MODELING POLICY FOR NEW PUBLIC SERVICE MEDIA NETWORKS

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PROFOUND SENSE.[1]

There is a growing consensus that significant structural change
and policy shifts will be necessary to transform the 20th century
American public broadcasting system into a 21st century system of
public service media.[2] Indeed, the 2010 National Broadband Plan,

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1. CARNEGIE COMMISSION ON THE FUTURE OF PUBLIC BROADCASTING, A PUBLIC TRUST
298–99 (1979) [hereinafter CARNEGIE II].

2. *See* AM. UNIV. SCH. OF COMMC'N CTR. FOR SOC. MEDIA, PUBLIC MEDIA 2.0:
DYNAMIC, ENGAGED PUBLICS (2009) [hereinafter PUBLIC
MEDIA 2.0], *available at* http://www.centerforsocialmedia.org/sites/default/files/
whitepaper.pdf; BARBARA COCHRAN, PUBLIC SERVICE MEDIA: MORE LOCAL, MORE
INCLUSIVE, MORE INTERACTIVE: A WHITE PAPER ON THE PUBLIC MEDIA
RECOMMENDATIONS OF THE KNIGHT COMMISSION ON THE INFORMATION NEEDS OF
COMMUNITIES IN A DEMOCRACY (2010); CORP. FOR PUB. BROAD., PUBLIC RADIO IN THE
NEW NETWORK AGE (2010) [hereinafter PUBLIC RADIO IN THE NEW NETWORK AGE],
available at http://www.srg.org/GTA/Public_Radio_in_the_New_Network_Age.pdf;
LEONARD DOWNIE, JR. & MICHAEL SCHUDSON, THE RECONSTRUCTION OF AMERICAN
JOURNALISM (2009), *available at* http://www.journalism.columbia.edu/system/
documents/1/original/Reconstruction_of_Journalism.pdf; KNIGHT COMMISSION ON THE
INFORMATION NEEDS OF COMMUNITIES IN A DEMOCRACY, INFORMING COMMUNITIES 23–
32 (2009) [hereinafter KNIGHT COMMISSION], *available at* https://secure.
nmmstream.net/anon.newmediamill/aspen/kcfinalenglishbookweb.pdf; Steve Coll, Reboot*:
A Media Policy for the Digital Age*, COLUMBIA JOURNALISM REV., Nov./Dec. 2010, 28;
Ellen P. Goodman, *Public Media 2.0*, *in . . .* AND COMMUNICATIONS FOR ALL: A POLICY
AGENDA FOR A NEW ADMINISTRATION 272–74 (Amit M. Schejter ed., 2009); Josh Silver et
al., *Public Media's Moment*, *in* CHANGING MEDIA 276–77 (2009), *available at*
http://www.freepress.net/files/changing_media.pdf; *see also* Reply Comments of Free Press,
A National Broadband Plan for Our Future, GN Docket No. 09-51, at 54–65 (Fed.
Commc'ns Comm'n July 21, 2009), *available at* http://www.policyarchive.org/
handle/10207/bitstreams/20225.pdf; JESSICA CLARK & SUE SCHARDT, SPREADING THE
ZING: REIMAGINING PUBLIC MEDIA THROUGH THE MAKERS QUEST 2.0 (2010), *available at*
http://www.centerforsocialmedia.org/sites/default/files/documents/pages/AIRPerspective20
10.pdf. This issue has also been of growing interest internationally. *See, e.g.*, SHELDON
HIMELFARB ET AL., MEDIA AS GLOBAL DIPLOMAT 6–7 (2009), *available at*
http://www.usip.org/files/resources/Special%20Report%20226_Media%20as%20Global%2
0Diplomat.pdf (discussing the value of public broadcasting as a "countervailing power"
between the public and private system for new, digital media efforts in public diplomacy);
IRIS, PUBLIC SERVICE MEDIA: MONEY FOR CONTENT (Susanne Nikoltchev ed., 2010); ORG.
FOR ECON. CO-OPERATION & DEV., WORKING PARTY ON THE INFORMATION ECONOMY:
THE EVOLUTION OF NEWS AND THE INTERNET 66–69 (2010) [hereinafter, OECD], *available
at* http://www.oecd.org/dataoecd/30/24/45559596.pdf (noting the "important role" public
broadcasters play in many OECD countries and the state aid that facilitates it, and citing
American efforts to consider increasing resources for public service broadcasting); Graham
Murdock, Building the Digital Commons: Public Broadcasting in the Age of the Internet,
University of Montreal 2004 Spry Memorial Lecture (Nov. 22, 2004), *available at*

which sets forth national communications priorities for the next decade, calls for a new public service media network, drawing directly on proposals we made to the Federal Communications Commission ("FCC").[3] Relentless and intensifying pressure on public broadcast funding makes it even more important to identify minimally necessary functional components of a public service media network going forward.[4]

The vision of a more inclusive, innovative, and community-oriented network of public service media makers, linked to ubiquitous broadband, has emerged as a potential solution to many problems, including insufficient investments in investigative journalism, a paucity of compelling educational materials, and widening gaps between the information rich and poor. The FCC's broadband workshops,[5] Federal Trade Commission workshops on journalism,[6]

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https://pantherfile.uwm.edu/type/www/116/Theory_OtherTexts/Theory/Murdock_Building DigitalCommons.pdf ("Public Service Broadcasting is a project whose time has finally come both philosophically and practically. . . . [Reinvention of the public domain] requires us to jettison our familiar analogue maps and draw up a new digital chart.").

3. FED. COMMC'NS COMM'N, CONNECTING AMERICA: THE NATIONAL BROADBAND PLAN 303 (2010) [hereinafter NATIONAL BROADBAND PLAN] (citing Reply Comments of Ellen P. Goodman & Anne Chen, A National Broadband Plan for Our Future, GN Docket No. 09-51 (Fed. Commc'ns Comm'n Nov. 9, 2009), *available at* http:// www.law.yale.edu/documents/pdf/Intellectual_Life/Goodman_publicmediacomments.pdf; Goodman, *supra* note 2), *available at* http://download.broadband.gov/plan/national-broadband-plan.pdf ("[P]ublic media must continue expanding beyond its original broadcast-based mission to form the core of a broader new public media network that better serves the new multi-platform information needs of America.").

4. *Obama Deficit Commissioners Advise Ending all CPB, PTFP Support by 2015,* CURRENT (Nov. 10, 2010, 4:33 PM), http://currentpublicmedia.blogspot.com/2010/ 11/presidents-commission-advises-ending.html.

5. *See, e.g.*, FED. COMMC'NS COMM'N, NATIONAL BROADBAND PLAN WORKSHOP: BUILDING THE FACT BASE: THE STATE OF BROADBAND ADOPTION AND UTILIZATION (2009) [hereinafter BUILDING THE FACT BASE], *available at* http://www. broadband.gov/docs/ws_09_adoption_utilization.pdf (presenting data on the current state of broadband adoption and utilization); FED. COMMC'NS COMM'N, NATIONAL BROADBAND PLAN WORKSHOP: DEPLOYMENT — UNSERVED AND UNDERSERVED (2009), *available at* http://www.broadband.gov/docs/ws_04_deploy_un_transcript.pdf (discussing solutions for reaching and engaging isolated and rural communities with better broadband access); FED. COMMC'NS COMM'N, NATIONAL BROADBAND PLAN WORKSHOP: DEPLOYMENT — WIRED (2009), *available at* http://www.broadband.gov/docs/ws_02_deploy_wired_transcript. pdf (addressing the need to deploy and operate more internet backbone services); FED. COMMC'NS COMM'N, NATIONAL BROADBAND PLAN WORKSHOP: EDUCATION (2009), *available at* http://www.broadband.gov/docs/ws_13_edu.pdf (identifying the potential impact of increased broadband access to education); FED. COMMC'NS COMM'N, NATIONAL BROADBAND PLAN WORKSHOP, OPEN GOVERNMENT AND CIVIC ENGAGEMENT (2009), *available at* http://www.broadband.gov/docs/ws_01_egov_transcript.pdf (discussing how broadband can improve public and civic engagement through transparency and citizen participation).

6. *See, e.g.*, FED. COMMC'NS COMM'N, FUTURE OF MEDIA WORKSHOP: SERVING THE PUBLIC INTEREST IN THE DIGITAL ERA (2010), *available at* http://reboot. fcc.gov/futureofmedia/blog?entryId=223657; FED. TRADE COMM'N, HOW WILL JOURNALISM SURVIVE THE DIGITAL AGE? (2009), *available at* http://www.ftc.gov/ opp/workshops/news/index.shtml.

and several recent blue ribbon reports[7] have documented national deficits in communications infrastructure, content, and content engagement. Based on the premise that the nation's information environment lacks crucial elements, the FCC launched its Future of Media Project to probe, among other things, the role of public service media in meeting public needs.[8]

Despite information abundance, broadly inclusive social media, and the distributed means of communication that characterize the digital age, society may lack the informational tools necessary to involve everyone in democratic decision-making and to foster widespread economic and social flourishing.[9] Information gaps are especially keen in the areas of investigative journalism[10] and content directed to underserved, minority, and poor populations.[11] Experts are calling on digital public service media — building on, but transcending the legacy public broadcasting system — to respond to these deficits.[12] In theory, and in the highest aspirations of American

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7. *See, e.g.*, DOWNIE & SCHUDSON, *supra* note 2 (describing potential drawbacks to recent fundamental changes in American journalism); KNIGHT COMMISSION, *supra* note 2, at 9–19 (describing the information needs of local communities in a democracy, including the need for shared narrative to promote connectedness).

8. *See* Examination of the Future of Media and Information Needs of Communities in a Digital Age, GN Docket No. 10-25 (Fed. Commc'ns Comm'n Mar. 8, 2010) (request for comments), *available at* http://hraunfoss.fcc.gov/edocs_public/attachmatch/DA-10-100A1.pdf.

9. *Cf.* KNIGHT COMMISSION, *supra* note 2, at 23–32 (discussing the needs of information communities); PUBLIC RADIO IN THE NEW NETWORK AGE, *supra* note 2, at 1–3 (discussing the need for public service media, and media organizations at large, to engage more directly with underserved and overlooked members of the population).

10. *See* GEOFFREY COWAN & DAVID WESTPHAL, PUBLIC POLICY AND FUNDING THE NEWS 12 (2010), http://communicationleadership.usc.edu/pubs/Funding%20the%20News .pdf ("[T]he field of investigative reporting . . . [is] an expensive but vital endeavor that newspapers and broadcast outlets have abandoned in large numbers in recent years."); DAVID WESTPHAL, PHILANTHROPIC FOUNDATIONS: GROWING FUNDERS OF THE NEWS 2 (2009), http://communicationleadership.usc.edu/pubs/PhilanthropicFoundations.pdf ("[I]nvestigative reporting . . . [is] a singularly threatened and critical area of watchdog journalism."); KNIGHT COMMISSION, *supra* note 2, at 27 (stating that journalistic "[c]overage falls short everywhere").

11. *See* NATIVE PUBLIC MEDIA, AN OPEN LETTER TO OUR PUBLIC MEDIA COLLEAGUES (2009), http://www.nativepublicmedia.org/images/stories/documents/OpenLetter.pdf (arguing that a lack of cultural and ethnic diversity in programming makes "America's younger and more ethnically diverse audiences . . . public media's great, untapped resource"); *see also* JOHN HORRIGAN, WIRELESS INTERNET USE 32–36 (2009), http://pewinternet.org/~/media//Files/Reports/2009/Wireless-Internet-Use-With-Topline.pdf (referencing the differences in digital access of low-income minority groups).

12. *E.g.*, *The Future of Newspapers: The Impact on the Economy and Democracy*: *Hearing Before the J. Econ. Comm.*, 111th Cong. (2009) (statement of Paul Starr, Professor, Princeton University), *available at* http://www.princeton.edu/~starr/articles/articles09/Starr_JEC_9-24-09.pdf (calling for greater government support of "public broadcasting, which has become an important source of news and public-affairs discussion," and asserting that countries that have invested in public funds have higher levels of newspaper readership and civic literacy than the United States); ROBERT W. MCCHESNEY & JOHN NICHOLS, THE DEATH AND LIFE OF AMERICAN JOURNALISM 117–21 (2010) (explaining the importance of free and dissenting media to democracy and arguing for subsidies to the press); *see also*

communications policy, public service media is tasked with generating a "social dividend"[13] from innovative communications technologies.

For public service media to fulfill this function — indeed, for public service media to make constructive and sustainable contributions in the digital future — policymakers will need to restructure and rethink what public service media is. In comments to the FCC, we have suggested new ways to conceptualize public service media networks and outlined substantive changes that would leverage federal support for public service media to push in the right direction.[14]

Here, we provide a conceptual framework for public service media policy reform, borrowing from the layered model of the Internet. The layered model was developed by computer scientists to explain the functional components of the Internet and how they work together to convey Internet traffic. This model has helped to reframe telecommunications policy options by mapping them to the flow of information through digital networks. The model conceives of network tasks, including content creation and transmission, as modular and unbundled. Many entities can create content and applications, and many can transmit bits to devices of all kinds, including handhelds, televisions, and personal computers. These entities can mix and match their functions so long as they use interoperable or common standards to link the modules of content, applications, and other services. Standards (technical and other) are the connective tissue for decentralized networks of specialized functions. Each function within the network is kept as simple as possible. Network participants can then innovate freely while still hooking into the network and supporting the functionality provided by others.

The layered model of the network privileges function over the form that carries out the function, and simplicity over complexity. These preferences have significance for policymakers. The structure

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DOWNIE & SCHUDSON, *supra* note 2, at 76 (nothing that the FCC and Corporation for Public Broadcasting could support more independent news reporting). Even on the political right, those generally skeptical of public service media funding have recommended increased involvement as a solution to the paucity of news and public affairs content. *See, e.g.*, FED. COMMC'NS COMM'N, THE FUTURE OF MEDIA & INFORMATION NEEDS OF COMMUNITIES: SERVING THE PUBLIC INTEREST IN THE DIGITAL ERA (2010) (testimony of Adam Thierer, Cato Institute), *available at* http://techliberation.com/2010/03/03/testimony-at-fccs-hearing-on-"serving-the-public-interest-in-the-digital-era"; KNIGHT COMMISSION, *supra* note 2, at 35–36 (calling for "[i]ncrease[d] support for public service media to meet community information needs").

13. This term comes from CARNEGIE II, *supra* note 1, at 297.

14. Reply Comments of Ellen P. Goodman & Anne Chen, A National Broadband Plan for Our Future, GN Docket No. 09-51 (Fed. Commc'ns Comm'n Nov. 6, 2009), *available at* http://www.law.yale.edu/documents/pdf/Intellectual_Life/Goodman_publicmediacomments.pdf.

of the networks should direct policy focus to where the action is — to the functional layers. Policy interventions should be designed to protect the public interest in the smooth functioning of the layers and the connective tissue between them.[15]

We argue that the layered conception of the network and associated policy implications should shape public service media policy reform. A modular, functional approach can help to reform "analog" policy structures and performance metrics for public service media. The old structures assumed a bundling of functions (namely, information creation and distribution) within a single firm: the broadcast station. The broadcast station has been the primary recipient of funding under the Public Broadcasting Act of 1967 under the assumption that this was the relevant unit for all network functions from physical infrastructure to content creation and user interfaces.[16] The new model should instead postulate a web of digital public service media makers, connected by shared protocols, business rules, and noncommercial public interest missions. Using the layered model, we theorize that the three key functions (or layers) of public service media are creation, curation, and connection. These functions ride atop of the bottom infrastructure layer that can be operated by public service media or (more likely) by commercial entities. We show how these functions might be networked to create public value, and consider the associated policy implications, including reconfigured federal legislation — a Public Service Media Act — for reconfigured networks.

Part II briefly discusses the layered model and its application in telecommunications policy. It then demonstrates how the layered approach helps us to theorize a new functional model of digital public service media that better serves public service media goals and reflects the architecture of digital communications. Part III outlines a layered model for public service media in greater detail, moving through physical infrastructure, creation, curation, and connection

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15. Open access, or net neutrality, requirements draw on the layered network model. The FCC's open access requirements for 700 MHz C Block licenses it auctioned in 2008, for example, mandate that the transport layer (the wireless spectrum) support a diverse array of applications capable of running on the wireless network. *See* Susan P. Crawford, *The Radio and the Internet*, 23 BERKELEY TECH. L.J. 933, 983–84 (2008) (describing the provisions prohibiting network operators from blocking top-layer content or locking out devices operating on the higher levels of the network). The government has similarly applied open access policies to broadband stimulus funding. Notice of Funds Availability and Solicitation of Applications for the Broadband Initiatives Program and Broadband Technology Opportunities Program, 74 Fed. Reg. 33,132, 33,133 (July 9, 2009), *available at* http://www.ntia.doc.gov/frnotices/2009/FR_BBNOFA_090709.pdf; Fawn Johnson, *Tech Industries Set for Spending Aid*, WALL ST. J., Jan. 15, 2009, http://online.wsj.com/article/SB123204944545386743.html (describing the requirement that Internet providers accepting broadband grant money must provide open access to networks).

16. *See, e.g.*, 47 U.S.C. § 396(k)(3)(A)(iv)(I) (2006) (defraying interconnection and operating costs to facilitate the availability of public television and radio programs).

layers. Part IV concludes with two specific policy reform proposals to actualize the layered model, with Part V concluding.

II. THE LAYERED FRAMEWORK FOR NETWORKED COMMUNICATIONS

The layered model for communications and communications policy is well established.[17] A number of legal scholars, including Yochai Benkler,[18] Lawrence Lessig,[19] Timothy Wu,[20] James Speta,[21] and Kevin Werbach[22] have advanced policy analyses and proposals employing variations of the layered approach.[23] Technologists[24] and industry experts[25] have done the same. These commentators argue that functional layers are optimal for modeling telecommunications policy in the digital age. The descriptive claim is that a layered model better reflects how information travels through digital networks.[26] The normative claim is that policy interventions will be more agile and long-lived, and will better foster innovation, competition, and free

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17. *See* James B. Speta, *A Common Carrier Approach to Internet Interconnection*, 54 FED. COMM. L.J. 225, 246 (2002) ("Telecommunications and computer networking experts have long conceived of networks and their associated computers as exhibiting a variety of well-defined 'layers.'"); Kevin Werbach, *A Layered Model for Internet Policy*, 1 J. ON TELECOMM. & HIGH TECH. L. 37, 58–59 (2002) ("Layering is a well-established concept among technologists, and several other scholars . . . have adopted it as a tool for legal and policy analysis.").

18. Yochai Benkler, *From Consumers to Users*, 52 FED. COMM. L.J. 561, 562–63 (2000).

19. LAWRENCE LESSIG, THE FUTURE OF IDEAS: THE FATE OF THE COMMONS IN A CONNECTED WORLD 23–25 (2001), *available at* http://thefutureofideas.s3.amazonaws.com/lessig_FOI.pdf.

20. Timothy Wu, *Application-Centered Internet Analysis*, 85 VA. L. REV. 1163, 1189–92 (1999).

21. Speta, *supra* note 17.

22. Werbach, *supra* note 17.

23. *See, e.g.*, Rob Frieden, *Adjusting the Horizontal and Vertical in Telecommunications Regulation: A Comparison of the Traditional and a New Layered Approach*, 55 FED. COMM. L.J. 207 (2003); John T. Nakahata, *Regulating Information* Platforms, 1 J. ON TELECOMM. & HIGH TECH. L. 95 (2002); Lawrence B. Solum & Minn Chung, *The Layers Principle: Internet Architecture and the Law*, 79 NOTRE DAME L. REV. 815 (2004); Philip J. Weiser, *Law and Information Platforms*, 1 J. ON TELECOMM. & HIGH TECH. L. 1 (2002).

24. *See, e.g.*, Douglas C. Sicker & Lisa Blumensaadt, *Misunderstanding the Layered Model(s)*, 4 J. ON TELECOMM. & HIGH TECH. L. 299 (2006); Douglas C. Sicker & Joshua L. Mindel, *Refinements of a Layered Model for Telecommunications Policy*, 1 J. ON TELECOMM. & HIGH TECH. L. 69 (2002).

25. *See, e.g.*, Richard S. Whitt, *Adaptive Policymaking: Evolving and Applying Emergent Solutions for U.S. Communications Policy*, 61 FED. COMM. L.J. 483, 563–67 (2009) (discussing the usefulness of the layered model); Richard S. Whitt, *A Horizontal Leap Forward: Formulating a New Communications Public Policy Framework Based on the Network Layers Model*, 56 FED. COMM. L.J. 587 (2004) [hereinafter Whitt, *Horizontal Leap Forward*].

26. *See* Frieden, *supra* note 23, at 215 ("The horizontal orientation . . . makes better sense in a convergent, increasingly Internet-dominated marketplace . . . ."); Whitt, *Horizontal Leap Forward*, *supra* note 25, at 590 ("As technology has evolved, existing networks and markets have begun converging to common IP platforms.").

expression, if they focus on network functionality, rather than on particular technologies or business arrangements.[27]

A. Advantages of the Layered Model for Communications Policy

Interest in the layered model for communications tracks changes in communications networks themselves. Communications policy of the last century was organized around specific services (e.g., voice or video) and predicated on the deployment of singular technologies for each service.[28] For example, the law regulated voice telephony separately from radio, assuming wired transmission for one and wireless transmission for the other.[29] In addition to assuming a correspondence between service and technological deployment, the law assumed that service providers bundled several distinct communications functions together, such as transmission and content.[30]

Indeed, this was how things were organized when the Communications Act of 1934 was enacted and for a long time after. Broadcast companies controlled both the transmission infrastructure for their signals and the content (programming) transmitted via those signals. Telephone companies controlled the wires used to transmit voice as well as the connections between these networks and telephone devices.[31] Accordingly, the law regulated radio, and subsequently television, broadcasting separately from cable

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27. Frieden, *supra* note 23, at 215 ("The horizontal orientation . . . provides a more intelligent model than the existing vertical orientation that creates unsustainable service and regulatory distinctions."); Werbach, *supra* note 17, at 58 ("Rather than seeking to defend ephemeral service boundaries in a digital world, regulation should track the architectural model of the Internet itself."); Whitt, *Horizontal Leap Forward*, *supra* note 25, at 591–92 ("By tracking the architectural model of the Internet — with IP at the center — we can develop a powerful analytical tool providing granular market analysis within each layer, which in turn puts public policy on a more sure empirical footing.").

28. *See* Werbach, *supra* note 17, at 39–40.

29. *See, e.g.*, Communications Act of 1934, Pub. L. No. 73-416, 48 Stat. 1064 (codified as amended at 47 U.S.C. §§ 151–615 (2006)) (separately classifying wireline voice telephone services as common carriers in Title II and radio and, later, television broadcasters into Title III).

30. *See, e.g.*, 47 U.S.C. §§ 223, 228–31 (regulating common carriers with respect to transmission and assuming no content production); 47 U.S.C. §§ 315, 318, 324–25 (regulating radio with respect to transmission, for example with respect to power, and content, for example with respect to children's television programming); 47 U.S.C. § 534(b) (regulating cable television services for both transmission, such as signal quality and content, such as program schedules); *see also* JONATHAN E. NUECHTERLEIN & PHILIP J. WEISER, DIGITAL CROSSROADS: AMERICAN TELECOMMUNICATIONS POLICY IN THE INTERNET AGE 210 (2005) (discussing common carrier, over-the-air broadcasting, and cable services regulation in Titles II, III, and VI, respectively, and "the markedly different rules contained in each for governing the corresponding physical layer platform").

31. *See* Crawford, *supra* note 15, at 947–52 (describing telephone company control over wires and devices that attached to the network).

transmissions, both of which it regulated separately from telephone transmissions.[32]

Technological advances at the end of the 20th century began to unsettle the regulatory assumptions and the industrial organization reflected in the Communications Act; the FCC and Congress slowly responded. Entities other than the phone companies developed services and devices to connect to the telephone network, and the FCC required the phone companies to unbundle the provision of telephone service from the provision of other information services and equipment.[33] Services began to migrate to different transmission technologies, such as video to telephone networks and voice to cable networks, creating the prospect of converged transmission platforms.[34] In this converged technological space, regulatory distinctions premised on dedicated technologies, bundled service, and transmission offerings made less and less sense. Critics called on government to break down the "siloed" approach to telecommunications regulation.[35] Regulators and legislators made some adjustments, but left most of the technology-specific and bundled structure of the Communications Act in place.[36]

Something besides convergence was happening in the late 20th century to challenge policy. Network architecture began to play a more important role in the growth of new services and in the possibilities for competitive entry into all segments of the communications value chain.[37] Because the original Internet network engineers designed standardized connection protocols, computers could communicate with each other easily, and application developers

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32. For examples of these separate regulations, see 47 U.S.C. §§ 301–99 (Title III language governing radio and subsequently television broadcasters), 47 U.S.C. §§ 201–76 (Title II regulations for common carriers, such as wireline voice telephone companies), and 47 U.S.C. §§ 521–61 (Title V provision accommodating cable television services).

33. *See, e.g.*, Use of the Carterfone Device in Message Toll Tel. Serv., 13 F.C.C.2d 420 (1968).

34. *See* JEAN-JACQUES LAFFONT & JEAN TIROLE, COMPETITION IN TELECOMMUNICATIONS 273 (2000) ("It is commonplace to note that the telecommunications, broadcasting, and computer industries are coming together."); NUECHTERLEIN & WEISER, *supra* note 30, at 23–27 (explaining and reviewing the trend of technological convergence in the telecommunications industry); Susan P. Crawford, *The Internet and the Project of Communications Law*, 55 UCLA L. REV. 359, 367 (2007) ("[Now, c]onnections to the Internet provide access to online activities that are the functional equivalents of all of these former modalities, and are not necessarily tied to the hardware used to reach them.").

35. *See, e.g.*, *supra* notes 17–25.

36. Werbach, *supra* note 17, at 41–42 (describing the FCC approach that left the technology-dependent horizontal approach in place, and the 1996 Telecommunications Act that essentially codified the FCC distinction).

37. *See* Werbach, *supra* note 17, at 58 ("[C]ompetitive dynamics are increasingly driven by behind-the-scenes network architectures."); *see also* BARBARA VAN SCHEWICK, INTERNET ARCHITECTURE AND INNOVATION 28–31 (2010) (describing how the design features of different architectures can create different economic environments for innovation).

could assume widespread connectivity even when writing software to run on a range of physical networks controlled by a range of firms.[38] In addition, there was an explosion in device innovation as economies of scale supported the production of devices that could inter-operate across multiple networks, taking advantage of common standards.[39]

With the proliferation of software and hardware connecting to the network, there was a need and support for what we might call promiscuous connectivity. For most of the history of electronic communications, one service didn't need to talk to another — the radio didn't communicate with the telephone network. As services became increasingly versatile across network platforms, and with all service providers wanting to connect to the Internet, rules of connection became more important. It was no longer just a question of what devices could connect to a particular network, but how networks would communicate with each other that mattered. The seamless connectivity of networks created scale. Software engineers knew that a single application, even if expensive to design, would reach all network users — indeed the users of all interconnected networks. The same was true for hardware engineers. This scale, and the associated incentives to experiment, fostered a culture of rapid innovation and competition among innovators. It is because of the role of networking in stimulating innovation and competition that networking is today central to the most pressing communications policy issues.[40]

Advocates of promiscuous connectivity look to the layered model of digital communications to explain the value of networking and to structure proposals for regulatory reform. Designed at the advent of computer networking in the 1970s,[41] the ingenuity of the layered model was in its adaptable and modular design. It conceived of communications systems as modules in which different functions could be carried out by many diverse entities, interconnected through technical protocols. It organized the functions of computer networking into distinct, yet permeable layers. By separating the functional responsibilities of the network, the architects of the layered model aspired to networks that were "as open, adaptable, and accessible to

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38. Speta, *supra* note 17, at 246–47, 273 ("Building off of the fully digital nature of applications, [the Internet's] standardized protocols create the opportunity for the development of new applications without interference from the network.").

39. NUECHTERLEIN & WEISER, *supra* note 30, at 24–27 (describing the dramatic changes in the telecommunications industry as devices have become increasingly interoperable across multiple platforms).

40. *See, e.g.*, Whitt, *Horizontal Leap Forward*, *supra* note 25, at 590 (describing, in referencing the usefulness of the layered model, how "network architecture tends to shape and drive business fundamentals").

41. JAMES F. KUROSE & KEITH W. ROSS, COMPUTER NETWORKING: A TOP-DOWN APPROACH FEATURING THE INTERNET 53–54, 63–64 (5th ed. 2010) (describing the history of the layered model as it developed in the late 1970s).

inventiveness as possible."[42] Such networks would be maximally robust and adaptable because network tasks (such as data transmission or Internet applications) could be switched out and provisioned by new entrants without disrupting service through the network as a whole, so long as the protocols that linked the functions together were accessible.[43] The layered model has now become the standard design for computer networking and a foundational concept for network communications.[44] It has governed, if not defined, the way computer engineers approach the field.

The two key features of the layered model — adaptability and modularity — are advantages not just for computer networking, but for communications policy as well. First, because layered networks are based on functions rather than services, they are inherently adaptable to change. Technologies are evolving, and services converging, too quickly for a service-dependent paradigm to have real meaning. Mobile devices can function as both radios and computer browsers. Computers and Internet access providers serve as telephones and telephone companies, respectively. In place of the old paradigm, the layered model conceives of communications policy in terms of functions, rather than specific kinds of technologies, platforms, or protocols.

Second, layered networks are modular in ways that mimic today's digital communications environment. Instead of being bundled together, the individual layers of the model are functionally independent. A single layer can be modified without having to change or redefine the other layers around it. A programmer can edit the protocol to the physical transmission of data, for example, without affecting higher-level communication between users and software applications. This approach more accurately reflects the roles of information providers in the digital world. There is no assumption in the layered model that a content producer also owns or operates infrastructure. Just as the modern communications paradigm has unbundled these roles, so the layered model unbundles components of information production and transmission.

These features have led scholars and practitioners to use the layered model to reframe communications policy paradigms. Timothy

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42. KATIE HAFNER & MATTHEW LYON, WHERE WIZARDS STAY UP LATE: THE ORIGINS OF THE INTERNET 147 (1996).

43. KUROSE & ROSS, *supra* note 41, at 50 ("For large and complex systems that are constantly being updated, the ability to change the implementation of a service without affecting other components of the systems is another important advantage of layering."). For example, the network can adapt to new email applications without disruption, because the underlying protocols, such as Post Office Protocol ("POP") or Simple Mail Transfer Protocol ("SMTP"), remain constant.

44. *Id.* at 51–54 (describing the Internet Protocol Suite ("TCP/IP") as a common standard for basic Internet communication); *see also* Sicker & Mindel, *supra* note 24, at 77 n.32 (describing how "[m]ost modern telecommunications protocols have layered protocols").

Wu was one of the first to point out the suitability of a layered framework for understanding policy for the digital age. At a time when technologists and academics were just beginning to understand the implications of the Internet, he invoked its layering architecture and proposed this layered framework for analyzing corresponding policy issues. As Wu described, "[t]he essence of network layering is a grand simplification by delegation to functional submodules," a way for enabling "specialized efficiency, organizational coherency, and future flexibility."[45] He saw these features as advantages not only for computer networking, but for communications policy analysis as well.

Yochai Benkler furthered Wu's approach, using the layered model to reexamine the entire regulatory structure of communications.[46] Benkler conceptualized the information environment in terms of each layer of the network — the content, logical or "software," and physical infrastructure layers. This framework supported Benkler's key insight: as the traditional mass media market structure of broadcasters and cable erodes, choices about what kinds of competition and innovation we want in the provision of media will have to be made at each level of the new networks.[47] That is, decisions will have to be made separately about how much proprietary control there is over access to physical transmission, to code, and to content.

Lawrence Lessig picked up on the importance of this more nuanced, modular approach, remarking on how Benkler's use of the layered model "helps organize our thought about how any communications system functions" and "helps show something we might otherwise miss" — that the potential of a communication system to foster and reflect freedom lies in the degree to which its functional components are unbundled.[48] Lessig went on to use the layered model to describe regulatory policies, showing how the content layer of a telephone system, for example, could be "free" to all users, whereas the content layer of a cable system could be "controlled" by the infrastructure provider.[49] These insights helped shape the subsequent debate surrounding Internet regulation. The layered model thus has allowed analysts to surface and sharply frame the key issues of communications policy in the Internet age.[50]

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45. Wu, *supra* note 20, at 1189.

46. *See* Benkler, *supra* note 18.

47. *Id.* at 562 ("As the digitally networked environment matures, regulatory choices abound that implicate whether the network will be one of peer users or one of active producers . . . . These choices occur at all levels of the information environment: the physical infrastructure layer . . . the logical layer . . . and the content layer.").

48. LESSIG, *supra* note 19, at 23.

49. *Id.* at 23–24.

50. Werbach, *supra* note 17, at 37 ("The layered model would make many of the conflicts that bedevil regulators more tractable."). Werbach gives the formerly disparate treatment of digital subscriber lines ("DSL") providers and cable broadband providers as

The layered model has had some impact on communications policymakers, who have come to conceptualize communications networks in at least two layers, as physical infrastructure separate from specific services offered over that infrastructure. Indeed, the most high-profile communications policy debate of recent years — the application of net neutrality principles or open access requirements — explicitly draws on the layered network model.[51] The layered model has also influenced policy on spectrum management and network competition. When FCC licensing policies for wireless spectrum, for example, adopted "technology neutrality" as an organizing principle, they drew on concepts from the layered model. The rules are supposedly neutral as to the technologies that might be deployed over the underlying infrastructure of spectrum, thereby regulating horizontally across functional layers rather than bundling distinct vertical functions (e.g., transmission and service).[52] Not only

one example: DSL providers were required to interconnect with competitors while cable providers, which offer similar services, were not. This perceived inconsistency, Werbach points out, is actually a figment of a service-oriented conception of regulation. The underlying rationale was to prevent service providers that control physical networks from controlling the content layers as well. From this perspective, the FCC could reasonably determine that cable market forces already protect against this outcome, whereas the same is not true for the DSL market. The layered-based reasoning thus shifts the focus onto the functional policy issue at stake, rather than the "almost accidental" context that currently defines the issue. *Id.* at 52–53. The FCC has since classified DSL as an "information service" instead of a "telecommunications service," taking it out of Title II regulation and making it no longer subject to interconnection requirements. Margeurite Reardon, *FCC Changes DSL Classification*, CNET NEWS (Aug. 5, 2005, 12:54 PM), http://news.cnet.com/FCC-changes-DSL-classification/2100-1034_3-5820713.html. The reclassification coheres with this layered-based reasoning, since regulators could have determined that market forces could protect against control of the content layer by DSL providers.

    51. *See* NUECHTERLEIN & WEISER, *supra* note 30, at 168–69, 174 explaining the network neutrality debate in terms of concern for competition between different layers of the network). The FCC's open access requirements for 700 MHz C Block licenses auctioned in 2008, for example, mandate that the physical infrastructure layer (the wireless spectrum) support a diverse array of applications capable of running on the wireless network. *See* Crawford, *supra* note 15, 983–84 (2008) (describing the provisions prohibiting network operators from blocking top-layer content or locking out devices operating on the higher levels of the network). The government has similarly applied open access policies to broadband stimulus funding. Johnson, *supra* note 15 (describing the requirement that Internet providers accepting broadband grant money must provide open access to networks); *see also* Notice of Funds Availability and Solicitation of Applications for the Broadband Initiatives Program and Broadband Technology Opportunities Program, 74 Fed. Reg. 33,132, 33,133 (July 9, 2009), *available at* http://www.ntia.doc.gov/frnotices/ 2009/FR_BBNOFA_090709.pdf.

    52. The White House and FCC have supported a policy of technological neutrality with respect to spectrum so as to be indifferent to particular spectrum-based technologies, while engineering maximum access to the spectrum. *See, e.g.*, FED. COMMC'NS COMM'N, SPECTRUM STUDY OF THE 2500–2690 MHz BAND INTERIM REPORT: THE POTENTIAL FOR ACCOMMODATING THIRD GENERATION MOBILE SYSTEMS 10 (2000), *available at* http://www.fcc.gov/3G/3G_interim_report.pdf (describing the goal of technology neutrality, in the context of identifying 3G-potential frequency bands, as allowing spectrum decisions to be based on "sound engineering" at the physical infrastructure layer); Press Release,

in particular policy implementations, but also when addressing network architecture in general, the FCC has come to adopt the vocabulary of the layered model.[53]

B. Advantages of the Layered Model for Public Service Media Policy

Insights from the layered model's conception of communications networks are nowhere more needed than in public service media policy. This policy shares the DNA of analog, pre-Internet communications policy at large. It is premised on the bundling of transmission (broadcasting) and audio or video services. It ignores the importance of network structure, connectivity, modularity, and adaptability. It further neglects the gains in diversity and robustness that can be obtained by ensuring that the layers of a communications network function in an open and interoperable manner.

Federal public service media policy is located in two sources: the Public Broadcasting Act of 1967[54] and the FCC's reservation of television and radio channels for noncommercial educational broadcast stations.[55] In both, the broadcast station is the principal target of federal subsidy and regulation. The vast majority of federal funding for public service media passes through the Corporation for

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Office of the Press Secretary, Memorandum for the Heads of Executive Departments and Agencies: Advanced Mobile Communications/Third Generation Wireless Systems (Oct. 13, 2000), *available at* http://www.ntia.doc.gov/ntiahome/threeg/3gmemo.htm (directing agencies to manage spectrum in a "technology-neutral" fashion, "not favoring one technology or system over another"); *Best Practices for National Spectrum Management*, FED. COMMC'NS COMM'N (Nov. 15, 2008), http://www.fcc.gov/ib/sand/irb/ bestpractices.html (including technology neutrality as a key principle to "allow for evolution to new radio applications"); *see also* Kevin J. Martin, Commissioner, Fed. Commc'ns Comm'n, Remarks to the Carmel Group's Satellite Entertainment 2002: TV and Radio from Space Conference (Apr. 25, 2002), *available at* http://www.fcc.gov/Speeches/ Martin/2002/spkjm205.html ("[T]he Commission should move toward policies that make sharing easier, and even desirable. For example, a robust secondary market for spectrum and flexible allocations (that are technology and service-neutral) can create strong incentives for making use of excess capacity.").

53. *See, e.g.*, Julius Genachowski, Chairman, Fed. Commc'ns Comm'n, Preserving a Free and Open Internet: A Platform for Innovation, Opportunity, and Prosperity, Remarks at the Brookings Institution (Sept. 21, 2009), *available at* http://www.openinternet.gov/read-speech.html (referring to the Internet network architecture's openness at the infrastructure, network, and application levels).

54. 47 U.S.C. § 396 (2006).

55. *See, e.g.*, 47 U.S.C. § 335(b)(1) (2006) (requiring digital broadcast satellite providers to reserve a portion of their channel capacity for "noncommercial programming of an educational or informational nature"); Noncommercial Educational TV Stations, 47 C.F.R. § 73.621(a) (2002) (reserving a limited number of television channels for noncommercial educational broadcasters); Implementation of Section 25 of the Cable Television and Consumer Protection Act of 1992, Direct Broadcast Satellite Public Interest Obligations, 13 FCC Rcd. 23,254, 23,285 (Nov. 19, 1998). Cable operators may also be required to devote channel capacity and equipment to noncommercial public, educational, and governmental programming. *See* 47 U.S.C. § 531 (2006). The FCC has been reserving channels for noncommercial educational broadcast stations since the 1950s. *See infra*, note 74.

Public Broadcasting ("CPB") to public broadcast stations.[56] These funds are then spent on broadcast infrastructure and content.

Broadcast spectrum is another kind of subsidy for public service media — a subsidy in the form of infrastructure support for a particular transmission technology.[57] This subsidy directs policy energy toward the favored transmission platform of broadcasting and, ultimately, toward the funding of media makers that are connected with this technology, even as they produce for non-broadcast transmission platforms as well, such as broadband.[58]

Like communications networks at large, 21st century public service media networks should diverge from the functionally bundled, technology-specific structure envisioned and enforced by the Public Broadcasting Act. Instead of an exclusive reliance on radio and television transmission, public broadcasting stations have long since expanded beyond broadcasting. They increasingly partner with other media makers and applications providers outside of the public broadcasting system.[59] Moreover, noncommercial media makers unaffiliated with public broadcasters are increasingly important in the creation and delivery of information to the public. Some of these are non-profit firms, while others are citizens engaging in a participatory media culture.[60]

A structural model organized around functions, rather than services or platforms, would help public service media to embrace newer, non-broadcast technologies in the quickly evolving pace of modern-day communications. Moreover, the layered model's functions-based approach would refocus public service media on the original purposes of the Public Broadcasting Act — to create, curate, and distribute high-quality media programming that engages diverse, underserved audiences at both local and national levels.[61] By

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56. *See, e.g.*, Letter from William P. Tayman, Jr. to CPB Board of Directors, Proposed FY 2009 Operating Budget (Sept. 23, 2008), *available at* http://www.cpb.org/aboutcpb/leadership/board/resolutions/080923_fy09OperatingBudget.pdf (indicating that nearly 90% of the approved annual budget, from federal appropriates and interest, is dedicated towards station and programming grants).

57. *See* Goodman, *supra* note 2, at 264–65 (discussing spectrum reservation as another form of public broadcasting subsidy).

58. *See, e.g.*, Ex Parte Letter of Ellen P. Goodman to Blair Levin, A National Broadband Plan for Our Future, GN Docket No. 09-51 (Fed. Commc'ns Comm'n Jan. 15, 2010) (pointing out that public service media entities were spending an estimate of $2.9 million to $27.3 million annually per licensee on broadcast delivery of content, at least a portion of which could be redirected towards broadband infrastructure).

59. *See* PUBLIC RADIO IN THE NEW NETWORK AGE, *supra* note 2, at 30–31 (recommending that public radio organizations partner with other content-creating organizations and community resources)

60. *See* PUBLIC MEDIA 2.0, *supra* note 2, at 7–8 (providing examples of public collaboration using tools such as social networks, open source platforms, and pervasive gaming); *see also* PUBLIC RADIO IN THE NEW NETWORK AGE, *supra* note 2, at 23 (mentioning partnerships between public radio and news organizations).

61. *See* 47 U.S.C. § 396(a)(6)–(7) (2006).

concentrating on public service media's core functions, the layered model would align public policy with an emphasis on inclusion, engagement, distribution, collaboration, and networked content where appropriate.

While layering helps to remake public service media network design, the Internet's implementation of layering does not perfectly map onto public service media. The layered model for the Internet adopts what are known as "end-to-end" principles, where complexity within the network is pushed to the edge of the network and away from the underlying physical infrastructure layer.[62] Unlike the Internet, public service media networks may be complex throughout, at least in the layers above mere transmission. Core network services in public service media, unlike those in the Internet, are not necessarily "simple and cheap" as end-to-end principles assume them to be.[63]

For example, it would be absurd to claim that content creation, which happens at the core of the network, can be done without intelligence. Indeed, intelligence and complexity are often the hallmarks of the creations imbued with a public service media mission. Unlike the Internet, which can function as a purely user-driven system, public service media requires coordination throughout the network, even though users and user-driven functionality may be critical at each layer. Thus, it is layering alone — and not the end-to-end philosophy often coupled with it — that offers the most meaningful guidance on reconfiguring public service media networks for the digital age.

Structural reform of public service media — indeed, a transformation from public broadcasting to public service media — will be crucial to achieving policy goals as the world moves ever faster from vertically bundled analog networks to the horizontal layers of digital networks. By offering an inherently adaptable, modular, and realistic approach, the layered model points the way to the reforms that will maximize fulfillment of the Public Broadcasting Act's aims.

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62. End-to-end principles are conceptually distinct from layering. The key to this design philosophy is that "function should not be placed at the lower-levels of a network system," but instead left to the applications at the edges, or ends, of the network. Wu, *supra* note 20, at 1192 (emphasis omitted). Thus, "the lower-level protocols should focus only on the minimal function of transmitting data, and in all other respects be kept as simple, unintrusive, and open as possible." *Id. See also* Marjory S. Blumenthal & David D. Clark, *Rethinking the Design of the Internet: The End to End Arguments vs. the Brave New World*, 1 ACM TRANSACTIONS ON INTERNET TECH. 70, 70 (2001) ("The end to end arguments suggest that specific application-level functions usually cannot, and preferably should not, be built into the lower levels of the system — the core of the network."); Jerome H. Saltzer et al., *End-to-End Arguments in System Design*, 2 ACM TRANSACTIONS IN COMPUTER SYS. 277 (1984), *reprinted in* INNOVATIONS IN INTERNETWORKING 195 (Craig Partridge ed., 1988) (first technical paper describing the end-to-end concept).

63. David P. Reed et al., *Commentary on "Active Networking and End-to-End Arguments,"* IEEE NETWORK, May/June 1998, at 66, 70.

The next section discusses how a layered model for digital public service media would work.

III. A FOUR-LAYER MODEL FOR DIGITAL PUBLIC SERVICE MEDIA NETWORKS

Different renditions of the layered model for computer networking and communications policy have used different layering nomenclature and levels of detail.[64] Based on research into emerging best practices in public service media,[65] we theorize a four-layer model for the future of public service media and policy consisting of physical infrastructure, creation, curation, and connection layers.[66] We describe each layer, and the connective tissue between them, in greater detail below.

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64. For example, the Open System Interconnection ("OSI") model uses seven layers, and the Internet Protocol Suite ("TCP/IP") uses four layers. Whitt, *Horizontal Leap Forward*, *supra* note 25, at 605–09 (explaining protocol layer models from computer networking in great detail). Communications scholars, policy experts, and media researchers have suggested a model with three to four layers. *See, e.g.*, Benkler, *supra* note 18 (suggesting a three-layer model); Werbach, *supra* note 17 (suggesting a four-layer model); Tracy Van Slyke, *Intro: Visualizing The 4 Network Layers*, BEYOND THE ECHO BLOG (Jan. 24, 2010), http://www.beyondtheecho.net/2010/01/24/sneak-peek-four-layers-of-networks-awesome-visuals/ (citing JESSICA CLARK & TRACY VAN SLYKE, BEYOND THE ECHO CHAMBER (2010)) (describing a four-layer visualization of networks in the media systems).

65. *See generally* AM. UNIV. SCHOOL OF COMMC'N CTR. FOR SOCIAL MEDIA, SCAN AND ANALYSIS OF BEST PRACTICES IN DIGITAL JOURNALISM 12–42 (2009) [hereinafter BEST PRACTICES] (identifying best practices in digital new media journalism for public service media); GUPTA CONSULTING, EMBRACING DIGITAL: A REVIEW OF PUBLIC MEDIA EFFORTS ACROSS THE UNITED STATES (2009), *available at* http://www.cpb.org/publicmedia2.0/docs/EmbracingDigitalReviewPublicMediaEfforts2009.pdf (providing examples of new and innovative public service media deployments); KNIGHT COMMISSION, *supra* note 2, at 35–36 (describing how public service media can best meet the information needs of communities by becoming more local, inclusive, interactive, and integrated with new technologies and communications); Goodman & Chen, *supra* note 14 (describing how digital public media can serve public purposes); Silver et al., *supra* note 2 (describing how public service media systems can become more relevant to 21st century information needs).

66. In their recent book, *Beyond the Echo Chamber*, Jessica Clark & Tracy Van Slyke conceptualize layers in the media ecosystem differently. Rather than thinking of them as layered in vertical stacks from data transport to content consumption, as in the traditional mode of network theory, they have conceived of horizontal layers representing alternative and complementary kinds of media networks: networked users, self-organized networks, institutional networks, and networks of institutions. *See* JESSICA CLARK & TRACY VAN SLYKE, BEYOND THE ECHO CHAMBER (2010).

Figure 1: Layers of Public Service Media Networks

Connection: Engaging the public with public service media content across platforms

Curation: Identifying content and applications of particular value and supporting broad access to the public

Creation: Creating content and applications the market does not support

Infrastructure: Transmitting public service media content and applications

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The functions represented in these layers work together to form a new kind of public service media network. "Networking" has always been a principal goal of the public service media system. The Public Broadcasting Act and associated structures took what were scattered educational television and radio stations and networked them through national membership organizations (the Public Broadcasting System ("PBS") and National Public Radio ("NPR")), a non-profit funding source ("CPB"),[67] and various legal provisions.[68] The goal was to preserve local experimentation and diversity while achieving better coordination and economies of scale.[69]

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67. RALPH ENGELMAN, PUBLIC RADIO AND TELEVISION IN AMERICA: A POLITICAL HISTORY 83–100 (1996) (describing the early transition of public broadcasting from a collection of educational programs and television facilities to a cohesive public broadcasting system by 1967); LAURENCE JARVIK, PBS: BEHIND THE SCREEN 9, 11–23 (1997) (same).

68. Legal provisions relevant to networking include interconnection rules, *see, e.g.*, 47 U.S.C. § 396(g)(1)(B) (2006) (authorizing the CPB to establish and develop "one or more interconnection systems to be used for the distribution of public telecommunications services"), legal authority to contract with other telecommunications entities or independent producers to produce telecommunications services and distribute content, *see, e.g.*, 47 U.S.C. § 396(g)(2)(B) (2006), and copyright clauses that facilitated the exchange of intellectual property in and out of the public service media network, *see, e.g.*, 17 U.S.C. § 114(b) (2006) (granting public broadcasters the right to use sound recordings without permission or in educational television and radio programs that are not commercially distributed); 17 U.S.C. § 118(b) (2006) (granting a compulsory license to use "published nondramatic musical works and published pictorial, graphic, and sculptural works").

69. *See, e.g.*, JEFFREY A. DVORKIN & ALAN G. STAVITSKY, "THE ACCOUNTABLE GUARDIAN": CONCEPTS IN TENSION: THE CHALLENGE OF ENSURING BOTH OBJECTIVITY AND BALANCE AND EDITORIAL INDEPENDENCE 13 (2007), *available at* http://www.cpb.org/aboutcpb/goals/objectivity/whitepapers/cpb_accountableGuardian_DvorkinStavitsky.pdf (recounting how public service media's roots were in localism); JARVIK, *supra* note 67, at 23 (describing PBS as "[i]nitially designed [to be] a mere routing system for program exchange" from local stations); Willard D. Rowland, Jr., *Public Broadcasting in the United*

Given the limitations of 20th century technology and the prevailing modes of organization in the broadcast industry, the only kind of networking possible for most of public service media's history was between national organization and local station — between hub and spoke. Indeed, this form of networking was a primary objective of the Public Broadcasting Act. The national organizations were formed to commission and aggregate a national programming schedule for distribution to local stations.[70] Some of this programming came from the few local stations that produce for the system.[71] Independent producers typically had to work through a local station or a national organization in order to distribute content through the network.[72]

Today, the concept of a media network in general is more open, fluid, and dynamic.[73] It is now possible for public service media

States, *in* ENCYCLOPEDIA OF COMMUNICATION AND INFORMATION 5 (2002), *available at* http://www.netaonline.org/NFPTE02-Rowland-PBinUSA.pdf (describing how the 1967 Act built upon "the tradition and imperatives of the largely decentralized, locally focused U.S. system of noncommercial radio and television"); Richard Somerset-Ward, *Public Television: The Ballpark's Changing*, *in* QUALITY TIME? THE REPORT OF THE TWENTIETH CENTURY FUND TASK FORCE ON PUBLIC TELEVISION 77 (1993) [hereinafter QUALITY TIME?] (discussing the prevailing notion of localism, which presents public television as "a mass of individual, locally based, autonomous, not-for-profit stations, which might loosely be united into a nationwide service or network").

70. 47 U.S.C. § 396(k)(3)(A)(ii) (2006) (allocating a set percentage of CPB appropriations towards "national public television programming"). These funds typically support national programming that is distributed to local stations, such as the National Program Service, which includes series such as *PBS NewsHour*, *Nova*, and *Masterpiece Theater*, as well as funding for programs produced by independent producers and targeting ethnic minorities. CORPORATION FOR PUBLIC BROADCASTING APPROPRIATION REQUEST AND JUSTIFICATION: FY 2011 AND FY 2013, at 13–14 (Feb. 2010), *available at* http://www.cpb.org/aboutcpb/financials/appropriation/justification_11-13.pdf.

71. The Boston station WGBH, for example, is PBS's single largest producer of television and online content, creating approximately a third of national public television programming. *Ex Parte* Comments of WGBH et al., A National Broadband Plan for Our Future, GN Docket No. 09-51, at 2 (Fed. Commc'ns Comm'n Feb. 22, 2010) [hereinafter WGBH Comments]; *see also* PUBLIC RADIO IN THE NEW NETWORK AGE, *supra* note 2, at 23 (noting that there are only about ten public radio stations with a significant local news capacity); QUALITY TIME?, *supra* note 69, at 138–39 (reporting as of 1991 that only a handful of local stations contribute significantly to national programming, with some 300 stations contributing no hours at all to the national schedule).

72. *See, e.g.*, ENGELMAN, *supra* note 67, at 99 (noting that NPR sought programming from local member stations).

73. The concept of the network has shifted perceptions of media delivery systems from hierarchical, one-way structures to flatter webs of interactive units. Commentators and scholars now describe these systems as comprising a "networked information environment" or "digitally networked environment." *See, e.g.*, PUBLIC MEDIA 2.0, *supra* note 2, at 2, 29 (referencing the transformation to "an open, many-to-many networked media environment" and the "networked information environment"); *see also* Benkler, *supra* note 18, at 563–65 (discussing the historical transformation from a centralized to a more open, permeable, and decentralized media system); Yochai Benkler, *Overcoming Agoraphobia: Building the Commons of the Digitally Networked Environment*, 11 HARV. J.L. & TECH. 287, 301–14 (1998). Network theory in general, which studies the relationships between adjacent units in a particular network, has also been applied to disciplines as diverse as computer science, sociology, biology, engineering, and economics. *See* Lior J. Strahilevitz, *A Social Networks Theory of Privacy*, 72 U. CHI. L. REV. 919, 946–58 (2005).

entities to be networked multi-laterally, between the local spokes as well as between local and national hubs. These spokes — or more accurately, network nodes — can partner to produce, distribute, and engage with content. The nodes can be comprised of many kinds of entities locally and across communities. New information providers can network with those "in the system" intermittently or on a project-by-project basis, using the public service media assets to build capacity in information development and distribution. All of this can happen through the use of distributed computing power, social networking, and legal rules that foster collaboration. The layered model shows how we might think about this new kind of network and its relationship to policy structures.

A. Infrastructure Layer

The infrastructure layer describes the physical infrastructure that transmits public service media bits to communities and individuals. This layer originally consisted of broadcast transmission towers, broadcast spectrum licenses, and associated broadcast infrastructure. In the past, most of this infrastructure was owned and operated by public service media entities themselves.[74] Indeed, one of the objectives of the system created by the Public Broadcasting Act was to support a public service media satellite interconnection system to distribute programming to the network of local stations.[75] This broadcast and satellite infrastructure remains central to the public service media mission, but much of what public service media now offers is transmitted over broadband networks, cable, satellite, fiber optic, and other technologies owned and operated by commercial

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74. The FCC first set aside 242 FM radio and television channel assignments for noncommercial, educational use in 1952. *See* Amendment of Section 3.606 of the Commission's Rules and Regulations, 41 F.C.C. 148 (1952); *History of Public Broadcasting in the United States, Timeline: 1950s-'60s*, CURRENT, http://www.current.org/history/timeline/timeline-1950s-60s.shtml (last visited Dec. 21, 2010). In 1998, "noncommercial educational television licensees reach[ed] 98% of the population through 242 UHF television stations and 124 VHF stations, the majority of which are funded in part by the CPB." Randi M. Albert, *A New "Program for Action:" Strengthening the Standards for Noncommercial Educational Licensees*, 21 HASTINGS COMM. & ENT. L.J. 129, 137 (1998). Today, certain rules still require satellite broadcasters to reserve four percent of their channel capacity for "noncommercial programming of an educational or informational nature." 47 U.S.C. § 335(b)(1) (2006); *see* Implementation of Section 25 of the Cable Television and Consumer Protection Act of 1992, 13 FCC Rcd. 23,254, 23,285 (1998). Cable operators may also be required under local franchise agreements to devote a certain amount of channel capacity and equipment to noncommercial public, educational, and governmental programming. *See* 47 U.S.C. § 531 (2006).

75. 47 U.S.C. § 396(g)(1)(B) (2006) (authorizing the CPB to establish and develop "one or more interconnection systems to be used for the distribution of public telecommunications services").

entities. In other words, the function of public service media infrastructure has been unbundled from its ownership and operation.

The layered model challenges policymakers to articulate requirements and goals for public service media infrastructure, as distinct from the system's other functions. Guidance comes from the Public Broadcasting Act and the decision of the FCC to reserve broadcast channels for noncommercial stations. The siting of broadcast stations in every sizable town such that a local signal would reach everyone and everyone would have access to local television and radio created the conditions for ubiquitous public service media.[76] The goal was universal service through a locally based, public service infrastructure.

The discourse on universal service has, until recently, centered on telecommunications infrastructure[77] and the challenge of providing basic telephone connectivity to rural areas.[78] In the past several years, the focus has shifted to broadband infrastructure in recognition of the reality that basic connectivity entails access to the high bandwidth services that drive our digital lives.[79] It is in this context that the FCC has created a National Broadband Plan to ensure there is universal

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76. *See id.* § 396(a)(9) (stating the government's public interest in ensuring that all citizens "have access to public telecommunications services through all appropriate available telecommunications distribution technologies"); Amendment of Section 3.606 of the Commission's Rules and Regulations, 41 F.C.C. 148, 152 (1952) (describing the demand for broadcasting service from local stations as a justification for reserving channels for their future use); 47 C.F.R. 73.621 (2002) (concluding that the FCC should set aside noncommercial channels "based upon the important contributions which noncommercial educational television stations can make in educating the people both in school — at all levels — and also the adult public").

77. Universal service describes the regulatory policies designed to add users, or keep existing users, on telecommunications networks through low rates. NUECHTERLEIN & WEISER, *supra* note 30, at 333. It is usually supported by either cross-subsidies from commercial entities or by government subsidies, such as the FCC's universal service fund program that provides need-based subsidies to low-income customers. *Id.* at 52–54, 339–47.

78. *See* Susan P. Crawford, *Transporting Communications*, 89 B.U. L. REV. 871, 899–901 (2009) (describing government regulation policies that have centered universal service funding concerns around telecommunications carriers and their networks); Hannibal Travis, *Wi-Fi Everywhere: Universal Broadband Access as Antitrust and Telecommunications Policy*, 55 AM. U. L. REV. 1697, 1703 (2006) (discussing challenges to providing broadband connectivity and stating that most legal scholarship on broadband policy has focused on debates surrounding infrastructure providers).

79. NUECHTERLEIN & WEISER, *supra* note 30, at 352–55 (describing how universal service policies may change as broadband becomes more widespread). The growth in high bandwidth applications and usage is exponential. *See* BUILDING THE FACT BASE, *supra* note 5, at 16–18, (quoting Wireless Association observations that "[w]e're . . . seeing an explosion in the area of data and data applications," and quoting Cisco Systems' predictions that wireless data usage will double every year for the next four years); *see also* Om Malik, *Data Revenues Will Push Mobile Biz Past $1 Trillion*, GIGAOM (Jan. 15, 2010, 8:30 AM), http://gigaom.com/2010/01/15/data-seen-pushing-wireless-revenues-past-1-trillion/ (citing predictions that in less than five years, nearly half of the world's 6.7 billion mobile users will use high-bandwidth broadband technologies).

access to broadband digital infrastructure in the United States.[80] In a sense, public service media infrastructure was the original broadband public infrastructure, providing high bandwidth service to all. As public service media has shifted to digital platforms, the public interest in universal access to public television and radio service has converged with the interest in universal access to broadband infrastructure. An interest in communicative capacity that was once segmented by the two competing transmission technologies of broadcast and telecommunications is now a singular interest in affordable access to robust digital networks.

Given the convergence of universal service interests — telecommunications and broadcast — what should public service media policy be with respect to the infrastructure layer? At a minimum, there is an interest in stimulating and supporting the development of ubiquitous broadband networks. Currently, broadband availability and penetration are not ubiquitous. Studies estimate that up to 46% of the U.S. rural population is not connected to broadband services.[81] The FCC has acknowledged that rural areas in particular "have long been unserved or underserved by broadband technology,"[82] with additional constraints based on price of access, age of user, household income, and level of education.[83] Low-income households are especially hard-hit; 63% of homes that have incomes less than $30,000 do not have broadband.[84] With the United States ranked 22nd in international broadband penetration rates and 14th in advertised download speed, American consumers are paying more for slower connections with more limitations than many other consumers around the world.[85]

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80. *See, e.g.*, American Recovery and Reinvestment Act of 2009, Pub. L. No. 111-5, 123 Stat. 115, 118 (2009) (providing funds for rural areas without sufficient access to broadband), *available at* http://www.gpo.gov:80/fdsys/pkg/PLAW-111publ5/pdf/ PLAW-111publ5.pdf; A National Broadband Plan for Our Future, GN Docket No. 09-51, at 1, 13 (Fed. Commc'ns Comm'n Apr. 8, 2009) (notice of inquiry) (emphasizing the value of high-speed ubiquitous broadband services to Americans and seeking comment on expanding broadband availability through universal service policies).

81. *See* BUILDING THE FACT BASE, *supra* note 5, at 31; NAT'L TELECOMM. AND INFO. ADMIN., DIGITAL NATION: 21ST CENTURY AMERICA'S PROGRESS TOWARD UNIVERSAL BROADBAND INTERNET ACCESS 9–10 (2010) [hereinafter DIGITAL NATION], *available at* http://www.ntia.doc.gov/reports/2010/NTIA_internet_use_report_Feb2010.pdf (reporting that 60% to 72% of rural Americans do not use broadband as of 2009).

82. MICHAEL J. COPPS, BRINGING BROADBAND TO RURAL AMERICA: REPORT ON A RURAL BROADBAND STRATEGY 8 (2009), *available at* http://ncbm.org/wp-content/ uploads/2009/05/fcc-reportbringing-broadband-to-rural-america.pdf.

83. BUILDING THE FACT BASE, *supra* note 5, at 13–14 (describing a gap between rural and urban areas in broadband availability, with data that reveals "sharp differences across the country").

84. *See id.* at 24. Lack of perceived need and affordability are two of the highest reported barriers to adopting broadband among American users. DIGITAL NATION, *supra* note 81, at 13.

85. *See* FED. COMMUNC'NS COMM'N, NATIONAL BROADBAND PLAN WORKSHOP: CONSUMER CONTEXT 17 (2009), *available at* http://broadband.gov/docs/ws_22_

Without better broadband infrastructure, public service media cannot deliver mission-driven services to everyone. Limited broadband has already begun to constrain public service media efforts to reach diverse, underserved, and young audiences. For example, Next Door Neighbors, a Nashville Public Television program that serves local immigrant and refugee communities,[86] relies heavily on broadband to reach its audience, most of which accesses the content online.[87] But the lack of access to broadband in rural areas of middle Tennessee — areas that include an increasing number of Somali, Hispanic, and other immigrant constituencies — has impaired service.[88] In addition, prohibitive streaming costs have made video delivery difficult.[89] The same obstacles — high streaming costs and limited broadband — have hindered another public service media producer, Skylight Pictures, from delivering high-resolution documentary films and other educational materials to high schools and universities.[90]

In addition to their general policy interest in robust and ubiquitous broadband, public service media entities have a special role to play in the diffusion of broadband infrastructure as owners and operators of such facilities. Many of these entities have broadband assets that can be networked with other noncommercial infrastructure assets to connect anchor institutions within a community.[91] Anchor institutions are generally nonprofits that are rooted in their local communities.[92] They include "[u]niversities, community colleges, museums, libraries, municipal enterprises, hospitals, parks,

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consumer.pdf; Shawn Powers, GOVERNMENT SUPPORT FOR INFORMATION INFRASTRUCTURE: AN OVERVIEW, http://fundingthenews.usc.edu/related_research/5_Carnegie_Broadband.pdf (last visited Dec. 21, 2010).

86. NEXT DOOR NEIGHBORS, http://www.wnpt.org/productions/nextdoorneighbors/ (last visited Dec. 21, 2010).

87. Conversation with Kevin Crane, Vice President of Content & Technology, Nashville Public TV (Oct. 6, 2009).

88. *Id.*

89. *Id.*

90. Email from Paco de Onis, Producer, Skylight Pictures, to Ellen Goodman (Sept. 18, 2009 12:38am). *See generally* SKYLIGHT PICTURES, http://skylightpictures.com/ (last visited Dec. 21, 2010).

91. *See* A National Broadband Plan for Our Future, GN Docket No. 09-31 (Fed. Commc'ns. Comm'n Apr. 8, 2009) (notice of inquiry). *See generally* American Recovery and Reinvestment Act of 2009, 111 Pub. L. No. 5, 123 Stat. 128, 514 (2009) (describing the Broadband Technology Opportunities Program, which is authorized to award grants to ensure broadband access to "community anchor institutions").

92. HENRY S. WEBBER & MIKAEL KARLSTRÖM, WHY COMMUNITY INVESTMENT IS GOOD FOR NONPROFIT ANCHOR INSTITUTIONS 6 (2009), *available at* http://www.community-wealth.org/_pdfs/articles-publications/anchors/report-webber-karlstrom.pdf (defining anchor institutions as institutions that "by reason of mission, invested capital, or relationships to customers or employees, are geographically tied to a certain location").

performing arts centers and sports arenas."[93] Because anchor institutions offer economic development; job training; education; health care; access to local, state, and federal government services; and are often one of the largest employers in their area, they are increasingly viewed as critical to the flourishing of the communities they serve.[94] These institutions have faced overwhelming demand for high-bandwidth connections.[95] At the same time, the high costs of building these networks for anchor institutions, which can place higher demands on the network than residential or business customers, have discouraged private sector companies from meeting these needs.[96]

In response, government and non-profit organizations have built, operated, or managed regional broadband networks that focus on the needs of community anchor institutions.[97] They have aggregated demand from several institutions to offer affordable, dedicated, high-bandwidth services not available from commercial providers.[98] Even with these entrepreneurial broadband networks, however, "[m]ost community anchor institutions cannot yet connect to these providers."[99] The federal government has acknowledged this gap. The

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93. DAVID MAURRASSE, CITY ANCHORS: LEVERAGING ANCHOR INSTITUTIONS FOR URBAN SUCCESS 2 (2007), *available at* http://www.community-wealth.org/_pdfs/news/recent-articles/10-07/paper-maurrasse.pdf.

94. *See, e.g.*, *id.* at 3, 6, 9–11 (listing how anchor institutions improve their communities through local educational and cultural programs, community safety, improved human and educational services, and job creation); Ira Harkavy et al., *Anchor Institutions as Partners in Building Successful Communities and Local Economies*, *in* RETOOLING HUD FOR A CATALYTIC FEDERAL GOVERNMENT 147–49 (2009), *available at* http://www.community-wealth.org/_pdfs/news/recent-articles/07-09/chapter-harkavy-et-al.pdf (discussing the growing recognition that anchor institutions are intricately intertwined with the economic vitality and competitiveness of their communities and cities); *see also* MAURRASSE, *supra* note 93, at 5–8 (recommending ways for anchor institutions to positively impact their communities).

95. Anchor institutions have requested seven times more funding than made available through the American Recovery and Reinvestment Act of 2009. Reply Comments of Commenters Supporting Anchor Institution Networks, International Comparison and Survey Requirements in the Broadband Data Improvement Act, GN Docket No. 09-47, at 3 (Fed. Commc'ns Comm'n Jan. 27, 2010) *available at* http://www.internet2.edu/government/docs/Anchor%20Institution%20Network%20FCC%20filing%20FINAL%201-27-2010.pdf.

96. Reply Comments of U.S. R&E Networks and HIMSS, International Comparison and Survey Requirements in the Broadband Data Improvement Act, GN Docket No. 09-47, at 12–14 (Fed. Commc'ns Comm'n Jan. 27, 2010), *available at* http://www.nlr.net/docs/R&EFiling_UCAN_1-27-10.pdf (discussing the market failure of high-capacity broadband to community anchors).

97. *See, e.g.*, Mary Alice Ball, *Aggregating Broadband Demand: Surveying the Benefits and Challenges for Public Libraries*, 26 GOV'T INFO. Q. 551 (2009) (analyzing efforts by state public libraries to establish library cooperatives that aggregate broadband demand, and state government initiatives to develop a telecommunications network for public sector agencies).

98. *See id.* at 553.

99. *See* Reply Comments of Commenters Supporting Anchor Institution Networks, International Comparison and Survey Requirements in the Broadband Data Improvement Act, GN Docket No. 09-47, at 2–3 (Fed. Commc'ns Comm'n Jan. 27, 2010) *available at*

Commerce Department's National Telecommunications and Information Administration ("NTIA") has directed much of its $2.6 billion in broadband stimulus grants to "comprehensive community" infrastructure projects that connect to anchor institutions.[100]

Public service media, with its trusted name brand[101] and historic mission to support public interest communications,[102] should have a mandate to be part of this solution. All public broadcasting stations have wireless spectrum assets, and public television stations have the ability to broadcast broadband content on their digital channels to consumers. It is not on the "last mile" to the home that public service media entities will make the greatest contribution to broadband infrastructure, but on the "middle mile" between broadband service providers and community institutions that are substantially open to the public. Many legacy public broadcasting stations have robust broadband capacities that connect them to schools, other stations, and other community institutions. Those that are part of state or municipal networks in particular often operate fiber or other broadband networks between stations in the network.[103]

Public service media entities can contribute to broadband connectivity by investing in their physical networks, in partnership with other community institutions, to create local hubs of broadband connectivity.[104] By helping provide broadband to schools, public

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http://www.internet2.edu/government/docs/Anchor%20Institution%20Network%20FCC%20filing%20FINAL%201-27-2010.pdf.

100. Comprehensive Community Infrastructure Grants, Search Applications, Broadband USA, http://www.ntia.doc.gov/broadbandgrants/applications/results.cfm?org=&keywords=&grantround=&id=&projtype=Comprehensive+Community+Infrastructure&state=&status=Awarded (listing all Comprehensive Community Infrastructure BTOP grants awarded thus far) (last visited Dec. 21, 2010); U.S. DEP'T. OF COMMERCE & NAT'L TELECOMM. AND INFO. ADMIN., BROADBAND TECHNOLOGY OPPORTUNITIES PROGRAM: KEY REVISIONS IN SECOND NOTICE OF FUNDS AVAILABILITY (2010), *available at* http://www.ntia.doc.gov/press/2010/BTOP_NOFAII_FACTSHEET_100115.pdf (noting that providing broadband to anchor institutions can be a way "of maximizing the benefits of BTOP funds"); Agencies Modify Broadband Stimulus Final Round, Set Modest Satellite Funding, Stifel Nicolaus: Telecom, Media & Tech Regulatory (Jan. 19, 2010) (on file with author).

101. *See* Silver et al., *supra* note 2, at 264 (citing statistics reporting PBS as the highest trusted U.S. institution by the public for six consecutive years, superseding institutions such as courts of law, newspaper publishing companies, and commercial broadcast TV networks by at least a 20% margin); Lauren J. Strayer, *Corporation for Public Broadcasting: Building a Digital Democracy Through Public Media*, CTR. FOR AM. PROGRESS ACTION FUND, http://www.americanprogressaction.org/issues/2008/changeforamerica/pdf/pbs.pdf (last visited Dec. 21, 2010) (reporting that Americans ranked PBS the second-best use of federal tax dollars in 2008, after military defense spending, and ranked NPR fifth, after law enforcement and the space program).

102. 47 U.S.C. § 396(a)(1)–(2) (2006) (declaring that "it is in the public interest to encourage the growth and development of public radio and television broadcasting" as well as that of "nonbroadcast telecommunications technologies for the delivery of public telecommunications services").

103. *See, e.g., infra* note 105 and accompanying text.

104. The National Public Lightpath ("NPL") is a representative example of an initiative between public service media entities and others to support public interest broadband

service media entities can ensure that high definition educational material is available in the classroom. A 100-megabit high-speed fiber-optic network, for example, now allows students in the small town of Lafayette, Louisiana to engage in peer-to-peer, real-time learning with students in San Francisco, California.[105] Recent regulatory changes further ensure that broadband connectivity in schools can be made available to the public at large after school hours.[106] This kind of proactive collaboration does not simply wait for high-quality infrastructure to arrive; it draws from the collective strength of multiple sectors to provide its own means to ensure high-speed connectivity between communities.

Because public service media policy today focuses only on broadcast infrastructure, there is no capacity to support these kinds of broadband collaborations and no definitive policy push to make them happen. What is needed is an explicit recognition in policy that the public service media infrastructure layer can and should involve many entities contributing transmission capacity and interconnecting with each other. These entities need have nothing to do with the creation of public service media content or the other functions in the public service media network. Application of layered model concepts to policy, discussed further in Part IV below, would more effectively network public infrastructure together and ensure that public service media entities were able to engage in rich media content exchanges with the public.

B. Creation Layer

Atop the infrastructure layer rides the creation layer, consisting of public service media content in the form of audio and video programming, gaming, mobile applications, and new forms of data or narrative expression. Through much of public broadcasting's past, the bundling of functions within the public service media network meant that content creators were largely the same as infrastructure owners and operators. In television, the content creation function falls mostly to a few of the local television stations that

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infrastructure. NPL brings together education, media, government, and technology sectors to create publicly-owned, fiber-optic networks that connect public service media stations to each other and to public education classrooms. NAT'L PUB. LIGHTPATH, http://www.publiclightpath.org/ (last visited Mar. 8, 2010).

105. NAT'L PUB. LIGHTPATH, WHITE PAPER: DOCUMENTATION AND RECOMMENDATIONS 17–20 (2009), *available at* http://www.publiclightpath.org/sites/default/files/NPL_WhitePaper_Ford.pdf.

106. *See* Press Release, FCC, FCC Gives School E-Rate Programs More Flexibility To Allow Community Use of Broadband Services (Feb. 18, 2010), *available at* http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-296371A1.pdf.

produce programming for national distribution.[107] A larger number of local stations produce local content. In radio, NPR produces most of the national public radio programming.[108] Some local stations produce local programming.

The origination of content with the stations themselves led to considerable criticism in the 1980s that public broadcasting was too insular and closed to diverse content inputs.[109] In addition, there has been repeated criticism that public broadcasting shines very little light on local affairs, especially for a system built around local stations.[110] Congress responded by amending the Public Broadcasting Act to require CPB to fund independent television producers.[111] While independent programming increased in the last part of the 20th century, it still remains a small portion of what gets carried on the

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107. *See* QUALITY TIME?, *supra* note 69, at 138–39 (noting that "very few of the 351 stations contribute to the national schedule," with only four that contributed more than 100 hours in 1991, and some "300 stations . . . contributing no programs at all to the national schedule"); *see also* ENGELMAN, *supra* note 67, at 91 (explaining that PBS' original articles of incorporation prohibited PBS from producing national programming).

108. *See* Tim Emmons, *Help (Still) Wanted: A P.D. at NPR To Look After Its Main Audience*, CURRENT (Feb. 2, 2009), *available at* http://www.current.org/npr/ npr0902emmons-pd.shtml (describing NPR as "the leading provider of public radio programming"). NPR produces and distributes more than 100 hours of weekly programming through more than 900 stations nationwide, with a weekly combined audience of 26.4 million listeners. *About NPR*, NAT'L PUB. RADIO, http://www.npr.org/about/ (last visited Dec. 21, 2010); *Ex Parte* Comments of NPR, National Broadband Plan for Our Future, GN Docket No. 09-51, at 1–2 (Fed. Commc'ns Comm'n Dec. 28, 2009) [hereinafter NPR Comments]. NPR also has program-producing and distributing public radio partners, such as Public Radio International and American Public service media. *See generally* PUB. RADIO INT'L, http://www.pri.org/ (last visited Dec. 21, 2010); AM. PUB. MEDIA, http://americanpublicmedia.publicradio.org/ (last visited Dec. 21, 2010).

109. *See, e.g.*, Reed Irvine, *Give Up on Public Broadcasting*, WALL ST. J., Mar. 28, 1986, at 12 ("The entire public broadcasting bureaucracy is so insulated from the market, from public opinion and even from the legislators who vote its funding that there is little chance that it will be depoliticized . . . ."); *see also* ENGELMAN, *supra* note 67, at 110–11 (describing heated criticisms during the Reagan administration accusing NPR of being too liberal and too tied to its congressional funding to be able to provide undistorted, diverse news coverage); JARVIK, *supra* note 67, at 198–201 (recounting criticisms in the 1980s that PBS programs had a liberal bias and were not open to other perspectives); Strayer, *supra* note 101, at 3 (describing how public broadcasting's funding system often pushes it to emphasize well-established programs "to the exclusion of new, more diverse programming").

110. *See* QUALITY TIME?, *supra* note 69, at 127 (citing CPB estimates that local programming "has been 'gently declining' for a decade," with most stations producing a little more than 100 hours a year); *Producers Defy the Trend Against Home-Brewed Local Show*s, CURRENT BRIEFING (Aug. 6, 2002), http://www.current.org/local/index.html (reporting a general decline of local programming in public radio and television).

111. 47 U.S.C. § 396(k)(3)(B) (2006) (declaring that a "substantial amount" of the funds allocated to CPB "shall be distributed to independent producers and production entities"). CPB currently does so with programs such as the Independent Television Service, which funds and promotes independently produced programs for public television, and the National Minority Consortia, which selects and funds programs by and for ethnic minorities. *See Funding Initiatives*, INDEP. TELEVISION SERV., http://www.itvs.org/funding (last visited Dec. 21, 2010); *National Minority Consortia*, CORP. FOR PUB. BROAD., http://www.cpb.org/aboutpb/consortia.html (last visited Dec. 21, 2010).

infrastructure layer.[112] In an unbundled network structure, the infrastructure layer of public service media must be more open to content creators and deliver more local content. This Part addresses how this need might be met, focusing on what kind of content public service media ought to be supplying, who ought to be supplying it, and how it might be supplied.

1. The "What" of Public Service Media Content

Public service media's mission has historically been to provide media content that the commercial market supplies in insufficient quantity.[113] The economic rationale for public and other forms of non-market investment in media is that commercial media producers lack the market incentives to produce optimal amounts of news and information, local content, educational content, innovative or experimental content, and certain kinds of cultural content.[114]

The reasons for the mismatch between market forces and the optimal provision of media content include positive externalities, distributional objectives, and innovation in production and consumption of information. These explanations, or a collection of

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112. CPB does fund independent programming through its Independent Television Service, but it is an exception to the general practice of sourcing most programming from a disproportionately small number of stations. In 2008, "the 'big three' stations — in New York (WNET), Boston (WGBH), and Los Angeles (KCET) — produce[d] approximately 60 percent of the programming for all public stations." Pat Aufderheide & Jessica Clark, *Public Broadcasting & Public Affairs*, BERKMAN CTR. FOR INTERNET AND SOC'Y AT HARVARD UNIV. (2008), http://cyber.law.harvard.edu/sites/cyber.law.harvard.edu/files/Public%20Broadcasting%20and%20Public%20Affairs_MR.pdf. WGBH alone produces about a third of national public television programming and is PBS's largest producer of television and online content. Lonna M. Thompson et al., *Ex Parte* Comments of WGBH, APTs, CPB, NPR, and PBS on the Relationship of Rights Clearance Matters to Public Media and the National Broadband Plan, A National Broadband Plan for Our Future, GN Docket No. 09-51, at 2 (Fed. Commc'ns Comm'n Feb. 22, 2010).

113. *See* CARNEGIE II, *supra* note 1, at 297 ("[T]he non-profit sector . . . has a different bottom line from the business community. . . . [I]ts contributions to human betterment constitute its 'profit.' This is a unique form of social dividend that Western society has devised as a counterweight to the implacable economic laws of the marketplace."); Ellen P. Goodman, *Media Policy out of the Box: Content Abundance, Attention Scarcity, and the Failures of Digital Markets*, 19 BERKELEY TECH. L.J. 1389, 1413–14 (2004) [hereinafter Goodman, *Media Policy out of the Box*] (discussing historical public elevation rationales for public service broadcasting).

114. *See* Machiel van Dijk et al., *Does Public Service Broadcasting Serve the Public? The Future of Television in the Changing Media Landscape*, 154 DE ECONOMIST 251, 254 (2006) ("Public service broadcasting should aim at those media objectives that are not sufficiently met by unregulated markets. Typical media objectives are pluralism and diversity, independence, quality and accessibility."); *see also* Allan Brown, *Economics, Public Service Broadcasting, and Social Values*, J. MEDIA ECON., Jan. 1996 at 3, 9 ("The economic rationale for PSB takes the familiar form of government intervention to address market failure."); Shaun Hargreaves Heap, *Television in a Digital Age: What Role for Public Service Broadcasting?*, ECON. POL'Y, Jan. 2005, at 112, 121 ("The case for intervention in any market turns primarily on the existence of market failure, and the broadcasting industry is no exception . . . .").

similar ones, are often referred to as "market failure."[115] The reference to "market failure" in the context of public service media subsidies can obscure and confuse the rationales for support because the term is used to cover more phenomena than its narrow meaning as an economic term of art abides. The technical meaning of market failure is that the market has failed to allocate goods and services efficiently because of defects in market transactions, and that there is another possible set of transactions that would result in a net gain for market participants.[116] Consumers as a group would, theoretically, be willing to pay for this more gainful result in the marketplace if they could do so easily.

One of the reasons that market failure, strictly speaking, is an insufficient justification for subsidized media is that even perfect market mechanics may not yield the optimal media output. In other words, some of what developed nations have traditionally sought from public service media might not be what the public would pay for in the marketplace even if they could. These outputs are still in the public interest if they increase political accountability, social solidarity, educational levels, and imaginative and expressive freedom, among other values.[117] The problem here is not market failure, per se, but a mismatch between what the market does — efficiently distribute goods and services — and what benefits democratic societies want from their media in addition to market efficiency — the nourishment of civil society.

To avoid the limitations of the "market failure" term, we will not use it. Instead, we identify more precisely the fissures between market capabilities and public needs that serve to justify public service media subsidies and establish the contours of public service media missions.

The first fissure has to do with the fact that media content of a certain kind is a public good that yields positive externalities for society. This is in fact a classic market failure. Something is a public good if there are no exclusive rights to consume the good and

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115. In previous work, I have differentiated between "narrow market failure" and "broad market failure," the former to describe ways in which media markets fail to function efficiently as markets in the production of desirable commodities and the latter to describe the ways in which even a perfectly functioning media market is not designed to produce some of the media that a democracy needs. Goodman, *Media Policy out of the Box*, *supra* note 113, at 1415.

116. PAUL KRUGMAN & ROBIN WELLS, ECONOMICS 112 (2d ed. 2009).

117. *See, e.g.*, Brown, *supra* note 114, at 4 (listing "creative freedom for program makers" as an additional rationale for public service media); Hargreaves Heap, *supra* note 114, at 116 (listing externalities such as promoting informed citizenship and social cohesion); van Dijk et al., *supra* note 114, at 266 (describing educational benefits and other externalities of high-quality public programs); OFCOM, ANNEX 11: MARKET FAILURE IN BROADCASTING, http://stakeholders.ofcom.org.uk/binaries/consultations/psb2_1/annexes/annex11.pdf (2008) [hereinafter ANNEX 11] (describing the broader social value of public service media, such as educating citizens so they can be more engaged in the democratic process).

consumption does not diminish the good itself.[118] This definition captures the two distinguishing features of public goods: non-rivalry and non-excludability.[119] Certain types of media content, such as content that is broadcast or made freely available online, are classic examples: they are both non-rivalrous (one person's consumption of a TV broadcast will not affect another's) and non-exclusive (no audience member or group has an exclusive right to the program).[120] Because producers cannot expect to charge for products whose consumption they cannot prevent, they are not optimally motivated to produce public goods.[121] Public subsidies and other forms of government intervention (for example, in the form of intellectual property rights) serve to motivate the production of public goods.[122]

These interventions to motivate production are particularly important where the public goods produce positive externalities — that is, social benefits whose value cannot be captured by market exchanges.[123] In the case of information, these positive externalities include a well-informed citizenry capable of holding public officials accountable.[124] There has clearly emerged a consensus that the most

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118. Urs Birchler & Monika Bütler, INFORMATION ECONOMICS 91–94 (2007) (defining and explaining information as public goods).

119. *Id.*

120. *See* DEP'T FOR CULTURE, MEDIA & SPORT, THE FUTURE FUNDING OF THE BBC: REPORT OF THE INDEPENDENT REVIEW PANEL 201–08 (1999) [hereinafter ANNEX 8], *available at* http://www.culture.gov.uk/images/publications/reviewcobbc.pdf; *see also* C. Edwin Baker, *Giving the Audience What It Wants*, 58 OHIO ST. L. J. 311, 316–17 (1997) (distinguishing public good media products from "natural monopolies" like cars and can openers); Cass Sunstein, *Television and the Public Interest*, 88 CALIF. L. REV. 499, 514 (2000) (noting that television programming differs from "ordinary product[s]" in part because of public good characteristics); John R. Woodbury, *Comment: Welfare Analysis and the Video Marketplace*, *in* VIDEO MEDIA COMPETITION: REGULATION, ECONOMICS, AND TECHNOLOGY 274 (Eli M. Noam ed., 1985) (distinguishing media products from sweaters and cars because of programming's "heavy dose of public-good characteristics").

121. Certainly, media content providers can and do charge for online content. But certain types of online media content — in many cases, content that also happens to be public media's mission to provide, such as local and international news and information — is currently not sufficiently provided by unregulated private markets. By and large, the news industry is still struggling to find viable commercial business models to support this kind of news and information. This combination of being (a) a public good that (b) is not supported by market mechanisms and (c) produces positive externalities (as discussed in the next paragraph) supplies the justification for public subsidies and government interventions.

122. *See* ANNEX 8, *supra* note 120; Hargreaves Heap, *supra* note 114 at 152.

123. *See* James T. Hamilton, *Private Interests in "Public Interest" Programming*, 45 DUKE L. J. 1177, 1181–82 (1996) (presenting a detailed explanation of positive externalities in public affairs coverage); *see also* C. EDWIN BAKER, MEDIA, MARKETS, AND DEMOCRACY 44–53 (2002) (considering positive externalities generated by media, such as the quality of public opinion and political participation, public interactions, exposing and deterring abuses of power, and audience impact on cultural products available to non-audience members); Daniel Farber, *Free Speech Without Romance: Public Choice and the First Amendment*, 105 HARV. L. REV. 554, 558–62 (1991) (providing a general discussion on the externalities of information).

124. MCCHESNEY & NICHOLS, *supra* note 12, at 118 (providing historical support for the notion, held by both James Madison and Thomas Jefferson, that "a free press was necessary

significant lacuna in media content today is in the area of accountability journalism. U.S. newspapers, which were always the most prolific producers of accountability journalism, have lost approximately 43% of their advertising revenue in the period from 2007 to 2009.[125] For example, U.S. newspaper classified advertising revenue dropped from $19.6 billion in 2000 to $6.0 billion in 2009.

Digital distribution allows media companies to unbundle news content from other, more entertainment-focused genres. This has led to an explosion of non-news content and the end of cross-subsidies that once flowed from things like classified advertisements to the production of news.[126] While certain kinds of news products are now easier and cheaper to produce (e.g., block-by-block traffic reports), other kinds of news are going uncovered. Recent reports chronicle the flight of reporters from state capitals, city halls, and more generally from the venues in which local governance takes place.[127] The powerful tool of citizen journalism fills some of the void of professional journalism, but has not been enough of a force to compensate for the lost information.[128]

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to create the informed citizenry that made popular sovereignty and democracy possible"); KNIGHT COMMISSION, *supra* note 2, at 3 (describing the public service function of journalism in keeping local citizens informed and helping to act as watchdogs over public officials). This is commonly known as the watchdog or "fourth estate" function of the press. *See* Benjamin Barron, *A Proposal To Rescue* New York Times v. Sullivan *by Promoting a Responsible Press*, 57 AM. U. L. REV. 73, 99 (2007) (describing how the press's role in scrutinizing political activity and promoting good governance is encapsulated in the "[f]ourth [e]state" epithet that provides a check upon the government at all levels); Justice Potter Stewart, "Or of the Press," Address at the Yale Law School Sesquicentennial Convocation (Nov. 2, 1974), *in* 26 HASTINGS L. J. 631, 634 (1975) (strongly espousing a fourth estate view of the press).

125. PEW PROJECT FOR EXCELLENCE IN JOURNALISM, THE STATE OF THE NEWS MEDIA: NEWSPAPERS (2010), *available at* http://www.stateofthemedia.org/2010/printable_ newspaper_chapter.htm.

126. *See* HAROLD L. VOGEL, ENTERTAINMENT INDUSTRY ECONOMICS: A GUIDE FOR FINANCIAL ANALYSIS (7th ed. 2007) (describing the pre-digital newspaper model of cross-subsidies between content categories and the ways in which resources must be reallocated as audiences move to niche content online); OECD, supra note 2 at 60–61 (attributing loss of local news, greater homogeneity of news, cheapening and softening of news, and increased fragmentation to digital distribution models).

127. *See, e.g.*, COWAN & WESTPHAL, *supra* note 10, at 6 ("Virtually every news organization that maintained a state capital presence pulled back. Statehouses like those in Denver and Des Moines, which once housed two to three dozen reporters each, have seen those numbers fall by roughly half."); DOWNIE & SCHUDSON, *supra* note 2, at 18 (finding that fewer newspaper journalists were reporting on city halls, schools, social welfare, life in the suburbs, local business, and other areas of local governance); AJR Staff, *AJR's 2009 Count of Statehouse Reporters*, AM. JOURNALISM REV., April/May 2009, *available at* http://www.ajr.org/article.asp?id=4722 (reporting that the number of full-time newspaper reporters covering state capitals fell from 524 in 2003 to 355 by early 2009).

128. While news has expanded to blogs and other forms of new media, studies suggest that most of the news that the public receives is still driven by traditional media and by newspapers in particular. *See, e.g.*, PROJECT FOR EXCELLENCE IN JOURNALISM, HOW NEWS HAPPENS: A STUDY OF THE NEWS ECOSYSTEM OF ONE AMERICAN CITY (2010), *available at* http://www.journalism.org/sites/journalism.org/files/Baltimore%20Study_Jan2010_0.pdf

Another less widely recognized positive externality concerns various forms of social capital. Citizens feel more solidarity with each other when they share stories and issues of national significance (but not necessarily of commercial value) that bind them together.[129] Under these conditions, they are likely to exhibit less prejudice and may find it easier to work together to solve problems, and public discourse is likely to be more civil, less polarized, and more productive than under conditions of social alienation or ignorance.[130] The production and circulation of certain kinds of narratives thus has the potential to create social capital that improves the ability of a diverse population to coexist and create value. For example, the documentary *Not in Our Town* about a hate crime against a gay man in a small town became a tool to create communal discussions about tolerance in towns across the country.[131]

A second justification for public service media subsidies relates to distributional concerns. Information of particular relevance to poor and other underserved populations tends to be under-produced because these populations cannot pay for the information either through their attention as a desirable demographic for advertising or through direct payments.[132] Commercial media underserved these

(studying all Baltimore local news outlets and finding that nearly 95% of all stories with new information came from traditional media, most of them newspapers).

129. *See* ROBERT D. PUTNAM, BOWLING ALONE: THE COLLAPSE AND REVIVAL OF AMERICAN COMMUNITY 22–23, 92–96 (2001) (explaining how "bridging," or inclusive, social capital can generate broader identities and reciprocity); CASS SUNSTEIN, REPUBLIC.COM 8–9 (2001) (pointing out the value of common experiences as a sort of "social glue" that allows citizens to understand one another, especially in heterogeneous nations that face greater risk of fragmentation, and as each nation becomes increasingly global); SUNSTEIN, *supra*, at 92–96 (discussing certain media experiences made possible by modern technology as "solidarity goods," because they increase tolerance and bind citizens together).

130. *Compare* Danielle Keats Citron, *Cyber Civil Rights*, 89 B.U. L. REV. 61, 81 (2009) (describing how groups with homogeneous views tend to become more extreme when they deliberate, because they reinforce each other's views without offering any counterarguments to tilt a viewpoint the other way), *with* Thomas P. Crocker, *Displacing Dissent*, 75 FORDHAM L. REV. 2587, 2614–15 (2007) ("Dissent opens up the possibility of change and challenges existing conceptions. . . . John Stuart Mill lamented the loss of dissent, because, by suppressing dissenting opinions, we 'are deprived of the opportunity of exchanging error for truth.'"), *and* Eduardo Peñalver, *Is Public Reason Counterproductive?*, 110 W. VA. L. REV. 515, 529–30 (2007) (describing the value of diversity of viewpoints and ideas within the deliberative process), *and* SUNSTEIN, *supra* note 129, at 73–74 (discussing the benefits of access to a heterogeneous public in minimizing fragmentation and polarization).

131. PUBLIC MEDIA 2.0, *supra* note 2, at 19; *Not in Our Town*, PUB. BROAD. SERV. http://www.pbs.org/niot/ (last visited Dec. 21, 2010). The nonprofit Facing History project provides another example, using history to engage students of diverse backgrounds on issues such as racism, prejudice, and anti-Semitism through community events, classroom education, and multimedia. FACING HISTORY AND OURSELVES, http://www.facinghistory.org/ (last visited Dec. 21, 2010).

132. *See, e.g.*, Comments of Native Public Media and the National Congress of American Indians, A National Broadband Plan for Our Future, GN Docket No. 09-51, at 18 (Fed. Commc'ns Comm'n June 8, 2009), *available at* http://fjallfoss.fcc.gov/ecfs/document/view?id=6520219943 (describing how the "economically disadvantaged and

populations either because they did not make purchasing decisions (e.g., children) or were insufficiently numerous (e.g., rural populations).[133]

Rural populations, even when able and willing to pay for programming, often could not aggregate enough audience members to support high-cost content — the common complaint of rural populations and the reason why there have always been subsidies for rural telecommunications.[134] Recent research on the broadband ecosystem and the provision of basic information to poor populations suggests that these populations often lack access to information that is circulated in abundance in wealthier communities.[135] The provision of

cyclically impoverished communities" of tribal lands in Indian Country have "neither the demographics nor market conditions" that would lead investors to provide access to broadband); van Dijk et al., *supra* note 114, at 259–61 (explaining why socially valuable programs may not be produced without advertising support, because of a bias against programs valued only by a small potential audience).

133. In fact, children's programming was perceived to be so infrequently produced by commercial media that the FCC chose to implement so-called "kidvid rules" in response to the Children's Television Act of 1990, requiring that broadcasters air a certain amount of programming for children. *See* 47 C.F.R. § 73.671(d) (2010) (requiring broadcast stations to devote three hours a week to educational children's programming); Children's Television Obligations of Digital Television Broadcasters, 19 F.C.C.R. 22943 (2004) (notice); Brittney Pescatore, *Time To Change the Channel: Assessing the FCC's Children's Programming Requirements Under the First Amendment*, 33 COLUM. J.L. & ARTS 81, 82 (explaining the kidvid rules and subsequent FCC-related policies). Commentators have argued that market failure continued in this area even after the kidvid rules were implemented. QUALITY TIME?, *supra* note 69, at 23 ("Commercial television's reluctance to contribute real educational programming for children is evident in its failure to conform to the spirit of the Children's Television Act of 1990.").

134. *See* William E. Kennard & Elizabeth Evans Lyle, *With Freedom Comes Responsibility: Ensuring that the Next Generation of Technologies Is Accessible, Usable, and Affordable*, 10 COMMLAW CONSPECTUS 5, 20–21, n.117 (2001) (describing government actions, such as matching grants and the Department of Agriculture's Rural Utilities Service, that respond to scarcity of telecommunications services in rural areas); Edwin B. Parker, *Closing the Digital Divide in Rural America*, 24 TELECOMM. POL'Y 281, 282–83 (2000) (describing how telecommunications providers shy away from investing in rural areas because they are less likely to recoup their investment); Curt Stamp, *Left Behind: The Lack of Advanced Telecommunication Services in Rural America and Its Strain on Rural Communities — Policy Options for Closing the Digital Divide*, 7 DRAKE J. AGRIC. L. 645, 651 (2002) ("Nearly six years after the passage of [the Telecommunications Act of 1996], rural communities continue to be plagued by the unavailability of [advanced telecommunications services] largely because they cannot offer the large customer base of urban areas."). Subsidies for rural telecommunications have traditionally come from universal service funds. *See supra* note 30 (describing universal service and mechanisms for subsidization).

135. *See, e.g.*, COPPS, *supra* note 82, at 8 (outlining the ways in which broadband is changing basic communication, work, learning, and entertainment, and stating that "[i]n rural areas . . . many Americans have no access to these applications and services, and by extension, to the global community"); NAT'L TELECOMM. & INFO. ADMIN., HOUSEHOLDS USING THE INTERNET IN AND OUTSIDE THE HOME, BY SELECTED CHARACTERISTICS: TOTAL, URBAN, RURAL, PRINCIPAL CITY (2007), http://www.ntia.doc.gov/reports/ 2008/Table_HouseholdInternet2007.pdf (last visited Dec. 21, 2010) (reporting that urban households with incomes above $25,000 were four times more likely to have broadband than rural, low-income households).

public service media content (and infrastructure) tailored to reach these underserved populations serves as an economic subsidy to address inequality. An illustrative model is One Economy Corporation's Public Internet Channel, an online resource designed to serve low-income users by providing interactive information about everyday finances, such as filing taxes online, writing checks, and understanding retirement plans.[136]

A third reason to subsidize media is to create the conditions for innovation that might be lacking either on the supply side in the production of content or on the demand side in the consumption of content. The Carnegie Commission Reports[137] and Public Broadcasting Act[138] both identified innovation as an objective for an American system of public service media. By this, they seemed to mean innovation in programming[139] and technology.[140] In the past, public broadcasting managed to launch new programming genres before the commercial media system did, such as children's programming[141] and reality programming.[142] In some technical areas as well, public service media led the way, for example by developing

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136. BEST PRACTICES, *supra* note 65, at 23; *Public Internet Channel*, ONE ECONOMY, http://www.one-economy.com/public-internet-channel (last visited Dec. 21, 2010).

137. CARNEGIE COMM'N ON THE FUTURE OF PUBLIC BROAD., PUBLIC TELEVISION: A PROGRAM FOR ACTION 13–14 (1967) [hereinafter CARNEGIE I] (discussing public service media as an innovative alternative to commercial media, because commercial television "is obliged for the most part to search for the uniformities within the general public, and to apply its skills to satisfy the uniformities it has found"); CARNEGIE II, *supra* note 1, at 16 (recommending support for "innovative and untried programming ideas" in public service media).

138. 47 U.S.C. § 396(g)(1)(A) (2006) (describing the "full development of public telecommunications in which programs of . . . innovation" are obtained and made available as one of CPB's key purposes and activities).

139. *Id.*

140. *Id.* § 396(a)(1)–(2) (declaring a public interest in the growth and development of broadcast and non-broadcast technologies).

141. Public television incubated the Children's Television Workshop, for example, which produced classics such as *Sesame Street* at a time when commercial media was producing no children's programming. QUALITY TIME?, *supra* note 69, at 22–23 (describing public service media's "deep roots in education" whereas commercial television was reluctant to contribute real educational programming for children); *see, e.g.*, Alison Alexander, *Children's Television Workshop*, THE MUSEUM OF BROAD. COMMC'NS, http://www.museum.tv/eotvsection.php?entrycode=childrenste (last visited Dec. 21, 2010) (providing a historical overview of the Children's Television Workshop).

142. *See* BARBARA ABRASH, THE VIEW FROM THE TOP: P.O.V. LEADERS ON THE STRUGGLE TO CREATE TRULY PUBLIC MEDIA 9–10, 21 (2007) (describing the PBS documentary series *P.O.V.* as "a showcase for first-person storytelling and subjective voices long before they became common modes of expression in mass media" through reality television); Karen Everhart Bedford, *PBS Version of 'Reality TV' Distills Drama from Real Life*, CURRENT, Jan. 29, 2001, *available at* http://www.current.org/prog/prog0102doc.html (noting that "PBS has been delivering reality-based documentaries to national audiences for decades").

closed captioning and a satellite system to distribute programming nationwide.[143]

Innovation happens at the consumer end as well. Today, of course, media consumers are also producers of media. They may upload as much as they download and tweet, post, and blog about the media they consume.[144] There may be media content and applications that are designed to enhance how consumers re-create and enhance received media that public service media alone supplies. There is another kind of consumer innovation that has always been available, even in the 20th century media environment. This has gone by many names, such as "horizon stretching,"[145] "social dividend,"[146] or "merit goods."[147]

These terms relate to the idea that while the commercial market seeks to respond to consumer preferences that are well established and bankable, consumers do not necessarily bring all their preferences fully formed to the marketplace.[148] As a result, a purely market-based approach can create "a danger that consumers will under-invest in their own tastes, experience and capacity to comprehend because it is only in retrospect that the benefits of such investment become apparent."[149] These consumers may be prepared to innovate with their preferences when exposed to more possibilities than the market will

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143. JAMES DAY, THE VANISHING VISION: THE INSIDE STORY OF PUBLIC TELEVISION 310 (1995) ("PBS, in significant ways, pioneered the use of the newer technologies. It was the first national network to distribute its programs by satellite, the first to televise in stereo sound, and the first to develop and use Closed Captioning for the hearing handicapped and Descriptive Video Service for the blind."); Strayer, *supra* note 101, at 4; *History of Public Broadcasting in the United States, Timeline: 1980s*, CURRENT, http://www.current.org/history/timeline/timeline-1980s.shtml (June 9, 2006) (noting that PBS developed closed captioning, and began offering it in 1980).

144. *See, e.g.*, Jack M. Balkin, *Digital Speech and Democratic Culture*, 79 N.Y.U. L. REV. 1, 6–9 (2004) (discussing the trend of users increasingly publishing and distributing their own content through digital media); Benkler, *supra* note 18, at 562–64 (discussing the trend of users as producers of information, especially for noncommercial purposes). This blending of the consumer and producer brings to mind notions of the "prosumer," a term first coined by Alvin Toffler in the 1980s. ALVIN TOFFLER, THE THIRD WAVE 284–85 (1980). Social software has also enabled users to interact and produce more of their own content. *See e.g.*, Michael J. Madison, *Social Software, Groups, and Governance*, 2006 MICH. ST. L. REV. 153, 163–64 (classifying types and uses of social software).

145. *See e.g.*, Hargreaves Heap, *supra* note 114, at 114 (describing underdevelopment of "horizon stretching" programs as a legitimate source of market failure).

146. CARNEGIE II, *supra* note 1, at 297.

147. ANNEX 11, *supra* note 117 (arguing that "high quality programming is a merit good"); ANNEX 8, *supra* note 120, at 203 (describing quality broadcasting as a "merit good"); *see also* CARNEGIE I, *supra* note 137, at 92–99 (emphasizing quality and excellence as goals for public service media).

148. *See, e.g.*, BAKER, *supra* note 123, at 87–95 (arguing that media preferences are endogenous to market dynamics); ANNEX 11, *supra* note 117 (describing how public service media can serve as a leader rather than a follower of public opinion, sometimes determining coverage independent of stated consumer preferences); SUNSTEIN, *supra* note 129, at 73–74 (2001) (describing the role of intermediaries in endogenous preference formation).

149. GILLIAN DOYLE, UNDERSTANDING MEDIA ECONOMICS 66 (2002) (quoting ANNEX 8, *supra* note 120, at 203).

supply. Public service media can create laboratories for this kind of experimentation and thereby foster the development of preferences outside of marketplace constraints on what is possible. It is for this reason that there are public subsidies for museums, the fine arts, and other kinds of goods that the public may value only after exposure to them.

2. The "How" of Public Service Media Content

It hardly needs stating that the methods available for media content delivery have dramatically changed since the Public Broadcasting Act was enacted. Most obviously, public service media content, like all media content, is delivered over multiple platforms, including the Internet and mobile networks.[150] Digital capabilities have also changed the construction of public service media content, which must continue to evolve, and more quickly, to speak to the "digital natives" who expect to be able to manipulate rich blends of text, audio, video, and other multimedia.[151] Public service media entities need to harness these digital capabilities by offering a diverse, innovative range of media, be they social network tools,[152] crowd-sourced mapping,[153] or educational online games.[154] The promising projects that are already underway demonstrate the potential of public service media to be more relevant and engaging to a decisively digital demographic.[155]

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150. GUPTA CONSULTING, *supra* note 65, at 5 ("Media content from a broad array of sources, especially Web-based, is usurping content offered by traditional outlets for consumer share of mind."). PBS, for example, reaches nearly 21 million people online each month. *About PBS*, PUB. BROAD. SERV., http://www.pbs.org/aboutpbs/ (last visited Dec. 21, 2010). Podcasts and live streaming have also been an extremely successful form of media consumption. NPR podcasts are downloaded over 15 million times a month, and its mobile web site is viewed 4.5 million times a week. NPR Comments, *supra* note 108, at 2.

151. PUBLIC MEDIA 2.0, *supra* note 2, at 5 (emphasizing that public service media needs to be dynamically connected to the new multiplatform, participatory digital environment); Jack M. Balkin, *Media Access*, 76 GEO. WASH. L. REV. 101, 104–05 (2008) (reviewing the changes from traditional conduits of media to new business models that encourage mass participation); *see also* Madison, *supra* note 144, at 157–63 (classifying and describing types of social software, which capitalize on highly interactive online tools that characterize the digital native world).

152. *See, e.g.*, LENS ON ATLANTA, http://www.lensonatlanta.org/ (last visited Dec. 21, 2010) (offering social networking tools to connect neighborhood organizations, arts and educational resources, and regional leaders with residents and each other).

153. BEST PRACTICES, *supra* note 65, at 37 (describing WNYC's Are You Being Gouged? tool, where users report prices of milk, beer, and lettuce onto a crowd-sourced map); Silver et al., *supra* note 2, at 278 (citing WNYC's "Uncommon Economic Indicators" project, which visually mapped listener-contributed stories by location).

154. Silver et al., *supra* note 2, at 277 (describing the issues-oriented game World Without Oil, produced by the Independent Television Service to simulate a sustained energy crisis).

155. *See* BEST PRACTICES, *supra* note 65, at 36–39 (offering public service media examples of projects that experiment with and integrate innovative digital technologies).

3. The "Who" of Public Service Media

Related to the expanding array of public service media genres is the expanding array of public service media practitioners. In the past, the entities responsible for the bulk of public service media content were public broadcasting stations, working at times with independent producers.[156] The production of media content was necessarily an expensive and specialized process. Digital technology has democratized the production of media content, dramatically lowering the barriers of entry to those who would express themselves through audiovisual media.[157] In addition, digital networks make collaboration among different kinds of producers much easier. As a result, there is today a much larger range of independent media outlets that are unaffiliated with broadcasters but share their noncommercial structure and public service mission.[158]

Some of the best newsgathering and cultural projects are collaborations with these independent organizations, which often have deep connections to the local community and are producing diverse, original, and engaging content.[159] A public television station in Kentucky, for example, coordinated with online platforms and community groups to produce online content and a television series promoting health literacy for children, families, and minorities.[160] In the San Francisco Bay Area, a public station partnered with local museums and universities and used its website as a multimedia hub to integrate radio, TV, and online community coverage, through features such as a community blog.[161]

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156. *See, e.g.*, WILLIAM HAWES, PUBLIC TELEVISION: AMERICA'S FIRST STATION: AN INTIMATE ACCOUNT 78–81 (1996) (describing how national public broadcasting programs in the 1960s were recorded on tape and film and distributed to affiliates by mail, and were produced by a mix of stations, independent producers, and others abroad through exchange agreements).

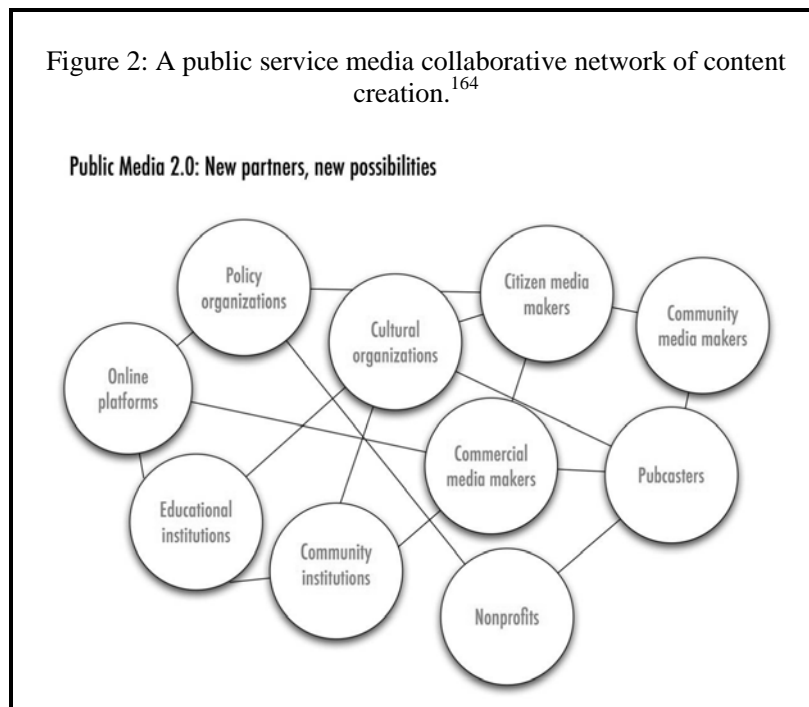157. Balkin, *supra* note 144, at 6–9 (describing the effects of digital media in democratizing free speech).

158. *See, e.g.,* COCHRAN, *supra* note 2 at 14–18 (identifying a range of new noncommercial news and information initiatives that should be deemed "public media").

159. Silver et al., *supra* note 2, at 281–82.

160. *See, e.g.*, Comments of the Association of Public Television Stations, A National Broadband Plan for Our Future, GN Docket No. 09-51, at 6 (Fed. Commc'ns Comm'n July 21, 2009), *available at* http://fjallfoss.fcc.gov/ecfs/document/view?id=7019917683; *KET Health Programs*, KY. EDUC. TELEVISION, http://www.ket.org/health/ (last visited Dec. 21, 2010).

161. BEST PRACTICES, *supra* note 65, at 30–31; *see also About Us*, THE BAY CITIZEN, http://www.baycitizen.org/about/ (last visited Dec. 21, 2010) (describing itself as "a nonprofit, nonpartisan news organization dedicated to fact-based, independent reporting on civic and community issues in the San Francisco Bay Area"). The success of these and other multi-platform efforts have caught the eye of other public broadcasting organizations that see the need to fundamentally restructure their operations. *See, e.g.*, PAUL STARR ET AL., A FUTURE FOR PUBLIC MEDIA IN NEW JERSEY 10, http://www.njpp.org/files/rpt_publicmedia.pdf (2010) (identifying several existing public media models that "have shown how to build multi-platform public media on that foundation," and concluding

The public service media network need no longer be limited to a hub and spoke arrangement of local stations moving content in and out of national centers. Instead, the digital media networks can be somewhat decentralized, allowing individual, content-producing nodes to exchange content with others across the network. In addition to traditional public broadcasting stations, these nodes now include groups as diverse as local universities, ethnic media, commercial newspapers, public policy think tanks, and online social networks.[162] Incorporating non-broadcasters into the chain of media creation and distribution in this way is key to adapting to the digitally networked environment.[163] Figure 2 below presents one visualization of this collaborative environment based on Jessica Clark and Pat Aufderheide's *Public Media 2.0* report.

Figure 2: A public service media collaborative network of content creation.[164]

Public Media 2.0: New partners, new possibilities

This depiction illustrates the key feature of the public service media creation layer: modularity.[165] With content production modules

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that "New Jersey needs to create that foundation if it is to move ahead with the larger project of building a network of public media organizations that can flourish in the digital age").

162. *See generally* PUBLIC MEDIA 2.0, *supra* note 2.

163. *See* PUBLIC MEDIA 2.0, *supra* note 2, at 3.

164. *Id.* at 24.

connected across a decentralized network, it becomes more feasible to specialize in content creation within a given node's area of expertise — say, science journalism — and then link the nodes together so that they can exchange, remix, and tailor content for their own use and follow-on creativity. In this way, each node can benefit from the others, collectively producing content that is more innovative, more relevant, and more accessible to the public.[166] Noncommercial broadcast stations and other public service media entities can develop specialties in content "verticals," such as health and the environment, and then share this content with others who alone or in partnership with yet more nodes can increase the relevance of the content to particular communities. This is the premise of CPB's new "local journalism centers," which are spread across the country with the mandate to develop particular content specialties that can be networked nationwide.[167]
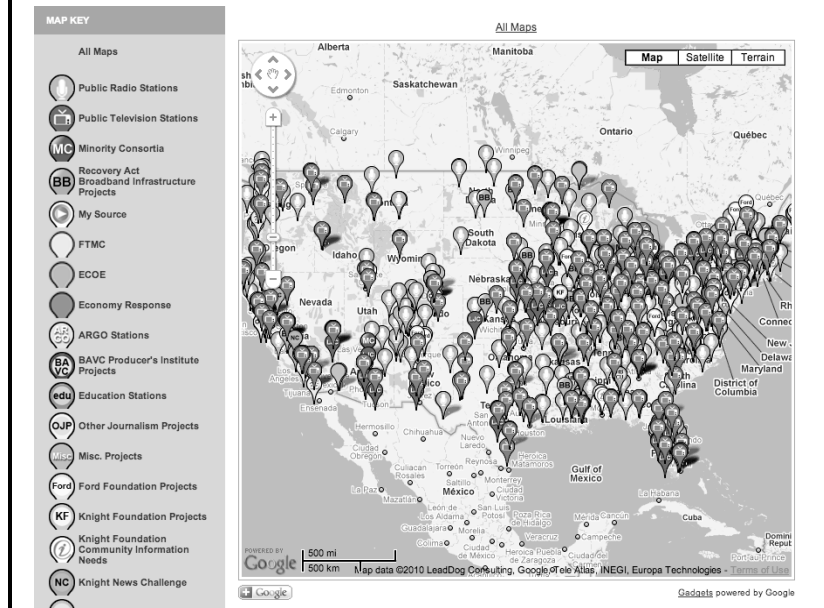
The maps in Figures 3 and 4 below show the potential for public service media collaboration in content production, either across the country or in a local region.

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165. *See* Goodman & Chen, *supra* note 14, at 17–19 (discussing modularity of public service media content).

166. The advantages of a networked collective model have been well articulated in academic scholarship. *See, e.g.*, YOCHAI BENKLER, THE WEALTH OF NETWORKS 2–5 (2006) (describing a "networked information economy" and discussing the benefits of social production in the network); LAWRENCE LESSIG, REMIX: MAKING ART AND COMMERCE THRIVE IN THE HYBRID ECONOMY 137–41 (2008) (describing "LEGO-ized innovation" as a feature of the Internet's success, where functionality is modularized so that others can build upon and use it in networked community and collaborative spaces); Benkler, *supra* note 18, at 562–65.
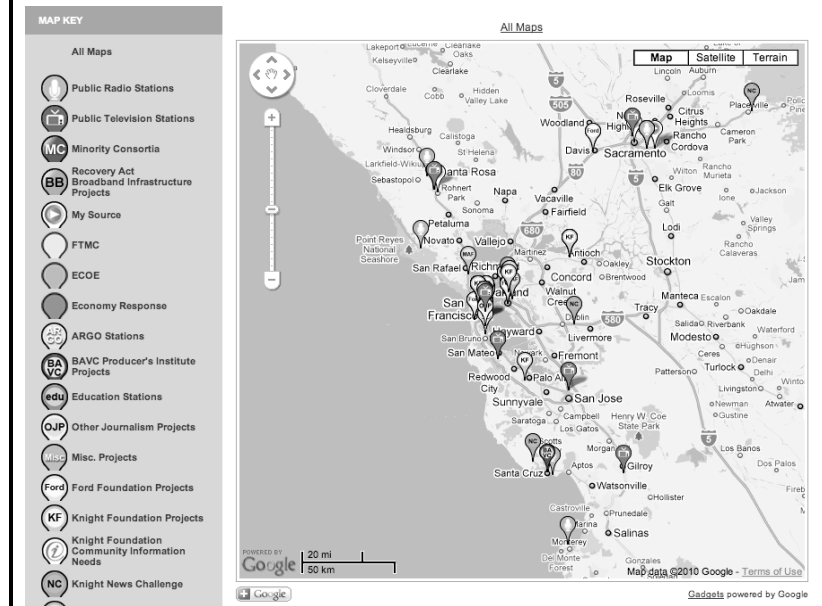
167. *See Request for Proposals: Grow the Audience: Strengthening Local Journalism*, CORP. FOR PUB. BROAD., http://www.cpb.org/grants/252/cpb_strengthlocal_rfp.pdf (June 11, 2009) (seeking grant proposals for "Local Journalism Centers"); Press Release, Corp. for Pub. Broad., Corporation for Public Broadcasting Launches Two New Local Journalism Centers and Gulf Coast Consortium (Sept. 29, 2010), *available at* http://www.cpb.org/pressroom/release.php?prn=836 (noting "funding for two new Local Journalism Centers . . . [which] will expand the major journalism initiative . . . from five regions to seven regions around the country"). The CPB-funded project Argo is also designed to encourage original local reporting in specialized subject areas relevant to the locale, such as environmental policy, rural economic diversification, and public health. The project is built on a common platform that encourages sharing and access to other groups' work. Press Release, Corp. for Pub. Broad., NPR Launches New Online Local Journalism Venture with CPB and Knight Foundation Funding (Oct. 2, 2009) [hereinafter Argo Press Release], *available at* http://www.cpb.org/pressroom/release.php?prn=776; Karen Everhart, *To Add Depth to Web News, Stations Try Going 'Vertical,'* CURRENT (June 10, 2009), *available at* http://www.current.org/news/news0911argo.shtml.

Figure 3: Map of Noncommercial and Public Broadcasting Initiatives Across the United States.[168]

168. All Maps, NATIONAL CENTER FOR MEDIA ENGAGEMENT, http://mediaengage.org/googlemap/all_maps.cfm (last visited Dec. 21, 2010).

Figure 4: Regional Map of Noncommercial and Public Broadcasting Initiatives in Northern California.[169]

In addition to modularity with respect to fully completed units of content, any given unit of content — e.g., the story or the program — may also be broken down into components. Charlie Firestone, for example, has distilled the functions involved in producing a news story into such separate tasks as fact-finding, verification, and analysis.[170] In some instances, for some kinds of content, digital collaboration allows disaggregation of these tasks, thereby increasing specialization, efficiency, and productive capacity across the network.

Modularity through the public service media content layer creates possibilities for widely distributed and innovative content creation, efficient collaboration within and across communities, and more responsive forms of digital content. A policy structure that fails to provide incentives and funding for this kind of creation fails to support the purposes of public service media content. The Public Broadcasting Act and associated policies fail in just this way, largely through omission. There is almost no dedicated funding for creators that operate independently from broadcasting stations and very little

169. *Id.* (zoomed in on the Northern California area).
170. Charles M. Firestone, *The Pixelization of Journalism*, HUFFINGTON POST (Apr. 29, 2010, 2:41 PM), http://www.huffingtonpost.com/charles-m-firestone/the-pixelization-of-journ_b_557318.html.

structural incentive for broadcasters to network content in innovative and collaborative ways. We address this policy failing in Part IV below.

C. Curation Layer

Above the creation layer is the curation layer. Curation refers to two related, but distinct, functions. The first is the aggregation and promotion of public service media content, broadly defined (and perhaps even other kinds of content), that intentionally and directly serves the public service media mission. The second is the creation and support of open, searchable platforms that enable others to grab public service media content and curate it themselves or, through new creation, to extend the value and utility of content otherwise lost to ephemeral broadcast. The curation layer, like the other layers in the model, is independent from adjacent functions and consists of networked modules. Those who curate public service media content need not be the same as those who produce it or transmit it. In addition, curation can take place at various nodes across the network, and can be performed by many different kinds of entities.

The aggregation function of curation has always been central to the public service media mission. One of the purposes of the Public Broadcasting Act and the creation of a national network of public broadcasting stations was to curate the best of what was being produced at local levels.[171] PBS and NPR aggregated national program schedules for prime time and "drive time" by selecting programs from independent and local station producers.[172] The thinking was that, by fostering economies of scale through national distribution, national networks, and a national program schedule on television and radio would enable more and better production.[173] Of course, the inherent scarcities of the broadcast world meant that any national program schedule — indeed, any broadcast schedule at all — constrained consumer choice.[174] Programming that was not included

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171. 47 U.S.C. §§ 396(a) (2006) (mentioning the public interest in developing local programming and communications); *see also* CARNEGIE I, *supra* note 137, at 92–99 (describing public television's goals to be a system of stations, focused on and intended to "deepen a sense of community in local life"); JARVIK, *supra* note 67, at 23 (stating that PBS was "initially designed as a mere routing system for program exchange" from local stations); Rowland, *supra* note 69, at 5 (describing how the 1967 Act built upon "the tradition and imperatives of the largely decentralized, locally focused U.S. system of noncommercial radio and television").

172. *See* ENGELMAN, *supra* note 67, at 99 (discussing how NPR sought out programs from member stations to develop its "public affairs and cultural programming").

173. *See supra* note 68 and accompanying text.

174. CHRIS ANDERSON, THE LONG TAIL 18 (2006) (contrasting the "world of scarcity" in the broadcasting era to "a world of abundance" with online distribution and retail (emphasis omitted)); Goodman, *Media Policy out of the Box*, *supra* note 113, at 1392 (discussing

on the broadcast dial could not find an audience and would not be produced.

Digital technologies and media consumption habits today have fundamentally changed the job of curation, but have not diminished its importance. Curators of information no longer control the delivery of a "program schedule" or constrain consumer choice. Whatever appears in a linear programming schedule can usually be disaggregated and consumed on demand, by use of digital video recorders and online streaming. And whatever does not appear in a programming schedule can still find an audience by appealing to other sources of curatorial authority. These alternative sources of curation can be found in search engines such as Google, recommendation engines such as Digg, and social media sites such as Facebook.[175] Whereas the world of content constraint allowed aggregators to determine consumer choice, the world of content abundance allows them merely to guide consumer choice. Guidance of this kind is growing in value. As information comes at us faster, in greater quantities, and in smaller bits, we experience information overload.[176] The role of the curator in this environment is to serve as a trusted intermediary to filter and accredit information, thereby assisting in the

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twentieth-century conditions where "video content was scarce and audience attention was abundant").

175. *See* Jeff Jarvis, *AP Took It to the Wire But Needs To Rethink Its Role*, THE GUARDIAN (London), June 30, 2008, http://www.guardian.co.uk/media/2008/jun/30/digitalmedia (contrasting the "content economy v[ersus] the link economy," which views links as "the currency of the new media economy," because online content is deemed "valueless if no one sees it"); Jeff Jarvis, *The Imperatives of the Link Economy*, BUZZ MACHINE BLOG (July 28, 2008, 8:57 AM), http://www.buzzmachine.com/2008/07/28/the-imperatives-of-the-link-economy/ (expanding the concept of the link economy into four imperatives); *see also* Benkler, *supra* note 18, at 567–68 (describing how the Internet is permitting much greater disaggregation and distribution of formerly mass media functions).

176. The problem of information overload is well established. *See* Yochai Benkler, *Siren Songs and Amish Children: Autonomy, Information, and Law*, 76 N.Y.U. L. REV. 23, 105 (2001) ("An important concern regarding widely distributed information production systems is the issue of information overload and the absence of means to determine what is worthwhile and what is not." (citing Ira S. Nathenson, *Internet Infoglut and Invisible Ink: Spamdexing Search Engines with Meta Tags*, 12 HARV. J.L. & TECH. 43, 51–57 (1998) (describing literature that treats overload or "data smog" as a primary problem in information economy))). *See generally* DAVID LEWIS, INFORMATION OVERLOAD: PRACTICAL STRATEGIES FOR SURVIVING IN TODAY'S WORKPLACE (1999) (suggesting techniques to deal with information overload); DAVID SHENK, DATA SMOG: SURVIVING THE INFORMATION GLUT (1997) (arguing that increases in information availability can lead to increases in ignorance); KRISTAN J. WHEATON, THE WARNING SOLUTION: INTELLIGENT ANALYSIS IN THE AGE OF INFORMATION OVERLOAD (2001) (suggesting techniques to deal with information overload); RICHARD SAUL WURMAN, INFORMATION ANXIETY (1990) (positing that the information overload brought on by modern-day communications leads to anxiety over the gap between data and knowledge).

increasingly difficult task of making information consumption choices.[177]

There are multiple sources of valuable curatorial authority. Commercial networks and brands, such as Fox News and Disney, provide one source of authority. Another source of authority comes from the algorithms we rely on to conduct searches. This is what Clay Shirky has called "algorithmic authority."[178] Yet another source of authority is what we might call "social authority." Social authority emerges from social software that allows friends or members of common communities to share recommendations based on overlapping tastes and values.[179]

Public service media can play a valuable role in complementing these other sources of authority by augmenting the salience of mission-oriented information and narratives. The public service media entities that have engaged in content production and distribution over the last half-century have built a public trust that is unparalleled in either the media or other markets. PBS, for example, is one of the most trusted brands in the U.S. economy.[180] The brand value built up in the content and distribution layers can be leveraged into the curation layer for the benefit of content that may or may not come from the same entities. In other words, public service media entities can use their earned public trust, community connections, technological assets, and editorial capacities to raise the profile of high-quality content.[181]

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177. *See* J.M. Balkin, *Media Filters, the V-chip, and the Foundations of Broadcast Regulation*, 45 DUKE L.J. 1131, 1148 (1996) ("All communications media produce too much information. . . . As a result, all media give rise to filtering by their audience, or, more importantly, by people to whom the audience delegates the task of filtering."); *see also* Beth Simone Noveck, *Designing Deliberative Democracy in Cyberspace: The Role of the Cyber-Lawyer*, 9 B.U. J. SCI. & TECH. L. 1, 40–43, 57–58 (2003) (discussing filtering and selection mechanisms that reduce information overload); Frank Pasquale, *Copyright in an Era of Information Overload*, 60 VAND. L. REV. 135 (2007) (same).

178. Clay Shirky, *A Speculative Post on the Idea of Algorithmic Authority*, SHIRKY.COM (Nov. 15, 2009, 4:06 PM), http://www.shirky.com/weblog/2009/11/a-speculative-post-on-the-idea-of-algorithmic-authority/ ("Algorithmic authority is the decision to regard as authoritative an unmanaged process of extracting value from diverse, untrustworthy sources, without any human standing beside the result . . . ."); *see also* Frank Pasquale, *Assessing Algorithmic Authority*, MADISONIAN.NET (Nov. 18, 2009), http://madisonian.net/2009/11/18/assessing-algorithmic-authority/ (questioning the reliability and credibility of algorithmic authority).

179. Social tagging technologies such as rating mechanisms at Amazon.com, eBay.com, or Digg.com, where members of a group use labels, ratings, and evaluations made by other individuals or entities in the group, are one such implementation of exercising peer authority. Madison, *supra* note 144, at 163–64 (discussing types of social tagging technologies); *see also* BENKLER, *supra* note 166, 75–80 (describing the "relevance/accreditation" process of peer-produced valuation).

180. *See* Strayer, *supra* note 101 (citing statistics ranking PBS as the most trustworthy U.S. institution and second-best use of 2008 federal tax dollars by the public).

181. *See* THE DIGITAL FUTURE INITIATIVE PANEL, DIGITAL FUTURE INITIATIVE: CHALLENGES AND OPPORTUNITIES FOR PUBLIC SERVICE MEDIA IN THE DIGITAL AGE 94–99 (2005), http://www.newamerica.net/files/nafmigration/archive/Doc_File_2766_1.pdf

The Public Radio Exchange[182] ("PRX") provides an example of how this can work. PRX is a new kind of public service media entity. It does not hold a broadcast license, and therefore is not part of the infrastructure layer. It does not produce content, and therefore is not part of the creation layer. Rather, PRX curates over 20,000 independently produced noncommercial radio programs.[183] It serves as a programmer of sorts, making quality judgments about audio content before that content achieves mass distribution on the radio. It also serves as a market-maker, giving new voices a platform for more widespread distribution by clearing copyrights and arranging for payments back to radio producers.[184] Although PRX is principally a business-to-business curator, facilitating transactions in the public radio station market, it also brings content directly to consumers and engages consumers in the content selection process. Consumers are encouraged to write reviews, create playlists, join the PRX social network, and offer feedback to public radio producers.[185]

In addition to its role as content aggregator, PRX exemplifies the second curatorial function as well: platform support. Scholars have come to recognize the importance of accessible archives in the information ecology.[186] Commercial entities have done a poor job,

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(proposing that public service media entities create "a Web-based 'engine' that allows parents, teachers and the general public to access the vast, and hopefully rapidly growing, universe of public service media content"). The content need not be limited to domestic topics, either; the International Television Service has curated international content as well. *FAQ*, INT'L TELEVISION SERV., http://www.itvs.org/about/faq (last visited Dec. 21, 2010) ("ITVS International's funding can support both international producers create [sic] for the U.S. and U.S. public television work for export to television networks abroad.").

182. PUB. RADIO EXCHANGE, http://www.prx.org/ (last visited Dec. 21, 2010).

183. *See* KNIGHT COMMISSION, *supra* note 2, at 51; Silver et al., *supra* note 2, at 276 (2009); PUBLIC MEDIA 2.0, *supra* note 2, at 13–14.

184. PUB. RADIO EXCHANGE, *supra* note 182.

185. Pub. Radio Exchange, *PRX.org: Help Make Public Radio More Public*, BLIP.TV, http://blip.tv/play/gYJCjdADAg (last visited Dec. 21, 2010).

186. Alyssa N. Knutson, Note, *Proceed with Caution: How Digital Archives Have Been Left in the Dark*, 24 BERKELEY TECH. L.J. 437, 439 (2009) ("Scholars widely acknowledge that preservation of and access to cultural artifacts is necessary for a robust cultural life. . . . [A]ccess to collective knowledge leads to the creation of new creative expression."); *see, e.g.*, ARCHIVES, DOCUMENTS AND INSTITUTIONS OF SOCIAL MEMORY: ESSAYS FROM THE SAWYER SEMINAR 165–68 (Francis X. Blouin, Jr. & William G. Rosenberg eds., 2007) (introducing a collection of essays discussing how archives can "play a critical role in the formation of social or collective memories," not only because archivists decide what is remembered or forgotten, but also because they can shape cultural assumptions about what counts as knowledge); Guy Pessach, *[Networked] Memory Institutions: Social Remembering, Privatization and Its Discontents*, 26 CARDOZO ARTS & ENT. L.J. 71, 75 (2008) ("[L]andscapes of history and social remembering are . . . major forces in the construction of ideologies and people's preferences."); Pamela Samuelson, *Google Books Search and the Future of Books in Cyberspace*, 39 (UC Berkeley Pub. Law Research Paper No. 1535067, 2010), *available at* http://papers.ssrn.com/sol3/papers.cfm?abstract_id= 1535067 (discussing the value of knowledge embedded in research libraries as "part of the cultural heritage of . . . humankind[,] which should be widely available and preserved for future generations"); *see also* NATIONAL BROADBAND PLAN, *supra* note 3, at 304 ("[Public

often for reasons related to intellectual property rights, of making electronic media content available over digital platforms. For example, there is no good way to access digital recordings of local news from decades past (or, indeed, to get access to these recordings in any form).[187] Google, with its controversial Google Books project,[188] is trying to create a searchable archive of the printed word, notwithstanding the intellectual property rights clearance problems.[189] This effort has given rise to fears that a commercial entity like Google could control access to collective wisdom and national heritage.[190]

Noncommercial, mission-oriented archival platforms could allay these fears, provided that they were committed to open access and fostered the curatorial and creative efforts of others. CPB has taken on this challenge with an ambitious new project called the American Archive. The American Archive seeks to "identify, restore, digitize, and distribute audio and visual assets held by American public media stations and producers."[191] Working in association with national digital media archives, including the Library of Congress, the American Archive envisions making this content accessible to and searchable by educational and cultural institutions, public

service media's] archival content could provide tremendous educational opportunities for generations of students and could revolutionize how we access our own history . . . .").

187. *See, e.g.*, WGBH Comments, *supra* note 71, at 8–10 (describing the clearance problems, costs, and legal risks besetting current efforts to archive public service media assets, such as the *American Archive* and *The Boston TV News Digital Library* project); *see also About the Vanderbilt Television News Archive*, VANDERBILT UNIVERSITY, http://tvnews.vanderbilt.edu/web/tvnews/about/?SID=20100303351806640 (last visited Dec. 21, 2010) (describing the News Archive's partial repository of news broadcasts from U.S. national television networks, but also explaining that the project is restricted by copyright provisions and does not include public service media works).

188. *See generally About Google Books*, GOOGLE, http://books.google.com/intl/en/googlebooks/about.html (last visited Dec. 21, 2010); Ryan Singel, *The Fight over the Google of All Libraries: An (Updated) Wired.com FAQ*, WIRED (Feb. 18, 2010, 8:34 AM), http://www.wired.com/epicenter/2010/02/the-fight-over-the-worlds-greatest-library-the-wiredcom-faq/ (providing an overview of basic aspects of the Google Books project and its surrounding controversies).

189. *See* Knutson, *supra* note 186, at 463–65 (discussing the Google Books settlement that arose out of an intellectual property dispute with authors and publishers); David Kravets, *Google Books Fosters Intellectual, Legal Crossroads*, WIRED (Feb. 18, 2010, 9:07 AM), http://www.wired.com/threatlevel/2010/02/google-books-fosters-intellectual-legal-crossroads (offering an overview of clearance problems); Tom Krazit, *Last Words? Google Books to Get Final Hearing*, CNET (Feb. 17, 2010, 3:51 PM), http://news.cnet.com/8301-30684_3-10455385-265.html (providing a review of legal developments surrounding the Google Books settlement).

190. *See* Pamela Samuelson, *Academic Author Objections to the Google Book Search Settlement*, 9 J. ON TELECOMM. & HIGH TECH. L. (forthcoming 2010), at 3–4, 6, *available at* http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1553894 (discussing fears from authors and national library associations that Google might have control over "access to information, patron privacy, and intellectual freedom"); *see also* Samuelson, *supra* note 186, at 44 ("[T]he future of public access to the cultural heritage of humankind embodied in books is too important to leave in the hands of one company and one registry that will have a de facto monopoly over a huge corpus of digital books and rights in them.").

191. WGBH Comments, *supra* note 71, at 8.

broadcasting stations, and the general public.[192] NPR and others are undertaking to build a related Public Media Platform that would provide a platform for digital public service media content to reside, permitting the use and re-use of this content according to terms that must be worked out.[193] By making content searchable and available on reasonable terms, public service media curators could support more productive use of the content layer and encourage innovators to write applications for public service media content that magnified its expressive value and the possibility of follow-on creation.[194]

There are significant technical obstacles to the creation of open digital platforms that allow access to rich archives of historical material. As media representatives have warned the current administration, "[b]illions of dollars worth of content assets" have yet to be indexed, archived, and made digitally accessible, and some are already in "danger of physical loss through disintegration and obsolescence."[195] In addition, intellectual property rights make it difficult for any entity to make content available for digital distribution that was created for other purposes.[196] Experiments like PRX are only possible because NPR worked through these obstacles and adopted an Application Protocol Interface ("API") that allowed third party curators to organize content and third party application developers to make that content maximally accessible to the public.[197] These steps essentially allowed content curation to become a distributed function, giving would-be curators access to the content layer below.

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192. *Id.*; Comments of the Association of Public Television Stations, A National Broadband Plan for Our Future, GN Docket No. 09-51, at 4–5 (Fed. Commc'ns Comm'n July 21, 2009), *available at* http://fjallfoss.fcc.gov/ecfs/document/view?id=7019917683.

193. *See* NPR Comments, *supra* note 108, at 3–4.

194. *See* Dennis Haarsager, *NPR's Digital Distribution Strategy*, TECHNOLOGY360 (Sept. 8, 2008), http://technology360.typepad.com/technology360/2008/09/nprs-digital-di.html (describing several kinds of digital "distributed distribution" efforts in public service media).

195. Letter from Patricia Harrison, President and CEO, CPB, Paula Kerger, President and CEO, PBS, and Dennis Haarsager, Interim President and CEO, NPR, to President-Elect Barack Obama (Jan. 2, 2009), *available at* http://www.current.org/pbpb/documents/stimulus-request-Jan09.pdf (requesting stimulus funds for media projects, including archival work).

196. NATIONAL BROADBAND PLAN, *supra* note 3, at 304–05 (noting that current copyright exemptions "no longer fulfill their original purpose" and "should be updated to facilitate the distribution of the highest quality programming on 21st century digital platforms," and acknowledging the difficulties in obtaining clearances from intellectual property rights holders for archival purposes); WGBH Comments, *supra* note 71, at 4–9 (describing in detail the various difficulties that prevent public broadcasters from distributing new and old archived materials).

197. *See* NPR Comments, *supra* note 108, at 1–4; *see also* Rekha, *New, Improved Public Radio Player Now Live in iTunes*, PUB. RADIO EXCHANGE (Mar. 2, 2010) http://blog.prx.org/2010/03/new-improved-public-radio-player-now-live-in-itunes/ (describing the use of NPR API "as a source of station schedule data and on-demand programs").

The Knight Commission's 2009 landmark report, the product of a detailed examination of the information needs of today's American communities, concluded that the health of a community's information ecology depends on its ability to "sift, organize and evaluate information."[198] This health depends, in other words, on information curation. The layered model of the network suggests that this task should be distributed across the network, with a diversity of curators using different forms of authority to create meaning from information made accessible and searchable over open platforms. There is currently no recognition in the law governing public service media that distributed curation is a value. There is no funding for an explicitly curatorial function. And there is scarcely any support for curation that takes place outside of the bundled broadcast creation and distribution functionality. In Part IV, we propose a change.

D. Connection Layer

The concept of connectivity infuses all layers of the public service media network. Building middle-mile infrastructure, producing public service media content, and curating that content over open platforms — all of these functions connect individuals to content that the market does not supply. The connection layer, which is the uppermost interface between individuals and public service media, describes those functions that are specifically and exclusively focused on engaging individuals and communities with public service media content. These functions are concerned with making public service media content matter to the public.

The Public Broadcasting Act specifically charges public service media entities with the task of reaching out to the public and engaging people with media content and information.[199] Although the rationale for outreach was never made explicit, the need for media engagement strategies follows naturally from the purposes of public service media content. Above, we outlined three principal justifications for public service media content related to commercial market gaps: to increase positive externalities (namely social capital and democratic engagement), to distribute information more equitably, and to support innovation in the supply and consumption of information.[200]

Some kinds of information need not be engaged with in order to produce positive externalities. As Robert McChesney and John Nichols note in their recent book *The Death and Life of American*

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198. KNIGHT COMMISSION, *supra* note 2, at 12–13.

199. 47 U.S.C. § 396(a)(8) (2006) ("Public telecommunications services constitute valuable local community resources for utilizing electronic media to address national concerns and solve local problems through community programs and outreach programs.").

200. *See supra* Section III.B (discussing economic and noneconomic rationales for public service media).

Journalism, a flourishing press can produce positive results even if the news is initially consumed by very few.[201] This is because journalists can hold the objects of their investigation accountable in the absence of broad audiences to the extent that the information impacts the influential.[202] Those who are never informed may still be happy to have (and to pay for) the information just as those who never visit Yellowstone National Park may have a keen interest in its protection.

However, to the extent that the positive externality we seek includes greater citizen engagement with politics and collective decision-making, information may fail to produce these results unless it actually diffuses among the affected citizenry. We have to assume that citizens confronted with information overload and stretched to keep up with commercial media content will not come to this information without a "nudge."[203] If they would, the commercial marketplace presumably would produce this information. Thus, intentional connection strategies forged outside of the marketplace are usually necessary to capture the positive externalities that the information is capable of generating.[204]

Connection strategies are also important if the goal is to disseminate information to underserved populations. One of the arguments for public service media is that the market may fail to

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201. MCCHESNEY & NICHOLS, *supra* note 12, at 105 ("Even people who do not regularly consume journalism like the idea that journalism exists . . . . They are willing to pay to see that journalism thrives even if they, for whatever reason, do not themselves plan to partake in it in substantial portions."); *see also* Goodman, *Media Policy out of the Box, supra* note 113, at 1456 ("To be sure, some kinds of media products could produce classic third-party positive externalities, even if content drift fails to expose the audience to such products.").

202. *See* C. Edwin Baker, *The Media that Citizens Need*, 147 U. PA. L. REV. 317, 324–25 (1998) (describing the importance of the watchdog role of the press, even when the general populace may be unable to or is uninterested in meaningfully understanding the social forces and structural problems at play, because the press can still influence government behavior by keeping it in check); Goodman, *Media Policy out of the Box, supra* note 113, at 1456 ("Prime examples . . . are investigative reporting and even the passive filming of public bodies. The press may serve a 'watchdog' function of exposing and deterring abuses simply by documenting proceedings, even if no one is watching.").

203. RICHARD H. THALER & CASS R. SUNSTEIN, NUDGE 78–82 (2008) (explaining how free markets can be insufficient in providing the "nudges" people need, requiring government policies to help produce positive externalities).

204. *See, e.g.*, MCCHESNEY & NICHOLS, *supra* note 12, at 110 (pointing out that "[m]any of the nations that enjoy the highest rates of voter participation, civic literacy and civil liberties maintain large direct public subsidies for journalism, through public broadcasting"); *see also* Casey A. Klofstad, *Talk Leads to Recruitment: How Discussions About Politics and Current Events Increase Civic Participation*, 60 POL. RES. Q. 180 (2007) (finding that civic discussion with peers promotes participation in civic activities); Scott D. McClurg, *Social Networks and Political Participation: The Role of Social Interaction in Explaining Political Participation*, 56 POL. RES. Q. 449, 449 (2003) (finding that "the effect of social interaction on participation is contingent on the amount of political discussion that occurs in social networks"). Using technology such as the Internet can also have an appreciable impact on civic and political engagement. M. Kent Jennings & Vicki Zeitner, *Internet Use and Civic Engagement: A Longitudinal Analysis*, 67 PUB. OP. Q. 311, 319 (2003) (finding that "access to the Internet is significantly related to . . . all measures of political involvement, volunteerism, and social trust").

produce content users do not initially signal that they want, but which may nonetheless increase social welfare once consumed. Exposure is thus key to the benefit sought, and it may well not happen without intentional engagement strategies. This is all the more true if the content depends on user participation and input as much as on user consumption.

Traditional methods of public service media outreach and engagement have included the production of teaching guides and other ancillary program-related material.[205] More recently, legacy public broadcasting stations have started to reach out to other community institutions, such as museums and libraries, to develop joint community outreach initiatives.[206] The objective of these efforts has been to make media more relevant to individual concerns and communities. For example, the relevance and impact of a St. Louis public radio station's reporting on economic recession increased dramatically when tied to local informational programs on how to combat mortgage foreclosure.[207] In other cases, the engagement efforts are tied to translations and outreach in ethnic communities. Twin Cities Public Television, for example, created and then translated a collection of health and safety programs into Spanish, Hmong, Khmer, Lao, Vietnamese, and Somali in order to better reach the diverse communities of Minnesota. [208]

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205. *See, e.g.*, NAT'L CTR. FOR MEDIA ENGAGEMENT, ENGAGEMENT IMPACT RESEARCH SUMMARY — CASE FOR SUPPORT, *available at* http://mediaengage.org/Communicate Impact/ResearchSummary.pdf (last visited Dec. 21, 2010) (recounting how public service media stations collaborated with the National Center for Media Engagement to educate local citizens through phone banks and organize collective viewing sessions of public programming).

206. *See* Association of Public Television Stations, *supra* note 160, at 2–10 (listing specific examples of public service media's outreach efforts in education, health awareness, civic participation, and worker development); Goodman, *Media Policy out of the Box*, *supra* note 113, at 1469–71 (listing examples of public service media initiatives that reach out to schools, libraries, museums, and the workplace to engage a wider audience).

207. *See* BEST PRACTICES, *supra* note 65, at 11; Letter from Jack Glamiche, President and CEO of KETC, to Patricia Harrison, President and CEO of CPB, KETC on the Impact of *Facing the Mortgage Crisis* (Sept. 11, 2009), *available at* http://www.cpb.org/ economicresponse/letter_ketc.html (describing the community impact of the program and claiming "[w]e have an unparalleled opportunity to see [public service media] stations emerge as a significant and relevant force in their local community"). The *Facing the Mortgage Crisis* web site serves as a local online resource and social network offering information on housing, health care, financial counseling, emergency services, and family support for individuals impacted by the economic crisis. CPB is awarding grants to stations that use the St. Louis model to create similar projects in their own communities. *Facing the Mortgage Crisis*, NAT'L CTR. FOR MEDIA ENGAGEMENT, http://www.mediaengage.org/ mortgagecrisis.cfm (last visited Dec. 21, 2010); *see also* FACING THE MORTGAGE CRISIS, http://facingthemortgagecrisis.org/ (last visited Dec. 21, 2010) (describing a similar program in Detroit).

208. *Emergency and Community Health Outreach (ECHO)*, THE COMMUNICATION INITIATIVE NETWORK, http://www.comminit.com/en/print/310018 (last visited Dec. 21, 2010). In this case, the spillover effects for the whole community of diffusing information to

The layered model of public service media helps us to conceptualize how different entities might work together, or work separately, to increase the relevance of information and thereby increase connection to public service media content. What have emerged as best practices in the public service media sphere involve multiple distribution platforms and multiple partnerships.[209] In both cases, the practices seek to take narratives and information to people through a number of channels, including the Internet,[210] mobile phones,[211] schools,[212] key "opinion leaders,"[213] or community groups and institutions.[214] Across information networks, multiple individuals and entities can act as nodes of engagement. Individuals in a particular geographic community or community of interest can radiate information by informing and engaging their followers, fans, and friends.[215] These individuals, identified as "opinion leaders" in the

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all is clear because "when a serious disease outbreak happens, no one can be fully protected unless everyone is first fully informed." *Id.*

209. *See* BEST PRACTICES, *supra* note 65, at 26 (recommending more multiplatform collaborations, which "combine the strengths, skills, resources, and constituencies of the partners in order to amplify impact and increase depth and breadth of coverage"); PUBLIC MEDIA 2.0, *supra* note 2, at 8, 22–24 (stating the importance of distribution and coordination with other groups for public service media engagement efforts).

210. NPR.org, for example, reached over 11 million visitors in November 2009, a 14% increase from the previous year; the NPR Music web site has over a million visitors a month. NPR Comments, *supra* note 108, at 2.

211. *See, e.g.*, CARLY SHULER, POCKETS OF POTENTIAL: USING MOBILE TECHNOLOGIES TO PROMOTE CHILDREN'S LEARNING 18, 43 (2009), *available at* http://www.instituteofplay .org/content/pockets_of_potential.pdf (describing the PBS KIDS Ready to Learn Cell Phone program, which delivers educational parenting tips, audio messages, and literacy-related *Sesame Street* videos to lower-income households); *id.* at 41 (describing iREAD, a Sesame Workshop mobile learning project that develops highly personalized, media-based literacy intervention systems for individual students); Press Release, NPR Launches New Breed of News App, Available Now in iTunes App Store (Aug. 16, 2009), *available at* http://www.npr.org/about/press/2009/081609.NPRNews_iPhoneApp.html (announcing NPR iPhone news applications, some of which offer simultaneous listening and reading services).

212. *See, e.g.*, Association of Public Television Stations, *supra* note 160, at 2–3 (describing The Teacher's Domain, a free collection of over 2,000 standards-based digital resources for students and teachers developed by Boston public station WGBH and drawing from trusted sources such as *NOVA* and *A Science Odyssey*); *see also* TEACHER'S DOMAIN, http://www.teachersdomain.org/ (last visited Dec. 21, 2010).

213. *See, e.g.*, BEST PRACTICES, *supra* note 65, at 39–42 (identifying key political blogs that essentially serve as opinion leaders, inspiring civic participation, engagement, and learning); PUBLIC MEDIA 2.0, *supra* note 2, at 14–15 (describing engagement efforts with online communities and key websites and outlets).

214. *See, e.g.*, BEST PRACTICES, *supra* note 65, at 27–30 (describing public service media projects that emphasize collaboration with other groups and institutions, such as public libraries and veterans' service organizations).

215. *See* Christine H. Roch, *The Dual Roots of Opinion Leadership*, 67 J. POL. 110, 110–11 (2005) (explaining the concept of opinion leadership and reviewing recent research). *See generally* ELIHU KATZ & PAUL F. LAZARSFELD, PERSONAL INFLUENCE: THE PART PLAYED BY PEOPLE IN THE FLOW OF MASS COMMUNICATION (2d ed. 2005); PAUL F. LAZARSFELD ET AL., THE PEOPLE'S CHOICE (3d ed. 1988); Elihu Katz, *The Two-Step Flow of Communication*, 21 PUB. OPINION Q. 61 (1957); Robert K. Merton, *Patterns of Influence*, *in* COMMUNICATION RESEARCH 180 (Paul F. Lazarsfeld & Frank N. Stanton, eds., 1949).

political science and communications literatures, act as information brokers who expose their networks to information that would otherwise go unattended.[216]

Opinion leaders may have no formal relationship to public service media curators, creators or infrastructure providers. Instead, they may operate in a completely modular way, taking public service media content and using it in ways that speak to their communities. Alternatively, public service media entities may partner with opinion leaders within communities to foster deeper engagement with public service media content. One approach is the Voices & Choices initiative created by the Fund for Our Economic Future, an informal collaboration of philanthropic organizations and individuals attempting to improve the economic competitiveness of Northeast Ohio.[217] The project integrated several models of public engagement, including modern town hall meetings, online dialogue, interviews, and community conversations.[218] In response to the more than 20,000 Northeastern Ohio residents that participated in these discussions, village mayors and city leaders began to see regional collaboration and dialogue as a priority.[219]

Another example comes from Kentucky. After Kentucky received some of the nation's poorest health status indicators, public radio station KET also teamed up with Foundation for a Healthy Kentucky to launch *Be Well Kentucky*, a community-media collaboration to raise public perception of individual well-being and its impact on community health.[220] The collaboration repurposed a 13-part public television series on health promotion into online toolkits, offered health literacy workshops for children, families, and minority populations, and tapped community leaders from around the state to network and share their ideas and experiences implementing the programs with each other.[221]

In the same ways that public service media policy can motivate advances in collaboration, networking, and innovation in the content and curation layers, it can do so in the connection layer. The reforms we propose below would increase incentives for the creation of strategic partnerships that engaged communities and individuals in public service media content. The goal of these reforms is engagement, as measured by new kinds of performance standards and

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216. *See* Matthew C. Nisbet & John E. Kotcher, *A Two Step Flow of Influence?: Opinion-Leader Campaigns on Climate Change*, 30 SCI. COMM. 328, 328–29 (2009).

217. *Voices & Choices*, AM. SPEAKS, http://americaspeaks.org/projects/case-studies/voices-choices/ (last visited Dec. 21, 2010); *About the Fund*, FUND FOR OUR ECON. FUTURE, http://www.futurefundneo.org/en/about (last visited Dec. 21, 2010).

218. *Voices & Choices*, *supra* note 217.

219. *Id.*

220. Association of Public Television Stations, *supra* note 160, at 6.

221. *Id.*; THE DIGITAL FUTURE INITIATIVE PANEL, *supra* note 181, at 82.

metrics, and would not be merely to increase the audience for public service media content. Rather, it would be to increase the utility of public service media content to society.

IV. Policy Reform for Public Service Media

A public service media system operating according to the logic of the layered model would yield greater efficiencies, greater diversity and inclusion, and greater impact. Significant changes in public service media practice and governance are possible without legislative initiative, and many of these are underway.[222] These advances, however, will not go far enough so long as the Public Broadcasting Act of 1967 remains substantially unchanged. As discussed in further detail below, existing law privileges a particular distribution technology — broadcasting — and assigns all federally funded network functions (infrastructure, creation, curation, and connection) to broadcasters. It creates few incentives for public broadcasting stations to unbundle their functions and network effectively with other entities throughout the layered network structure. For public service media to operate in newly configured media networks will require a law that recognizes the modular structure of digital networks and exploits these characteristics to serve the public better. Below are two specific recommendations to further the development of that law.

A. Amend the Public Broadcasting Act To Become the Public Service Media Act

The Public Broadcasting Act specifies in great detail how CPB should distribute the federal monies appropriated for public service media. Under the Act, CPB is required to fund broadcast stations in

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222. *See, e.g.*, Memorandum from Michael Levy to Ernest Wilson, Chairman, CPB Board of Directors Digital Media Committee, Aspen Institute Roundtable on Public Service Media (Mar. 1, 2009), *available at* http://www.cpb.org/events/aspen2009/Aspen2009ReportToBoard.pdf (summarizing 2009 Aspen Roundtable discussions on proposals for enhancing public service media, including revising business models and media platforms to account for digital environments and networks); Ernest Wilson, Acceptance Speech as Chair of CPB Board of Directors, at 3 (Sept. 16, 2009), *available at* http://www.ernestjwilson.com/uploads/Chairman_Wilsons_Remarks_-_Sept_16,_2009.pdf (describing the new CPB agenda of "dialogue, diversity, and digital"); *Aspen Institute Roundtable on Public Service Media*, Corp. for Pub. Broad., http://www.cpb.org/events/aspen2009/ (last visited Dec. 21, 2010); *Goals and Objectives*, Corp. for Pub. Broad., http://www.cpb.org/aboutcpb/goals/goalsandobjectives/goalsandobjectives_full.html (last visited Dec. 21, 2010) (articulating updated goals and objectives for content and services, innovation, leadership, and support for public service media); Public Radio in the New Network Age, *supra* note 2 (presenting findings and recommendations from the Public Radio Audience Growth Task Force to increase the reach of the public radio system by, among other things, exploiting the opportunities of digital networks).

preference to content creation, curation, and connection originating outside of the broadcast system and other, non-broadcast, modes of distribution.[223] The statute requires that about 70% of all CPB annual funding for public broadcasting be distributed to public television and radio stations.[224] The Act further dictates that approximately 19% of the annual appropriation goes for "public television programming"[225] and approximately 2% for "public radio programming."[226] While non-broadcast entities are eligible for this funding, the use of technology-specific language to characterize the content means that producers must try to wedge digital content into an analog conception of linear broadcast programming and strain to create older media formats or hooks.[227]

The statutory funding allocation creates an over-investment in broadcast infrastructure, an under-investment in content, and an anachronistic bundling of network functions. CPB community service grants to broadcast stations are unrestricted. However, CPB grant criteria demanding significant investments in broadcast transmission have the effect of yoking the grants to the physical broadcast infrastructure.[228] With respect to television stations, whose broadcast infrastructure is more costly than radio, infrastructure expenses (characterized as "content distribution and delivery" expenses) constitute sixteen to nineteen percent of station budgets. This amounts to $2.9 million to $27.3 million in annual expenditures per public

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223. *See* 47 U.S.C. § 396(k) (2006). Although CPB funding constitutes a relatively small portion of funding for many public television stations, its support of noncommercial media activities often provides critical leverage for other funding and the necessary breathing room to experiment with business and creative models. *See, e.g.*, Silver et al., *supra* note 2, at 278 (describing CPB's funding of experimental station-based online grants that will facilitate the development and incorporation of new technologies into public broadcasting); PUBLIC MEDIA 2.0, *supra* note 2, at 21–24 (describing the importance of adequate government funding for experimenting in public service media 2.0 projects).

224. *See* 47 U.S.C. § 396(k)(3)–(7) (2006) (describing formula for calculating allocation of funding and delineating criteria for funding eligibility). This does not include the additional appropriations dedicated to broadcast equipment upgrades. *See, e.g.*, Larry Sidman, APTS President, Speech at the 2010 NETA Conference (Feb. 2010), *available at* http://www.netaonline.org/2010/2010%20PPTs/APTS-SidmanSpeech.pdf (discussing $25 million in grant funds that are being made available for the Public Telecommunications Facilities Program to support telecommunications infrastructure).

225. 47 U.S.C. § 396(k)(3)(i)(III), (ii)(II) (2006).

226. *Id.* § 396(k)(3)(i)(V), (iii)(II).

227. *See, e.g.*, *The Program Challenge Fund*, CORP. FOR PUB. BROAD., http://www.cpb.org/grants/07challengefund/ (last visited Dec. 21, 2010) (inviting anyone to apply, including non-broadcast entities, but designing the grant to be for broadcast-oriented "series and feature length documentaries").

228. *See FY2010 Radio Community Service Grant General Provisions & Eligibility Criteria*, CORP. FOR PUB. BROAD., https://isis.cpb.org/ISIS_Help_Files/FY2010_Radio_CSG_General_Provisions.htm (last visited Dec. 21, 2010) (setting requirements such that only certain stations that provide strong broadcast signals — over a 50-mile radius, for example, or to at least two-thirds of its coverage area population — are eligible to apply for funding).

television station licensee on broadcast delivery of content.[229] Licensees spend about the same amount on content creation.[230]

Heavy federal investment in broadcast infrastructure was appropriate in the 20th century. But this financial commitment to broadcast transmission technology, in preference to other kinds of infrastructure or other functional layers of the public service media network, is no longer desirable or necessary. Both the CPB and public service media entities need more flexibility to invest in multiplatform content creation, curation, and community connections. Moreover, public service media entities that are not public station licensees — that operate in an unbundled fashion in other layers of the network — should be eligible for CPB funding.

The American system of public broadcasting is notoriously underfunded.[231] Federal appropriations of about $400 million a year are absurdly small, especially given the emerging consensus in journalism circles that public service media should compensate for shortfalls in the production of commercial journalism.[232] To be sure, any new Public Service Media Act should, at minimum, preserve the meager funding for public broadcasters, especially as they work to leverage value derived from the broadcast infrastructure layer to other functional layers in the network. To this funding should be added an allocation for unbundled digital content creation, curation, and connection initiatives. "Digital" ought to be a category of public service media activity alongside broadcasting.[233]

Defining this larger set of public service media entities that would be eligible for digital funds is difficult, but need not frustrate a reconstruction of the public service media network or applicable policy. There are entities that share the public service media service function and are creatures of federal media policy in one way or another. These would include cable public access channels[234] and

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229. Goodman, *supra* note 58, at 1.

230. Ex Parte Letter of Ellen P. Goodman to Blair Levin, Executive Director, Omnibus Broadband Initiative, A National Broadband Plan for Our Future, GN Docket No. 09-51 (Fed. Commc'ns Comm'n Dec. 29, 2009).

231. MCCHESNEY & NICHOLS, *supra* note 12, at 191–97 (discussing the underfunding of U.S. public service media, especially relative to international counterparts); Silver et al., *supra* note 2, at 260, 266–68 (describing the "chronic underfunding" of U.S. public service media which, at $1.35 per capita, ranks as among the lowest-funded public service media systems in the world).

232. *See* MCCHESNEY & NICHOLS, *supra* note 12, at 86, 192 (describing how "only a fraction" of public service media revenues, which have remained static over the past ten years, have gone to journalism and explaining how government intervention could help achieve "healthy journalism").

233. *See* NATIONAL BROADBAND PLAN, *supra* note 3, at 303–04 ("As broadband adoption and utilization continue to grow, public media will require greater and more flexible funding to support new digital platforms.").

234. *See* Jerome A. Barron, *Access to the Media*, 35 HOFSTRA L. REV. 937, 949–50 (2007) (describing how many localities have required cable operators to have public access channels); Ed Foley, Comment, *The First Amendment as Shield and Sword: Content*

noncommercial channels that operate on satellite capacity set aside for public service media purposes.[235] Beyond this, there are noncommercial journalistic entities, such as Pro Publica, [236] Voice of San Diego, [237] and The Center for Public Integrity,[238] that share many of the service goals of federally funded or federally enabled media entities.[239] Ultimately, we believe any statutory definition of public service media entities would suffer from over- and under-inclusiveness as well as predictable obsolescence. We believe a better course would be to define particular service characteristics of a public service media entity (such as noncommercial, objective and balanced, and primarily informational and educational) and give the CPB — renamed the Corporation for Public Service Media[240] — discretion to make grants to appropriate entities in a manner that is entirely transparent to the public.

Constraining the CPB's discretion in all cases should be a requirement that grantees function as part of a meaningful network. This means for public service media networks what it means for telecommunications and computer networks: interconnecting across nodes of distributed and modular activity such that each node has its own delineated purpose and function, but also self-consciously works with other nodes within and between each layer. Rather than connection to a network simply in name, the distinguishing twin features here are that public service media entities would be both intentional and collaborative in working with other entities as part of a

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Control of Peg Access Cable Television, 27 CAP. U. L. REV. 961, 966–67 (1998) (reviewing the history of FCC regulations authorizing the requirement of public access cable channels).

235. 47 U.S.C. § 335(b)(1) (2006) (authorizing the FCC to require satellite services to set aside a portion of channel capacity "exclusively for noncommercial programming of an educational or informational nature"); Time Warner Entm't Co. v. Fed. Commc'ns Comm'n, 93 F.3d 957, 973–77 (D.C. Cir. 1996) (upholding the constitutionality of satellite set-aside requirements); Michael M. Epstein, *Spectrum Set-Asides as Content-Neutral Metric: Creating a Practical Balance Between Media Access and Market Power*, 35 HOFSTRA L. REV. 1139, 1155–56 (2007) (describing public access requirements for satellite providers). Link TV, which produces a *Mosaic* program summarizing TV news programming in the Middle East, is one example of a direct broadcast satellite set-aside channel for nonprofit use. Pat Aufderheide, *The 1996 Telecommunications Act: Ten Years Later*, 58 FED. COMM. L.J. 407, 410 (2006); LINK TV, http://www.linktv.org/ (last visited Dec. 21, 2010).

236. PROPUBLICA, http://www.propublica.org/ (last visited Dec. 21, 2010).

237. VOICEOFSANDIEGO.ORG, http://www.voiceofsandiego.org/ (last visited Dec. 21, 2010).

238. THE CENTER FOR PUBLIC INTEGRITY, http://www.publicintegrity.org/ (last visited Dec. 21, 2010).

239. *See generally* COWAN & WESTPHAL, *supra* note 10, at 2–3 (noting instances of, and suggesting improvements to, distribution of federal funds "to support the gathering and dissemination of news").

240. *Cf.* DOWNIE & SCHUDSON, *supra* note 2, at 87 (advocating a renaming of CPB the "Corporation for Public Media"); Strayer, *supra* note 101, at 4 (same). CPB has already begun considering the idea. Wilson, *supra* note 222, at 2 ("[O]ne step to consider is the possibility of changing our name to better reflect our current reality and our future directions and ambitions to become the Corporation for Public Media.").

larger, coherent whole. In addition to funding digital networks, the Public Service Media Act should incent their most effective operations in service of the goals of public service media.

B. Mandate Interconnection Throughout the Network

Part II above identifies the value that networks can generate when entities carrying out discrete network functions are able to interconnect with each other, providing for more sources of information and better access to that information. The Public Broadcasting Act recognized the value of interconnection. Indeed, one of the purposes of the CPB was to provide "interconnection systems" for broadcast stations so that they would have access to national programming.[241] Beyond this, the CPB has funded and facilitated informal networking by identifying best practices among public broadcasting stations and encouraging partnerships at various layers in the network.[242]

The concept of interconnection, however, is grossly underdeveloped in a Public Broadcasting Act that preceded the possibilities and needs of digital networks. Consider, for example, the Public Service Media Platform discussed in Part III.C above as an example of public service media curation. The platform provides a repository for public service media content and a structure, eventually, for open access to such content by other creators, users, curators, and connectors. It serves as a new form of interconnection if we conceptualize the nodes in the network not only as broadcast stations, but also as individuals and other public service media entities. And yet this interconnection platform has no place in the Public Broadcasting Act, no funding source, and no requirements that grantees support it.

Indeed, the Public Broadcasting Act neither specifically supports nor encourages any type of interconnection outside of the satellite interconnection system. There are a number of promising partnerships in public service media that leverage public investments in media content and infrastructure to maximize audience reach, relevance, and service. Some of these partnerships involve public broadcasting stations working together; others involve collaborations between broadcasting stations and nonprofit community institutions or

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241. 47 U.S.C. § 396(g)(1)(B) (2006).

242. *See, e.g.*, *Public Media 2.0: Digital Media Activities*, CORP. FOR PUB. BROAD., http://www.cpb.org/publicmedia2.0 (last visited Dec. 21, 2010) (providing information on CPB-funded studies on best practices in public radio and digital public service media); *Partnership for a Nation of Learners*, CORP. FOR PUB. BROAD., http://www.cpb.org/ partnershipforlearners (last visited Dec. 21, 2010) (describing a funding initiative encouraging public broadcasters to partner with museums and libraries to address the needs of local communities).

journalism start-ups.[243] These partnerships happen largely in spite of, not because of, the incentives created by the Public Broadcasting Act.

At least in the short term, public broadcast stations have incentives to resist collaborations both within and across functional layers. Especially in light of recent sharp declines in funding for public broadcasting,[244] stations jealously guard their relationships with funding sources and may reject collaborations that threaten to dilute support for particular institutions.[245] All public service media entities would like access to more content, but may not want to contribute their content to others. There are obvious tensions between preserving the value of the public broadcasting "brands" and using those brands to provide curatorial services across the network for multiple sources of content. Public broadcasters with digital multicast channels may be reluctant to allow other content providers to access their infrastructure, even when these channels are underutilized.[246]

These disincentives to cooperate with other public service media entities and to interconnect with independent creators, curators and connectors should be addressed in the new Public Service Media Act and in CPB grant-making. In order to be eligible for public service media funding, prospective grantees should be incentivized to contribute content to the Public Service Media Platform or other similar curatorial and archival services. Providers of both infrastructure and content should be incentivized to provide infrastructure access on reasonable terms to other content providers, and content providers of all kinds should be incentivized to collaborate in the production of news, narratives, and other information.[247] Finally, public service media content providers should

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243. *See, e.g.*, PUBLIC MEDIA 2.0, *supra* note 2; BEST PRACTICES, *supra* note 65; GUPTA CONSULTING, *supra* note 65. For a well-organized collection of new, community-based start-ups in journalism, see *Promising Community News Sites*, KNIGHT DIGITAL MEDIA CTR., http://www.knightdigitalmediacenter.org/leadership_blog/comments/ 20100202_promising_community_news_sites_-_an_update/ (Feb. 4, 2009).

244. *See* Sidman, *supra* note 224 (reporting a significant revenue decline for public television stations from non-federal sources); Melissa Maynard, *The Squeeze on Big Bird*, STATELINE.ORG (Mar. 4, 2010), http://www.stateline.org/live/details/story?contentId= 465517 (describing severe cuts in public broadcasting funding, including a $36 million decline in CPB state and local funding for public television stations nationwide and an additional $45 to $49 million in cuts for the next fiscal year).

245. *See, e.g.*, Jill Drew, *NPR Amps Up*, COLUMBIA JOURNALISM REV., Mar./Apr. 2010, at 33 (citing one station manager's doubts over NPR's collaborative efforts, suspecting that such efforts may potentially upset their funding base and viewing the scene as "inherently competitive").

246. *See, e.g.*, Jeremy Egner, *World and Go! Streams Flow into PBS Plans*, CURRENT Apr. 3, 2006, *available at* http://www.current.org/dtv/dtv0606multicast.shtml (describing how most of the new shows on the Go! Multicast channel will be available only to stations that pay for the channel).

247. *See, e.g.*, *Request for Proposals: Strengthening Local Journalism: Round Two Targeting the South and Northwest*, CORP. FOR PUB. BROAD., http://www.cpb.org/grants/ 252/cpb_strengthlocal_rfp.pdf (Mar. 3, 2010) (seeking grant proposals for establishing Local Journalism Centers, where public broadcasting entities can collaboratively create

be incentivized to make content available in useful ways to connectors so that the content becomes maximally relevant to the communities it is meant to serve. CPB could require its grantees, for example, to report quantitatively and qualitatively report how they are meeting the information needs of their specific communities.[248] This would encourage greater accountability, transparency, and prioritization of local service among individual stations.

V. CONCLUSION

Public service media have the potential to meet some of the nation's most critical information needs, but only if public service media networks are reconfigured for more collaboration, innovation, and service in a networked environment. This Article shows how the Public Broadcasting Act and associated policies stand in the way of such progress. The law imposes an outdated analog structure on public service media, assuming that discrete network functions such as infrastructure, creation, curation, and connection should be bundled in a single firm using a distinct technology. The law further assumes that networking or interconnections should run almost entirely between hub and spoke, rather than throughout the network.

The layered approach that we develop here, based on models of telecommunications and computer networks, provides guidance for reconfiguring public service media policy and networks. We model four network functions derived from the original purposes of the Public Broadcasting Act. The model depicts a wide array of public service media nodes, each undertaking a particular network function and collaborating or interconnecting effectively in furtherance of these purposes. This type of network configuration promotes the kinds of innovation and diversity that make any communications network robust and that are particularly important to the mission of public service media. Public service media networks must be updated to accommodate and exploit digital technologies, but existing law stands in the way.

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high-quality journalism). Argo, a new journalism project that encourages stations to submit proposals for deeper online news coverage, is another example. *See* Argo Press Release, *supra* note 167; Everhart, *supra* note 167.

   248. In fact, the CPB recently adopted just such a recommendation after rejecting more powerful mechanisms for encouraging a commitment to local service, including incentive grants for exemplary local service and minimum local service requirements for grant eligibility. CORP. FOR PUB. BROAD., CPB MANAGEMENT'S RECOMMENDATIONS AS REVISED BY THE CPB BOARD (2010), http://64-210-228-75.acumensolutions.com/aboutcpb/leadership/board/resolutions/100922_TV_2010CSG_Recommendations.pdf. *See also* Resolution of the Board of Directors, Corp. for Pub. Broad., 2010 TV CSG Management Recommendations (Sept. 22, 2010), http://64-210-228-75.acumensolutions.com/aboutcpb/leadership/board/resolutions/resolution.php?prn=934.

We have proposed two specific legal reforms that address this disparity. First, Congress should dismantle current legislation that privileges broadcasting over digital and other technologies, and base support of public service media on service characteristics rather than type of entity or technology. Second, Congress should mandate interconnection between public service media entities to allow greater exchange and collaboration within a larger public service media network. These reforms would remake the Public Broadcasting Act into a Public Service Media Act appropriate for the structures of digital networks and the needs of digital natives.