



January 2000

Computer Languages as Networks and Power Structures: Governing the Development of XML

Edward L. Rubin

Recommended Citation

Edward L. Rubin, *Computer Languages as Networks and Power Structures: Governing the Development of XML*, 53 SMU L. REV. 1447 (2000)
<https://scholar.smu.edu/smulr/vol53/iss4/5>

This Article is brought to you for free and open access by the Law Journals at SMU Scholar. It has been accepted for inclusion in SMU Law Review by an authorized administrator of SMU Scholar. For more information, please visit <http://digitalrepository.smu.edu>.

COMPUTER LANGUAGES AS NETWORKS AND POWER STRUCTURES: GOVERNING THE DEVELOPMENT OF XML

*Edward L. Rubin**

LANGUAGE, as modern philosophers tell us, is the medium of thought; “understanding itself has a fundamental connection with language.”¹ Without language, we could not formulate complex ideas within our own minds, communicate those ideas to others, or pass them down from one generation to the next. Thus, knowledge would not cumulate, and cultural continuity would be impossible. But if language is a source of our humanity and cultural unity, it is also a political battleground. It is regarded as an essential component of ethnic identity, the characteristic that most distinctively sets one group apart from others. Two of the world’s wealthiest, most democratic nations, Canada and Belgium, have virtually been torn apart by conflicts over language use.² Many developing nations have proven to be largely ungovernable because of their multiplicity of languages, the refusal of many groups or tribes to abandon their own language in favor of a national tongue, and the refusal of the national government to accommodate the languages that these groups or tribes have retained.³

Extensible Markup Language, or XML, is a language, as its name suggests, as well as a means of creating subsidiary languages.⁴ It is not the language of any geographic locality, however; no group of XML speakers will implore any nation in the world to allow them to secede and create their own political entity. If XML speakers constitute a tribe, they are a

* Professor of Law, University of Pennsylvania. J.D. Yale Law School, 1979.

1. HANS-GEORG GADAMER, *TRUTH AND METHOD* 357 (1988).

2. See generally LIESBET HOOGHE, *A LEAP IN THE DARK: NATIONALIST CONFLICT AND FEDERAL REFORM IN BELGIUM* (1991); EVA MACKEY, *THE HOUSE OF DIFFERENCE: CULTURAL POLITICS AND NATIONAL IDENTITY IN CANADA* (1999); PETER NEWMAN, *THE CANADIAN REVOLUTION, 1985-1995: FROM DEFERENCE TO DEFIANCE* (1995).

3. See generally BRIAN HOROWITZ, *ETHNIC GROUPS IN CONFLICT* (1985).

4. See generally Winchel “Todd” Vincent, III, *Legal XML and Standards for the Legal Industry*, 53 SMU L. REV. 1395 (2000); see also Bert Bos, *XML in 10 Points* (last modified Mar. 9, 2000) <<http://www.w3.org/xml/1999/XML-in-10-points>>. Strictly speaking, XML is best described as a meta-language, that is, a set of rules by which languages can be created. For this reason, it is not a false reification of an acronym to speak of an “XML language,” even though the “L” in “XML” stands for the word “language.” Since XML is really a meta-language (it would be more accurate to call it “XMML”) the usage makes perfect sense.

tribe of highly-educated computer programmers working for or running the world's most forward-looking firms. If these speakers are located anywhere, it is in that disconcertingly abstract realm known as cyberspace. If XML has a vocabulary, it is not a fixed catalogue of words but a framework that allows the creation of subsidiary languages, which are themselves frameworks that allow participants to converse in ordinary languages.

Despite its technical, disembodied, and abstract character, XML is not merely a rational, scientific response to a communications problem. It is a language that represents both the promise and the problems that are common to the more familiar languages of "meatspace." Like these languages, XML facilitates thought and allows knowledge to cumulate over space and time. Like these languages as well, it becomes more effective and more powerful the more widely it is used. Wittgenstein asserts that a private language cannot even exist;⁵ even assuming that it could, it would not be of much use. Norwegian, with about four million speakers, is more useful, German, with about 100 million, is more useful still, and English, which has at least 350 million native speakers and has become, to the dismay of the French, the lingua franca of the world, is the most useful of all.⁶ Thus, language displays the characteristic that economists describe as a positive network externality.⁷ Each additional person who makes an individual, self-interested decision to join the community of speakers confers a benefit on the existing speakers. The more people see fit to join, the more powerful the language becomes as an instrument for thought and communication.

These advantages, however, result from conscious and unconscious choices that have disadvantages as well. XML, like every language, possesses an internal structure that excludes some modes of thought and possibilities of communication at the same time that it facilitates others. In creating a community of speakers who can use the language, it necessarily creates a body of outsiders for whom it is incomprehensible, and a body of novices for whom it is difficult. To the extent that its speakers control resources and use the language to manage or allocate those resources it greatly decreases the ability of outsiders to share those resources, and often denies them access to those resources entirely. In other words,

5. See LUDWIG WITTGENSTEIN, *PHILOSOPHICAL INVESTIGATIONS* §§ 256-281 (G.E.M. Anscombe trans., Oxford 1953). "If a person speaks when no one else is present, does that mean he is speaking to himself?" *Id.* § 260. "Why can't my right hand give my left hand money? . . . [Because] the further practical consequences would not be those of a gift And the same could be asked if a person had given himself a private definition of a word" *Id.* § 268.

6. See DAVID CRYSTAL, *THE CAMBRIDGE ENCYCLOPEDIA OF LANGUAGE* app. III, at 436-44 (1987). When those who use English as a second language are added, the number of speakers is between .7 and 1.4 billion. On the use of English as a world language, see *id.* at 358-59.

7. See STEPHEN SEGALLER, *NERDS 2.0.1: A BRIEF HISTORY OF THE INTERNET* 283 (1998) (Metcalf's Law, named after Ethernet founder Bob Metcalfe, is: "The power of a network is N squared, where N is the number of nodes The reason [for squaring] is that the network gets more valuable to me if you come on it.").

XML, like every language, creates political issues. This means that it is likely to become a source of conflict, perhaps as great a source as Basque, or French or Kannada.

This article is a preliminary inquiry into the political implications of XML. Part I describes the governance structure of one aspect of cyberspace that will directly affect the acceptance of XML and that demonstrates where many of the promises and problems for a computer language will reside. This is the World Wide Web, and the privately-developed World Wide Web Consortium (W3C) that manages it. Part II describes a publicly-designed mechanism for achieving agreement among private parties, the Negotiated Rulemaking Act of 1990. From this Act, and other considerations, this section then outlines some general features of governance structures that do not depend on the government's use of coercive force, either explicitly or implicitly. Part III describes the structure of XML itself, in particular its dual character as a network and a political structure. Part IV then applies these considerations to the governance of organizations that will create XML languages. It argues that the political character of XML language creation requires that these organizations be regulated and that the more likely regulator is the government, not W3C. But it also argues that this regulation, like the regulation of the negotiated rulemaking process, should not specify substantive results, but simply specify the structure of the non-governmental decision making body that creates the language.

I. THE ORIGIN AND GOVERNANCE OF THE WORLD WIDE WEB

A. ORIGIN

Prior to the late 1960s, computers were viewed as computational devices, not as means of communication. The origins of the Internet lie in efforts by the Defense Department to establish communication linkages among the computers in its Advanced Projects Research Agency (ARPA), which was set up in the wake of the Sputnik launch. This effort was spearheaded by Bob Taylor, a Pentagon official, as a means of connecting large computers at research facilities, thereby saving expenses on "big iron." The ARPAnet, as it was called, began functioning on an experimental basis in 1969 among four computers at Stanford, UCLA, the University of California at Santa Barbara, and the University of Utah.⁸ By the 1970s, it had expanded to connect about one hundred facilities. E-mail was developed by Ray Tomlinson, who worked for a private contractor to the ARPAnet, in 1972 as a by-product of this network. It allowed the scientists at the various research facilities to send messages to each other at the mailboxes they had already established to receive internal

8. See Steve Bickerstaff, *Shackles on the Giant: How the Federal Government Created Microsoft, Personal Computers, and the Internet*, 78 TEXAS L. REV. 1, 38 (1999); SEGALLER, *supra* note 7, at 35-116. The first message sent over this network was the unpoetic but prophetic words "LOG IN." *Id.* at 92-93.

communications. Tomlinson chose the @ symbol for the receiver's address because it meant "at" and no one had an "@" in their name.⁹ In 1973, Bob Metcalfe, working at Xerox Corporation's Palo Alto Research Center (PARC), invented the Ethernet, a means of connecting hundreds of smaller computers to form a network. These local area networks, which tended to be located at a single private company, were then connected to the ARPANet.¹⁰

The ARPANet transferred messages between computers by attaching each one to a smaller computer, or Interface Message Processor (IMP), which could then communicate with another computer's IMP. This worked well as long as the computers used the same hardware and software. ARPANet's original four computers were designed to be compatible, but proliferation of local area networks using Ethernet connections led to serious incompatibility problems, and thus to greatly reduced effectiveness of the expanded ARPANet. Bob Kahn at ARPA and Vint Cerf at Stanford solved this problem in 1973 by replacing the IMP's with a protocol, soon divided into two protocols, that allowed different computer networks with different hardware and software to communicate with each other.¹¹ The first protocol enclosed each packet of information generated by a local area network in an Internet Protocol or IP that could be read by any other local area network connected to the ARPANet. The IP did not operate within any of the component networks; rather, it enclosed the message as it left one network and was opened when it reached its destination network. To manage the flow of these IP-enclosed messages as they moved among networks, Kahn and Cerf designed a second protocol, the Transmission Control Protocol, or TCP. The combined TCP/IP resulted in an "inter-networking of networks," which was shortened to the term Internet. ARPANet began using TCP/IP in 1983.

As the Department of Defense's network became more widely known in government and the scientific community, other agencies began developing equivalent networks. The most important one was developed by the National Science Foundation (NSF), and named—logically enough—NSFnet. It connected both universities and private scientific firms and because it was designed later, it had much more advanced technology than ARPANet.¹² The military uses of ARPANet were transferred to a separate network, called MILNET, in 1983; by 1989, the NSFnet had absorbed the remaining ARPANet activity, and the latter's protocols were retired.¹³

The rapid expansion of local area networks connected to the ARPANet, and then to NSFnet was paralleled by the rapid development of personal computers. Ed Roberts, an Air Force engineer, had invented

9. See SEGALLER, *supra* note 7, at 104-06.

10. See *id.* at 161-66.

11. See *id.* at 109-13.

12. See *id.* at 223-25.

13. See *id.* at 225.

the first very small computer for personal use in 1975.¹⁴ Paul Allen and Bill Gates, recognizing that a microcomputer would need its own software, founded Microsoft shortly thereafter.¹⁵ By the end of the 1980s, personal computers were in use in a significant proportion of America's workplaces for word processing, graphics work, and information retrieval from stored files, as well as for communication over local area networks.

These developments created the underlying conditions for the World Wide Web (the "Web"). The Web itself is a set of protocols developed by Tim Berners-Lee, an English physicist who was working at CERN, the European nuclear physics laboratory in Switzerland.¹⁶ Berners-Lee was looking for a further solution to the incompatibility problem. It was all very well for TCP/IP to allow messages to be sent between networks, but Berners-Lee wanted to connect individual documents that were stored in computers, so that scientists could access each other's work without sending a message and receiving a specific response. To do so, he developed the idea of hypertext, where texts in different computers were linked together, so that a person reading one text could immediately access the other on the basis of a highlighted phrase in the first. The linkage was provided by a HyperText Transfer Protocol, or HTTP, which establishes a uniform method of transmitting texts and graphics over TCP/IP, so that they appear identical. Thus, one computer can reach inside another computer's network and access specific documents, as long as the other computer has an address that the requesting computer can access.¹⁷ These addresses are provided by the Universal Resource Locator, or URL. The documents, once transmitted, are displayed on the requesting computer in a format called HyperText Markup Language, or HTML.¹⁸

CERN published these codes on the Internet in 1991, thus making them available to all participants without charge. In effect, this initiated the World Wide Web, at least from a technical standpoint. But there was a major legal impediment to the development of the World Wide Web as it exists today. The Internet, having been invented by the Defense Department and developed by the National Science Foundation, remained dedicated to research and education functions. In 1992, at the initiative of Virginia Representative Rick Boucher, the National Science Foundation Act was amended to remove these restrictions, thereby allowing commercial uses of the Internet.¹⁹

14. See *id.* at 140-42.

15. See *id.* at 145-50; see also BICKERSTAFF, *supra* note 8, at 29-31.

16. See SEGALLER, *supra* note 7, at 283-92; TIM BERNERS-LEE, WEAVING THE WEB 25-51 (1999).

17. See BERNERS-LEE, *supra* note 16, at 35-51. The original name of Berners-Lee's program, when he developed it at CERN in 1980, was "Enquire Within Upon Everything." *Id.* at 1-3, 15-16; see also LAWRENCE LESSIG, CODE 102-04 (1999).

18. For a description of HTML, see Vincent, *supra* note 4, at 1399-1401.

19. See Pub. L. No. 102-476, § 4, 106 Stat. 2300 (1992) (codified at 42 U.S.C. § 1862).

During the very first years of the Web's operation texts could only be accessed by typing in the URL line. A number of groups began working to develop a browser that would search the Web on the basis of less specific, more user-friendly instructions. In 1992, a group of computer programmers at the University of Illinois, led by Marc Andreessen, developed a program called Mosaic that would apply all the graphical user interfaces that had been developed for word processing to texts being sent through the Internet.²⁰ The University was averse to entrepreneurial efforts by its employees so Andreessen, alert to the commercial possibilities of his program, formed a private firm with financier Jim Clark. They named the company Netscape and two years later released their browser, now called Netscape Navigator, for free, so that anyone who wanted to use it could simply download it from the Internet.²¹ When Microsoft announced that it was developing a competing browser, the Web suddenly became big news. It became even bigger news when Netscape, anxious for a cash infusion to combat Microsoft's challenge, made an initial public offering whose value rose to 4.4 billion dollars after a single day of trading—the largest such offering that had ever occurred.²²

B. GOVERNANCE

Even before Andreessen formed Netscape, there was considerable tension between him and Berners-Lee. Berners-Lee, who was deeply committed to the Web's universality, feared that Mosaic, and later Netscape, would try to take over the Web, and rename it after their browser.²³ In response, Berners-Lee decided to organize a consortium of organizations that would set standards and develop protocols for the Web. The plan was based on the earlier X Consortium, which MIT had organized to set standards for a Unix program.²⁴ In 1994, after Berners-Lee had moved from CERN to MIT, the World Wide Web Consortium, or W3C, began to operate. MIT and CERN served as host institutions; within a few years, however, CERN was replaced by INRIA, a French government computer facility, and Keio University was added, reflecting the Web's growth in Asia.²⁵

W3C's small staff is housed at these three institutions. Its first Chair was Al Veza of MIT, and its current chair is Jean-Francois Abramatic of INRI; its Director is Tim Berners Lee.²⁶ This staff is supported by the

20. See SEGALLER, *supra* note 7, at 296-306.

21. See BERNERS-LEE, *supra* note 16, at 68-71; SEGALLER, *supra* note 7, at 301.

22. See BERNERS-LEE, *supra* note 16, at 92-93, 103-06; SEGALLER, *supra* note 7, at 302.

23. For a description of the interactions between the Illinois/Netscape group and Berners-Lee, see BERNERS-LEE, *supra* note 16, at 68-71. "All my earlier meetings with browser developers had been meetings of minds, with a pooling of enthusiasm. But this meeting [with the Illinois group] had a strange tension to it." *Id.* at 70. Web group refuses to reschedule its conference when Illinois group's plans conflict because "[t]here was honor and pride at stake here, but also the future direction of the Web." *Id.* at 71.

24. See *id.* at 75-78.

25. See *id.* at 101-02, 115-16.

26. See *id.* at 95, 109.

members of the Consortium, which pay an annual fee of \$50,000 or \$5,000. For-profit firms with an annual gross revenue of over 50 million dollars pay the higher fee, while smaller firms, non-profits, and government organizations pay the lower amount.²⁷ Each member designates one representative; together these representatives constitute the Advisory Committee.²⁸ The Committee meets twice a year in meatspace and, of course, communicates more frequently over the Internet. The Committee reviews proposals submitted by the Director and reports its conclusions to him. The Director (Berners-Lee) decides whether to implement the proposal.²⁹ Smaller groups are selected from among the members of the Advisory Committee: an Advisory Board, which provides ongoing advice to the Director, and various Activity Groups that review specific proposals that the Director submits.³⁰ These groups may also include invited experts, individuals who do not belong to a member organization. Of the Activity Groups organized from among the members of the Advisory Committee, the most important seem to be the Working Groups, which develop specifications or prototype software. The Director appoints the Chair of each Working Group and Advisory Committee members then decide whether to send a representative. The Chair may not reject a nomination, but the Director may do so.³¹

The decision rule for both the Advisory Committee and the Working Groups is identified as consensus, but it is defined somewhat differently in each case. For the Advisory Committee, consensus is essentially defined as ninety-five percent agreement. Some proposals are submitted to a review process, in which comments are solicited from the members of the Committee. If five percent of the Members are opposed, the review process begins again, presumably with a different proposal.³² Other proposals are not submitted for review, but if five percent of the Advisory Committee appeals the decision, then review must be provided.³³ The ultimate decision rests with the Director, but the published rules state that “[a] Director’s decision implies that consensus has been reached by the Advisory Committee . . . and accounts for comments collected during a review, projections as to whether W3C is likely to achieve market consensus, and personal experience.”³⁴

In Working Groups, the Chair decides whether consensus has been reached “by considering the ideas and viewpoints of all participants (including invited experts) who are in good standing.”³⁵ Minority views

27. See *id.* at 93-94; *World Wide Web Consortium Process Document* (visited Mar. 14, 2000) <www.w3.org/Consortium/Prospectus/Join> [hereinafter *Process Document*].

28. See BERNERS-LEE, *supra* note 16, at 91-102; *Process Document*, *supra* note 27, at § 2.1.1.

29. See *Process Document*, *supra* note 27, at § 2.2.1.

30. See *id.* at §§ 3.1.1.-3.3.4.

31. See *id.* at § 3.2.6.

32. See *id.* at § 2.4.4.

33. See *id.* at § 2.2.1.

34. *Id.*

35. *Id.* at § 3.3.2 (link indicator omitted).

should be considered, and solutions that everyone finds acceptable are preferable to ones that a majority finds optimal but a majority finds unacceptable. If the minority will not agree, the "Chair may occasionally ask members of the minority questions of the general form, 'Can you live with this decision?'"³⁶ Even if they answer in the negative, however, the Chair may record dissenting views and proceed. Arbitrary issues that do not have a "technical or process impact," such as where to meet, may be resolved by majority vote.³⁷ The Working Groups are to reach the point of consensus by holding both face-to-face and remote meetings. To remain a member in good standing of the Group, the representative or invited expert must attend both types of meetings on a regular basis. However, "the Chair may relax the attendance requirement for expensive meetings (international phone calls or travel) for invited experts who do not have financial support."³⁸

At present, the Advisory Committee has 407 members.³⁹ Not surprisingly, the bulk of these, some 273, are computer firms, for-profit companies whose primary business is the production of computer hardware or software. Many produce software products specifically for the Internet. Another sixteen are trade organizations of these same types of companies. Of the remainder, the main categories consist of twenty-five government research institutes, such as NASA/Ames, Fermilab and CERN; sixteen government agencies, such as the Library of Congress, London's Metropolitan Police, Britain's National Health Service, NATO and the National Security Agency; twenty-five industrial firms such as Boeing, Eastman Kodak, and Toyota, whose primary lines of business are in non-computer products; fourteen communications companies, both public and private; and ten financial firms, such as Citibank, Merrill Lynch, American Express, and TIAA-CREF.⁴⁰ Finally, there are a few philanthropic organizations, a few trade organizations for non-computer firms, and the Hong Kong Jockey Club.⁴¹

36. *Id.*

37. *Id.*

38. *Id.* at § 3.3.1.

39. For the list of members, see *World Wide Web Consortium (W3C) Members Process Document* (visited on Mar. 10, 2000) <<http://www.w3.org/Consortium/Member/List>>.

40. Other categorizations are possible of course; even accepting those used here, the particular categorizations can be questioned. Non-computer firms, for example, include firms whose leading products are mobile phones, such as Ericsson, and financial firms include internet-oriented institutions such as PrivacyBank.

41. The following is an approximate breakdown by percentage:

Computer-oriented firms	68%
Government research institutes	6%
Non-computer firms	6%
Trade orgs. for computer firms	4%
Government agencies	4%
Universities	4%
Communications companies	4%
Financial companies	3%
Other trade orgs	1%
Philathropic orgs and jockey clubs	1%

The evolution and existing procedures of the World Wide Web Consortium are relevant to XML for two different reasons. First, and most obviously, it is through this procedural structure that the Consortium will promulgate the standards and protocols for XML.⁴² Second, the Consortium's procedures are one obvious model to be used by groups developing more specific languages within the XML framework. XML is more general than HTML; its power is that it allows more specific languages, serving the needs of particular industries, disciplines or organizations, to be established. But such languages must generally be agreed upon; to modify Wittgenstein's dictum, a private XML language cannot exist. Agreement requires a procedure among the entities that will use the language, whether that procedure is unanimity, consensus, majority voting, or command through a hierarchy. There are two alternatives to agreement in this situation. The first is market power, where a single entity creates a language and other entities accept that language because it is in their economic self-interest to do so. Such efforts, however, are likely to engender competing efforts by competitors, which may include the formation of an organization to oppose market compulsion. In addition, antitrust law is likely to be invoked against such efforts, as it was with Microsoft,⁴³ because only a monopolist or near monopolist has the level of market power that would be required. The second alternative to agreement is governmental action, where a single entity, either part of the government or designated by it, issues an order backed by some sort of formal or informal sanctions that rely on governmental force. At present, no one wants this; the government does not want to undertake the task, private groups do not want government intrusion, and no one thinks the government will develop the optimal standards.

Cast back upon the mechanism of agreement, the question now is how to achieve such agreement. As stated, the W3C procedure constitutes one appealing and readily available approach. It can be described as achieving the virtues of voluntary participation and consensus decision making. The question is whether there are alternative approaches, and if so, which of the approaches is the most desirable.

II. NEGOTIATED RULEMAKING AS AN ALTERNATIVE

It would be possible to develop a general model of decision making approaches. Looking only to considerations of participation and decision-making, one could establish a range of choices along the participation axis including universal participation, voluntary participation, restricted participation and so forth. On the decision-making axis, the

42. For descriptions of the W3C efforts to create XML, see *Extensible Markup Language (XML)* (visited Apr. 14, 2000) <<http://www.w3.org/XML/#9802xm110>>; *Namespaces in XML* (visited Apr. 14, 2000) <<http://www.w3.org/TR/1999/REC-xml-names-19990114/>>; *Extensible Markup Language (XML) Activity* (visited Apr. 14, 2000) <<http://www.w3.org/Activity.html>>.

43. See generally *United States v. Microsoft*, 97 F. Supp. 2d 59 (D.D.C. 2000).

choices would include unanimity, consensus, supermajority and majority.⁴⁴ Taken together, these two considerations would generate a grid or set of boxes. American states, for example, use universal participation and majority rule to select their governor. Many of these boxes, however, would be empty, or at least uninteresting. Universal participation and unanimity would lead to deadlock, while restricted participation and majority vote would produce a decision few non-participating parties would be likely to accept. In addition, the model operates on such a general, abstract level that specific mechanisms within each category are suppressed.

A preferable approach is to look at actual decision-making processes, such as the W3C procedures, that exist in different settings. Their existence guarantees their applicability, at least within their own context, and also provides specific details at the operational level. Following this approach, then, the W3C procedures will be compared to a different, but related model that might serve as an alternative. That model is negotiated rulemaking, developed by various federal administrative agencies, most particularly the Environmental Protection Agency,⁴⁵ during the 1980s and codified in the Negotiated Rulemaking Act of 1990.⁴⁶ Negotiated rulemaking is a mechanism for consensus decision making that resembles the W3C in certain ways and differs from it in others. It is controversial, and probably has more detractors than supporters at the present time.⁴⁷ The point of presenting it here is not to argue its merits in its present setting but to discuss it as an alternative model of collective decision making for the new setting of XML creation.

A. NEGOTIATED RULEMAKING

Rulemaking by federal administrative agencies is subject to procedures codified under the Administrative Procedure Act (APA) of 1946.⁴⁸ In essence, the agency is required to publish the text of a proposed rule in

44. For a general discussion of voting schemes and preference assessment, see KENNETH ARROW, *SOCIAL CHOICE AND INDIVIDUAL VALUES* (2d ed. 1963); JAMES M. BUCHANAN & GORDON TULLOCK, *THE CALCULUS OF CONSENT: LOGICAL FOUNDATIONS OF CONSTITUTIONAL DEMOCRACY* (1962); RALPH KEENEY & HOWARD RAIFFA, *DECISIONS WITH MULTIPLE OBJECTIVES: PREFERENCES AND VALUE TRADEOFFS* (1993).

45. See generally Cary Coglianese, *Assessing Consensus: The Promise and Performance of Negotiated Rulemaking*, 46 *DUKE L.J.* 1255 (1997); William Funk, *When Smoke Gets in Your Eyes: Regulatory Negotiation and the Public Interest—EPA's Woodstove Standards*, 18 *ENVTL. L.* 55 (1987); Philip Harter, *Point on a Continuum: Dispute Resolution Procedures and the Administrative Process*, 1 *ADMIN. L.J.* 141 (1987); James Rossi, *Participation Run Amok, The Costs of Mass Participation for Deliberative Agency Decisionmaking*, 92 *Nw. U. L. REV.* 173 (1997). For continuing efforts by the EPA to develop innovative approaches to rulemaking, see Jody Freeman, *Collaborative Governance in the Administrative State*, 45 *UCLA L. REV.* 1 (1997).

46. Codified at 5 U.S.C. §§ 561-570. Like other recent statutes, such as the Freedom of Information Act, 5 U.S.C. § 552, or the Government in the Sunshine Act, 5 U.S.C. § 552b, it is codified as part of the Administrative Procedure Act.

47. For criticisms of negotiated rulemaking, see Coglianese, *supra* note 45; Funk, *supra* note 45; Rossi, *supra* note 45.

48. 5 U.S.C. §§ 551-559 (1994 & Supp. IV).

the Federal Register, and establish a defined period of time when written comments may be submitted to the agency. The agency may then issue final rules "with a concise general statement of their basis and purpose." In doing so, "consideration" of the comments is required, but the agency has no other definitive obligation.⁴⁹ It is apparent that this statute grants citizens rather limited participatory rights in the regulatory process. In interpreting the APA, courts have often experienced a sense of dissatisfaction with these limited rights and have struggled to expand them through creative interpretation.⁵⁰ This has been one of the most controversial issues in all of administrative law.

Negotiated rulemaking developed as a means of providing additional avenues of participation in the regulatory process. It does not replace the APA's notice and comment procedure; rather, it is an alternative way to generate the agency proposal that will then be subject to that procedure. The agency can initiate negotiated rulemaking on its own, or it can appoint a convener. The convener's role is to identify persons "who will be significantly affected by a proposed rule,"⁵¹ and then conduct discussions with them to determine whether they could effectively participate in a negotiated rulemaking.⁵² Once the agency has determined, either on its own or on the basis of the convener's report, that negotiated rulemaking is feasible, it must announce this determination in the Federal Register, and include "a list of the interests which are likely to be significantly affected by the rule," and "a list of the persons proposed to represent such interests."⁵³ "Persons who will be significantly affected by a proposed rule and who believe that their interests will not be adequately represented by any person specified in the notice . . . may apply for, or nominate another person for membership. . . ."⁵⁴

If the agency decides to proceed with negotiated rulemaking, it forms a committee, usually of no more than twenty-five persons.⁵⁵ The committee's goal is to reach a consensus on a proposed rule, with consensus defined as "unanimous concurrence among the interests represented on a negotiated rulemaking committee . . . unless such committee (A) agrees to define such term to mean a general but not unanimous concurrence; or (B) agrees upon another specified definition."⁵⁶ If such consensus is reached, the committee submits the proposed rule to the agency; if it is not reached, the committee may submit "a report specifying any areas in which the committee reached a consensus."⁵⁷

49. *Id.* § 553.

50. *See, e.g.,* Mobil Oil Corp. v. Federal Power Comm'n, 483 F.2d 1238 (D.C. Cir. 1973). *See generally* Antonin Scalia, *Vermont Yankee: The APA, the D.C. Circuit, and the Supreme Court*, 1978 SUP. CT. REV. 345.

51. 5 U.S.C. § 563(b)(1)(A) (1994 & Supp. IV).

52. *Id.* § 563(b).

53. *Id.* § 564(a)(3), (4).

54. *Id.* § 564(b).

55. *See id.* § 565.

56. *Id.* § 562(2).

57. *Id.* § 566(f).

B. NEGOTIATED RULEMAKING AND W3C COMPARED

The procedure specified in the Negotiated Rulemaking Act bears a certain resemblance to the procedures of the W3C, but also exhibits some important differences. To begin with, both use consensus as their decision procedure, rather than the more familiar procedure of majority, or even supermajority, voting. All such procedures—that is, consensus, majority and supermajority—may be regarded as pluralist procedures, in the sense that they accept the participants' choice of a decision, rather than relying on some expert or authority or substantive set of rules.⁵⁸ By definition, there can be only one majority, only one supermajority, and only one consensus on a given issue. Thus, an unambiguous decision can be reached without invoking any other criterion aside from the vote. A majority is the lowest level of agreement that can be characterized as pluralist; once a minority is permitted to decide, some expert or authority or substantive set of rules must be invoked to determine which minority will prevail.

Within the category of pluralist decisions, majority voting is the most common, and is typically found where two circumstances prevail: first, where a definitive decision is necessary, and second, where that decision can be enforced by some fairly convincing sanction. Consensus is a procedure most often found in the absence of these circumstances. Because consensus is so difficult to achieve, breakdowns are likely to occur, and the process will often fail to yield a decision. If the decision cannot be effectively enforced, however, then consensus may be the only viable option—that is, the only way to reach a decision that will actually be followed since it does not depend on the minority's willingness to accede to the majority, but only on each participant's willingness to be bound by its own commitments. Because most or all of the participants agreed at the moment of decision, all that is required is that they regard their agreement as binding. Social contract theories are based on this feature of consensus.

The W3C and Negotiated Rulemaking procedures represent different versions of consensus procedure. W3C defines consensus as either ninety-five percent, or minority deference; the Negotiated Rulemaking Act defines it as unanimity. What may explain the difference is that the W3C is more strongly motivated to rely on consensus because of the second circumstance, the lack of an effective sanction. Without any ability to sanction those who disobey, the Committee must rely on willing compliance. Thus, it needs broad agreement but can tolerate a few dissenters. Negotiated rulemaking's reliance on consensus is more heavily motivated

58. For general discussions of the increasing role of pluralism in modern administrative law, see THEODORE LOWI, *THE END OF LIBERALISM: THE SECOND REPUBLIC OF THE UNITED STATES* (2d ed. 1979); Gerald Frug, *The Ideology of Bureaucracy in American Law*, 97 HARV. L. REV. 1277 (1984); Thomas O. Sargentich, *The Reform of the American Administrative Process: The Contemporary Debate*, 1984 WIS. L. REV. 385; Richard Stewart, *The Reformation of American Administrative Law*, 88 HARV. L. REV. 1667 (1975).

by the lack of need for a decision. If the negotiation fails to produce a result, the agency can proceed to draft the rule itself, in exactly the same manner as it would have done had it followed the more usual approach and never considered a negotiated rule. The second circumstance does play a role, however, because one of the main motivations for negotiated rulemaking is to increase levels of compliance with federal rules. But the agency can indulge in a unanimity rule because the negotiation need not produce a result. In fact, a cynical view would suggest that the federal government chose the unanimity rule because it ensures that relatively few agency rulemaking efforts will be displaced by negotiated rules.

A second issue where the W3C rules and Negotiated Rulemaking bear a partial resemblance involves the issue of participation. This is a central issue for pluralist decision making; since the decision results from some sort of vote, rather than an authority or an objective standard, the actual persons who are voting become a matter of obvious concern. The Western legal tradition, until quite recently, was dominated by natural law, which was defined as a universal set of principles, prescribed by God or nature, and accessible to reason.⁵⁹ This means, at least in theory, that the identity of the decision maker is not crucial, because any person, other than a mentally or morally disabled one, will reach the correct conclusion.⁶⁰ A continuing reverberation of this belief can be found in the theory of constitutional review, which holds that the Constitution embodies objective standards that will yield the same conclusion regardless of the identities of the particular judges who are making the decision. The skepticism with which this theory is currently regarded indicates how rapidly we have progressed toward the pluralist perspective. Administrative law was an area where objective standards, generally described as expertise, were regarded as residing, but that belief has rapidly eroded during the past few decades. Negotiated rulemaking is a dramatic illustration of this process, of course. The result, both there and in W3C, is the central emphasis on the identity of the participants.

W3C is explicitly an organization of organizations, as stated above. Participation in negotiated rulemaking under the APA is not limited to organizations, but organizations are the principal participants, for obvious reasons. Beyond this basic question of identity, both W3C and rulemaking under the APA are open processes, in the sense that there is no pre-defined group from which participants are drawn. To become a

59. See generally THOMAS AQUINAS, *SUMMA THEOLOGICA* 995-1024 (Fathers of the English Dominican Province trans., 1981); HUGO GROTIUS, *THE RIGHTS OF WAR AND PEACE* (Walter Dunne trans., 1901). For contemporary statements, see JOHN FINNIS, *NATURAL LAW AND NATURAL RIGHTS* (1980); JACQUES MARITAIN, *THE RIGHTS OF MAN AND NATURAL LAW* (Doris Anson trans., 1971); LLOYD WEINREB, *NATURAL LAW AND JUSTICE* (1987).

60. The extreme version of this position was articulated by William of Ockham, the great nominalist philosopher, who argued that any Christian, even a woman or a child, could oppose a sinful king or pope on the basis of natural law. See WILLIAM OF OCKHAM, *A SHORT DISCOURSE ON TYRANNICAL GOVERNMENT* (Arthur Stephen McGrade ed., 1992).

member of the W3C Advisory Committee, an organization need only pay an annual fee; because this is set at \$50,000 in the case of a for-profit firm with annual sales over \$50 million, and \$5,000 for all other organizations, it does not seem like much of an impediment. APA rulemaking does not have any such requirements for participation. To say anything persuasive, however, the commentator will generally need to conduct some research and spend some time crafting the comment, so some expenditure of financial resources is likely to be involved.

In both federal agency procedure under the APA and the W3C process, the openness of participation is combined with the participants' relative lack of authority. An agency is not required to pay any particular attention to the comments it receives; it is free, in theory and often in practice, to promulgate a final rule that entirely ignores the commentators' points of view. The APA does not even require the agency to respond to the comments in its statement of basis and purpose; it simply requires that the agency provide such a statement "after consideration of the relevant matter presented."⁶¹ Federal courts that review challenges to agency rules have been clearly dissatisfied with the spareness of this requirement and have generally held that agency rules are "arbitrary and capricious,"⁶² when the agency fails to give serious consideration to relevant comments.⁶³ But the Supreme Court has curtailed the creativity of the Circuit Courts and restricted the APA requirements to a fairly narrow interpretation of the text.⁶⁴

As for the W3C, final authority to accept or reject proposals rests with the Director (Berners-Lee). The rules state, however, that the "director's decision implies that consensus has been reached by the Advisory Committee or the Team and accounts for comments collected during the review."⁶⁵ The concept of accounting for comments is reminiscent of the APA, and equally vague, but the requirement that consensus be achieved gives the participants a larger role. Nonetheless, final authority rests with the Director. Both the W3C and the APA procedure may be contrasted with voting in American elections. These elections are not open; one cannot simply choose to vote, but must be a citizen, of legal age, and a member of the relevant jurisdiction⁶⁶

61. 5 U.S.C. § 553(c).

62. *Id.* § 706(2)(A) (stating the statutory standard for invalidating a rule adopted by informal rulemaking).

63. *See, e.g.,* Motor Vehicle Manufacturers Ass'n v. State Farm Mut. Auto. Ins. Co., 463 U.S. 29, 35 (1983); Portland Cement Ass'n v. Ruckelshaus, 486 F.2d 375, 392-402 (D.C. Cir. 1973).

64. *See generally* Mobil Oil Exploration & Producing Southeast, Inc. v. United Distrib. Co., 498 U.S. 211 (1991); Pension Benefit Guar. Corp. v. LTV Corp. 496 U.S. 633 (1990); Vermont Yankee Nuclear Power Corp. v. NRDC, 435 U.S. 519 (1978); Chevron U.S.A. v. Natural Resources Defense Council, Inc., 467 U.S. 837 (1984).

65. *Process Document, supra* note 27, § 2.2.1

66. A resident of New Jersey, for example, cannot choose to vote in an election for the governor of Pennsylvania.

A somewhat higher level of participation is provided by the negotiated rulemaking and W3C Working Groups. In a negotiated rulemaking, the participants are chosen by the convener, according to prescribed criteria, which is certainly not an open process. In the W3C, the Working Group consists of Advisory Committee members; any organization may join the Committee, but those that have actually joined represent a limited group at a given point in time. Outside experts may also participate in a Working Group, but they must be specifically selected by the Chair. Once formed, these two groups exercise a fair amount of authority because they are actually generating a proposal. There is no guarantee that the proposal coming out of either group will be adopted, of course, but there is a virtual guarantee that as long as the group is meeting, no alternative proposal on the same subject matter will be considered. This represents what Steven Lukes describes as agenda control.⁶⁷

III. THE NATURE OF XML

As stated at the outset, any language is both a means of communication that displays the positive externalities of a network and a set of political choices that produces different effects upon existing interests. In order to evaluate the two models of consensus decision-making represented by the W3C and negotiated rulemaking, it is necessary to consider these two features in somewhat greater detail. The discussion of this complex topic presented here will be a cursory one; its purpose is simply to introduce some of the basic considerations that facilitate the selection and adaptation of a decision-making model.

A. XML AS A NETWORK

The Internet and the World Wide Web are not randomly named; they display many of the features that have been identified as characterizing networks. The economic features of networks have been applied to the Internet by Mark Lemley and David McGowan.⁶⁸ Other aspects of a network are described, in somewhat more fanciful terms, by Deleuze and Guattari's famous description of a rhizome in *A Thousand Plateaus*.⁶⁹ A rhizome is a diffuse underground root system from which above-ground plants, such as mushrooms and strawberries, emerge. The features that Deleuze and Guattari derive from this metaphor include an interconnected structure, undifferentiated substructures, functional membership

67. See generally STEVEN LUKES, *POWER: A RADICAL VIEW* (1974).

68. See generally Mark Lemley & David McGowan, *Legal Implications of Network Economic Effects*, 86 CAL. L. REV. 479 (1998).

69. GILLES DELEUZE & FELIX GUATTARI, *A THOUSAND PLATEAUS: CAPITALISM AND SCHIZOPHRENIA* 3-25 (1987). Deleuze and Guattari do not explicitly connect their rhizome image to language; in fact, what they suggest is that some approaches to linguistics (theirs, for example) are rhizome-like, while others (Chomsky's, for example) are more hierarchical. See *id.* at 7-8. Thus, their concept is being applied to language by analogy. This seems fair enough, since the entire book consists of metaphors that are consciously being used in a playful manner. See *id.* at 22-23.

and open boundaries. These can be understood by contrasting a network with a hierarchy.⁷⁰

In a hierarchy, the essential connections are vertical and centralized; they are formed between higher and lower status components of the hierarchy, with the components becoming less numerous, and the communications correspondingly more centralized, at each higher level.⁷¹ Thus, an executive supervises a group of managers, each of whom then supervises a group of workers; the workers are connected, for official purposes at least, to the manager, rather than to each other or to the executive. In a network, connections are horizontal and decentralized, that is, between each component and many other components, without any status-based distinctions.⁷²

Second, hierarchies are often differentiated, with each subsection performing a unique task, whereas networks tend to be undifferentiated, with each subsection reproducing the tasks and patterns of the network as a whole.⁷³ It is possible that this feature, at least as stated in the text, does not truly correspond with Deleuze and Guattari's description. On the one hand, they do state that a rhizome involves "capture of a code, surplus value of a code,"⁷⁴ which sounds a good deal like a network and, in fact, like Lessig's description of the Internet.⁷⁵ On the other hand, they insist that one section of the rhizome does not reproduce another. In the same discussion, for example, they state: "There is neither imitation nor resemblance, only an exploding of two heterogeneous series on the line of flight composed by a common rhizome that can no longer be attributed to or subjugated by anything signifying."⁷⁶ What they may be referring to here, however, is the lack of coordination (i.e., lines of flight), rather than the absence of a means of interconnectivity. Thus, the components of a network are each able to act in any manner they choose, but they must reproduce the basic pattern of the network if they are to remain part of it. In fact, Deleuze and Guattari suggest that once one becomes part of a rhizome it is difficult to divest oneself of its operative pattern, perhaps because of the capacities that the pattern provides.⁷⁷ "[T]he line of flight is part of the rhizome. These lines always tie back to

70. Deleuze and Guattari's symbol for a hierarchy is a tree. *See id.* at 5-6. Networks are one of the dominant images in modern thought, and references to them are far too numerous to catalogue. For a few examples, see PATRICIA CHURCHLAND & TERRENCE SEJNOWSKI, *THE COMPUTATIONAL BRAIN* (1992) (neural network model of human mind); KARL DEUTSCH, *THE NERVES OF GOVERNMENT* (1963) (network model of government and political system); C. NELSON DORNY, *UNDERSTANDING DYNAMIC SYSTEMS* (1993) (network model of mechanical and electrical systems).

71. *See* DELEUZE & GUATTARI, *supra* note 69, at 7-8.

72. Deleuze and Guattari describe this as the principles of connection and heterogeneity. *See id.*

73. Deleuze and Guattari describe this as the principle of multiplicity, or as one aspect of that principle. *See id.* at 8-9. This is closely connected with their next principle, assigning rupture. *See id.* at 9-12.

74. *Id.* at 10.

75. *See* LESSIG, *supra* note 17, at 102-04.

76. DELEUZE AND GUATTARI, *supra* note 69, at 10.

77. *See id.* at 9.

one another . . . You may make a rupture, draw a line of flight, yet there is still a danger that you will reencounter organizations that restratify everything. . . .”⁷⁸ The example that they use to illustrate this feature is the symbiotic relationship of two organisms, such as a wasp and an orchid. The reason is that a hierarchy can take advantage of the coordination that its vertical connections provide, whereas the components of a network can only rely on the lower level of coordination that can be maintained through horizontal connections. On the other hand, networks are more resilient, because they cannot be decapitated, and because damage to one section leaves other sections performing the same tasks intact;⁷⁹ this characteristic of networks is sometimes described as graceful degradation.⁸⁰

A third contrast is that a hierarchy is structured on the basis of form, that is, the relative position of its elements; it admits particular individuals or components into its structure on the basis of their identity, and then attempts to determine their behavior in accordance with its goals or purposes. Networks are structured on the basis of function or their operational program, so that any person or entity who is performing the same function or following the same operational program can become part of the network.⁸¹ The fourth feature is a direct consequence of the third. A hierarchy is generally a closed system with a definitive boundary and determinations about additions to the hierarchy are made by some specially identified component of the hierarchy. A network is an open system in the same sense that the notice and comment process or the W3C is open; it has a fluid boundary and new components may join the network at their own initiative. An alternative image, more specific to a network is that the network has the ability to expand by engulfing new components or attaching them to its margins.⁸² The reason, of course, is that membership on the basis of identity requires a determination whether the particular individual or entity is one of the ones that the hierarchy will accept,

78. *Id.*

79. Deleuze and Guattari describe this as the “principle of asignifying rupture.” *Id.* at 9-12 (“A rhizome may be broken, shattered at a given spot, but it will start up again on one of its old lines, or on new lines.”).

80. See WILLIAM BECHTEL & ADELE ABRAHAMSEN, CONNECTIONISM AND THE MIND: AN INTRODUCTION TO PARALLEL PROCESSING IN NETWORKS 60-62 (1991).

81. The principle of cartography is another aspect of the principle of multiplicity, according to Deleuze and Guattari. See DELEUZE & GUATTARI, *supra* note 69, at 8-9, 12-14. The reason for describing this concept as cartography may not seem obvious (it is not intended to be); in essence, Deleuze and Guattari distinguish between a tracing and a map. To make a tracing involves passive reproduction of a form, while making a map involves active construction of that form.

82. This is implication of the principles of multiplicity and cartography. *Id.* at 8-13; see also *id.* at 26-38 (“One or Several Wolves”). “The map is open and connectable in all of its dimensions; it is detachable, reversible, susceptible to constant modification. It can be torn, reversed, adapted to any kind of mounting, reworked by an individual, group or social formation.” *Id.* at 12. The concepts of open and closed are partially informed by general systems theory. See LUDWIG VON BERTALANFFY, GENERAL SYSTEMS THEORY: FOUNDATIONS, DEVELOPMENT, APPLICATIONS 139-54 (rev. ed. 1968). Deleuze and Guattari seem influenced by this theory at various points, perhaps through Luhmann. See generally NIKLAS LUHMANN, SOCIAL SYSTEMS (John Bednarz trans., 1994), but they would be disinclined to acknowledge Luhmann or this approach.

while membership based on function requires only that the individual or entity engage in that function and then enter into communication with the network.

As an illustration, this article is organized hierarchically. It is meant to be read in a fixed sequence, from page 1447 to page 1475 in this journal, and it is organized with major and subsidiary headings. This is done in deference to the traditions of law review publication, and also because of the nature of the medium, printed words on pages, in which it is presented. If it were organized in network form, the article might consist of a collection of segments, each a few paragraphs long, that were interconnected with each other, although not meant to be read in any particular order. Each segment would contain references to some or all of the others, and none would be identified as principal or subordinate. Such a structure could not be used in a print medium, where something necessarily comes first,⁸³ but it could be used on the Internet. Upon accessing the document, the reader would be confronted with a page that had words or icons for each segment, arranged in a circle, or perhaps, some other non-linear fashion. Each segment, once accessed, would contain links to some or all of the other segments, which the reader could click on based on her own inclinations or sense of relevance. It is an interesting question whether this alternative mode of presentation would not only change the overall structure of the article (obviously it would) but also the mode of argument within each segment.

Clearly, the Internet and World Wide Web are truly networks, in the sense defined above.⁸⁴ Any application of XML is likely to display the same network properties. To begin with, all the users of the language would be connected with each other; the whole point is to facilitate communication between any two users of the language without the need to route the communications through a central control mechanism. Second, the entire protocol is available to its users in an equal fashion, thereby reproducing the general structure at each particular site. This is true of HTML as well as XML of course; what distinguishes XML is that the set of protocols available to each user is more specific to the user's function, and thus more powerful. Third, and again consistent with the general features of a network, XML is an entirely functional relationship; a user participates in the network simply by downloading the protocol and using it, without needing to establish any particular relationship with any other participant in the network. This means, in accordance with the final feature of a network, that the system is an intrinsically open one. Anyone can join by simply using the language and communicating with some

83. Several fiction writers have attempted to escape from the linearity of written narrative in printed books. The most explicit effort is JULIO CORTAZAR, *HOPSCOTCH* (Gregory Rabassa trans., 1998). To some extent, this is also true of novels such as JOSEPH CONRAD, *NOSTROMO* (1917); VLADIMIR NABOKOV, *PALE FIRE* (1963); MILORD PAVIC, *DICTIONARY OF THE KHAZARS* (Christina Pribicevic-Zoric, trans.).

84. For another discussion of the Internet as a network, see Lemley & McGowan, *supra* note 68.

other participant in the network. In theory, it would be possible to restrict access to the network through business means, such as encryption, or legal means, such as intellectual property protection. Incentives for doing so will typically be weak, however, and will often motivate users in the opposite direction. As mentioned at the beginning of this article, languages generally display positive network externalities—when additional people begin using the language, the language becomes more valuable to the existing users. This general property of language will clearly apply to languages developed within the XML protocol as well.

B. XML AS A POLITICAL STRUCTURE

The network features of XML also apply to ordinary language, of course. Any language connects each of its speakers with any other, reproduces its general structure within each individual user, defines its participants in the functional terms of language use, and is open to anyone who learns the language. As stated at the outset, XML also resembles ordinary language in that it possesses strong political implications. Choices about which of the languages spoken within a nation will be used for official purposes, taught in school, or permitted in judicial proceedings determine the political influence and social status of the speakers.⁸⁵ A natural way to express this is to say that language is an instrument of political power. Neil Netanel has insightfully explored the ways in which the Internet, despite its benign appearance and reputation, can create social injustice through status discrimination, content discrimination (including filtering and self-censorship), and limitations on access.⁸⁶ The following discussion, which is more limited, focuses specifically on XML, and on the relationship between language and our contemporary concept of power.

Hobbes treats power as a possession, a set of abilities that enable a person to get what he wants,⁸⁷ Bertrand Russell uses a similar definition.⁸⁸ Most modern writers, however, tend to regard it as a relationship, the ability of one person to control the actions of another.⁸⁹ In recent years, a body of thought has developed that treats power as an aspect of social structure, rather than personal ability or behavior. According to Steven Lukes, for example, there are several forms of power; one corresponds to the familiar notion that A controls the actions of B, a second

85. See WILL KYMLICKA, *MULTICULTURAL CITIZENSHIP: A LIBERAL THEORY OF MINORITY RIGHTS* 107-30 (1995). See generally BRIAN WEINSTEIN, *THE CIVIL TONGUE: POLITICAL CONSEQUENCES OF LANGUAGE CHOICES* (1983).

86. See Neil Netanel, *Cyberspace Self-Governance: A Skeptical View from Liberal Democratic Theory*, 88 CAL. L. REV. 395 (2000).

87. See THOMAS HOBBS, *LEVIATHAN* ch. 10 (Richard Tuck ed., 1991).

88. See BERTRAND RUSSELL, *POWER: A NEW SOCIAL ANALYSIS* 25 (1992).

89. See, e.g., Robert Dahl, *The Concept of Power*, 2 BEHAV. SCI. 201 (1957), in RODERICK BELL ET AL., *POLITICAL POWER: A READER IN THEORY AND RESEARCH* 79 (1969); MICHAEL MANN, 1 *THE SOURCES OF SOCIAL POWER* 6 (1986); MAX WEBER, *ECONOMY & SOCIETY: AN OUTLINE OF INTERPRETIVE SOCIOLOGY* 53 (Guenther Ross & Claus Wittich eds., 1968).

involves agenda control, the ability to set the agenda for political decision making, and the third involves the ability to create an overall structure that favors some individual or groups over others.⁹⁰ Foucault emphasizes this final category when he speaks of a grid that underlies all social action and controls its various expressions⁹¹ as does Giddens when he describes power as a necessary component of any human action, whose magnitude varies with the actor's control of particular resources.⁹² Whether these diffuse phenomena are truly recognizable as power, in the conventional sense, is an open question, but they clearly represent a central feature in certain modern theories about social ordering.

Language is closely related to this third conception of power, as Foucault himself observes.⁹³ Modern theories of language emphasize that it is much more than a neutral mode of expression; rather it is the medium of thought itself, and forms the horizon which defines thought's possibilities within a given culture.⁹⁴ Language determines what is thought, the way it is thought, and the extent of thought. Thus, the language exercises power, in Lukes', Foucault's and Giddens' sense, over those who speak it; it creates an underlying structure that controls thought and behavior. Most commonly, this exercise of power involves the use of language, not its design. A language such as English was not created by any living person, or indeed, within living memory, so its control over its speakers' thoughts and action lies beyond the reach of any current political actor. It is the use of English that is political—the extent to which non-English speaking groups within the United States are required to speak English, for example, or the extent to which colloquial language is accepted in schools or other governmental settings.

When a new language is created, however, its creators are able to exercise political effects of a more comprehensive nature by the design decisions that they make. One of the most vivid depictions of this

90. See LUKES, *supra* note 67.

91. See MICHEL FOUCAULT, DISCIPLINE AND PUNISH: THE BIRTH OF THE PRISON 202 (Alan Sheridan trans., 1977) ("Power has its principle not so much in a person as in a certain concerted distribution of bodies, surfaces, lights, gazes; in an arrangement whose internal mechanisms produce relations in which individuals are caught up."); MICHEL FOUCAULT, THE HISTORY OF SEXUALITY: VOLUME 1: AN INTRODUCTION 81-102, 92 (Robert Hurley trans., 1978) (stating power is "a grid of intelligibility of the social order . . . The omnipresence of power: not because it has the privilege of consolidating everything under its invincible unity, but because it is produced from one moment to the next, at every point, or rather in every relation from one point to another."). See generally HUBERT DREYFUS & PAUL RABINOW, MICHEL FOUCAULT: BEYOND STRUCTURALISM AND HERMENEUTICS 184-204 (1982).

92. See generally ANTHONY GIDDENS, PROFILES AND CRITIQUES IN SOCIAL THEORY 197-230 (1982); see also ANTHONY GIDDENS, THE NATION-STATE AND VIOLENCE (1985).

93. See FOUCAULT, THE HISTORY OF SEXUALITY, *supra* note 91, at 83 ("Power's hold on sex is maintained through language, or rather through the act of discourse that creates, from the very fact that it is articulated, a rule of law").

94. This idea was originally advanced by Sapir and Whorf. See generally EDWARD SAPIR, LANGUAGE: AN INTRODUCTION TO THE STUDY OF SPEECH (1939); LANGUAGE, THOUGHT AND REALITY, SELECTED WRITING OF BENJAMIN LEE WHORF (John Carroll ed., 1964). It has become a central principle of modern hermeneutics. See HANS-GEORG GADAMER, TRUTH AND METHOD (1975).

phenomenon—which after all does not occur very often in the real world—can be found in Orwell's *1984*.⁹⁵ The novel describes any number of grinding oppressions, including continuous surveillance of the populace, the total suppression of political liberty, complete control of information by the state, a massive secret police apparatus, and the use of torture to brainwash political dissidents. But the oppression most destructive of freedom, in Orwell's view, and the one he chose to expand on in an essay appended to the novel, is the creation of Newspeak, a language designed by the rulers of the totalitarian state to perpetuate their regime of Ingsoc (English Socialism). Here is part of his description:

The purpose of Newspeak was not only to provide a medium of expression for the world-view and mental habits proper to the devotees of Ingsoc, but to make all other modes of thought impossible. It was intended that when Newspeak had been adopted once and for all and Oldspeak forgotten, a heretical thought—that is, a thought diverging from the principles of Ingsoc, should be literally unthinkable, at least so far as thought is dependent upon words. Its vocabulary was so constructed as to give exact and often very subtle expression to every meaning that a party member could properly wish to express, while excluding all other meanings and also the possibility of arriving at them by indirect methods.⁹⁶

IV. GOVERNING XML

A. THE NEED FOR REGULATION

With the network and the political aspects of XML in mind, we can now assess the W3C and negotiated rulemaking models as means of governing the process by which XML is used. The issue is not the creation of XML itself; that is currently being carried out by the W3C, under the decisions procedures described above. Rather, the issue is the rules that will be imposed on groups that use the XML protocols to create specialized languages. Consider two examples, both of which display the capabilities of XML; first, a language used by hospitals that enables them to transfer patient records (subject to patient consent, as the law currently provides); second, a language used by employers in a particular industry to obtain personnel information for hiring purposes, and to disseminate information about job opportunities. Unlike HTML, XML will enable the hospitals to transfer patient records directly, to search through all the records of the participating hospitals to find patterns of disease, or of positive or adverse response to treatment, and to rapidly identify available resources such as a specialist who is on duty at a particular time, an available bed, operating room or machine, or a supply of a particular medicine. Similarly, it will enable employers to search through job applications for particular characteristics of the worker, enable the applicants to conduct a similar search of job announcements, and it will facilitate the

95. GEORGE ORWELL, *1984* (1950).

96. *Id.* at 246.

development of programs that automatically match firm and worker characteristics.

Both these languages should be designed to capture the network character of an XML language. Any hospital should be able to communicate with any other hospital, and any employer should be able to communicate with any other employer on an equal basis. Individual patients and job applicants should be able to communicate with any hospital or employer. Each portion of the network should be able to perform all its operations, so that the departure of any particular participant, or group of participants, does not impair the ability of the remaining participants. The networks should be organized in functional terms, and without membership requirements, so that anyone who needs the information (again subject to privacy limitations) can join the network and obtain it.

It seems unlikely that any external regulation or control would be required to achieve this desirable purpose. As described above, the network structure is virtually inherent in any XML language; the whole value of these languages lies in their decentralized, open structure. Of course, some group of hospitals or employers might want to create a more restricted system of communication on the World Wide Web, and there is no reason to prohibit them from doing so. But the application that will make a difference, the one that will take hold and become widely used, will be a decentralized, open language that will enable large numbers of organizations and related users to share information and communicate with one another in a more efficient manner. Such a language may be regarded as a market phenomenon; in fact, it will respond to a demand for communication that is even broader, since it will be felt as insistently by non-profit organizations.⁹⁷

Although the XML applications that will be most important will have this network quality, they will also possess many of the political characteristics of a language. The reason is that they must be designed, and the designer is likely to be a much smaller and potentially more restricted body than the ultimate group of users. Lawrence Lessig has pointed out that the design features of Internet communications, which he refers to as Code, allow the government to regulate the Internet,⁹⁸ and Neil Netanel has explored the political morality of doing so.⁹⁹ The point here is that these design features are inherently a mode of regulation, although they may be private rather than public. Once they are built into the particular language, they will affect everyone who relies upon that language, often in rather powerful ways. The subsequent openness and decentralization of the network will not counteract the determinism of its design, since the

97. See, e.g., I. Trotter Hardy, *The Proper Legal Regime for "Cyberspace,"* 55 U. PITT. L. REV. 993 (1994); David R. Johnson & David Post, *Law and Borders—The Rise of Law in Cyberspace*, 48 STAN. L. REV. 1367 (1996); Henry H. Perritt, Jr., *Cyberspace Self-Government: Town Hall Democracy or Rediscovered Royalism?*, 12 BERKELEY TECH. L.J. 413 (1997).

98. See LESSIG, *supra* note 17.

99. See Netanel, *supra* note 86.

network is defined in functional terms, and users who want to join subsequently can only do so if they adopt the previously designed language.

Suppose, for example, that the XML language for hospitals is designed by a group of programmers who are employed by large hospitals. It is likely that the resulting design for patient records would contain tags that identified the drugs that each patient was given, at what stages in the patient's illness and in what amounts. Such a design would be enormously valuable. A physician who was trying to decide whether an innovative drug would benefit her patient could readily find out, without ever learning the name of any patient or otherwise violating anyone's privacy, precisely how many times the drug had been given for the particular ailment in question, at what stage and in what amount, and what the results were. But would the design, as developed by these hospital employees, also contain tags indicating how many times each hospital had been accused of malpractice, how many times malpractice had been found, which physicians had committed it, which procedures led to the highest number of accidental or unexplained deaths and so forth? Would the XML language for employers contain tags that enabled people to determine how often particular employers discriminated on the basis of race or age, or that enabled women or gay people to determine which employers created a hostile environment for members of their group, or members of their group with the particular characteristics they possess?

B. THE CONTOURS OF AN EFFECTIVE REGULATORY SCHEME

These political implications of XML languages raise the issue of design procedure: how will decisions be made regarding the design of particular languages within the XML framework? To begin with, it would appear that the procedure should be pluralist in nature, that is, it should accept the participants' choice of a decision, rather than relying on some expert, authority or substantive set of rules. Each language should be designed to meet the needs of those who will use it, and the best way to do so is to consult the potential users. There are no sets of rules available in this area, nor are there any recognized experts who know the best rules in advance. The reasons, among others, are that the entire enterprise is too new for anyone to have had significant experience, and that the needs of the users are too varied and complex to be known to one person or embodied in a pre-established set of rules.

As previously noted, the least demanding pluralist procedure is a majority vote, but the decentralized, open character of a network counsels against this option. If a significant proportion of potential users are dissatisfied with the result, they are unlikely to use the language, and it will fail to achieve the positive network externalities that constitute much of its value. Absent compulsion, therefore, the decision procedure that will achieve the desired outcome is at least supermajority and more probably consensus. This may mean unanimity, as in negotiated rulemaking, but the preferable definition, following the W3C procedures, is that only a

small number of the participants can disagree (five percent, for example) and that even those participants must agree that they "can live with" the decision. While this is a demanding decision rule, the success of the W3C attests to its practicality.

A second question about the design procedure involves the identity of the participants. As in the case of the World Wide Web, there is an obvious distinction between those who design the language and those who use it. The users are an open-ended group, of large or vast proportions, who join the network by simply accepting its functional rules. The designers are a much smaller group who can work together to achieve consensus about those rules. In the W3C, the designers, called Working Groups, are drawn from the Advisory Committee. This may seem like a promising model; the Advisory Committee, after all, is open to any organization, and joining requires only a relatively small fee that virtually any organization can afford. As a practical matter, however, the Advisory Committee's membership is quite restricted in nature and dominated by one type of organization, namely, businesses who provide Internet services. Users, even large corporate or government users, constitute less than twenty percent of the total. If one excludes large research laboratories, which, as a group, are closely connected with the Internet's creation, the figure drops to a bit more than ten percent. Smaller users are almost completely absent. The problem for non-specialists is probably not the fee but a lack of motivation. The World Wide Web, despite its importance, represents just one of many issues that a firm must confront; many firms will not even be aware of the Web's governance structure. Once aware, and once convinced of the important role that this governance process plays, the organization must identify one or more individuals who will participate in the process. These persons, moreover, must be knowledgeable about the subject matter; uninformed people tend to be ignored in collective decision making sessions.

Skewed representation in the decision making body will lead to a general design that favors some uses, and some users, while disfavoring others. These preferences will be built into the structure of the language, just as the preference for political conformity was built into Newspeak. In the examples given above, an XML language designed by large hospitals is likely to facilitate access to information about the performance of particular drugs, but to deny access to information about the performance of particular doctors; it is likely to assist those who want to continue the status quo, but not those who want to alter it. An XML language designed by employers is likely to lower the transaction costs of the hiring process for both employers and applicants, but to deny information about the less savory aspects of the process to potential employees, potential litigants, and law enforcement officials.

The value of more comprehensive representation of different groups in a decision making process is both political and conceptual. In a pluralist process, and in our pluralist society, the representational advantage is ob-

vious; different groups have different interests in the process, and their inclusion in the process means that these interests must be taken into account. While this is advantageous, it interacts with the decision procedure in complex ways. The more divergent groups are included, the greater the difficulty in reaching decisions using a consensus or even supermajority rule, and the greater the pressure for moving to a simple majority. But majority voting conflicts with the decentralized, open, non-coercive quality of a network; an XML language, like any other language, will be generally accepted if it is simply taken for granted, and resisted—by certain groups at least—if it is a source of controversy. In addition, majority voting formalizes the choice of participants, since it makes the precise proportions of representatives from each group a decisive factor. With a consensus or supermajority rule, the precise numbers are less important as long as there is someone to speak for each interest group. Finally, groups that lose out in a majority vote will tend to seek redress in other fora. When the vote is taken by the supreme political authority, the only sources of redress are foreign powers or violence, both of which are rather costly avenues to pursue, but when the vote is taken by a private body like an XML design group, the political system provides a potential source of redress, and that is a much more readily pursued alternative.

To some extent, these problems are meliorated by the second advantage of representation, which is conceptual. When different views are represented in the decision making group, the more likely the group will be to reach non-zero sum solutions that take all interests into account.¹⁰⁰ Of course, there will not always be such a solution; in some situations, our definition of fairness is nothing more than the best way to cut a cake.¹⁰¹ But when different points of view are represented by the participants in a decision making process, and when those participants are motivated, by either internal or external means, to act cooperatively, new solutions sometimes emerge that simply had not been previously conceived. This may seem naive to many people who have read too much public choice literature, but there is a considerable amount of empirical evidence in its favor, and to deny it is to claim that all creative human problem-solving occurs in settings that are free of conflicting interests, which is a much more naive position.

Ensuring the broad participation that will secure these political and conceptual advantages may be a difficult task. To begin with, there is a natural reluctance among like-minded individuals to include others who think differently and have different values. How willing will administra-

100. See generally Edward Rubin, *Thinking Like a Lawyer, Acting Like a Lobbyist: Some Notes on the Process of Revising UCC Articles 3 and 4*, 26 LOY. L.A. L. REV. 743 (1993).

101. See generally JACK ROBERTSON & WILLIAM WEBB, *CAKE CUTTING ALGORITHMS: BE FAIR IF YOU CAN* (1998). These algorithms are designed to divide a fixed and positive entity (a cake, an ongoing business) or a fixed and negative entity (a lawn to be mowed, an expensive obligation) so that each participant feels that the division has been fair. They all depend on the premise that the positive entity cannot be increased in size, or the negative entity decreased.

tors of large hospitals be to include patient advocates, medical malpractice attorneys, and government regulators in a working group that they have organized? How willing will employers be to include union representatives, women's rights, minority and gay rights advocates, plaintiff's lawyers and government regulators? We need not imagine either group filled with evil or conspiratorial people to conclude that such participants will be excluded. All that is needed is the more restrained hypothesis that people hold their beliefs sincerely, and regard those who disagree with them as mistaken and potentially disruptive. Moreover, a mere invitation to such groups will not be sufficient. Because the issue will not be as salient to these groups, and because they will generally not have staff members who are knowledgeable about the issue and available to spend large amounts of time on it, they must receive positive encouragement of some kind. This means a specific invitation, at the very least, and perhaps financial assistance of some sort.

At this point, the example of negotiated rulemaking becomes relevant. As provided by statute, the group that designs a proposed rule under this procedure is constituted by a public authority (the agency) or by an outside convener who is in turn appointed by that authority. The agency's announcement of the negotiated rulemaking must include "a list of the interests which are likely to be significantly affected by the rule" and "a list of the persons proposed to represent such interests."¹⁰² Thus, the procedure involves a definitive effort by a public authority, to ensure that all relevant interests are represented. In addition, the statute goes on to provide that those "who will be significantly affected by a proposed rule and who believe that their interests will not be adequately represented by any person specified in the notice . . . may apply for, or nominate another person for membership."¹⁰³ While negotiated rulemaking has been regarded as the quintessential expression of pluralism,¹⁰⁴ the emphasis on having all affected interests represented, combined with the lack of concern about specific proportions of representatives and the requirement of consensus decision making, suggests that the conceptual effort predominates. That is, the aspiration is that the members of the group will work cooperatively to develop new solutions that will be preferable to the one the agency would have developed on its own. But while the agency defers to the group that it has created on substantive issues, it does not defer to any private organization on the construction of the group. On this matter, the agency exercises intensive supervision, because only such supervision can ensure that the group is sufficiently balanced to generate desirable solutions.

Following the example of negotiated rulemaking, some supervening authority is needed to ensure that groups that are organized to develop XML languages contain representatives of all the interests that will be

102. 5 U.S.C. § 564(a)(3)-(4) (1994).

103. *Id.* § 564(b).

104. See Coglianese, *supra* note 45; Rossi, *supra* note 45.

affected by that language. Of course, some XML groups may achieve the desirable breadth of participation on their own. If experience is any guide, however, most groups will not.¹⁰⁵ Supervision will be needed to determine which groups have failed to include relevant participants, and then induce them to institute the necessary changes. One conceivable source of such supervision is the W3C, which, after all, has established the protocols for XML in the first place, and currently supervises the entire World Wide Web. But W3C, at least in its present form, lacks the administrative capacity to monitor all XML developers, the institutional motivation to do so, and the political authority to enforce any decisions that it reached. This is not surprising, given the composition of its Advisory Committee. The situation not only makes W3C an unlikely regulator, but also indicates the need for regulation. Left to their own devices, most of the groups that are organized to develop XML languages will probably look like W3C itself—they will be dominated by suppliers of the goods or services in question, include a few other organizations which specialize in the field, and perhaps of few large customers or users.

Unless W3C decides to accompany its promulgation of XML protocols with a massive redefinition of its role and reorganization of its structure, the government must be the supervening authority that is needed to ensure the necessary levels of participation. What this means is that government would forbid any legal or natural person within its jurisdiction to use an XML language unless that language had been developed by a process that met specified criteria of participation. In the United States, this requirement would presumably be imposed by national legislation under the commerce power, and enforced by a federal agency such as the Federal Trade Commission¹⁰⁶ or the Federal Communications Commission.

105. For example, the American Law Institute and the National Conference of Commissioners on Uniform State Laws are organized as law reform organizations, and explicitly claim neutrality and balance. The working groups that they have formed to draft proposed uniform laws, however, have typically lacked representation from the full range of interested parties. In drafting the payments provisions, Articles 3 and 4, the ALI and NCCUSL have not only failed to include consumer representatives, but have not even included corporate users. See Rubin, *supra* note 100, at 759-67. As a result, the statutes that they have produced are widely regarded as shamelessly pro-bank. See, e.g., Frederick Beutel, *The Proposed Uniform [?] Commercial Code Should Not Be Adopted*, 61 *YALE L.J.* 334 (1952); Corinne Cooper, *The Madonnas Play Tug of War with the Whores or Who Is Saving the UCC*, 26 *LOY. L.A. L. REV.* 563 (1993); Kathleen Pachtel, *Interest Group Politics, Federalism, and the Uniform Laws Process: Some Lessons from the Uniform Commercial Code*, 78 *MINN. L. REV.* 83 (1993); Edward Rubin, *Efficiency, Equity and the Proposed Revision of Articles 3 and 4*, 42 *ALA. L. REV.* 551 (1991); Alan Schwartz & Robert E. Scott, *The Political Economy of Private Legislatures*, 143 *U. PA. L. REV.* 595 (1995). The statute is generally defended only by those who were responsible for designing or implementing the drafting process. See, e.g., Fred Miller, *U.C.C. Articles 3, 4 and 4A: A Study in Process and Scope*, 42 *ALA. L. REV.* 405 (1991).

106. It would not be difficult for a federal statute to declare that the use of a computer language in interstate commerce that was not designed through a sufficiently cooperative process is an unfair trade practice under 15 U.S.C. § 45(a)(1) ("Unfair methods of competition in or affecting commerce, and unfair or deceptive acts or practices in or affecting commerce, are declared unlawful"), and thus subject to an FTC cease and desist order and civil penalty action.

The rules for participation in negotiated rulemaking would be a useful starting point, because there has already been some experience with them. Truly balanced participation, however, would probably require that the participating for-profit organizations subsidize the selected non-profit participants in some manner, perhaps by charging them the sort of fees that the W3C imposes.

Of course, federal regulation has a bad reputation these days, and it may seem particularly inappropriate for the Internet, with its decentralized structure and its bedazzling rate of growth and change. There are, in fact, those who celebrate the Internet's unregulated anarchy, often in fairly millennial terms.¹⁰⁷ But one must remember that the subject matter of the regulation in question, namely XML languages, is inherently political, as most languages are. Most users of these languages will be subject to decisions that were reached by distant people whom they do not know, regardless of whether those people are private actors or government officials.¹⁰⁸ Moreover, the Internet, far from being some idealized playground of private enterprise is, in fact, a government creation. It was invented by that most governmental of governmental institutions, the Department of Defense, and remained a military project for the first twenty years of its development.¹⁰⁹ It was then transferred to the National Science Foundation, which operated it for another decade. Indeed, the Internet was so inherently governmental in its first decades that federal legislation was required to allow its use for private commercial transactions.¹¹⁰ Both the World Wide Web itself and the Netscape browser were developed by employees of government-funded research facilities—CERN and the University of Illinois. It can hardly be argued that moderate levels of government intervention will kill the Internet when massive levels of government intervention were responsible for its creation.

What is crucial, of course, is that the government regulate XML in a manner that preserves its advantageous network features, while moderating its political impact. Heavy-handed regulation is also an abuse; whether it is a worse abuse than private oppression can be fairly described as one of the most controversial questions in the history of the world. At present, the government's position has been ambivalent. On the one hand, it enacted overbroad decency legislation that was struck down by the Supreme Court;¹¹¹ on the other hand, it has declared a three-year moratorium on taxation of Internet sales¹¹² and announced an

107. See *supra* note 97 (citing sources).

108. Habermas regards this as a central dilemma of modern society—that people's every day experience, their "lifeworld," is colonized by political forces that are not only beyond their control but beyond their comprehension. See JURGEN HABERMAS, *THE THEORY OF COMMUNICATIVE ACTION: VOL. 2: LIFEWORLD AND SYSTEM: A CRITIQUE OF FUNCTIONALIST REASON* 301-73 (Thomas McCarthy trans., 1987).

109. See Bickerstaff, *supra* note 8.

110. See *supra* note 19 and accompanying text.

111. See *generally* *Reno v. ACLU*, 521 U.S. 897 (1997) (declaring unconstitutional the Communications Decency Act of 1996).

112. See Internet Tax Freedom Act, Pub. L. No. 105-277, 112 Stat. 2681-2719 (1998).

intention to surrender regulation of domain names to a private entity.¹¹³ Perhaps the problem is that the choices are conceived as either classic command and control regulation, or a complete absence of regulation. The preferable option in this case is a new mode of regulation that has been explored by Jody Freeman, Claus Offe, Guenther Teubner¹¹⁴ and others. In this case, it involves the effort to control a process rather than a product, to establish an institutional dynamic that will produce results that the government cannot prescribe or predict in advance, but that are likely to satisfy the demands of fairness by virtue of the process used in their creation.

CONCLUSION

This article joins a growing body of literature, by Lawrence Lessig, Neil Netanel, Margaret Radin, R. Polk Wagner and others,¹¹⁵ which rejects the view that the Internet either cannot or should not be regulated by public authorities. In the case of XML, however, standard forms of regulation will not work. While XML languages represent an exercise of power that justifies regulation, their advantages lie in their network characteristics that would be destroyed by the rigidity of the regulatory process, and demand levels of information that would overwhelm any public agency. Thus, the necessary and desirable regulation of XML is not one that involves the imposition of rules, but the supervision and subtle adjustment of a private rule-making process. Thus, it challenges public policy makers to think in new ways. At the same time, like any other important technological and social development, it also promises to teach new ways of thought to those same policy makers.

113. See National Telecommunications and Information Admin., U.S. Dep't of Commerce, Statement of Policy on Management of Internet Names and Addresses, 63 Fed. Reg. 31,741 (1998).

114. See generally Freeman, *supra* note 45; CLAUS OFFE, CONTRADICTIONS OF THE WELFARE STATE (John Keane, ed. 1984); Guenther Teubner, *The Two Faces of Janus: Rethinking Legal Pluralism*, 13 CARDOZO L. REV. 1443 (1992); Guenther Teubner, *The "State" of Private Networks: The Emerging Legal Regime of Polycorporatism in Germany*, 1993 BYU L. REV. 553 (1993). Teubner describes the state itself as a network; more specifically, he says that "the state is now being transformed into the self-description of a loose network of private and public actors." *Id.* at 570. This suggests that a mode of regulation that is based on this conception of the state is in some sense homologous with the subject matter being regulated in the case of XML languages, and therefore a more appropriate mode of regulation.

115. See LESSIG, *supra* note 17; Netanel, *supra* note 86; Margaret Radin & R. Polk Wagner, *The Myth of Private Ordering: Rediscovering Legal Realism in Cyberspace*, 73 CHI.-KENT L. REV. 1295 (1998).

