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# **THE INTERNET IS NOT A SUPER HIGHWAY: USING METAPHORS TO COMMUNICATE INFORMATION AND COMMUNICATIONS POLICY**

BY KRISTEN OSENGA\*

Do metaphors influence our information policy preferences? Professor Osenga thinks so, which makes it especially important to choose the right one, as a metaphor is often the primary tool the general public uses to understand information policy. Using a five-point rubric, she evaluates, among others, understanding the Internet as “tubes,” “highway,” “space (cyberspace),” “coffee shop/bar” and “cloud.” Osenga finds them all lacking in important ways. However, she believes the metaphor of the Internet as “ecosystem” is very promising and deserves to be further developed.

## **INTRODUCTION**

In today’s world, you do not have to look far to encounter issues of information and communications policy. Major newspapers and news websites run frequent stories on broadband policy, net neutrality, spectrum allocation, Internet privacy and security, and use (or misuse) of electronic data. Given the ubiquity of personal computers, wireless devices, and smart phones and the fact that most Americans “live” a good portion of their lives online, information and communications policies touch all areas of human lives. As technology progresses, information and communication policy’s influence on day-to-day existence is only likely to increase.

For example, net neutrality is the principle that all data on the Internet should be treated equally, rather than allowing an Internet service provider (ISP) to pick and choose which content and content providers to which it will offer preferential treatment.<sup>1</sup> Policy decisions about net neutrality could impact everyday consumers in both positive and negative ways. On one hand, if ISPs are able to discriminate against different types of Internet traffic, there could be a reduction in services offered by disfavored providers.<sup>2</sup> Furthermore, if consumers are charged by the amount of bandwidth they consume, the “digital divide,” or inequality of Internet services available based on socioeconomic factors, will be exacerbated.<sup>3</sup> On the other hand, there are benefits to providing tiered service, such as having individuals pay their fair share for consuming large amounts of

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<sup>1</sup> Larry Abramson, “Net Neutrality: What’s at Stake?” National Public Radio, July 24, 2006, accessed Feb. 12, 2013, <http://www.npr.org/templates/story/story.php?storyID=5578594>.

<sup>2</sup> Jeremy Gin, “Impact of the Net Neutrality Ruling on Consumers,” The Sitejabber Blog, Apr. 7, 2010, accessed Feb. 12, 2013, <http://www.sitejabber.com/blog/2010/04/07/impact-of-the-net-neutrality-ruling-on-consumers>.

<sup>3</sup> Ibid.

bandwidth and encouraging companies to develop lower bandwidth-consuming applications.<sup>4</sup> Whatever policy decisions are made with respect to net neutrality have the potential to immediately and significantly alter the public's Internet experience.

Policy decisions such as these form the backdrop against which discussions about information and communications policies will take place. Given the widespread effects of any decision, it is important to allow all interested parties to participate in policy debates that will affect the future trajectories and governance of these areas.<sup>5</sup> Behind the policies may be economic, technological, behavioral, or social concerns. Crafting these policies requires developing a set of desired objectives that ideally represent the diverse – and often divergent – concerns, values, and interests of the stakeholders and then creating the instruments and regulations to achieve these objectives.<sup>6</sup> To ensure that the values and interests of all stakeholder groups are represented, information and communications policy cannot be determined by only one or two potential stakeholders. To view only the technological perspective may ignore important social or economic goals; as Alan McGowan notes, scientists have the responsibility to clarify the scientific and technological issues and implications of public policies, but science alone should not make policy decisions.<sup>7</sup> Similarly, if the debate focuses only on economic or political issues, other values, such as social concerns of the public, may be ignored.<sup>8</sup> Good policymaking, especially in areas integral to the human experience, requires the ability for the public to voice their opinions within the debate.<sup>9</sup> Beyond that, public participation in policy debates may even inject fresh perspectives.<sup>10</sup>

Although there is value in including a diverse group of stakeholders, including the public, at the table to discuss information and communications policies, it is not without difficulty. The diversity of members creates the potential for an ineffective discourse community. A discourse community is “a group of individuals who share a *common language*, common knowledge base, common thinking habits, and common intellectual assumptions.”<sup>11</sup> The more diverse the debate participants, the less likely they share a common language and knowledge, thereby hampering fruitful discussion. Although having a lack of common “language” and knowledge could certainly be said of the

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<sup>4</sup> Ibid.

<sup>5</sup> Richard S. Whitt, “Adaptive Policymaking: Evolving and Applying Emergent Solutions for U.S. Communications Policy,” *Federal Communications Law Journal* 61, no. 3 (2009): 574. Whitt notes that policy makers should “coordinate, and not control,” these debates.

<sup>6</sup> Barbara A. Cherry and Johannes M. Bauer, “Adaptive Regulation: Contours of a Policy Model for the Internet Economy,” white paper, unknown date, accessed Feb. 12, 2013, <http://www.quello.msu.edu/sites/default/files/pdf/wp-04-05.pdf>.

<sup>7</sup> Alan H. McGowan, “Communicating Science in the Information Age,” *Environment* (Mar.-Apr. 2009), accessed Feb. 12, 2013, <http://www.environmentmagazine.org/Archives/Back%20Issues/March-April%202009/editorial-ma09.html>.

<sup>8</sup> Whitt, 495.

<sup>9</sup> Ibid. See also Albert C. Lin, “Technology Assessment 2.0: Revamping Our Approach to Emerging Technologies,” *Brooklyn Law Review* 76, no. 4 (2011): 1325. Lin notes that public participation is essential to ensure that policy choices reflect the values of the public. Although Lin's article is directed toward controversial technologies, such as genetic engineering and nanotechnology, his assertions are apt in the area of information and communications policy as well.

<sup>10</sup> Lin, 1327, 1329.

<sup>11</sup> Ruth Ann McKinney, *Reading Like a Lawyer: Time-Saving Strategies for Reading Law Like an Expert* (Durham, N.C.: Carolina: Carolina Academic Press, 2005), 14 [emphasis added].

multiple parties taking part in these policy debates, more often than not, it is the public that is perceived to be the most technologically challenged.<sup>12</sup>

Successful participation by the public (or any stakeholder group, for that matter) in information and communications policy debates requires the creation of a discourse community through information and education.<sup>13</sup> Unfortunately, educating the public about science and technology is not necessarily a simple task, particularly when the citizens must have enough knowledge and understanding to make valuable contributions to the debate.<sup>14</sup> First, preexisting ideas and attitudes about science and technology may need to be overcome.<sup>15</sup> Second, educating the public to participate in these policy debates requires both laying a scientific or technological foundation and providing a legal/policy background – an overlap of education that has been scarcely examined in existing scholarship. This article proposes using a common theme from both threads of scholarship – metaphor – to create the necessary discourse community for effective participation in information and communications policy discussions. There is research about educating the public on legal or policy theories, many of which involve rhetorical devices, such as metaphor.<sup>16</sup> There are also articles about using metaphor to explain science to laypersons.<sup>17</sup> To create the best discourse community, the participants must understand the science and the policy components, as well as the relationship between the two.<sup>18</sup> Essentially, metaphors can be used to educate the public about science while framing it within the debate.

Although rhetorical devices, such as metaphor, may be useful for creating an adequate discourse community for the information and communications policy debate, the metaphor being used must be appropriate. As a starting point, it is helpful to look at metaphors that have been or are being used in this area, although not without criticism, as discussed in the *Metaphors in Information and Communications Policy* section below. However, the use of metaphors to bridge the gaps of both technology and policy has not been critically examined, nor have suggestions been offered for

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<sup>12</sup> McGowan.

<sup>13</sup> Ibid. “The extensive debate that is needed to address [the issues in question] is only possible with a scientifically well-informed public.”

<sup>14</sup> Although the terms *science* and *technology* are being used here in the general sense, for the purposes of information and communications policy discussions, these terms include the underlying technology that makes information and communications possible, such as the Internet. Specific examples are provided below.

<sup>15</sup> Ibid. “We cannot just put information out there and expect a lay audience to read it, understand it, and absorb it. If we are to succeed in informing them, we must speak to and sometimes break through people’s preexisting ideas and attitudes.”

<sup>16</sup> See for example Keith Cunningham-Parmeter, “Alien Language: Immigration Metaphors and the Jurisprudence of Otherness,” *Fordham Law Review* 79, no. 4 (2011): 1546; Louise A. Halper, “Tropes of Anxiety and Desire: Metaphor and Metonymy in the Law of Takings,” *Yale Journal of Law & the Humanities* 8 (1996): 31; Haig Bosmajian, *Metaphor and Reason in Judicial Opinions* (Carbondale, Ill.: Southern Illinois University Press, 1992).

<sup>17</sup> Andrew Ortony, “Metaphor, Language, and Thought,” in *Metaphor and Thought*, 2nd ed., ed. Andrew Ortony (New York: Cambridge University Press, 1993), 2.

<sup>18</sup> Stephen Strauss, “We Need a Satisfactory Metaphor for DNA,” *New Scientist*, Feb. 23, 2009, accessed Feb. 12, 2013, <http://www.newscientist.com/article/mg20126965.800-we-need-a-satisfactory-metaphor-for-dna.html> [subscription required]. Strauss notes that the common metaphors for DNA, such as a blueprint or the symphony of life, do not provide context for policy discussions about DNA.

improving the metaphors offered to create an effective discourse community. This article is the beginning of that research.

The next section below offers more discussion about the need for an appropriate discourse community for information and communications policy debates as well as why there is a disconnect in knowledge that hampers the creation of discourse communities. The following section explains why rhetorical devices, and particularly metaphor, are powerful tools for bridging knowledge gaps between and within the discourse community, including scientists, policymakers, the public, and others. Furthermore, the article suggests a rubric to be used to assess whether a given metaphor is appropriate for a particular policy debate. The next section analyzes some of the metaphors that have been or are currently being used in the information and communications policy area. The final section explains how strong metaphors may be introduced into policy discussions, offers a promising metaphor for discussing issues involving the Internet, and analyzes that metaphor's viability using the rubric. The article concludes that metaphors are a good means for educating the public about technology and policy issues to create a solid discourse community for developing information and communications policy, but only if the metaphors are tailored to the issue in question, are not viewed as universally useful, and represent the starting point and not the ending point of the discussion.

## **THE NEED FOR THE PUBLIC IN THE DISCOURSE COMMUNITY**

### ***Why the Public Should Participate***

Stakeholders in information and communications policy debates span a wide range of backgrounds and areas of interest. Participants run the gamut from scientists or technologists with highly specialized technical knowledge; to well-versed, but not scientifically trained, members of government or industry, including lobbyists; to academics immersed in the legal or policy issues but with little understanding of the underlying technologies; to the general public that is affected by the results of the policymaking. Included in the group of scientists and technologists should be the providers of services that permit and control the public's access to particular technologies, such as ISPs. The party most frequently omitted from discussions is the public; yet, as noted above, the policies at issue will affect the use and availability of the technologies at the center of the public's everyday lives.

Two groups often stand in for the public in these policy discussions – politicians and the media – but in this particular context, neither group provides an adequate proxy.<sup>19</sup> Politicians are often seen as surrogates for the public in policy debates; after all, the point of representatives is to be the voice of their constituencies in government matters. However, when technology is at stake, the

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<sup>19</sup> Another potential proxy representing the public in policy discussions is a citizens' lobbying group. While such a group may be more attuned to the public's interests, it is unclear if they are any better suited than the public at large with respect to the knowledge of science.

government representatives may be as ignorant about the technology as the lay public, and thus, Albert Lin argues, the representatives are more likely to be swayed by lobbying or the latest headlines, rather than the values of their constituencies.<sup>20</sup> The mass media often acts as an intermediary between the public and the policy debates, providing both sides with information from the other; however, in the case of information and communications policy, the mass media is actually an independent stakeholder with interests that may diverge from the public and are thus potentially likely to distort rather than convey the public's best interests.<sup>21</sup>

Because the public may not be adequately represented by others in discussions about information and communications policies, the public's participation is important. Returning to the net neutrality example provided previously, policy discussions may include ISPs, governmental officials, and lobbying groups representing various interests. This represents the discourse community for debates about net neutrality; policy is often made based on these discussions. However, none of these groups may adequately support the public's interest, even though, as noted above, the outcome of policy discussions on net neutrality has a substantial impact on the everyday lives of the public.

There are additional benefits to including the public. First, public participation is likely to increase public education and mobilization about these issues.<sup>22</sup> Second, greater inputs (in the form of information provided by the public) should result in better decision-making by the policymakers.<sup>23</sup> Finally, public participation, especially as it adds additional viewpoints, adds to the legitimacy of the actions taken by lawmakers and policymakers.<sup>24</sup> Participation of the public is valuable.

There are, of course, downsides to including the public in information and communications policy discussions. Increasing the number of parties to a discussion often adds inefficiencies and consumes greater resources. If policy decisions take longer to finalize and more resources have been spent in determining the policy, progress in the technology field may be retarded.<sup>25</sup> The upside, though, is more robust communications and information policies that reflect the best mix of the various stakeholders' positions, including culture and values. This upside is worth the potential inefficiencies and costs.

### ***Overcoming the Lack of Valuable Public Participation***

The upside of the public's participation, however, is unlikely to be realized by simply dropping the public into the discussion. True debate can only happen if the parties start from a mutual baseline, with shared vocabulary and background – a discourse community. For the most part, the perceived deficient group will be the public – but not necessarily because of chosen ignorance. The public

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<sup>20</sup> Lin, 1329.

<sup>21</sup> Heather Savigny, "Public Opinion, Political Communication and the Internet," *Politics* 22, no. 1 (2002): 1.

<sup>22</sup> Peter M. Shane, "Cybersecurity Policy as if 'Ordinary Citizens' Mattered: The Case for Public Participation in Cyber Policy Making," *I/S: A Journal of Law and Policy for the Information Society* 8, no. 2 (2012): 449.

<sup>23</sup> *Ibid.*

<sup>24</sup> *Ibid.*; Savigny, 1.

<sup>25</sup> Gregory Mandel, "Technology Wars: The Failure of Democratic Discourse," *Michigan Telecommunications Technology Law Review* 11 (2005): 119-120. Mandel notes that the longer a technology "conflict" exists, the more inefficiencies are created and the more resources are spent on the conflict, thereby retarding technological progress and growth.

possesses intellectual curiosity, values and culture, and a vested interest in the outcome, all of which may incentivize the public to overcome whatever deficiencies exist to allow for positive participation in the policy debates.

One characteristic of human beings is intellectual curiosity.<sup>26</sup> In a recent study, 41% of Americans indicated they are very interested in new scientific developments and 50% are moderately interested.<sup>27</sup> They tend to get this information from both Internet and television sources.<sup>28</sup> The innovation that is occurring in the United States in the areas of communications, Internet, and telecommunications is much greater than innovation in most manufacturing and even many non-manufacturing industries.<sup>29</sup> In short, developments in the information and communications areas are those that Americans are going to hear about and are most likely going to hear about from the Internet or television, which makes the participation of the public much more important. (This is necessary in order to overcome the slant of the media coverage, which may reflect the media's own interest in information and communications policy.)<sup>30</sup> Furthermore, these developments are likely to affect the public's daily lives via their pocketbooks, their lifestyles, and their livelihoods. They have every reason to want to learn about these technologies.

Another characteristic of human beings is the presence of values and culture. The best solutions to technological conflicts recognize that science and culture are competing to influence and generate the conflict;<sup>31</sup> without culture, science could progress unchecked. As Lawrence Lessig noted, "We can build, or architect, or code cyberspace to protect values that we believe are fundamental. Or we can build, or architect, or code cyberspace to allow those values to disappear."<sup>32</sup> These fundamental values and cultures are important aspects that the public, and only the public, can bring to the debates.

Finally, the public is often a purported beneficiary of information and communications policy, making them all the more important participants in the debate. For example, in the United States, the Federal Communications Commission (FCC) is charged with "mak[ing] available, so far as possible, to all the people of the United States... a rapid, efficient, nationwide, and world-wide wire and radio communications service with adequate facilities at reasonable charges."<sup>33</sup> Of course, as with most government agencies, the sometimes onerous procedural rules and the onslaught of

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<sup>26</sup> Although the data and examples throughout this paper reference the United States, the need for public participation in information and communications policy discussions and the utility of metaphors to facilitate the public's participation is not limited to the United States.

<sup>27</sup> National Science Board, "Science and Technology: Public Attitudes and Understanding," chapter 7 in *Science and Engineering Indicators 2012*, accessed Feb. 12, 2013, <http://www.nsf.gov/statistics/seind12/c7/c7h.htm>.

<sup>28</sup> Ibid.

<sup>29</sup> National Science Board, "Industry, Technology, and the Global Marketplace," chapter 6 in *Science and Engineering Indicators 2012*, accessed Feb. 12, 2013, <http://www.nsf.gov/statistics/seind12/c6/c6h.htm>.

<sup>30</sup> Matthew C. Nisbet, "Communicating Climate Change: Why Frames Matter for Public Engagement," *Environment*, Mar.-Apr. 2009, accessed Feb. 12, 2013, <http://www.environmentmagazine.org/Archives/Back%20Issues/March-April%202009/Nisbet-full.html>.

<sup>31</sup> Mandel, 120.

<sup>32</sup> Lawrence Lessig, *Code 2.0* (New York: Basic Books, 2006), 6.

<sup>33</sup> Federal Communications Act of 1934, 47 U.S.C. § 151.

comments from special interest groups often make it difficult to discern, let alone realize, the public's interest.<sup>34</sup> The public, via interested citizens' groups, has gotten involved in some policy debates regarding FCC rules.<sup>35</sup> In one example, the citizens' group Free Press petitioned the FCC in 2007 for a rule clarification. Specifically, the FCC's Internet policy statement stated that ISPs could not discriminate subject to reasonable network management. Free Press sought a statement from the FCC that an ISP violated the Internet policy when it intentionally degraded a targeted Internet application, specifically BitTorrent.<sup>36</sup> Although the citizen's group did not get as broad a ruling as it had sought, it was still able to convince the FCC to alter the landscape in favor of the public's desires.<sup>37</sup> However, there is a sense that greater participation would be helpful in ensuring that the policy goals of the FCC are met.

For all the reasons the public may wish to, and should, get involved in policy debates about information and communications policy, there are also a number of reasons why the public may decline to participate. Certainly apathy, lack of time, onerous procedures, and other issues may inhibit public involvement.<sup>38</sup> Tom R. Burns identifies three specific deficits that hinder public participation in policy debates: representation deficit (an inability to span the challenges of a diverse and complex world); knowledge deficit (an inability to master the technological knowledge demanded for participation); and commitment deficit (a lack of interest sufficient to participate fully in issues).<sup>39</sup> The key issue for the purposes of this article is the knowledge deficit.

The public must be informed about the technology and policy implications both to be enticed to participate and to be valuable participants. Returning to the net neutrality example provided in the introduction, to fully participate the public needs to be informed about the technology behind the issue, as well as the implications that arise from the various policy decisions that could be made. Specifically, the public would likely need a basic understanding of how the Internet works, such as the role of servers, packets, protocols, DNS, and ISPs. With that knowledge, the public would need to understand the capabilities of an ISP to discriminate – how does an ISP know whose data is coming through and how can the ISP either fail to send, reroute, or slow that data's transfer. Finally, the public should understand the implications of imposing net neutrality versus allowing tiered Internet service provision. The implications are likely to entice participation; the explanation of how and why the issue can occur permits the public to communicate with other members of this policy debate – the discourse community.

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<sup>34</sup> Whitt, 553.

<sup>35</sup> Brandi Field, "Net Neutrality: An Architectural Problem in Search of a Political Solution," *Asper Review of International Business and Trade Law* 10 (2010): 196.

<sup>36</sup> *Ibid.*, citing *In the Matter of the Petition of Free Press et al. for Declaratory Ruling that Degrading an Internet Application Violates the FCC's Internet Policy Statement and Does Not Meet an Exception for "Reasonable Network Management"*. The FCC's archived version of this petition can be found at [http://www.fcc.gov/broadband\\_network\\_management/fp\\_et\\_al\\_nn\\_declaratory\\_ruling.pdf](http://www.fcc.gov/broadband_network_management/fp_et_al_nn_declaratory_ruling.pdf).

<sup>37</sup> Field, 198.

<sup>38</sup> Tom R. Burns, "The Evolution of Parliaments and Societies in Europe," *European Journal of Social Theory* 2, no. 2 (1999): 167.

<sup>39</sup> *Ibid.*, 171.

One recent concern is that information and communications policy debates have become increasingly driven by empirical research, which is often unavailable or inaccessible to the public.<sup>40</sup> But putting that aside, stakeholders are unlikely to get involved if they do not understand the technology or how the debates around the technology are likely to affect their lives. Worse, if they do not understand the science, yet choose to participate in the debate anyway, they may simply defer to the most expert or most vocal participant in the debate (negating the positive influences of the public on the debate) or rely on inaccurately simple information (potentially skewing the debate).<sup>41</sup> Uneducated participation runs the risk of being unproductive or even harmful; at the very least, it may be ignored. In response to an overwhelming amount of public comments against the relaxation of the FCC's media ownership rules, then-FCC chairman Michael Powell said the comments did not warrant consideration because they were "at a very generalized level."<sup>42</sup> As noted above, though, a simplistic understanding of the technology is probably insufficient. To fully participate in the debate, the public must understand both the technology and how that technology is situated within the policy debate; the public must fully join the discourse community.

### *Providing Scientific and Technological Knowledge to the Public*

Most Americans get their first understanding of new technologies and the surrounding policy debates via the news, whether delivered by television, Internet, or newspapers. This understanding will naturally be superficial. The purpose of providing this information is not to educate the public about the details of the scientific or technological developments, but rather to make them aware that technology has improved or that a debate has been taken up. To get to the level of detail required to participate in policy debates, it is necessary to obtain more in-depth information. The typical sources of this information will include explanatory broadcasts/podcasts (either via television or Internet) by scientists or, perhaps, articles written by scientists. The problem is that science and technology conveyed by scientists is traditionally difficult to understand – and not just because of the science involved. Science is traditionally difficult to read because it is densely written in passive voice, includes extensive noun phrases and over-description, and includes technical taxonomies and peculiar linguistic uses of common words.<sup>43</sup> This may be simply how scientists are trained to convey information, or perhaps the purpose is to achieve exclusivity and create boundaries between professionals and amateurs.<sup>44</sup>

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<sup>40</sup> Philip M. Napoli and Michelle Seaton, "Necessary Knowledge for Communications Policy: Information Asymmetries and Commercial Data Access and Usage in the Policymaking Process," *Federal Communications Law Journal* 59, no. 2 (2007): 296-297.

<sup>41</sup> Lin, 1355.

<sup>42</sup> Napoli and Seaton, 306, n.53.

<sup>43</sup> Nicholas Russell, *Communicating Science: Professional, Popular, Literary* (New York: Cambridge University Press, 2010), 19-21.

<sup>44</sup> *Ibid.*, 22-23.

One noticeable issue of science communication is that, as an area of technology improves, scientists working in that field tend to write papers that are more and more difficult to read and understand.<sup>45</sup> Some of this effect may be due to the increased complexity of the technology itself. However, there is also what is known as a “silo effect,” in which scientists (through their actions and their language) create a jargon and manner of describing the technology to separate their science from the public and even from other scientists working in different fields.<sup>46</sup> Some of the silo effect may be intentional; some of the silo effect may simply be due to the increasingly specialized nature of scientific inquiry. Some of the language specialization also may be attributed to the “textual economy” associated with science.<sup>47</sup> Unlike legal and policy scholarship, where lengthy papers reign and verbosity is cherished, science scholarship is generally approved for its concision; this may lead to further “lingoization” of the scientific information to decrease the amount of verbiage needed to convey the information.<sup>48</sup>

Even worse, all of this is occurring in an area where the audience – that is, the public – may already be outside of its comfort zone. The concepts being conveyed are new, often abstract, and generally confusing. To successfully convey technical information, communication to the public has to both explain the science or technology in a manner that highlights the science within the context of the public’s everyday life, while at the same time maintaining sufficient credibility and sophistication.<sup>49</sup> The most important principle of science communication is to know the audience and to tailor the message and medium to be of interest and to capture the attention of the audience.<sup>50</sup> If the science or technology is explained in a way in which it connects with the experiences the audience has already had, it is most likely to be understood.

It is not enough to educate the public about the technology at a sufficient level of scientific understanding; the public must also understand where that technology fits in the context of the policy debate. This is often referred to as “framing” and is related to the idea of drawing on the audiences’ previous experiences and backgrounds.<sup>51</sup> However, framing is sometimes used by one or both sides of a policy debate to gain sympathy or induce fear.<sup>52</sup> Framing, however, should not be confused with putting a false spin on the science to presuppose the result of the debate.<sup>53</sup> An example of “spin” versus “framing” would be referring to genetically-modified food as

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<sup>45</sup> Jonathan Knight, “Scientific Literacy: Clear as Mud,” *Nature*, May 22, 2003, 377 (noting that as the number of people active in science increased, so did subspecialties and along with them specialized vocabularies); Donald P. Hayes, “The Growing Inaccessibility of Science,” *Nature*, Apr. 30, 1992, 739-740.

<sup>46</sup> John Mixon, “Linguistic Silos as Barriers to Sustainable Environment,” *Tulsa Law Review* 44, no. 1 (2008): 14.

<sup>47</sup> David Kellogg, “Toward a Post-Academic Science Policy: Scientific Communication and the Collapse of Mertonian Norms,” *International Journal of Communications Law and Policy* (2006): 10-11.

<sup>48</sup> *Ibid.*, 11.

<sup>49</sup> Neil Hook and Mark Brake, “Science in Popular Culture,” in *Introducing Science Communication*, ed. Mark Brake and Emma Weitkamp (Basingstoke, UK: Palgrave Macmillan, 2009), 37-38.

<sup>50</sup> Karen Bultitude, “Presenting Science,” in *Introducing Science Communication*, ed. Mark Brake and Emma Weitkamp (Basingstoke, UK: Palgrave Macmillan, 2009), 130.

<sup>51</sup> Russell, 85.

<sup>52</sup> McGowan; Nisbet.

<sup>53</sup> Nisbet.

“Frankenfood.”<sup>54</sup> Successful framing means staying true to the underlying science, understanding the existing views and preconceived notions about the technology, and reexamining the assumptions that have traditionally informed communication efforts about the technology.<sup>55</sup> Rather than seeking division and alienation, a framing that emphasizes potential opportunity from the technology (and being honest about potential negative implications) rather than resorting to unfounded scare tactics is more likely to draw the public in and result in valuable participation in information and communications policy debates.<sup>56</sup> Educating the public for participation in information and communications policy debates requires recognition of all of these issues and the realization that addressing them is not an easy task.

### CREATING A DISCOURSE COMMUNITY VIA GOOD METAPHORS

Once the importance of engaging the public in information and communications policy debates and creating an adequate discourse community to allow valuable participation by the public is recognized, the question becomes how to create it. Communication of specialized knowledge, such as science, requires that the speaker and audience have shared representations; the key is providing shared representations to groups with very different backgrounds.<sup>57</sup> One way to bridge the communication divide is through the use of rhetorical devices such as metaphor. Metaphors work especially well for this purpose because, even outside the world of science communication, they are used to convert an abstract or conceptual idea to a more tangible idea, based on experiences that the audience should have in common.<sup>58</sup> Interesting metaphors not only educate, but they may also make an issue more pleasant to think about, which is helpful in engaging the public in the debate.<sup>59</sup> Although metaphors are a natural and convenient way to bridge the gap between the unknown and the known, the downside is that the metaphors chosen also have the opportunity to influence the policy debate.<sup>60</sup> For this reason, it is important that metaphors are chosen and used carefully and deliberately.

Metaphor has long been used as a means to convey new knowledge using existing understanding by comparing attributes of an unknown or abstract concept to attributes of a known concept, or for

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<sup>54</sup> Claire Mcinerney, Nora Bird, and Mary Nucci, “The Flow of Scientific Knowledge from the Lab to the Lay Public: The Case of Genetically Modified Food,” *Scientific Communication* 26 (2004): 52.

<sup>55</sup> Nisbet.

<sup>56</sup> Ibid.

<sup>57</sup> Loet Leydesdorff and Iina Hellsten, “Metaphors and Diaphors in Science Communication: Mapping the Case of Stem Cell Research,” *Science Communication* 27 (2005): 68.

<sup>58</sup> Whitt, 537-538; Cunningham-Parmeter, 1552-1553.

<sup>59</sup> Chad Oldfather, “The Hidden Ball: A Substantive Critique of Baseball Metaphors in Judicial Opinions,” *Connecticut Law Review* 27 (1994): 21.

<sup>60</sup> Cunningham-Parmeter, 1547-1548 (“In attempting to comprehend new ideas, people borrow from familiar concepts. The metaphors floating in our minds determine our linguistic choices, which in turn affect social discourse and ultimately social action. Thus, how we think metaphorically affects how we talk about problems and the solutions we formulate in response to those problems.”); J. Pierre De Vries, “Imagining Radio: Mental Models of Wireless Communication,” paper presented at New Frontiers in Dynamic Spectrum Access Networks, symposium, Apr. 2007, accessed Feb. 12, 2013, [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=965477](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=965477), 2.

“leaping the... chasm between old knowledge and radically new knowledge.”<sup>61</sup> Consider some well-known metaphor structures: ideas as plants (the idea blossomed, she has a fertile imagination) or love as war (he is known for conquests, she is besieged by suitors).<sup>62</sup> The new, or abstract, concept is the “target domain” and the known experience offered for comparison is the “source domain.”<sup>63</sup> The metaphor may either be comparative or interactive. Comparative metaphors implicitly match one or more attributes of two dissimilar concepts<sup>64</sup> – for example, the “flow” of electricity (source domain – the idea of water or other liquid flowing is a common concept) builds the idea that electricity moves directionally (target domain). Interactive metaphors first create the similarities between the attributes and then create the bridge between the ideas, requiring a little more creativity.<sup>65</sup> Another way to consider metaphor is as a knowledge substitution – replacing one signifier for another signifier, where the second signifier provides a richer understanding of the first.<sup>66</sup>

Resistance to the idea of using metaphor to explain science is easy to understand. First, science is supposed to be precise, whereas metaphors are anything but.<sup>67</sup> Second, for the context of educating the public to participate in policy discussions, metaphor could make the technology too simple, providing little value above the pop culture knowledge that the public has already obtained from media outlets.<sup>68</sup> Third, when applying metaphor to complex technology, the metaphors are often multi-faceted, which may result in providing different meanings to different audiences, defeating the idea of the common understanding required to create a discourse community.<sup>69</sup> Finally, metaphors necessarily highlight some attributes or aspects of an issue or technology and suppress other attributes and aspects; this obviously ignores some physical realities, aggravating the previously mentioned concerns.<sup>70</sup>

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<sup>61</sup> Hugh G. Petrie and Rebecca S. Oshlag, “Metaphor and Learning,” in *Metaphor and Thought*, 2nd ed., ed. Andrew Ortony (New York: Cambridge University Press, 1993): 583; Anuška Štambuk, “Metaphor in Science Communication,” *Meta: Translator’s Journal* 43, no. 3 (1998): 375-376.

<sup>62</sup> Štambuk, 374.

<sup>63</sup> Cunningham-Parmeter, 1553.

<sup>64</sup> Petrie and Oshlag, 584.

<sup>65</sup> Ibid. One example of an interactive metaphor is “the winter is a wolf.” The attributes in question may be cruelty and aloofness. To get from the cruelty and aloofness of the wolf (source domain) to the winter (target domain) requires more imagination than is required in a comparative metaphor.

<sup>66</sup> Halper, 40.

<sup>67</sup> Ortony, 2. “Metaphors characterize rhetoric, not scientific discourse. They are vague, inessential frills, appropriate for the purposes of politicians and poets, but not for those of scientists because the goal of science is to furnish an accurate (i.e., literal) description of physical reality.”

<sup>68</sup> José Julián Lopez, “Notes on Metaphors, Notes as Metaphors: The Genome as Musical Spectacle,” *Science Communication* 29 (2007), 7.

<sup>69</sup> De Vries, 2.

<sup>70</sup> I. Glenn Cohen and Jonathan H. Blavin, “Gore, Gibson, and Goldsmith: The Evolution of Internet Metaphors in Law and Commentary,” *Harvard Journal of Law & Technology* 16 (2002): 267; J.M. Balkin, *Cultural Software: A Theory of Ideology* (New Haven, Conn.: Yale University Press, 1998), 247-248 (noting that “metaphoric models selectively describe a situation, and in doing so help suppress the alternative conceptions”).

The use of metaphor in science communication, however, has a long history and is even encouraged.<sup>71</sup> Science makes use of metaphor, on one hand, to provide its own terminology.<sup>72</sup> Metaphors are also used to explain science, and to teach or clarify theories.<sup>73</sup> This may seem surprising, as science is generally considered to be about precision.<sup>74</sup> Metaphors also arise in science issues from a reverse perspective – that is, when science attracts the attention of groups who do not understand the scientific literature but want to open a discourse on ethics or social implications, these groups may adopt metaphorical terms to permit discussion.<sup>75</sup> Despite potential resistance, metaphors are particularly useful both to explain science and to describe it in the context of policy, thereby facilitating the creation of a discourse community for information and communications policy debates.

There are many common metaphors in science, some that are used in science classes and others that populate the mainstream media. Some metaphors are fairly simple to understand. For example, water is used as a metaphor for the flow of information or electronic data.<sup>76</sup> The solar system has been used as a visual metaphor for the contents of an atom (the Bohr model).<sup>77</sup> Genomes and genetics are characterized as music notes, from which “nature creates many symphonies.”<sup>78</sup> Sometimes the metaphors are a bit more complex. For example mRNA (messenger RNA) has been described as a magnetic recording tape with ribosomes acting as the tape recorder.<sup>79</sup>

More important than the history and prevalence of use of metaphor in science, however, is the notion that humans think in metaphors.<sup>80</sup> Rather than simply being flowery language used to make a point, a number of cognitive psychology scholars have shown that metaphors are instead necessary cognitive constructs.<sup>81</sup> Metaphors act as categories, organizing our thinking based on our previous experiences and interactions with the world.<sup>82</sup> And from there, the metaphors shape our reasoning.<sup>83</sup>

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<sup>71</sup> Thomas S. Kuhn, *The Structure of Scientific Revolutions*, 2nd ed. (Chicago: The University of Chicago Press, 1970), 43–46 (arguing for the use of more metaphors in increasingly abstract fields of science); W.H. Leatherdale, *The Role of Analogy, Model, and Metaphor in Science* (New York: American Elsevier Publishing Co., 1974).

<sup>72</sup> Richard Boyd, “Metaphor and Theory Change: What is ‘Metaphor’ a Metaphor For?” in *Metaphor and Thought*, 2nd ed., ed. Andrew Ortony (New York: Cambridge University Press, 1993), 483 (“[T]he use of metaphor is one of many devices available to the scientific community to accomplish the task of accommodation of language to the causal structure of the world.”); Petrie and Oshlag, 587.

<sup>73</sup> Boyd, 483–484; Roy Dreistadt, “An Analysis of the Use of Analogies and Metaphors in Sciences,” *Journal of Psychology* 68 (1968): 97.

<sup>74</sup> Ortony, 1. “Science is supposed to be characterized by precision and the absence of ambiguity, and the language of science is often thought to be correspondingly precise and unambiguous – in short, literal.”

<sup>75</sup> Leydesdorff and Hellsten, 65.

<sup>76</sup> Štambuk, 2.

<sup>77</sup> *Ibid.*, 4.

<sup>78</sup> Lopez, 20.

<sup>79</sup> *Ibid.*, 19.

<sup>80</sup> George Lakoff and Mark Johnson, “The Metaphorical Structure of the Human Conceptual System,” *Cognitive Science* 4, no. 2 (1980): 195; Mark Johnson, *The Body in the Mind: The Bodily Basis of Meaning, Imagination, and Reason* (Chicago: University of Chicago Press, 1987); George Lakoff, *Women, Fire, and Dangerous Things: What Categories Reveal About the Mind* (Chicago: University of Chicago Press, 1987).

<sup>81</sup> George Lakoff and Mark Johnson, *Metaphors We Live By* (Chicago: University of Chicago Press, 1980).

<sup>82</sup> Cohen and Blavin, 267.

<sup>83</sup> *Ibid.*

Unfortunately, metaphors are not a panacea. Although they are helpful to bridge informational gaps, they may also take on lives of their own.<sup>84</sup> In addition to potentially diverting attention from the main point for which metaphor was developed, metaphors have the tendency to become sticky, leading to continued usage even when inappropriate – “A bad metaphor can also simply lead to bad decision making.”<sup>85</sup> And when interjected into policy debates, there are parties who may “use the language of science and the language of the lay community strategically and effectively when it advances their cause” – using metaphors as spin rather than framing, by crafting a metaphor that pushes an agenda rather than simply explains the technology.<sup>86</sup> Instead of enhancing communication and understanding, these concerns may, in fact, decrease information flow between scientists; hinder access to information by scientists, policymakers, and the public; disenfranchise parties to the policy debate; and engender distrust in the technology.<sup>87</sup> But even with these concerns, metaphors are often used in legal discourse as an essential analog to policy debates. In fact, much legal doctrine is metaphor. Science and policy both rely on metaphor, despite the potential shortcomings.

To ameliorate concerns about stickiness, spin, and poorly designed metaphors, it is important to determine what makes a good metaphor. I suggest that the following five-point rubric may help identify when a metaphor is appropriate for educating the public about technology for the purposes of information and communications policy debates:<sup>88</sup>

- 1) The metaphor must resonate with the audience.<sup>89</sup> It must be based on experiences common to the audience and be sufficiently interesting to capture its attention.
- 2) The metaphor must make the abstract concrete. It must be subject to a limited range of interpretations, such that each individual in the audience understands it to mean essentially the same thing.
- 3) The metaphor must be concise.<sup>90</sup> The longer the metaphor, the less useful it becomes in capturing the audience’s attention and in being concrete.

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<sup>84</sup> Bosmajian, 38, quoting Monroe Beardsley, “The trouble with metaphors is that they have a strong pull on our fancy. They tend to run away with us. Then we find that our thinking is directed not by the force of argument at hand, but at the interest of the image in our mind;” Bosmajian, 12, quoting *Berky v. Third Ave. Ry. Co.* (1926), “Metaphors... are to be narrowly watched, for starting as devices to liberate thought, they end often by enslaving it.”

<sup>85</sup> Cohen and Blavin, 266-267.

<sup>86</sup> Mixon, 24.

<sup>87</sup> Knight, 77 (“[T]he public’s fear and mistrust of science... in part arises from difficulties in understanding new research...”); Hayes, 740; Mixon, 24 (“Lawyers also know how to use the findings of science subversively without worrying about logical consistency, public trust, or ultimate truth”); Balkin, 248 (noting that the “power [of metaphors] stems precisely from their ability to empower understanding by shaping and hence limiting it”).

<sup>88</sup> Oldfather, 20. Oldfather identifies five functions of metaphor in legal discourse: “serve a decorative purpose, lend concreteness to abstract principles or concepts, operate as a form of analogical reasoning, ... spark new insights about the underlying concept that they describe, [and they] are often a more economical means of expression than ordinary language.” I have adapted from Oldfather’s functions to deal particularly with the creation of discourse communities for information and communications policy purposes.

<sup>89</sup> Jörg Zinken, “Metaphor and Discourse: How Metaphor Models Structure Domains of Activity,” white paper, unknown date, accessed Feb. 13, 2013, [http://www.dur.ac.uk/resources/mlac/research/metaphors\\_as\\_models/Zinken2.pdf](http://www.dur.ac.uk/resources/mlac/research/metaphors_as_models/Zinken2.pdf).

4) The metaphor must be accurate for the purpose for which it is being offered. The attributes of the source domain that are highlighted must be related to the attributes of the target domain that are at issue.<sup>91</sup> Any limitations on the accuracy of the metaphor should be disclosed with the metaphor itself. Requiring accuracy of a metaphor should also alleviate some concern associated with over-simplifying difficult technical or policy issues, as it is likely a metaphor of this type would be found accurate.

5) The metaphor must be neutral with respect to the issue for which it is being offered. Of course, in a policy debate, there will be parties arguing on either side. However, a good metaphor will be focused on the technology, not persuading participants of the debate to go in one direction or the other.

## METAPHORS IN INFORMATION AND COMMUNICATIONS POLICY

The metaphors that have been used in information and communications policy debates are diverse. A concern is whether these metaphors are sufficiently engaging the public with the debate and educating them as to the technology, while at the same time not overly capturing their attention or spinning the issue such that the debate is skewed. From the first attempts to explain the Internet to today's cutting edge issues, metaphors have been offered to explain the technology. This section examines common information and communications policy metaphors using the above rubric. To be fair, the metaphors examined in this article are quite broad and general; this article serves only as a first foray into this area, to be followed by further research looking at information and communications metaphors in greater depth.

### *The Internet*

Throughout its existence, the Internet has been explained through a number of metaphors, including tubes, highways, spaces/places, and now clouds. Each of these metaphors has positive and negative aspects, although the negative aspects often overshadow the benefit of any particular metaphor.

One early metaphor for the Internet was tubes (or if the speaker was being fancy, conduits).<sup>92</sup> This metaphor is old and rarely used now;<sup>93</sup> however, it helps to look at it under the proposed rubric to see if it has properly been dismissed. The analogy of tubes is certain to resonate with a public

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<sup>90</sup> Oldfather, 20-24.

<sup>91</sup> Ibid., 24 ("The basic problem is that a metaphor highlights certain aspects of its subject while obscuring others. Thus, for all the good that a metaphor can accomplish, the reality that we envision when we view a subject through metaphor differs from the reality of that subject as we knew it 'pre-metaphor'."); Thomas Ross, "Metaphor and Paradox," *Georgia Law Review* 23 (1989): 1072 ("If we attempt to express a meaning without explaining the significance of our culturally bounded imaginations, we probably say too little. But as soon as we attempt to explain in this way, we probably say too much.")

<sup>92</sup> Whitt, 559.

<sup>93</sup> But, see Andrew Blum, *Tubes: A Journey to the Center of the Internet* (New York: Ecco, 2012).

audience and it is sufficiently concrete that there are limited interpretations available for tubes. Furthermore, the analogy is concise. The downfall for this analogy comes in its accuracy, or lack thereof. There are significant limitations that hamper the metaphor of the Internet as tubes, including the ideas of one-way directionality, low ability to change direction, static connections, and simple scale. All of these limitations are likely to skew the analysis with respect to any issue that would be on the table for policy debate, such as Internet governance, adoption of new technology standards, or net neutrality. The fact that this metaphor is essentially no longer used is consistent with the proposed rubric for good metaphors.

Another proposed metaphor for explaining the Internet is viewing it as a highway.<sup>94</sup> This metaphor was used frequently in popular media, policy debates, and legal opinions. Looking at the metaphor under the proposed rubric, it too is revealed as a relatively poor metaphor for most purposes. The Internet as a highway will resonate with most audiences and is more attention-grabbing, perhaps, than the Internet as a set of tubes. Furthermore, the number of interpretations of highway is limited, so the metaphor is sufficiently concrete and concise. The popularity of the metaphor was based on: 1) its suitability for state involvement, 2) ephemerality of information (transfer, movement), and 3) low degree of exceptionalism (nothing special – just like the phone or the mail).<sup>95</sup> These track with the attributes to be highlighted; however, there are also limitations specifically associated with these attributes that have been identified by many scholars over the years.<sup>96</sup> Unfortunately, these highlighted attributes fail to illustrate other important aspects of the Internet, such as the fact that the Internet, unlike a highway, permits nearly instantaneous backtracking.<sup>97</sup> In spite of these limitations, the metaphor got sticky – in part because it resonated so well and was concise – causing problems when the metaphor was later used without being tied to the issue in question. In fact, the metaphor still has some life in it.<sup>98</sup>

The third metaphor for the Internet is as a place or space. This metaphor (in popular vernacular, “cyberspace”) has been soundly rejected by commentators,<sup>99</sup> although the name is still used and likely continues to influence the public’s understanding of the term. For example, a quick search of major American newspapers via the LexisNexis research system identifies 43 articles using the term “cyberspace” in the month spanning July 14, 2012 through August 14, 2012. The appeal of this metaphor is nearly dichotomous to that of the Internet as highway metaphor; highlighted attributes

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<sup>94</sup> Ibid.

<sup>95</sup> Cohen and Blavin, 269.

<sup>96</sup> Ibid.

<sup>97</sup> Ibid., 273.

<sup>98</sup> A common net neutrality metaphor is built from the metaphor of the Internet as highway, as discussed later in this article. In addition, the Internet as highway metaphor is often commonly used in court arguments and judicial proceedings, as recently as 2011. For example, in *Automated Transaction, LLP v. IYG Holdings Co.* (2011) a Federal Circuit Court stated, “Finally, the District Court’s analogy to the Daytona International Speedway is misplaced. For example, the Speedway was not built using the infrastructure of any public highway system. The Eisenhower Interstate Highway system did not enable the Speedway;” in *PowerOasis, Inc., v. Wayport, Inc.* (2007) a different Federal court stated, “The District Court’s analogy is inapposite, however, because while many cars can drive simultaneously on a multilane highway, in Wayport’s system only one customer’s data packet can be transmitted through each network component at any time.”

<sup>99</sup> Cohen and Blavin, 275; Mark Lemley, “Place and Cyberspace,” *California Law Review* 91 (2003): 521.

of the cyberspace metaphor include: 1) unsuitability for government regulation because it is a nebulous space “consisting of the addresses between machines,” 2) the notion of a static, borderless place, and 3) a high degree of exceptionalism – this is like nothing we’ve seen before.<sup>100</sup> Interestingly, what makes this an attractive metaphor for policy purposes actually makes it unsuitable as a metaphor for educating the public for participation in the policy debate. A static, borderless place that is like nothing known is unlikely to resonate with the average citizen – this is an experience that is also unfamiliar. Some have tried to improve this problem by analogizing the Internet to the American frontier or Wild Wild West, but that too is not going to resonate with a large portion of the audience. In addition, the ideas of boundless space and the western frontier are likely to pull any range of interpretations from the audience, rendering the concept less than concrete. Because additional explanation would be required to ensure that the audience derived the same interpretation of the metaphor, the analogy ceases to be concise. Finally, with respect to accuracy and neutrality based on the issue, this metaphor also has some other downfalls. The boundless space and western frontier call to mind limitlessness and lawlessness; neither of these are entirely accurate and both are likely to skew the audience prior to the debate, putting them in a frame of mind to accept or reject based on those notions. Particularly for the purposes of policy debate, this metaphor is not suitable.

A new metaphor for the Internet, or at least one modern use of the Internet, is the cloud.<sup>101</sup> Rather than the Internet acting as a conduit (or highway or even place), it has now become an amalgamator, where content resides somewhere off of any individual user’s personal device and is accessed with no knowledge of where the server holding the content exists.<sup>102</sup> It is just up there, in the cloud. This metaphor is likely to resonate with the audience; clouds are commonly encountered and analogizing the Internet with a cloud is likely to capture attention. Although the metaphor is also concise, it is not entirely clear that the analogy is concrete – that is, will most of the audience hearing the metaphor default to a common interpretation? Because some view clouds scientifically and others view clouds romantically, it is unclear that the audience will all reach a single interpretation. This problem is further amplified by the fact that the attributes highlighted by the cloud metaphor may not be easily grasped by the average audience. Furthermore, this metaphor suffers from inaccuracy because it doesn’t highlight other important attributes such as connectivity or information flow that progresses from the amalgamation. Therefore, for the metaphor to have any success in explaining the scientific aspects necessary to discuss the policies, additional explanation may be required and the metaphor becomes less concise. Assuming that these deficiencies can be overcome, however, this metaphor does seem to be neutral with respect to the issue and may serve as a solid tool for some Internet policy debates moving forward.

### *Spectrum*

Common metaphors in the areas of spectrum and signals, in which spectrum is the medium and signals are the messages conveyed via that medium, have been studied by J. Pierre de Vries, who

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<sup>100</sup> Cohen and Blavin, 275-276.

<sup>101</sup> Daniel J. Gervais and Daniel J. Hyndman, “Cloud Control: Copyright, Global Memes and Privacy,” *Journal on Telecommunications and High Technology Law* 10 (2012): 53, 62 (“In [the] most basic of terms, the Cloud is the internet.”).

<sup>102</sup> *Ibid.*, 56.

identifies limitations associated with the use of these metaphors for information and communications policy discussions.<sup>103</sup> Some of the metaphors he studied include spectrum as space, spectrum as resource, and spectrum as land or property. Consistent with de Vries's analysis, these metaphors also generally fail under the proposed rubric, although their use may be appropriate in certain instances.

The first metaphor is spectrum as space.<sup>104</sup> The idea of broadband spectrum as space is appealing. First, space is a container and measurable and particular subspaces can be allocated; this idea should resonate with the typical audience and it is concise. Furthermore, it should be concrete, or limited to a standard range of interpretations. Unlike the boundless Internet as space metaphor discussed above, spectrum as space has boundaries. As de Vries notes, however, this metaphor is inaccurate because the signals that are supposed to reside in any given space spill over the boundaries.<sup>105</sup> This limitation bleeds into the final element of the rubric, neutrality with respect to the issue at hand. When the issue is the allocation of spectrum, the fact that signals leak over into spectrum allocated to others may affect the audience's view for policy determination. In that case, the metaphor becomes more problematic than helpful.

The second metaphor is spectrum as resource.<sup>106</sup> This metaphor is likely to resonate with the audience. Resources are seen as useful, productive, exhaustible, and ownable, and these are attributes of broadband spectrum as well. The metaphor may not be as concrete as others; the term "resource" is used in multiple different contexts and so various members of the audience may reach different interpretations; however, given the common features of resources (and the features shared with spectrum), most members of the audience are likely to be in the ballpark with respect to their interpretation of the metaphor. The analogy is also concise. The problem instead lies in its accuracy with respect to two issues. One inaccuracy of the metaphor lies in the fact that spectrum is not as finite as most resources (such as trees or oil); therefore, the issues for which this metaphor is apt should not depend on a model of plenty or scarcity. In other contexts, the metaphor may work just fine. A second inaccuracy of this metaphor is that the discussion of broadband spectrum often includes the signals that traverse the spectrum. In the case of spectrum as resource, it is difficult to incorporate that idea.<sup>107</sup> Again, depending on the issue subject to debate, this limitation may not hamper the discussion.

Finally, in a few places, spectrum is analogized as land.<sup>108</sup> Land is certainly an object that will resonate with the audience and their common experiences. Furthermore, it is concise and concrete. The problem with the spectrum as land metaphor is similar to that as identified for spectrum as

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<sup>103</sup> De Vries, 4. Space and resource are the two most popular metaphors for spectrum, being used approximately 40-45% of the time. Land is rarely used, found in only 5% of the instances de Vries studied.

<sup>104</sup> Ibid., 2.

<sup>105</sup> Ibid.

<sup>106</sup> Ibid., 2-3.

<sup>107</sup> Ibid., 3.

<sup>108</sup> Ibid.

space. There are no sharp, well-defined edges as there are in real property and it is impossible to isolate a signal within a particular defined band.<sup>109</sup>

### ***Social Media***

Social media services, such as Facebook or Twitter, are becoming the subject of greater interest in information and communications policy discussions, including the potential regulation of these services.<sup>110</sup> One of the more common metaphors for these services is as a conversation or an encounter in a bar or coffee shop.<sup>111</sup> This analogy is likely to resonate with the audience and capture their attention. And it is also fairly concrete; there are limited interpretations as to a coffee shop conversation. Finally, it is concise. The problem comes with accuracy. The relevant attributes that are highlighted in the metaphor of a coffee shop is the openness of conversation, the idea that you come there to meet old friends and perhaps new ones, the comfort and casual nature of the encounter, etc. However, the issue which is often at issue in policy debates surrounding social media is privacy; in a coffee shop or bar, is that there is limited privacy. Therefore, if the discussion is about how to impose a certain level of privacy on various social media platforms, the coffee shop encounter may not be the most apt metaphor. It is not neutral with respect to the issue because it is highlighting precisely the issue that is one side's position in the debate. Specifically, if you are going to have a private conversation, you are not going to do it in a coffee shop or bar; therefore any expectation you have of privacy using social media platforms is unfounded. Furthermore, the coffee shop can alter the amount of privacy you can expect at any time by raising or lowering the level of the music, the level of lights, etc.; therefore, so should social media platforms. More importantly, this metaphor for social media does not highlight other attributes that are at issue in policy debates, such as ownership of content or whether content "lives on" after the user's death or account cancellation. Social media is an area for which new (and likely multiple) metaphors may be needed as the information and communications policy debates in this area grow.

### ***Net Neutrality***

As mentioned previously, net neutrality is the concept that all data on the Internet should be treated equally.<sup>112</sup> Another way to explain this is that access to the Internet should be open and non-tiered.<sup>113</sup> A common metaphor to explain net neutrality returns us to the highway metaphor adopted (and then disfavored) for the all-encompassing Internet. Net neutrality means that each car, carrying a load of data, gets to drive on the roads at the same speed as the surrounding traffic allows.<sup>114</sup> It is not possible to drive at a higher speed than other traffic on that road, simply by paying a toll or

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<sup>109</sup> *Ibid.*, 3-4.

<sup>110</sup> Alexandra Paslawsky, "The Growth of Social Media Norms and Governments' Attempts at Regulation," *Fordham International Law Journal* 35, no. 5 (2012): 1487-1490.

<sup>111</sup> Jonathan Kupferman, "Twitter is a Bar and Other Social Network Metaphors," blog post, *Regular Expression*, June 16, 2010, accessed Feb. 13, 2013, <http://www.regexprn.com/2010/06/twitter-is-bar-and-other-social-network.html>.

<sup>112</sup> Abramson.

<sup>113</sup> Joe Moreno, "Insights & Opinions: Net Neutrality for Poets," *SocialTech.com*, Dec. 21, 2010, accessed Feb. 13, 2013, <http://www.socaltech.com/articles/insights-and-opinions-net-neutrality-for-poets/a-00143.html>.

<sup>114</sup> Moreno; Abramson (highlighting the transportation metaphor of being relegated to the slow lane).

additional fee.<sup>115</sup> It is also not possible to divert or stop certain cars simply because they are disfavored.<sup>116</sup> The first thing to note about this metaphor is that it requires more than a simple statement of the Internet as a highway – it is not concise. It does, however, resonate with the average audience’s experience, but the additional explanation may take away from its ability to capture the audience’s attention. The additional explanation, however, does make the metaphor quite concrete; once the multiple parts of the analogy have been provided, there are few other interpretations that can remain. With respect to highlighting the particular attributes at issue, the metaphor does not do a terrible job; the biggest complaint is that it may over-simplify the issue. There are many more technological and political issues at stake beyond simply making sure data moves all at the same rate. Recall that net neutrality could result in greater services being provided because ISPs could not discriminate against disfavored companies, but on the other hand, so long as each company can use as much bandwidth at the same cost as all others, there is no incentive to develop lower-bandwidth applications. Neither of these policy issues, or others, can be teased out from the net neutrality as toll highway metaphor. And certainly, at least one side of the debate will argue that this metaphor is missing one more piece of data – the fact that whoever built the highway should have some say in the matter. Of course, this may actually work against these proponents, as the average audience is less likely to believe that whoever built the highway can discriminate.

### *Privacy*

Without question, the most prevalent metaphor to explain Internet or data privacy is of Big Brother, alluding to the totalitarian government portrayed in George Orwell’s *1984*.<sup>117</sup> Essentially, the concern revolves around surveillance, uncovering hidden details, and damaging reputations using those details.<sup>118</sup> In today’s world of increasing surveillance and loss of privacy, this analogy certainly resonates with the audience and results in a fairly concrete understanding of the issue. It is concise and catchy. The main problem with this metaphor lies in its accuracy. The attributes highlighted in this metaphor are those of wrong-doing, of interference, and of “stealing” information. As Daniel Solove notes, however, this metaphor fails to capture the problem of privacy with respect to databases, where the information is not hidden or embarrassing, but simply being gathered and used without your permission.<sup>119</sup> This metaphor for privacy, like so many others, is dependent on the issue for which it is being used.

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<sup>115</sup> Moreno.

<sup>116</sup> Ibid.

<sup>117</sup> Daniel J. Solove, “Privacy and Power: Computer Databases and Metaphors for Information Privacy,” *Stanford Law Review* 53 (2001): 1395.

<sup>118</sup> Ibid., 1398.

<sup>119</sup> Ibid. Solove goes on, in the rest of his article, to argue for a privacy metaphor based on Franz Kafka’s depiction of bureaucracy in *The Trial*: “a more thoughtless process of bureaucratic indifference, arbitrary errors, and dehumanization, a world where people feel powerless and vulnerable, without any meaningful form of participation in the collection and use of their information.”

## INTRODUCING A PROMISING METAPHOR INTO THE DISCUSSION

Thus far, this article has explained why many metaphors previously used to discuss information and communications policy have fallen short. Rather than viewing this as an indictment of the utility of metaphors in explaining technology, there are two points that can be drawn. First, there is no one perfect metaphor for any given technology at issue in a particular information and communications policy debate. Second, metaphors need to be chosen carefully and deliberately. To support these claims, this article discusses how metaphors could be introduced and then provides a carefully chosen metaphor for the Internet that – when assessed under the rubric above – shows promise, at least for some policy discussions.

Every time a policy debate arises, the parties involved should look to see if a metaphor is necessary, develop or adopt a metaphor, and determine its fitness. Metaphors could be introduced into the policy discussion by any party that believes they would be helpful. In order to entice public participation in the discussion, it is important to craft a metaphor at the early stage of discussions; if the public does not understand what is at stake, they are unlikely to overcome the obstacles to participation discussed above. The best metaphor would be one that both sides of the debate agree to; however, in the absence of complete agreement, the metaphor should largely satisfy the rubric suggested above. Hopefully, in attempting to find an agreed-upon metaphor that resonates and is concrete, concise, accurate, and neutral, the parties will choose the metaphor carefully and deliberately. Furthermore, if the development of a metaphor is shifted to the front end of the policy debate, the concerns of simply picking up an existing metaphor, regardless of its suitability for the particular issue at hand, should be alleviated.

Finally, to overcome the appearance that no metaphor would satisfy the suggested rubric, consider the metaphor of the Internet as an ecosystem. The term “ecosystem” has often been used in conjunction with the Internet;<sup>120</sup> however, using “ecosystem” as a metaphor to explain the Internet to those unfamiliar with the technology has been less explored. This metaphor provides advantages over previous metaphors for the Internet. The Internet as ecosystem is preferable to tubes and highways because an ecosystem is not constrained to limited interactions; rather than being a one-or two-directional system, an ecosystem evokes multiple different entities interacting with each other simultaneously. Unlike the space/place and cloud metaphors, the ecosystem metaphor is likely to be more concrete to most people. The definition of “ecosystem” is fairly standard, even to those with the most basic background and it is not typically subject to poetic or fanciful interpretations like clouds or space.

Besides these advantages over previous metaphors, there are two additional benefits. First, although the idea of an ecosystem is simple to understand, an ecosystem itself is complex and composed of many different entities. For example, consider a rainforest ecosystem with its variety of plants and animals. This can help illustrate the diversity of participants interacting on the Internet.

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<sup>120</sup> See for example Dirk Grunwald, “The Internet Ecosystem: The Potential for Discrimination,” *Federal Communications Law Journal* 63, no. 2 (2011).

Furthermore, the rainforest ecosystem is affected by various different external forces, such as weather or governmental regulation. The Internet, too, is governed by peripheral parties. Second, the ecosystem metaphor can be used in conjunction with related metaphors to create a larger picture of technology. For example, the ecosystem relies on food supply; the entities that comprise the rainforest cannot exist without food. The “feeding” of the Internet is done via the injection of information as food, such as described by J.P. Rangaswami in a recent TED Talk.<sup>121</sup> Notice that this is different from the metaphor of a toll road for net neutrality – this additional information is not necessary to develop the metaphor itself, but rather as an auxiliary metaphor to add breadth and flexibility to the discussion.

Although this metaphor appears to have facial advantages over previous metaphors for the Internet, a critical test – both for the utility of metaphors in information and communications policy debates and for the fitness of the rubric proposed in this article – is to determine whether the metaphor passes muster under the rubric. Applying the rubric, the idea of an ecosystem should resonate with most of the public; even people not particularly versed in detailed biological science will understand the salient points of comparing the Internet to an ecosystem. To increase the understanding, a particular ecosystem could be used as the metaphor instead. The relevant attributes of the Internet, such as the diversity of participants, the importance of information flow, the wider effect of one problem on the whole Internet, and so on, are easily understood from the ecosystem metaphor. Similarly, because of the simplicity of the idea of an ecosystem at the level required to understand it as a metaphor for the Internet, it should result in a singular meaning or concrete definition. The simplicity also permits a concise explanation of the technology. The biggest issues for most metaphors are accuracy and neutrality. This metaphor for the Internet, more so than the others, appears to be promising in both its accuracy and neutrality. With respect to accuracy, an ecosystem can be described via many characteristics, without sacrificing concreteness, providing flexibility that can be used to target specific issues relevant to the particular policy discussion. The more targeted the use of any metaphor, the more accurate it can be made. Finally, this same flexibility permits greater neutrality because, given the myriad characteristics of an ecosystem that can be captured in the information and communications policy discussion, the more the focus can be placed squarely on the technology issues, not the parties’ positions. The attributes to be highlighted, however, must be related to the issue at hand in order for the metaphor to be carefully and deliberately chosen and used.

Although the metaphor satisfies the rubric, it is useful to see whether the metaphor helps to explain the technology and policy issues in question – the ultimate question to determine whether a metaphor should be used. Recall that to participate in policy discussions about net neutrality, the public would need to understand the basic ideas of the Internet, the capabilities of ISPs to

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<sup>121</sup> J.P. Rangaswami, “Information is Food,” video presentation, TED, May 2012, accessed Feb. 13, 2013, [http://www.ted.com/talks/jp\\_rangaswami\\_information\\_is\\_food.html](http://www.ted.com/talks/jp_rangaswami_information_is_food.html). TED Talks are videos presented by TED Conferences, LLC., an organization with the following mission: “We believe passionately in the power of ideas to change attitudes, lives and ultimately, the world. So we’re building here a clearinghouse that offers free knowledge and inspiration from the world’s most inspired thinkers, and also a community of curious souls to engage with ideas and each other.” See “About Ted,” <http://www.ted.com/pages/about>.

discriminate, and the policy considerations surrounding those capabilities. Within the metaphor of the ecosystem, the various components of the Internet can be described as parts of the ecosystem. Depending on the issue at hand, the interconnection or network of the various elements could be highlighted; for other issues, perhaps the hierarchy of the ecosystem (e.g., food chain) is the focus. Returning to the example of net neutrality, it is likely that the interconnection aspect of the Internet is an important attribute, coupled with the idea that what occurs at one element in the ecosystem affects many other elements. Once the elements of the Internet are explained in terms of an ecosystem, the policy issues too can be explained. Perhaps a river, having a lock or a dam, could illustrate the role of an ISP in the ecosystem. Operation of the lock or dam has both positive and negative effects on what happens to different ecosystem residents downstream from the lock or dam. Using this metaphor to explain the Internet may be useful, especially as it provides information about both the technology and the policy issues.

## CONCLUSION

Perhaps the most important concept to recognize is that there is no one perfect metaphor for any given technology at issue in information and communications policy debates. With each new debate, any metaphor used should be chosen carefully and deliberately, using the above rubric as a guide. Most metaphors imagined will resonate with the audience's experiences and be concise; many will lead to a limited range of interpretations. The key is to identify a metaphor that will highlight the relevant attributes of the technology in a way that is neutral with respect to the issue. Both of these requirements are critical. A metaphor that highlights the correct attributes but is skewed or biased is often easy to recognize; a metaphor that is neutral but highlights the wrong attributes is more difficult to see but is just as poor a metaphor as a biased one. It is not enough to simply take a metaphor for a technology that has already been used and import it into the next debate about that technology without taking stock of its appropriateness under the rubric proposed here. A metaphor must be judged favorably for each issue for which it is being offered. And finally, once the metaphor opens the door to understanding, one must realize that it is the starting point of the communications and policy debate, not the end point.

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