its revenue as a program provider will have less incentive to provide these facilities than one that profits solely from carriage and manipulation facilities. A carrier that also provides programming would therefore tend to concentrate control over the communicative functions involved in reception of a message, as well as in its origination and transmission. The expected organizational response to the open video system approach, as compared to a carriage system that separates content from conduit, is therefore more likely to cause the communications model offered within the open video system regulatory framework to be closer in structure to the broadcast model than to the Internet model.

The institutional choices to adopt open video systems rather than video dialtone, or to foster the deployment of high definition television as well as U-NII devices, are stark examples of institutional choices that can affect information flow patterns in society. They are by no means the only choices that could have such effects. Any institutional choice that affects the incentives of individuals and organizations to shape their use of communications facilities has similar implications. For example, imposing contributory or vicarious liability on internet service providers for offering the facilities over which users have transmitted prohibited content, such as defamatory material, copyrighted material reproduced without a license, or sexually offensive or otherwise regulated content, will tend to foster a more centrally controlled communicative environment,<sup>35</sup> while immunity from such liability for service providers who refrain from controlling the content of information carried on their network tends to foster a more broadly distributed model.<sup>36</sup> An important challenge for regulators operating in any field that affects communications infrastructure organization is to identify the likely effects of their decisions on the pattern of information flow over the communications facilities affected by the regulatory action. Understanding and expressly addressing the consequences of a regulatory decision for the pattern of information flow over the affected infrastructure is a crucial step towards making informed decisions about communications regulation.

<sup>35</sup>For a broader description of US cases and statutory choices following such a path see LRN, MCI, and Benkler, Y, *Rules of the Road for the Information Superhighway, Electronic Communications and the Law*. West Publishing, St. Paul, Minnesota, 1996, pp 330-350.

<sup>36</sup>See Telecommunications Act of 1996, Section 502 (amending 47 U.S.C. Section 223(e)). The section exempts from liability for indecent or obscene transmissions any person whose role has been 'solely . . . providing access or connection to or from a facility, system, or network not under the person's control, including transmission, downloading, intermediate storage, access software, or other related capabilities that are incidental to providing such access or connection that does not include the creation of the content of the communication'. While the indecency provisions as to which this exemption applies have been struck as unconstitutional, the approach remains in force as to obscene materials, and, more importantly, is instructive as a general approach to immunizing carriers from liability, so long as they play a passive transmission role in the communications model they facilitate.

### **Communications models and self-governance in a democratic society**

The focus of the discussion to this point has been positive, asking how we might predict at least the direction, if not the magnitude, of the effects of regulatory choices on the pattern of information flow in a society. Assuming one accepts the proposed (or a similar) descriptive framework, evaluating the implications of regulatory choices still requires a conception of the social-political implications of the social prevalence of one or another communications model. Normatively, the impact of various information flow models can be most clearly identified by their effects on the capacity of both individuals and communities to exercise self-governance in a society typified by one model or another.

<sup>37</sup>The primary objections to this conclusion are (a) centralization of communicative functions is efficient; and (b) too broad a distribution of communicative capacity will lead to atomization.

The first argument, call it 'the division of labor' argument, relies on the notion that centralized communications models developed because they play an important function. To be able to govern oneself effectively, one needs time and attention to order one's preferences and plan a course of action. If one needs to devote too much time to information collection, filtration, accreditation, processing, etc., one is left with less time and attention to perform the most important function of self-governance-making choices. The primary answer to the division of labor argument is that the Internet model relies on significant distribution of machine-processing power, and the theme of distributed communicative capacity is to replace centralized organizational processing with distributed machine processing. This transition avoids the power shift that occurs when some of the communicative functions are organizationally centralized in order to capture the economies of specialization, and relies on flexibly customizable equipment to provide the communicative functions without constantly employing individual resources, while maintaining the control acquired by fulfilling that function in the hands of the individual equipment owner.

The second argument, call it the Babel objection, is that distribution of communicative capacity will lead to atomization, rather than to better political discourse. There undoubtedly is a reasonable likelihood that centralization of cultural production is an important way in which communities are built, and that in the absence of such centralization political communities will suffer atomization. The Babel objection relies on a relatively static conception of community that exists prior to and independent of individuals, who, in the absence of stabilizing cultural centralization, will disperse. The primary answer to the Babel objection is that fragmentation and recombination are precisely how human communities are produced. It is by differentiation of language and culture that communities arise, always defined not only internally, but also externally, through the 'otherness' of those who are not part of the community. While a change in the distribution of the capacity to control the knowledge environment in a given community may destabilize incumbent perceptions of community, the destabilization is not likely to result in atomization, but rather in a dynamic social stability-stability achieved through constant motion in response to information exchange among constituents.

The capacity to plan a course of action for one's life and to pursue that plan is crucially effected by the knowledge environment within which one does the planning and execution. The capacity to acquire knowledge, to determine for oneself what is true and untrue, to access information from which to make that judgment, to be able to communicate or not to communicate as one wills, to choose one's mode of expression and one's audience, are important elements of the capacity of an individual to be a source of willed choices that effect how his or her life shall go. To be able to choose the path of one's life, one must be able to perceive the world, form a belief about the state of the world and other possible states, and develop a conception of how the world ought to be. To live one's life according to one's own decisions, anyone but a hermit must be able to communicate his or her conception of the preferred state of the world, and the path that must be taken to attain that state, and must have the facility to persuade others of the validity of that preference and the course of conduct necessary to arrive at it, so as to seek their cooperation or at least quiescence in shaping the state of the world as one seeks to make it.

This effect occurs at two levels when one considers community self-governance. First, the self-governing community considered as a subject is self-governing *vis-à-vis* other actors who could constrain community choices only insofar as it has, collectively, the equivalent access to information and communicative capacities as the individual needs to be a self-governing person. Second, for a community to be one that is built on self-governance, it must be governed by its constituents. The broader the distribution among constituents of the effective capacity to control the communication of their beliefs and preferences to a greater portion of their fellow constituents, the higher the fidelity of public discourse to the actual preferences and beliefs of the members of the community. The dialogic soul of the Agora was its immediacy; the purported absence of a medium to filter and warp the political will of Athenians. The more the preferences of constituents are communicated through a medium that centralizes the communicative functions involved in formulating and disseminating intelligence, the more the collective perception of the community will be likely to be distorted by the lens through which it is passed. The broader the distribution of the capacity to control the communicative environment of each constituent, the higher the likelihood that the product of public discourse will reflect the vectorial sum of the considered will of its individual constituents, rather than a sum of preferences weighted in favor of those constituents who have a greater control over their own communicative environments and that of others in the community.

Communications models in a society range over a spectrum of configurations, each with varying degrees of distribution and concentration of the various communicative functions that structure the intelligence produced in the model. A society that values self-governance, both in the sense of individual autonomy and in the sense of political participation, will better serve this value by adopting for its primary model of communications a broader distribution of more of these communicative functions.<sup>37</sup>

## Conclusion

Technological and market convergence of the media that have dominated remote communications in the 20th century are leading to a regulatory reshuffling of the institutional framework governing the production,

collection, processing, storage, and communication of information and knowledge. While there is a strong commitment by many governments and regulatory authorities to develop and implement an appropriate institutional framework for the technological transition, many of the problem definitions, guiding principles for solution, and gauges for measuring success reflect the inertial forces of the institutional structures that developed around the historically contingent patterns of telecommunications and radio broadcasting. In formulating regulatory policy, it is important to recognize this weakness in how problems and solutions are formulated, and to correct for it as best as possible.

This paper suggested one conceptual framework within which regulatory decisions concerning communications regulation could address values at a higher level of abstraction than those generated by the experiences of the telecommunications and broadcasting industries. The approach begins with the proposition that communications technology interacts with institutional choices and organizational adaptations to structure communications in a society in a certain pattern. Patterns of communication differ from each other by the degree of distribution or concentration of control over the functions involved in producing and conveying intelligence among constituents of a society. Throughout most of the century the knowledge environment in which industrialized nations have existed has been dominated by a combination of what have been termed here the broadcast model and the telephony model of communications. More recently, cheap computers and digital processing and communications technology have made possible the rise of a much broader distribution of control over communicative capacity, referred to here as the Internet model.

The pattern of distribution of control over communicative functions affects the pattern of distribution in society of the capacity to produce private and public perceptions of the state of the world as it is and of the range of possible alternative states towards which individuals or communities can strive by their actions. By doing so, different patterns of communications create different distributions of individual autonomy in society, and different degrees of fidelity with which public discourse in a society reflects the positions held by that society's constituents. To the extent that it is possible to predict whether a given institutional choice is likely to lead to a more concentrated or more distributed model of communications, the implications of that choice for the value of self-governance can therefore be predicted and should be incorporated into the regulatory decision.

As a practical matter, regulatory agencies, legislatures, and courts define and implement communications policy whenever they make a decision that affects the pattern of distribution of communicative functions in society. This is true whether the choice is conceived as 'content regulation' or 'infrastructure regulation', or whether it is not thought of as communications regulation at all. Those who make such decisions will best serve the democratic value of self-governance by adopting policies that are likely to lead to a broad social distribution of communicative functions, rather than policies likely to lead to a concentrated model of communications. While this value may legitimately be negated by competing values, it is incumbent upon all decision makers who choose to foster more concentrated models of communications to make their choice explicit, and thereby to open it for public debate. To enable the development of decision making practices that are self-conscious and transparent about their

impact on the distribution of communicative functions, it is important for both regulators and researchers to develop good descriptive and predictive models, perhaps along the lines suggested in this paper, that will allow an assessment of the effects of regulation on social information flow patterns. Using such models, regulators in particular could develop a practice of preparing and presenting environmental impact statements that would describe and justify the likely implications of a proposed regulatory action on the communicative environment it affects, thereby making the democratic implications of their choices available for public assessment and debate.