2020

Internet Architecture and Disability

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The Internet is essential for education, employment, information, and cultural and democratic participation. For tens of millions of people with disabilities in the United States, barriers to accessing the Internet—including the visual presentation of information to people who are blind or visually impaired, the aural presentation of information to people who are deaf or hard of hearing, and the persistence of Internet technology, interfaces, and content without regard to prohibitive cognitive load for people with cognitive and intellectual disabilities—collectively pose one of the most significant civil rights issues of the information age. Yet disability law lacks a comprehensive theoretical approach for fully facilitating Internet accessibility. The prevailing doctrinal approach to Internet accessibility seeks to treat websites as metaphorical "places" subject to Title III of the Americans with Disabilities Act (ADA), which requires places of public accommodations to be accessible to people with disabilities. While this place-centric approach to Title III has succeeded to a significant degree in making websites accessible over the last two decades, large swaths of the Internet—more broadly construed to include Internet technologies beyond websites—remain inaccessible to millions of people with a variety of disabilities.

As limitations of a place-based approach to Title III become clearer, a new framework for disability law is needed in an increasingly intermediated Internet. Leveraging the Internet-law literature on perspectives, this article recognizes the place-centric approach to Title III as normatively and doctrinally "internal," in the terminology of Internet-law scholars. It offers a framework for supplementing this internal approach with an external approach that contemplates the layered architecture of the Internet, including its constituent content, web and non-web applications, access networks operated by Internet service providers, and devices and the role of disability and other bodies of law, particularly including

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telecommunications law and attendant policy issues, such as net neutrality, in making them accessible.

INTRODUCTION

The nearly fifty-million Americans who are deaf or hard of hearing, many of whom have speech disabilities, face limited outlets for real-time communication, a glut of Internet-delivered video programming with missing or poor-quality captions, and an increasingly large array of devices with inaccessible voice-operated interfaces.[1] The more than seven million Americans who are blind or visually impaired have witnessed the revolution of web and mobile applications pass with inconsistent, broken, or missing support for screen readers and a dearth of video content with audio descriptions.[2] The estimated two-and-a-half million to nearly twelve-million Americans with intellectual and cognitive disabilities routinely face complex user interfaces designed without considering cognitive load and a dearth of content delivered in plain language.[3] And millions more have motor and physical disabilities that prevent them from interacting with a variety of Internet-enabled devices and applications, including the "smart" vehicles, homes, and clothing that constitute the "Internet of Things." Making the Internet accessible to people with disabilities is one of the most pressing civil rights challenges of the twenty-first century, with unique and complex legal, technical, architectural, and political dimensions.

More generally, the United Nations estimates that a billion people—fifteen percent of the world's population—live with a disability, making people with disabilities "the world's largest minority."[4] Yet the Internet—the gateway to the economic, social, cultural, and participatory fruits of the information age—has remained inaccessible,[5] in a variety of ways, to this significant population.

These are not trivial concerns of luxury or convenience. People with disabilities have faced historical barriers to societal institutions that are, in many cases, exacerbated by Internet-enabled technological disruptions that render social change without accessibility in mind. Access to the Internet is a primary driver of education, employment, civic participation, cultural engagement, and more. The denial of equal access to the Internet is tantamount to "second-class citizenship" and inhibits the social integration mandate of the ADA.[6] The Internet likewise promises to serve the ADA's integration mandate as much or more than any other technological

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1. Frank R. Lin, John K. Niparko & Luigi Ferrucci, *Hearing Loss Prevalence in the United States*, 171 ARCHIVES INTERNAL MED. 1851, 1851–52 (2011).

2. *See Blindness Statistics,* NAT'L FED'N OF THE BLIND, https://nfb.org/blindness-statistics [https://perma.cc/53TV-LN9N].

3. *See* THE NAT'L ACADS. OF SCI. ENG'G MED., MENTAL DISORDERS AND DISABILITIES AMONG LOW-INCOME CHILDREN 267–79 (Thomas F. Boat & Joel T. Wu eds., 2015) (ebook).

4. Dep't of Econ. and Soc. Affairs, *Factsheet on Persons with Disabilities*, UNITED NATIONS, https://www.un.org/development/desa/disabilities/resources/factsheet-on-persons-with-disabilities.html [https://perma.cc/DE4A-WX8P].

5. *See* PETER BLANCK, EQUALITY: THE STRUGGLE FOR WEB ACCESSIBILITY BY PERSONS WITH COGNITIVE DISABILITIES 45–49 (2014).

6. JONATHAN LAZAR, DANIEL GOLDSTEIN & ANNE TAYLOR, ENSURING DIGITAL ACCESSIBILITY THROUGH PROCESS AND POLICY 91 (2015).

development, and "promotes democratic engagement and human fulfillment by fostering understanding and communication among people with and without disabilities across the economic spectrum."[7] Against this backdrop, shortcomings in Internet accessibility threaten to deny millions of Americans access to the economic, educational, cultural, and democratic life of the twenty-first century.[8]

This Article starts from the premise that full access[9] to the Internet for people with disabilities[10] is normatively important and that to achieve Internet accessibility for people with disabilities, "anti-discrimination measures and positive actions are sometimes needed."[11] While many anti-discrimination movements begin with a fight to overcome overt animus, the movement toward Internet accessibility has, from its inception, dealt more directly with questions of how to overcome omissive failures to incorporate accessibility into the design of technological systems by the proprietors, vendors, and users of Internet-enabled technology.[12]

In other words, Internet accessibility is situated squarely in what Samuel Bagenstos has deemed in the context of employment law a "structural turn" in the broader movement to fight discrimination against people with disabilities.[13] The questions Internet accessibility poses are not matters of preventing conscious animus toward people with disabilities, but matters of constructing and remediating

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7. BLANCK, *supra* note 5, at 40, 44.

8. *See* Bradley Allan Areheart & Michael Ashley Stein, *Integrating the Internet*, 83 GEO. WASH. L. REV. 449, 452 (2015).

9. The term "equal access" is often used as well, though it elides that accessibility often entails customization tailored to the particular aspects of a person's disability.

10. This Article uses "person-first" language—e.g., "people with disabilities" throughout primarily as a matter of consistency, and not as an intentional endorsement of person-first language over identity-first language—e.g., "disabled people."—or an attempt to stake a position in the debate over the appropriate language to use. While I interact with many accessibility advocates in my clinical work who prefer "person-first" language, others prefer identity-first language. *See, e.g.*, Lydia X. Z. Brown, *The Significance of Semantics: Person-First Language: Why It Matters* (Aug. 4, 2011), https://www.autistichoya.com/2011/08/significance-of-semantics-person-first.html [https://perma.cc/KX6C-69PT] (arguing for the use of identity-first language). Also, this Article does not contend in depth with the debate over the scope of disabilities that should be swept into the right to equal access. *See infra* Section III.E.

11. BLANCK, *supra* note 5, at 45.

12. This is not to suggest that the accessibility requirements on the Internet have been or will be uncontroversial. For example, Eric Goldman has argued that applying the ADA to the Internet will "potentially rip[] open a huge hole in Internet law" and enable "jobless recent law school grads" to make "buckets of money . . . in ADA litigation against Internet companies." Eric Goldman, *Will the Americans With Disabilities Act Tear a Hole in Internet Law?*, ARS TECHNICA (June 27, 2012, 9:30 AM), https://arstechnica.com/tech-policy/2012/06/will-the-americans-with-disabilities-act-tear-a-hole-in-internet-law/ [https://perma.cc/72LC-GRHE]. Though grappling with the treatment of disability issues by Internet law scholars is beyond the scope of this Article, some of the economic concerns that Goldman and others raise are addressed in the context of this Article's discussion on undue economic burden. *See supra* Section III.C.

13. *See generally* Samuel R. Bagenstos, *The Structural Turn and the Limits of Antidiscrimination Law*, 94 CALIF. L. REV. 1 (2006) (discussing proposals for structural approaches to employment discrimination law).

architecture and content to make it accessible and usable; the answers are not merely barring discriminatory conduct, but identifying specifically who must do what, and when, and how, to ensure that people with disabilities can fully use the Internet. These questions and answers are no less important from the perspective of anti-discrimination theory than those of animus,[14] but they require a structural set of doctrinal accessibility mandates to fulfill the normative vision of antidiscrimination.[15]

This Article aims to grapple, then, with the question of how, exactly, the goal of Internet accessibility can be achieved, and provide disability-law scholars and advocates with a lens for more comprehensively understanding that set of problems that "Internet accessibility," broadly construed, should be concerned with solving.

Part I of this Article observes that the use of Title III of the ADA as the wellspring for Internet accessibility has led to a prevailing doctrinal approach to Internet accessibility that is rooted in a place-centric conception of the civil rights of people with disabilities. This approach advocates treating the Internet as a metaphorical "place" subject to Title III of the ADA, which requires places of public accommodations to be accessible to people with disabilities.[16] As a result, much of the attention to Internet accessibility is centered on Internet-enabled technology that is easily amenable to Title III's "place" metaphor. The technology most amenable to that metaphor is the websites that comprise the World Wide Web (colloquially, "the web"), which users "visit" or "go to" using their computer's web browser. In disability scholarship, *Internet* accessibility has become implicitly synonymous with *web* accessibility.

Part II introduces the Internet-law literature of "perspectives" to Internet accessibility. Applying the perspectives literature reveals that the prevailing place- and website-centric approach to Title III is properly understood as what Internet-law scholars call an "internal" perspective, rooted in the user's experience of the Internet.

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14. *See, e.g.*, Samuel R. Bagenstos, *"Rational Discrimination," Accommodation, and the Politics of (Disability) Civil Rights*, 89 VA. L. REV. 825, 826–27 (2003) (rejecting a "normative distinction between the [ADA]'s mandate to provide 'reasonable accommodation' to people with disabilities and the antidiscrimination requirements of the civil rights laws that emerged in the 1960s and 1970s"); *see also* Helen Norton, *The Supreme Court's Post-Racial Turn Towards a Zero-Sum Understanding of Equality*, 52 WM. & MARY L. REV. 197, 206 (2010) (discussing "whether antidiscrimination law should be understood as driven by antisubordination as opposed to anticlassification values").

15. Sarah Schindler has addressed issues of discrimination and exclusion in physical, built architecture. *See* Sarah B. Schindler, *Architectural Exclusion: Discrimination and Segregation Through Physical Design of the Built Environment*, 124 YALE L.J. 1934 (2015).

16. 42 U.S.C. § 12182(a) (2012). Place-centrism is uncommon in disability laws outside of Title III of the ADA; Title I focuses on employment, 42 U.S.C. ch. 126, subch. I (2012); Title II focuses on state and local government services, 42 U.S.C. ch. 126, subch. II (2012); and Title IV focuses on telecommunications relay services, 47 U.S.C. § 225 (2012). Sections 504 and 508 of the Rehabilitation Act of 1976, 29 U.S.C. §§ 794, 794(d) (2012), and state laws such as California's Unruh Civil Rights Act, CAL. CIV. CODE § 51 (West 2007) and Disabled Persons Act, CAL. CIV. CODE §§ 54–55.2 (West 2007), have different substantive scopes that do not necessarily focus on places. Though a full exploration of these laws is beyond the scope of this article, these laws potentially play an important role in Internet accessibility. *See infra* Sections III.C, III.D, and III.E.

While I explain why such a perspective is both doctrinally and normatively justified, I also describe the shortcomings of the internal perspective as a framework for addressing Internet accessibility beyond the application of Title III to websites. By augmenting the internal perspective on Title III with a countervailing "external" perspective, I sketch a broader framework for addressing Internet accessibility informed not only by the experience of using the Internet, but by the Internet's layered architecture.

In Part III, I color in the external sketch by illustrating with examples what a more comprehensive realization of the goal of Internet accessibility would require. I first disentangle the application and content layers of both the web and the diverse array of modern Internet applications, including those delivered by dominant platform companies that host the content of their users. I close with a discussion of underexplored accessibility considerations specific to the Internet's building blocks—the network and physical layers—and the class of devices that comprise the so-called "Internet of Things," in which issues such as the accessibility dimensions of network neutrality and voice assistants arise. Throughout, I consider the role that other substantive bodies of law—in particular, telecommunications law—may play in facilitating a more comprehensive approach to Internet accessibility.

I. TITLE III AND THE INTERNET: THE WEB AS THE INTERNET AND THE WEBSITE AS THE PLACE

As a doctrinal matter, the conceptions of Title III as applied to the Internet most favorable to people with disabilities treat the Internet as the web and websites as places—as in Title III's "places of public accommodation." This is partially a result of the ADA's inception in a pre-Internet society, where the goal of an accessible world necessarily took root in physical places. But it has also proved facile in the context of the Internet; Title III has the capacity to win accessibility cases primarily focused on websites, because websites are easy to understand as metaphorical places. This Part begins with a short history of Title III and its website- and place-centrism, and how it has driven disability-law scholars to theorize about the Internet as the Web and websites as places.

Enacted in 1990, the ADA was intended as a comprehensive and unqualified civil rights remedy for discrimination against people with disabilities. The ADA's preamble makes explicit that the purpose of the ADA is "to provide a clear and comprehensive national mandate for the elimination of discrimination against individuals with disabilities."[17] In signing it into law, President George H.W. Bush declared that the ADA "signal[ed] the end to the unjustified segregation and exclusion of persons with disabilities from the mainstream of American life."[18]

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17. 42 U.S.C. § 12101(b)(1) (2012).

18. Statement by President George Bush upon Signing S. 933, Pub. L. No. 101-336, 1990 U.S.C.C.A.N. 601–02 (July 26, 1990). *Compare* Lawrence O. Gostin, *The Americans with Disabilities Act at 25: The Highest Expression of American Values*, 313 J. AM. MED. ASS'N. 2231, 2234 (2015) (lauding the role and breadth of the ADA in improving the state of equality for people with disabilities and influencing the development of international disability instruments), *with* Arlene S. Kanter, *The Americans with Disabilities Act at 25 Years: Lessons to Learn from the Convention on the Rights of People with Disabilities*, 63 DRAKE L. REV. 819,

If the anti-discrimination goal of the ADA was broadly scoped, its implementation was drawn at least rhetorically with the physical, built world of the late 1980s and early 1990s in mind. Title III, the portion of the ADA intended to deal with the accessibility of private businesses, explicitly prohibits discrimination against people with disabilities in "any *place* of public accommodation."[19] Title III likewise defines public accommodations extensively in terms of places—places of lodging,[20] places of exhibition or entertainment,[21] places of public gathering,[22] places of public display or collection,[23] places of recreation,[24] and places of exercise.[25] Moreover, it illustrates them in terms of traditionally physical buildings—hotels and motels,[26] restaurants and bars,[27] theaters and concert halls,[28] stores and shopping centers,[29] laundromats and banks,[30] museums and libraries,[31] parks and zoos,[32] daycare centers and homeless shelters,[33] and gyms and bowling alleys.[34]

Of course, the legislative history of the ADA makes clear that it was not intended to exclude future technology, noting that "the types of accommodation and services provided to individuals with disabilities, under all of the titles of [the ADA], should keep pace with the rapidly changing technology of the times."[35] But however Congress might have intended the ADA to apply to the Internet is obscured by the fact that the commercial Internet was essentially nonexistent when the ADA was signed into law in July of 1990.[36] In fact, it was not until five months later that Tim Berners-Lee hosted the first website,[37] five years later that the Federal Networking Council resolved to officially recognize "the Internet" in the form that it more or less

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819 (2015) (criticizing the ADA's anti-discrimination approach and lauding the human rights approach of the Convention on the Rights of People with Disabilities).

19. 42 U.S.C. § 12182(a) (emphasis added); *see also* Jacobus tenBroek, *The Right to Live in the World: The Disabled in the Law of Torts*, 54 CALIF. L. REV. 841, 848, 850 (1966) (referring to "the right to live in the world" for people with disabilities).

20. 42 U.S.C. § 12181(7)(A).

21. *Id.* § 12181(7)(B).

22. *Id.* § 12181(7)(D).

23. *Id.* § 12181(7)(H).

24. *Id.* § 12181(7)(I).

25. *Id.* § 12181(7)(L).

26. *Id.* § 12181(7)(A).

27. *Id.* § 12181(7)(B).

28. *Id.* § 12181(7)(C).

29. *Id.* § 12181(7)(E).

30. *Id.* § 12181(7)(F).

31. *Id.* § 12181(7)(H).

32. *Id.* § 12181(7)(I).

33. *Id.* § 12181(7)(K).

34. *Id.* § 12181(7)(L).

35. H.R. REP. NO. 101-485, pt. 2, at 381 (1990), *as reprinted in* 1990 U.S.C.C.A.N. 303, 391.

36. *E.g.*, LAZAR ET AL., *supra* note 6, at 89.

37. *Frequently Asked Questions*: *Examples of Early WWW Hypertext: What Was the First Web Page?*, https://www.w3.org/People/Berners-Lee/FAQ.html#Examples [https://perma.cc/FXD5-G3UZ].

exists today,[38] and nearly ten years later than advocates and policymakers first began to debate the applicability of the ADA to the Internet.[39]

A congressional hearing in 2000 previewed the two defining features of the emerging debate over the ADA's applicability to the Internet. First, the debate would center specifically on the web and websites. The use of websites by private businesses predominated usage of the early Internet, and so the question of *website* accessibility appeared exhaustive of the question of *Internet* accessibility.[40] Nearly every witness, whether in support of the ADA's applicability or against, spoke of the Internet, the web, and websites interchangeably. [41]

Second, the debate would turn on whether the Internet could be conceived of as a physical "place" in the statute's terms. Some witnesses argued that "[t]he Internet has become a place of public accommodation,"[42] while others argued that "[c]yberspace isn't a physical place" as contemplated by Title III's list of "places."[43]

Nearly two decades of litigation have calcified these features of the debate. First, Internet accessibility under Title III has hinged on whether websites can be properly conceived as places of public accommodation even though they do not occupy a physical space.[44] Nearly all Title III Internet-related litigation has been focused on websites, and primarily on compatibility with screen readers for blind people.[45]

As to the second, even before the Internet became a concern, the federal courts had split over whether Title III was limited to physical places. The leading set of cases split over whether the content of insurance policies, and not simply the physical structure of insurance company *offices*, were covered by Title III.[46]

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38. BARRY M. LEINER, VINTON G. CERF, DAVID D. CLARK, ROBERT E. KAHN, LEONARD KLEINROCK, DANIEL C. LYNCH, JON POSTEL, LARRY G. ROBERTS & STEPHEN WOLFF, BRIEF HISTORY OF THE INTERNET 17 (1997), https://www.Internetsociety.org/wp-content/uploads /2017/09/ISOC-History-of-the-Internet_1997.pdf [https://perma.cc/N72G-3BZT].

39. *See* BLANCK, *supra* note 5, at 81–82 (discussing the early days of the debate over the ADA's applicability to the Internet in the late 1990s and early 2000s).

40. *See Applicability of the Americans with Disabilities Act (ADA) to Private Internet Sites: Hearing Before the Subcomm. on the Constitution of the H. Comm. on the Judiciary*, 106th Cong. 1–2 (2000) (testimony of Chairman Charles Canady) (referring interchangeably to "greater handicapped accessibility of the Web," the applicability of the ADA to "private Internet Web sites," and "the impact of the ADA on the Internet"); *id.* at 6 (testimony of Gary Wunder) ("[L]et's lower [the bar for accessibility] for Web sites and the Internet."); *id.* at 19, 21 (testimony of Judy Brewer) (framing the hearing in terms of "Web accessibility" and referring interchangeably to the "Web industry" and the "Internet industry"); *id.* at 25 (testimony of Susyn Conway) (referring interchangeably to the "World Wide Web" and the "Internet").

41. *See id.*

42. *Id.* at 10 (Testimony of Dr. Steven Lucas).

43. *Id.* at 38 (Testimony of Elizabeth K. Dorminey).

44. *See*, *e.g.*, BLANCK, *supra* note 5, at 82; LAZAR ET AL., *supra* note 6, at 89.

45. *See infra* notes 47–51 and accompanying text.

46. *Compare* Pallozzi v. Allstate Life Ins., 198 F.3d 28, 32 (2d Cir. 1999) (subsequent history omitted) (extending Title III to insurance policies sold in insurance offices and noting that Title III "was meant to guarantee them more than mere physical access"), *and* Carparts Distribution Ctr., Inc. v. Auto. Wholesaler's Ass'n, 37 F.3d 12, 20 (1st Cir. 1994) (extending Title III to the administration of a health benefit plan and noting that Title III "make[s no]

That split has continued into the era of Title III Internet litigation along three lines:

> 1. *Nexus-Between-Website-and-Place*: One line of cases, followed by courts in the Ninth and Eleventh Circuits, concludes that websites alone are not public accommodations but can be the subject of a Title III claim to the extent they have a sufficient nexus to a physical place of public accommodation—often found, for example, with websites for retail establishments.[47]

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mention of physical boundaries or physical entry"), *with* McNeil v. Time Ins., 205 F.3d 179, 186 (5th Cir. 2000) (same), Weyer v. Twentieth Century Fox Film Corp., 198 F.3d 1104, 1115 (9th Cir. 2000) (same), Ford v. Schering-Plough Corp., 145 F.3d 601, 612–13 (3d Cir. 1998) (declining to extend Title III to an insurance policy as a "place" even though insurance offices are covered under Title III), *and* Parker v. Metro. Life Ins., 121 F.3d 1006, 1014 (6th Cir. 1997) (same). *See also* Torres v. AT&T Broadband, LLC, 158 F. Supp. 2d 1035, 1038 (N.D. Cal. 2001) (declining to extend Title III to AT&T's digital cable service); Doe v. Mut. of Omaha Ins., 179 F.3d 557, 558–59 (7th Cir. 1999) (declining to apply Title III to the content of an insurance policy but recognizing in dicta that Title III extends to public accommodations "whether in physical space or in electronic space") (citing *Carparts*, 37 F.3d at 19); Stoutenborough v. Nat'l Football League, Inc., 59 F.3d 580, 583 (6th Cir. 1995) (declining to extend Title III to the televised broadcast of football games).

47. *E.g.*, Gomez v. Bang & Olufsen Am., Inc., No. 1:16-CV-23801-LENARD, 2017 WL 1957182, at *3 (S.D. Fla. Feb. 2, 2017) ("[A] website that is wholly unconnected to a physical location is generally not a place of public accommodation under [Title III]," but "if a plaintiff alleges that a website's inaccessibility impedes the plaintiff's 'access to a specific, physical, concrete space[,]' and establishes some nexus between the website and the physical place of public accommodation, the plaintiff's ADA claim can survive a motion to dismiss."). *Compare* Earll v. eBay, Inc., 599 F. App'x 695, 696 (9th Cir. 2015) (concluding that eBay's website was not connected to any "actual physical place" and thus not subject to Title III) (quoting *Weyer*, 198 F.3d at 1114)), Jancik v. Redbox Automated Retail, LLC, No. SACV 13-1387-DOC (RNBx), 2014 WL 1920751, at *9 (C.D. Cal. May 14, 2014) (rejecting that Redbox's instant video delivery website was sufficiently integrated with its physical kiosks to support a Title III claim), Cullen v. Netflix, Inc., 880 F. Supp. 2d 1017, 1024 (N.D. Cal. 2012) (concluding that Netflix's website was not an "actual physical place" and therefore not a place under Title III) (quoting *Weyer*, 198 F.3d at 1114)), Young v. Facebook, Inc., 790 F. Supp. 2d 1110, 1115–16 (N.D. Cal. 2011) (rejecting that the sale of gift cards at retail outlets formed a sufficient nexus to treat the Facebook's website as a "place" under Title III), Ouellette v. Viacom, No. CV 10-133-M-DWM-JCL, 2011 WL 1882780, at *1, *4–5 (D. Mont. Mar. 31, 2011) (concluding that various websites including Google, YouTube, and Myspace lacked a sufficient nexus to a physical location to support a Title III claim), *and* Access Now, Inc. v. Sw. Airlines Co., 227 F. Supp. 2d 1312, 1318 (S.D. Fla. 2002) (rejecting that Southwest Airlines' website had a sufficient connection with a physical location to be a place of public accommodation under Title III), *aff'd on other grounds*, 385 F.3d 1324 (11th Cir. 2004), *with* Robles v. Domino's Pizza, LLC, 913 F.3d 898, 905 (9th Cir. 2019), *cert. denied*, 140 S. Ct. 122 (2019) (concluding that Domino's Pizza's website had a sufficient nexus to brick-and-mortar Domino's Pizza franchises to support the place element of a Title III claim), Gorecki v. Hobby Lobby Stores, Inc., No. CV 17-1131-JFW(SKx), 2017 WL 2957736, at *3 (C.D. Cal. June 15, 2017) (recognizing a sufficient nexus between Hobby Lobby's website and stores to sustain a Title III claim), Gil v. Winn Dixie Stores, Inc., 242 F. Supp. 3d 1315, 1321 (S.D. Fla. 2017) (concluding that Winn-Dixie's website had a sufficient nexus to its physical grocery stores to uphold a Title III claim), *and* Nat'l Fed'n of the Blind v. Target Corp., 452 F. Supp.

> 2. *Standalone-Websites-as-Place*: A second line of cases, followed by courts in the First, Second, and Seventh Circuits, concludes that even standalone websites can comfortably be considered places of public accommodation under Title III.[48] The common thread of reasoning in these cases is that websites can be "analogous to a brick-and-mortar store or other venue that provides similar services."[49]
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> 3. *Physical Places Only (No Websites)*: A third line of cases, followed in the Third Circuit, concludes that websites cannot be treated as public accommodations even with a nexus to a physical place of public accommodation.[50]

As a result of this uncertainty, many Title III website cases settle prior to judicial resolution.[51]

2d 946, 954–55 (N.D. Cal. 2006) (accepting a Title III claim against Target's website, which the court deemed "heavily integrated with [Target's] brick-and-mortar stores and operat[ing] in many ways as a gateway to the stores"); *compare* Stern v. Sony Corp. of Am., 459 F. App'x 609, 610 (9th Cir. 2011) (rejecting a sufficient connection between the accessibility of Sony's video games with its video game conventions and retail stores), *with* Rendon v. Valleycrest Prods., 294 F.3d 1279, 1285 (11th Cir. 2002) (upholding a Title III challenge to an off-site screening process for a game show).

48. *E.g.*, Morgan v. Joint Admin. Bd., 268 F.3d 456, 459 (7th Cir. 2001) (rejecting the argument that a Title III public accommodation must "literally . . . denot[e] a physical site, such as a store or a hotel"); Access Now, Inc. v. Blue Apron, LLC, No. 17-CV-116-JL, 2017 WL 5186354, at *4 (D.N.H. Nov. 8, 2017) (concluding that Blue Apron, the meal ingredient delivery service, is a place of public accommodation as a sort of "online 'grocery store'"); Markett v. Five Guys Enters. LLC, No. 17-CV-788 (KBF), 2017 WL 5054568, at *2 (S.D.N.Y. July 21, 2017) (holding that Five Guys' website was its own place of public accommodation in addition to being closely related to Five Guys' brick-and-mortar hamburger restaurants); Andrews v. Blick Art Materials, LLC, 268 F. Supp. 3d 381, 385, 387 (E.D.N.Y. 2017) (holding that a website for the sale of art supplies was a "place" under Title III); Nat'l Fed'n of the Blind v. Scribd Inc., 97 F. Supp. 3d 565, 573 (D. Vt. 2015) (rejecting "that only physical places open to the public can be public accommodations"); Nat'l Ass'n of the Deaf v. Netflix, Inc., 869 F. Supp. 2d 196, 200 (D. Mass. 2012) (citing *Carparts*, 37 F.3d at 19) (noting that the application of Title III "as applying to web-based businesses is supported by [*Carparts*], which held that 'places of public accommodation' are not limited to 'actual physical structures'").

49. *See Nat'l Ass'n of the Deaf*, 869 F. Supp. 2d at 200.

50. *E.g.*, Anderson v. Macy's Inc., No. 2:12-CV-00556, 2012 WL 3155717, at *4 (W.D. Pa. Aug. 2, 2012) (rejecting a Title III claim against Macy's website notwithstanding a connection to Macy's retail stores); *see also* Peoples v. Discover Fin. Servs., Inc., 387 F. App'x 179, 183–84 (3d Cir. 2010) (rejecting a Title III claim regarding customer support for a credit card used to purchase in-person prostitution services); *cf.* Noah v. AOL Time Warner Inc., 261 F. Supp. 2d 532, 544 (E.D. Va. 2003), *aff'd*, No. 03-1770, 2004 WL 602711, at *1 (4th Cir. Mar. 25, 2004) (declining to treat AOL chat rooms as places of public accommodation under Title II of the Civil Rights Act).

51. *See* LAZAR ET AL., *supra* note 6, at 91 ("If the law has remained cloudy, it is in part because entities who might argue the degree to which they are subject to Title III have chosen instead to reach settlement agreements to make their web sites and services accessible."); *id.*

Advocates and scholars have also become increasingly concerned with the perspective of the Department of Justice (DOJ),[52] which is charged with administering regulations for the implementation of Title III[53] and routinely files amicus briefs and negotiates settlements in website accessibility cases.[54] While DOJ's view on the applicability of Title III to standalone websites has been historically supportive,[55] a 2010 DOJ rulemaking to implement Title III website

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at 92 (noting Title III settlements with H&R Block, Peapod, eBay, Monster.com, Amazon, Ticketmaster, Travelocity, Wellpoint, and Charles Schwab); Lainey Feingold, *Settlements in Structured Negotiation*, LFLEGAL.COM, https://www.lflegal.com/negotiations/ [https://perma.cc/MB5H-6ATR] (listing dozens of website settlements from 1999–2018); *see also* Michael Ashley Stein, Michael E. Waterstone & David B. Wilkins, *Cause Lawyering for People with Disabilities*, 123 HARV. L. REV. 1658, 1682 (2010) (noting that successful disability law outcomes, such as the *Target* litigation, often involve a sophisticated team of firms and attorneys dedicated to nuanced disability cause lawyering with an understanding of the value of settlements); Michael E. Waterstone, Michael Ashley Stein & David B. Wilkins, *Disability Cause Lawyers*, 53 WM. & MARY L. REV. 1287, 1321 (2012) (noting that forcing settlements in web accessibility cases is often preferable because of the risk of an adverse ruling by the Supreme Court); Minh N. Vu, Kristina M. Launey, Susan Ryan & Kevin Fritz, *Website Access and Other ADA Title III Lawsuits Hit Record Numbers*, SEYFARTH SHAW: ADA TITLE III NEWS & INSIGHTS (July 17, 2018), https://www.adatitleiii.com/2018/07/website-access-and-other-ada-title-iii-lawsuits-hit-record-numbers/ [https://perma.cc/3P8F-RSCS] (projecting approximately 10,000 Title III website cases would be filed in 2018). For example, the first Title III web case was filed against America Online by the National Federation of the Blind in 1999, but settled in 2000 without a judicial determination. *See* BLANCK, *supra* note 7, at 81; Wired Staff, *AOL Settles Accessibility Suit*, WIRED: BUSINESS (July 28, 2000, 3:00 AM), https://www.wired.com/2000/07/aol-settles-accessibility-suit/ [https://perma.cc/N9VA-XC2G]. This trend continues today. *E.g.*, *ACB, et al. v. Hulu LLC*, DISABILITY RIGHTS ADVOCS., https://dralegal.org/case/acb-et-al-v-hulu-llc/ [https://perma.cc/T57L-ZRBK] (describing the settlement of Title III claims against Hulu); *Amazon.com, Inc. Agree to Expand Closed Captions on Amazon Video*, NAT'L ASS'N DEAF, https://www.nad.org/2015/10/14/amazon-com-inc-agree-to-expand-closed-captions-on-amazon-video/ [https://perma.cc/QY3C-LBSC] (describing a settlement between Amazon and the National Association of the Deaf). One leading civil rights attorney has formally articulated a dispute resolution methodology specifically aimed at facilitating settlements in website and other cases. *See generally* LAINEY FEINGOLD, STRUCTURED NEGOTIATION (2016). *But see* Richard A. Posner, *The Economic Approach to Law*, 53 TEX. L. REV. 757, 762 (1975) (citing William M. Landes, *An Economic Analysis of the Courts*, 14 J. L. & ECON. 61 (1971)) (suggesting that the frequency of litigation should increase, not decrease, in the face of uncertainty).

52. *E.g.*, BLANCK, *supra* note 5, at 145–47; LAZAR ET AL., *supra* note 6, at 89.

53. 42 U.S.C. § 12186(b) (2012).

54. *See* U.S. Dep't of Justice Civil Rights Div., *ADA Enforcement*: *Title III*, ADA.GOV, https://www.ada.gov/enforce_current.htm#TitleIII [https://perma.cc/B2E3-TB62] (listing the DOJ's numerous interventions in Title III cases); *see also* Robert L. Burgdorf, Jr., *Restoring the ADA and Beyond: Disability in the 21st Century*, 13 TEX. J. C.L. & C.R. 241, 274 nn.151–52 (2008) (describing DOJ's settlement practices).

55. A 1996 letter from Assistant Attorney General Deval Patrick suggested that at least some websites could be covered under Title III. Letter from Deval L. Patrick, Assistant Attorney Gen., to Senator Tom Harkin (Sept. 9, 1996), https://www.justice.gov/crt/foia/readingroom/frequent_requests/ada_tal/tal712.txt [https://perma.cc/7QX7-KCV6]. In 2010, DOJ issued an Advanced Notice of Proposed Rulemaking in 2010 on web accessibility

regulations languished[56] and then was formally withdrawn in 2017 by then-Attorney General Jeff Sessions.[57]

As a result, much of the disability law literature on Internet accessibility has been dedicated to narrow arguments debating the doctrinal contours of Title III's applicability to websites in place-centric terms.[58] Many of the articles and notes advocate for resolving the circuit split by treating standalone websites as "places"

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specifically endorsing several of the nexus cases and implying endorsement of the applicability of Title III to standalone websites. Nondiscrimination on the Basis of Disability; Accessibility of Web Information and Services of State and Local Government Entities and Public Accommodations, 75 Fed. Reg. 43,460, 43,463–64 (July 26, 2010) (noting that Title III's "broad and expansive nondiscrimination mandate reaches goods and services provided by covered entities on Web sites over the Internet" and noting its "repeate[d] affirm[ation of] the application of title III to Web sites of public accommodations"). DOJ has also filed statements of interest in Title III website cases. *E.g.*, Statement of Interest of the United States of America in Opposition to Defendant's Motion for Judgment on the Pleadings at 4–12, Nat'l Ass'n Deaf v. Netflix, Inc., No. 3:11-cv-30168 (D. Mass. May 15, 2012), https://www.ada.gov/briefs/netflix_SOI.pdf [https://perma.cc/7KMN-2MYG] (arguing that Netflix's website is subject to Title III).

56. In 2017, the administration placed the web rulemaking on its inactive list. Office of Info. & Reg. Affairs, *Unified Agenda of Regulatory and Deregulatory Actions*, REGINFO.GOV, https://www.reginfo.gov/public/jsp/eAgenda/InactiveRINs_2017_Agenda_Update.pdf [https://perma.cc/UN8B-6Q6J].

57. Department of Justice: Semiannual Regulatory Agenda, 83 Fed. Reg. 1890, 1890–91 (Jan. 12, 2018), https://www.govinfo.gov/content/pkg/FR-2018-01-12/pdf/2017-28223.pdf [https://perma.cc/D2Z2-CNXJ]. DOJ explained the withdrawal without addressing the substance of the split in a vague letter to Representative Ted Budd. Letter from Stephen E. Boyd, Assistant Attorney Gen., to Rep. Ted Budd (Sep. 25, 2018), https://www.adatitleiii.com/wp-content/uploads/sites/121/2018/10/DOJ-letter-to-congress.pdf [https://perma.cc/4LDZ-RZ2H].

58. *See* Areheart & Stein, *supra* note 8, at 453 n.23 (noting that the pre-2015 "legal scholarship to address this issue consists of student notes that invoke valuable doctrine, but are in want of normative grounding or of broader implication").

under Title III,[59] though some have argued in favor of either requiring a nexus from a website to a physical location[60] or limiting Title III's application to physical sites.[61]

While few scholars have made a broader normative case for applying the ADA to the Internet,[62] some recent scholarship has sought to articulate a theory for Internet accessibility rooted in terms of civil and human rights, including the UN Convention

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59. *E.g.*, Burgdorf, *supra* note 54, at 285–86 (arguing that standalone websites should be covered); Carrie L. Kiedrowski, *The Applicability of the ADA to Private Internet Web Sites*, 49 CLEV. ST. L. REV. 719, 723 (2001) (same); Jeffrey Scott Ranen, *Was Blind but Now I See: The Argument for ADA Applicability to the Internet*, 22 B.C. THIRD WORLD L.J. 389, 391–92 (2002) (same); Adam M. Schloss, *Web-Sight for Visually-Disabled People: Does Title III of the Americans with Disabilities Act Apply to Internet Websites?*, 35 COLUM. J.L. & SOC. PROBS. 35, 49–50 (2001) (same); *see also* Colin Crawford, *Cyber*place*: Defining a Right to Internet Access Through Public Accommodation Law*, 76 TEMP. L. REV. 225, 234 (2003) (criticizing "highly location-bound conceptions of public accommodation law" as "both wrong-headed and out of step with the historical development and purposes of public accommodation law."); Senator Tom Harkin, *The Americans with Disabilities Act Ten Years Later: A Framework for the Future*, 85 IOWA L. REV. 1575, 1578–79 (2000) (suggesting a broad application of the ADA to the web); Matthew A. Stowe, *Interpreting "Place of Public Accommodation" Under Title III of the ADA: A Technical Determination with Potentially Broad Civil Rights Implications*, 50 DUKE L.J. 297, 326–27 (2000) (lauding the *Doe* court's decision to "tak[e] the emphasis off the physicality of 'places of public accommodation"); Tara E. Thompson, *Locating Discrimination: Interactive Web Sites as Public Accommodations Under Title II of the Civil Rights Act,* 2002 U. CHI. LEGAL F. 409 (2002).

60. *E.g.*, Michael Goldfarb, Access Now, Inc. v. Southwest Airlines, Co.*—Using the "Nexus" Approach to Determine Whether a Website Should be Governed by the Americans with Disabilities Act*, 79 ST. JOHN'S L. REV. 1313, 1317 (2005) (arguing for applying the nexus approach); Richard E. Moberly, *The Americans with Disabilities Act in Cyberspace: Applying the "Nexus" Approach to Private Internet Websites*, 55 MERCER L. REV. 963, 978–79 (2004) (same); *see also* Michael P. Anderson, *Ensuring Equal Access to the Internet for the Elderly: The Need to Amend Title III of the ADA*, 19 ELDER L.J. 159, 181 (2011) (acknowledging the nexus test but recommending amending the ADA to broaden Title III's reach); Jonathan Bick, *Americans with Disabilities Act and the Internet*, 10 ALB. L.J. SCI. & TECH. 205, 225 (2000) (discussing the possibility of the nexus test); *see also* Samuel H. Ruddy, *Websites, Apps, Accessibility, and Extraterritoriality Under Title III of the Americans with Disabilities Act*, 108 GEO. L. J. ONLINE 80, 101–02 (2019) (arguing that the nexus requirement should also apply to the data centers in which websites are hosted to address extraterritoriality considerations).

61. *E.g.*, Ali Abrar & Kerry J. Dingle, *From Madness to Method: The Americans with Disabilities Act Meets the Internet*, 44 HARV. C.R.-C.L. L. REV. 133, 136 (2009) (suggesting rejecting the nexus test in favor of a text-based vs. "media-rich" content test); Michael O. Finnigan, Jr., Brian C. Griffith & Heather M. Lutz, *Accommodating Cyberspace: Application of the Americans with Disabilities Act to the Internet*, 75 U. CIN. L. REV. 1795, 1825 (2007) (arguing that Title III should apply only to physical places); Goldman, *supra* note 12; Paul Taylor, *The Americans with Disabilities Act and the Internet*, 7 B.U. J. SCI. & TECH. L. 26, 51 (2001) (suggesting "carefully addressing the potential pitfalls" of applying Title III to website).

62. Areheart & Stein, *supra* note 8, at 453 n.23; *see also* Michael Waterstone, *The Untold Story of the Rest of the Americans with Disabilities Act*, 58 VAND. L. REV. 1807, 1811–12 (2005) (noting that the majority of "high-profile" disability scholarship is focused on Title I of the ADA).

on the Rights of Persons with Disabilities (CRPD)[63] and First Amendment values of freedom of information, democratic self-governance, personal autonomy, and self-expression.[64] But that theory, too, has expressly equated *Internet* accessibility with *website* accessibility.[65] Bradley Areheart and Michael Stein specifically declare in *Integrating the Internet* that their version of "'Internet accessibility' . . . is principally concerned with the opportunity to traverse and navigate the Internet, which means *mediating and utilizing the Internet's constituent websites.*"[66] Victoria Ekstrand acknowledges the importance of Internet accessibility in other contexts, such as devices and networks, but declares the proliferation of cases under Title III warrants a specific focus on websites.[67] Peter Blanck likewise speaks primarily to the importance of making "web content" accessible.[68]

Likewise, recent Internet accessibility scholarship has advocated for web accessibility in explicitly place-centric terms, even beyond those imposed by Title III itself. Areheart and Stein argue in *Integrating the Internet* that the ADA should be interpreted broadly to cover the Internet by channeling disability pioneer Jacobus tenBroek's seminal (and pre-ADA) right "to live in the world" to a right to "live in the Internet."[69] Areheart and Stein argue that "[f]or a growing number of people, the Internet is their world—*a place* where one can do nearly everything one needs or wants to do."[70] Ekstrand argues that "the Internet serves as another important place of public accommodation for disabled citizens," citing the Supreme Court's holding

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63. Convention on the Rights of Persons with Disabilities art. 21, Dec. 13, 2006, 2515 U.N.T.S. 44910 (requiring member states to "take all appropriate measures to ensure that persons with disabilities can exercise the right to freedom of expression and opinion, including the freedom to seek, receive and impart information and ideas on an equal basis with others and through all forms of communication of their choice," including "urging private entities" and "encouraging the mass media" to make their information and services accessible, "including through the Internet").

64. *See* BLANCK, *supra* note 7, at 33–45 (casting Internet accessibility in terms of human rights, freedom to information, and the democratic values of the First Amendment); Areheart & Stein, *supra* note 8, at 476 (casting Internet accessibility as a normative function of the Civil Rights Act of 1964 and the First Amendment values of democratic self-governance, personal autonomy, and self-expression); Victoria Smith Ekstrand, *Democratic Governance, Self-Fulfillment and Disability: Web Accessibility Under the Americans with Disabilities Act and the First Amendment*, 22 COMM. L. & POL'Y 427, 430 (2017). *But cf.* Gottfried v. FCC, 655 F.2d 297, 311 n.54, 312 (D.C. Cir. 1981), *rev'd in part sub nom.* Cmty. Television v. Gottfried, 459 U.S. 498 (1983) (rejecting the notion that the First Amendment affirmatively required television stations to include closed captions with their broadcasts).

65. *But cf.* Joshua Newton, *Virtually Enabled: How Title III of the Americans with Disabilities Act Might Be Applied to Online Virtual Worlds*, 62 FED. COMM. L.J. 183 (2010) (arguing for the application of Title III to non-web virtual worlds).

66. Areheart & Stein, *supra* note 8, at 452 n.20 (emphasis added).

67. Ekstrand, *supra* note 64, at 430.

68. BLANCK, *supra* note 5, at 14–15.

69. Areheart & Stein, *supra* note 8, at 456–57 (citing tenBroek, *supra* note 19, at 843, 847–48).

70. *Id.* at 456, 458 (emphasis added) (criticizing the "digital architectural barriers [that] are springing up every day to undermine Title III's normative social integration mandate."). *But see* Burgdorf, *supra* note 54, at 284–85 ("From my perspective, the overemphasis on 'place' in Title III [web cases] is misplaced.").

in *Packingham v. North Carolina* that websites are "the principal sources for . . . speaking and listening in the modern public square."[71] Blanck similarly points to the Supreme Court's description of the web as a "sprawling mall offering goods and services" in *Reno v. ACLU* as an "encouraging" metaphor for resolving Title III's applicability to websites.[72]

Both litigation and academic efforts to address Internet accessibility have consistently cast the web as a proxy for the Internet and conceptualized websites as places under the meaning of Title III. In the next Part, I position Title III in the context of Internet law's internal/external perspectives literature to unpack the consequences of disability advocates' and scholars' place- and website-centric approach.

II. INTERNAL/EXTERNAL PERSPECTIVES ON INTERNET ACCESSIBILITY: WEBSITE-CENTRISM VS. LAYER-CONSCIOUSNESS

The metaphysical place-ness of websites, driven by the website-centricity of prevailing approaches to Title III, has emerged as perhaps the most critical question of the ADA's applicability to the Internet. However, the question of place is not a novel one to Internet-law scholars, who routinely confront similar questions in a variety of bodies of law. Internet-law scholars have framed questions of the Internet's place-ness in terms of internal and external *perspectives*.

In this Part, I begin by introducing the perspectives literature and explaining why the prevailing place- and website-centric approach to Title III is properly understood as an internal perspective—and why such a perspective is both doctrinally and normatively justified. I turn, however, to considering what an internal perspective on Internet accessibility leaves out—namely, a framework for addressing Internet accessibility beyond websites—and use the external perspective to flesh out a broader framework for addressing Internet accessibility with a broader conception of the Internet's layered architecture.

A. Title III's Place- and Website-Centricity as an Internal Perspective

As Tim Wu notes, "[l]egal thinkers, no strangers to metaphor, took immediately to the idea of Cyberspace as a place" when beginning to confront Internet-law problems in the late 1990s and early 2000s.[73] Julie Cohen explains that, as a result, Internet-law scholars have engaged in a "full-blown debate about the merits of cyberspatial reasoning and rhetoric."[74]

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71. Ekstrand, *supra* note 64, at 435–36 (quoting Packingham v. North Carolina, 137 S. Ct. 1730, 1732 (2017)).

72. BLANCK, *supra* note 5, at 84 (citing Reno v. ACLU, 521 U.S. 844, 853 (1997)) (emphasis added) ("The Web is thus comparable, *from the readers' viewpoint*, to both a vast library including millions of readily available and indexed publications and a sprawling mall offering goods and services.").

73. Timothy Wu, *When Law & the Internet First Met*, 3 GREEN BAG 2D 171, 171 (2000).

74. Julie E. Cohen, *Cyberspace as/and Space*, 107 COLUM. L. REV. 210, 211 (2007). *Compare* Dan Hunter, *Cyberspace as Place and the Tragedy of the Digital Anticommons*, 91 CALIF. L. REV. 439, 446–47 (2003) ("I think of cyberspace as a place. It may be virtual and

Orin Kerr has framed questions of "whether we look to physical reality or virtual reality for guidance" as the problem of *perspective*.[75] These questions arise in the context of examples in computer crime and the Fourth Amendment,[76] the governance

abstract, but I conceive of it as a place nonetheless. Let me be bolder: though you may have never consciously thought about the proposition, you also conceive of cyberspace as a place. Let me go further and suggest that all legislators, judges, and lawyers unconsciously think that cyberspace is a place, even though at times they may argue vehemently that it is not."), *and* Kevin Werbach, *The Song Remains the Same: What Cyberlaw Might Teach the Next Internet Economy*, 69 FLA. L. REV. 887, 945–46 (2017) (criticizing the dichotomy between virtual and physical interactions), *with* Mark A. Lemley, *Place and Cyberspace*, 91 CALIF. L. REV. 521, 523 (2003) ("As a technical matter, of course, the idea that the Internet is literally a place in which people travel is not only wrong but faintly ludicrous. No one is 'in' cyberspace. The Internet is merely a simple computer protocol, a piece of code that permits computer users to transmit data between their computers using existing communications networks."), *and* Jacqueline D. Lipton, *Law of the Intermediated Information Exchange*, 64 FLA. L. REV. 1337, 1342 (2012) ("[A]ll online conduct involves information exchange as opposed to physical contact"). *See also* LAWRENCE LESSIG, CODE VERSION 2.0, at 83–119 (2006) (grappling broadly with questions of the nature of "cyberspace"); MOBILE TECHNOLOGY AND PLACE 3–25 (Rowan Wilken & Gerard Goggin eds., 2012) (discussing the concept of place in the context of media studies).

75. Orin S. Kerr, *The Problem of Perspective in Internet Law*, 91 GEO. L.J. 357, 357 (2003); *see also* Stephanie A. Gore, *"A Rose by Any Other Name": Judicial Use of Metaphors for New Technologies*, 2003 U. ILL. J.L. TECH. & POL'Y 403, 416 (2003); Lyria Bennett Moses, *Recurring Dilemmas: The Law's Race to Keep up with Technological Change*, 2007 U. ILL. J.L. TECH. & POL'Y 239, 255–56 (2007).

76. *E.g.*, Orin S. Kerr, *The Fourth Amendment and New Technologies: Constitutional Myths and the Case for Caution*, 102 MICH. L. REV. 801, 875–76 (2004); Orin S. Kerr, *Cybercrime's Scope: Interpreting "Access" and "Authorization" in Computer Misuse Statutes*, 78 N.Y.U. L. REV. 1596, 1619–20 (2003); Kerr, *supra* note 75, at 364–71; Deirdre K. Mulligan, *Reasonable Expectations in Electronic Communications: A Critical Perspective on the Electronic Communications Privacy Act*, 72 GEO. WASH. L. REV. 1557, 1571–72 (2004); *see also* F. Gregory Lastowka & Dan Hunter, *Virtual Crimes*, 49 N.Y.L. SCH. L. REV. 293, 296 (2005).

of virtual worlds[77] and virtual reality,[78] the law of robotics,[79] intellectual property law,[80] privacy law,[81] and even Internet taxation law.[82]

Kerr's critical insight, which has framed much of this debate, is to divide perspectives of the Internet into a dichotomy of *internal* and *external* perspectives.[83] The internal perspective "adopts the point of view of a user who is logged on to the Internet and chooses to accept the virtual world of cyberspace as a legitimate construct," while the external perspective "adopts the viewpoint of an outsider concerned with the functioning of the network in the physical world rather than the perceptions of a user."[84] From the internal perspective, "a computer connected to the Internet provides a window to a virtual world that is roughly analogous to the physical world of real space."[85] From the external perspective:

> [T]he Internet is simply a network of computers located around the world and connected by wires and cables. The hardware sends, stores, and receives communications using a series of common protocols. Keyboards provide sources of input to the network, and monitors provide destinations for output. When the Internet runs properly, trillions of zeros and ones zip around the world, sending and receiving communications that the computers connected to the network can translate into commands, text, sound, and pictures.[86]

Kerr concludes that the choice between the internal and external perspectives is often outcome-determinative when we apply the law to a scenario on the Internet.[87] That is, choosing to evaluate a situation from a user's perspective may lead to different

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77. *E.g.*, F. Gregory Lastowka & Dan Hunter, *The Laws of the Virtual Worlds*, 92 CALIF. L. REV. 1, 12 (2004); Nicolas Suzor, *The Role of the Rule of Law in Virtual Communities*, 25 BERKELEY TECH. L.J. 1817, 1842 (2010); Gilad Yadin, *Virtual Reality Surveillance*, 35 CARDOZO ARTS & ENT. L.J. 707, 732–38 (2017).

78. *E.g.*, Mark A. Lemley & Eugene Volokh, *Law, Virtual Reality, and Augmented Reality*, 166 U. PA. L. REV. 1051, 1080–81 (2018); Gilad Yadin, *Virtual Reality Exceptionalism*, 20 VAND. J. ENT. & TECH. L. 839, 874 (2018); Gilad Yadin, *Virtual Reality Intrusion*, 53 WILLAMETTE L. REV. 63, 99 (2016).

79. *E.g.*, Ryan Calo, *Robotics and the Lessons of Cyberlaw*, 103 CALIF. L. REV. 513, 545 (2015).

80. *E.g.*, Candidus Dougherty & Greg Lastowka, *Virtual Trademarks*, 24 SANTA CLARA COMPUTER & HIGH TECH. L.J. 749, 814–15 (2008).

81. *E.g.*, Ryan Calo, *Robots as Legal Metaphors*, 30 HARV. J.L. & TECH. 209, 213–14 (2016); M. Ryan Calo, *The Boundaries of Privacy Harm*, 86 IND. L.J. 1131, 1161 (2011); Jonathon W. Penney, *Privacy and the New Virtualism*, 10 YALE J.L. & TECH. 194, 229–30 (2008).

82. Bryan T. Camp, *The Play's the Thing: A Theory of Taxing Virtual Worlds*, 59 HASTINGS L.J. 1, 44 (2007).

83. Kerr, *supra* note 75, at 359–60.

84. *Id.*

85. *Id.*

86. *Id.* at 360 (footnotes omitted).

87. *Id.* at 362.

legal results than evaluating the same situation from a perspective that views the Internet literally in terms of its constituent computers, wires, and so forth.[88]

While the debate has never been firmly resolved by Internet-law scholars, the prevailing approaches of disability advocates and scholars to Internet accessibility have a plainly internal perspective on the Internet. The reason for the embrace of the internal perspective by pro-accessibility advocates and scholars is driven in part by Title III doctrine, where, consistent with Kerr's thesis, perspective is outcome-determinative. Indeed, the sides of the circuit split on Title III website cases discussed in the previous Part fit neatly into the internal/external dichotomy. The cases where courts are willing to recognize standalone websites as places of public accommodation necessarily invoke an internal perspective, giving primacy to the user's experience of the website as a metaphysical "place" subject to Title III's requirements.[89] Conversely, the cases that require a nexus between a website and a physical place to invoke Title III, as well as those cases that reject entirely the notion that a website can be subject to Title III, necessarily invoke an external perspective, giving primacy to the fact that a website is not literally a physical place and considering it under the law only to the extent it is directly tied to a physical place, or not at all.[90]

In this light, disability law advocates and scholars are justified in taking an internal, place-centric perspective *at least* because it has yielded positive results in cases involving standalone websites. That is, Title III's scope—places of public accommodation—has created path determinacy, effectively requiring advocates to adopt an internal, place-centric perspective to win website accessibility cases.

Disability scholars also raise compelling normative reasons for adopting an internal, place-centric perspective on Internet accessibility. Areheart and Stein's "right to live in the Internet" is inherently personal and focused on the lived experience of people with disabilities.[91] How the Internet works, mechanically or physically speaking, is much less important than the fact that websites are an "indispensable part of day-to-day life in the modern world" through which a person conducts all their "[c]ore life activities such as commerce, education, employment, personal relationships, and recreation."[92] Blanck likewise argues that the application of the ADA to the Internet "[m]ore than any other means ever conceived . . . holds the promise to advance integrationalism and participation" and that, for people with disabilities, the "community enfranchisement [of Internet accessibility] constitutes tangible engagement and connection with others."[93] Ekstrand argues for conceiving the ADA in terms of the right of "people with disabilities [to] speak, gather, organize and know each other in virtual space."[94] And disability scholars have also identified good reasons to reject an external perspective on Internet accessibility—for example, Paul Jaeger argues for putting "more emphasis on human-focused arguments for

88. *See id.*

89. *See supra* notes 42–44, 46–51 and accompanying text.

90. *See supra* notes 42–44, 46–51 and accompanying text.

91. Areheart & Stein, *supra* note 8, at 456–58.

92. *Id.* Of course, how the Internet works may be outcome determinative of its accessibility.

93. BLANCK, *supra* note 5, at 40–41.

94. Ekstrand, *supra* note 64, at 430–31.

accessibility" because "[l]egal and technical standards are too distant and inhuman to capture the very profound personal impacts of inaccessibility on people with disabilities."[95]

The doctrinal contours of Title III and normative importance of focusing specifically on the lived experience of people with disabilities understandably counsel toward adopting an internal perspective and rejecting an external one. In the context of advocating for Title III's applicability to websites, an internal perspective may be truly mutually exclusive with an external one—that is, Title III effectively forces advocates and scholars to view Internet accessibility through an internal lens, or incur substantial risk of losing Title III website cases and undervaluing the rights of people with disabilities that are at the heart of the ADA.

Thus, I agree with disability law scholars and advocates about the doctrinal need to approach the application of Title III to the Internet through an internal perspective focused on websites—and the normative need to consider an internal perspective to Internet accessibility more generally. However, as I explain in the next Section, there are good reasons for pro-accessibility advocates and scholars to augment this internal perspective with an external one.

B. Layer-Consciousness as an External Perspective

As the previous Section describes, there are compelling reasons to maintain an internal perspective in promoting Internet accessibility and doctrinally considering Title III's application to the Internet. However, some Internet-law scholars have rejected the need to choose between internal and external perspectives.[96] Brett Frischmann, for example, argues that both internal and external perspectives are "descriptively valid and real" and "yield important insights about the facts of the Internet and the interests at stake."[97] Frischmann also argues that focusing on a single perspective risks "mask[ing] important policy decisions in the rhetoric of metaphor and factual analogy."[98] Jonathon Penney likewise urges a less hierarchical approach to perspective that focuses on internal concerns but is also willing to consider external concerns.[99]

In that spirit, it is worth acknowledging a key drawback of the place-centric internal perspective for Internet accessibility: it has focused much disability law jurisprudence and scholarship on the aspects of the Internet that are most readily amenable to the place metaphor—namely, websites. This is because websites can be

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95. Paul T. Jaeger, *Disability, Human Rights, and Social Justice: The Ongoing Struggle for Online Accessibility and Equality*, FIRST MONDAY (Sept. 7, 2015), https://uncommonculture.org/ojs/index.php/fm/article/view/6164/4898 [https://perma.cc/6ZN9-L3WL].

96. *E.g.*, Brett M. Frischmann, *The Prospect of Reconciling Internet and Cyberspace*, 35 LOY. U. CHI. L.J. 205 (2003); Penney, *supra* note 81. *But see* Cohen, *supra* note 74, at 226 ("[R]esistance to spatialization persists . . . largely because of misunderstandings about both the kind of spatiality that the 'cyberspace' metaphor expresses and the processes by which the metaphor operates.").

97. Frischmann, *supra* note 96, at 207.

98. *Id.* at 208.

99. Penney, *supra* note 81, at 204.

colloquially understood even by non-tech-savvy judges and policymakers as "places" that an Internet user "visits."[100]

But an external perspective reveals that the Internet is much more than a collection of websites. The goal of Internet accessibility embraced by disability scholars and arguably embodied in at least the spirit of the ADA, and perhaps its letter, is to make the entirety of the content, interactions, and functionality of the Internet—not just websites—accessible to and usable by people with disabilities. In this Section, then, I use an external perspective to illuminate several contexts in which Internet-enabled technology manifests outside the bounds of websites, turning in the next Part to the implications for Internet accessibility.

As early as 1999, before the Title III website battles had begun in earnest, Tim Wu critiqued the prevailing singular, web-centric conception of the Internet as "too small to capture the dramatic diversity" of the early Internet.[101] The World Wide Web—the collection of websites that adhere to standards developed by the World Wide Web Consortium—is only one *application* on the Internet, which, even in 1999, supported numerous others including e-mail, instant messaging and chat, remote administration of computers, file transfer, Usenet (a collection of discussion forums), MUDs (multiuser dungeons—early network-enabled multiplayer video games), and more.[102] Today, Internet users can access a wide variety of Internet-enabled applications, from streaming video and audio, to elaborate massively multiplayer online games and virtual worlds, to real-time navigation, to voice and video communication, to electronic books, to virtual and augmented reality.

From an external perspective, just as the World Wide Web (and its constituent websites) is only one of the many applications enabled by the Internet, making *websites* accessible to people who rely on screen readers represents only one of the many challenges entailed in making the whole of the *Internet* accessible. While questions remain about the application of Title III to websites,[103] a place-centric conceptualization of Title III that treats websites as places of public accommodation under the ADA leaves unanswered questions about making the whole range of Internet applications accessible—many of which might in turn be amenable to an internal, place-centric application of Title III. In this light, a framework capable of illuminating the constituent parts of the Internet in a more granular fashion is necessary.

As a starting point, it is helpful to consider the wide variety of Internet-enabled applications available today. That proliferation is no accident, but a function of the deliberate, normative goal expressed in the "end-to-end" network design argument of Internet pioneers Jerome Saltzer, David Reed, and David Clark.[104] The goal of the end-to-end principle, motivated in part by a desire to avoid AT&T's iron-fisted control over the telephone system, was to leave application intelligence at the

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100. *See, e.g.*, Timothy Wu, *Application-Centered Internet Analysis*, 85 VA. L. REV. 1163, 1176 (1999) (discussing the conception that "a user actively 'goes out and visits' websites").

101. *Id.* at 1163.

102. *Id.* at 1169.

103. *See supra* notes 47–61 and accompanying text.

104. *See* Wu, *supra* note 100, at 1164–65 (citing J. H. Saltzer, D. P. Reed & D. D. Clark, *End-to-End Arguments in System Design*, 2 ACM TRANSACTIONS ON COMPUTER SYSTEMS 277 (1984)).

endpoints of a network, leaving to the network itself no more than the job of carrying application data from one point to another.[105]

As a result, the modern Internet uses a layered design where, in oversimplified terms, arbitrary applications can ride atop a set of common basic data transmission protocols (most famously, the Internet Protocol (IP)) which in turn, can be used to encapsulate data for transmission across any number of arbitrary, interconnected physical networks—whether coaxial cable networks, the copper telephone network, fiber-optic cable networks, or terrestrial or satellite wireless networks.[106] In other words, the Internet Protocol, administered by Internet access service, backbone, and other providers, serves as a digital common language for any user on the Internet to use any application—whether sending an e-mail, requesting the contents of a website, or downloading a file—to communicate with any other user on the Internet, with both users having the flexibility to use any Internet access provider with the comfort of knowing that the "network of networks" will ultimately convey the communication from one endpoint to the other. This layered architecture has resulted in what Jonathan Zittrain has termed "generativity"—the Internet's "capacity to produce unanticipated change through unfiltered contributions from broad and varied audiences."[107] These contributions materialize in the aforementioned proliferation of applications.[108]

Multiple generations of Internet-law scholars have advocated for addressing societal problems on the Internet with a nuanced understanding of this layered architecture.[109] Though the full implications of the layered model (and the conception

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105. *See* Saltzer et al., *supra* note 104.

106. *See* D. Waitzman, *A Standard for the Transmission of IP Datagrams on Avian Carriers*, RFC EDITOR (Apr. 1, 1990), https://tools.ietf.org/html/rfc1149 [https://perma.cc/JG7W-WEG3] (explaining, tongue-in-cheek, how Internet Protocol packets can be transmitted by printing their contents on scrolls of paper secured to the legs of birds, then removed and scanned by a recipient).

107. JONATHAN ZITTRAIN, THE FUTURE OF THE INTERNET—AND HOW TO STOP IT 70–71 (2007); *see also* James Grimmelmann & Paul Ohm, *Dr. Generative Or: How I Learned to Stop Worrying and Love the iPhone*, 69 MD. L. REV. 910, 926 (2010) (noting the importance of generativity on computers connected to the Internet).

108. *See* ZITTRAIN, *supra* note 107, at 70–71.

109. *See, e.g.*, DAVID POST, IN SEARCH OF JEFFERSON'S MOOSE: NOTES ON THE STATE OF CYBERSPACE (2009); BARBARA VAN SCHEWICK, INTERNET ARCHITECTURE AND INNOVATION (2010); ZITTRAIN, *supra* note 107; Yochai Benkler, *From Consumers to Users: Shifting the Deeper Structures of Regulation Toward Sustainable Commons and User Access*, 52 FED. COMM. L.J. 561, 561–63 (2000); John Blevins, *The New Scarcity: A First Amendment Framework for Regulating Access to Digital Media Platforms*, 79 TENN. L. REV. 353 (2012); Annemarie Bridy, *Remediating Social Media: A Layer-Conscious Approach*, 24 B.U. J. SCI. & TECH. L. 193 (2018); Susan P. Crawford, *The Internet and the Project of Communications Law*, 55 UCLA L. REV. 359 (2007); Mark A. Lemley & Lawrence Lessig, *The End of End-to-End: Preserving the Architecture of the Internet in the Broadband Era*, 48 UCLA L. REV. 925 (2001); Lawrence Lessig, *The Law of the Horse: What Cyberlaw Might Teach*, 113 HARV. L. REV. 501, 519 (1999); Lawrence B. Solum & Minn Chung, *The Layers Principle: Internet Architecture and the Law*, 79 NOTRE DAME L. REV. 815 (2004); Kevin Werbach, *Breaking the Ice: Rethinking Telecommunications Law for the Digital Age*, 4 J. ON TELECOMM. & HIGH TECH. L. 59 (2005); Kevin Werbach, *A Layered Model for Internet Policy*, 1 J. ON TELECOMM.

of the layers themselves) are hotly debated and beyond the scope of this Article, three insights are worth noting for the purposes of accessibility law: the principles of layer separation, minimizing layer crossing, and application-centered analysis.

First, as Larry Solum and Minn Chung have emphasized, the layered architecture of the Internet is not merely a description of the Internet, but a normative manifestation of the end-to-end principle—that is, the Internet not only *is* layered, but was *designed to be and should remain so*.[110] Second, as a result, Solum and Chung argue, regulatory regimes governing the Internet should, where possible, respect and maintain the layered architecture of the Internet by targeting regulations directly at the layers where problems occur—what Solum and Chung call the principle of layer separation.[111] Where that is impossible, regulatory regimes should target regulations as proximately as possible to those problems—what Solum and Chung call the principle of minimizing layer crossing.[112] As I explain in the next Part, these principles are important considerations for Internet accessibility because they counsel toward both ensuring a full accounting of accessibility problems across the full scope of the Internet and strive to ensure that people with disabilities can access Internet technologies of their own choosing on their own terms rather than being relegated to an isolated "accessible" subset of the Internet—though they are challenged by the economics of making applications and content accessible at scale.[113]

Third, Wu and others make clear that the panoply of Internet-enabled applications vary widely in terms of their social salience and attendant problems.[114] As a result, different applications require different analytical frames and the problems those frames reveal require different interventions—what Wu terms "application-centered analysis."[115] As I explain in the next Part, accessibility issues manifest in

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& HIGH TECH. L. 37 (2002); Wu, *supra* note 100; Christopher S. Yoo, *Protocol Layering and Internet Policy*, 161 U. PA. L. REV. 1707 (2013).

110. Solum & Chung, *supra* note 109, at 849–51.

111. *Id.* at 851.

112. *Id.* at 852. However, some technical scholars have challenged the normative underpinnings of the Internet's layered model and argued for affording system designers and engineers the ability to cross layers. *E.g.*, Robert Braden, Ted Faber & Mark Handley, *From Protocol Stack to Protocol Heap—Role-Based Architecture*, 33 ACM SIGCOMM COMPUTER COMM. REV. 17, 17–22 (2003); Vikas Kawadia & P. R. Kumar, *A Cautionary Perspective on Cross-Layer Design*, 12 IEEE WIRELESS COMMS. 3 (2005), http://manet.eurecom.fr/kawadia.pdf [https://perma.cc/QJ4T-NY6S]; Robert Surton, *Network Stacking Considered Harmful*, PROCEEDINGS OF THE ACM INT'L CONFER. ON COMPUTING FRONTIERS (2013), http://dx.doi.org/10.1145/2482767.2482780 [https://perma.cc/T5ZL-K4VG]; David L. Tennenhouse, *Layered Multiplexing Considered Harmful*, U. CAMBRIDGE: DIGITAL COMM. I (1989), https://www.cl.cam.ac.uk/teaching/0708/DigiCommI/tennenhouse1989layered.pdf [https://perma.cc/2REB-7TC4].

113. *See infra* Part. III

114. *See* Jack M. Balkin, *The Path of Robotics Law*, 6 CALIF. L. REV. CIRCUIT 45, 46 (2015) ("When we consider how a new technology affects law, our focus should not be on what is essential about the technology but on what features of social life the technology makes newly salient."); Wu, *supra* note 100, at 1164.

115. Wu, *supra* note 100; *see also* Lessig, *supra* note 109, at 519.

significantly different ways across different applications that warrant different interventions.

The principles of layer separation, minimizing layer crossing, and application-centered analysis demand a more concrete account of the relevant layers. Though more specific models describe in detail how traffic flows over the Internet,[116] Internet-law scholars have frequently invoked a simplified model with four distinct layers, visualized vertically and adjacently in a "stack" format (the "layer stack"), which are worth contemplating for the purpose of Internet accessibility:[117]

> 1. The distinct *content layer* articulated by Yochai Benkler and others,[118] which disentangles the individual pieces of content transmitted within each application—the individual websites (content) comprising the World Wide Web (application), the individual articles (content) comprising Wikipedia (application), the individual messages (content) sent via e-mail (application), the individual videos (content) served up via a streaming video service (application), and so on.
>
> 2. The *application layer* emphasized by Wu, encapsulating the various applications that facilitate the delivery of content to and from users—streaming video, e-mail, instant messaging, VoIP, etc.—with which users interact.
>
> 3. The *network (protocol) layer*, primarily encapsulating the Internet Protocol and related protocols that structure the underlying transmissions required to operate the applications, which are administered by Internet access service, backbone, and other network providers.

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116. More formal and complex layer models exist to describe the function of the Internet. One of the earliest and still most-recognized is the seven-layer model articulated by the Open Systems Interconnection (OSI) subcommittee of the International Organization for Standardization (ISO), which divides the Internet into application, presentation, session, transport, network, data link, and physical layers. Hubert Zimmermann, *OSI Reference Model—The ISO Model of Architecture for Open Systems Interconnection*, COM-28 IEEE TRANSACTIONS COMMS. 425, 430 & fig. 13 (Apr. 1980), http://www.ce.uniroma2.it/~lopresti/Didattica/Biss2010/BasicInterntetTCPIP/OSI.pdf [https://perma.cc/UGE3-XV5F]; *see also* RACHELLE MILLER, SANS INST., THE OSI MODEL: AN OVERVIEW (2001), https://www.sans.org/reading-room/whitepapers/standards/osi-model-overview-543 [https://perma.cc/KNP2-MX7W]. J. Pierre de Vries, Ljiljana Simić, Petri Mähönen, and Marina Petrova have proposed reconceptualizing the seven-layer OSI stack as a circle, and adding two additional layers—a "Layer Zero" that encompasses the regulatory regimes governing the implementation of the networking layers and a "Layer Eight" that encompasses businesses and social practices of entities on the network, which in turn inform the Layer Zero regulatory decisions. Ljiljana Simić, Petri Mähönen, Marina Petrova & J. Pierre de Vries, *Illuminating the Road from Engineering and Policy to Radio Regulation* (2012) (unpublished manuscript), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2031656 [https://perma.cc/R3HC-6XAK].

117. *But see* Werbach, *supra* note 109, at 59 (arguing for the importance of the logical and interface layers for policy).

118. Benkler, *supra* note 109, at 561–63.

> 4. The *physical layer*, encapsulating the various types of wired and wireless Internet access services, such as coaxial cable and cable modem technology, digital subscriber line (DSL) for copper telephone wires, and cellular telephone networks, which carry the signals logically described at the network layer and which are deployed and maintained by various types of Internet service providers.

Finally, I posit the important role of *devices*, such as desktop and laptop PCs, smartphones and tablets, speakers with embedded virtual assistants like Amazon's Echo, wearable "smart" clothing, and more—typically referred to as the "Internet of Things."[119] Though generally considered adjacent to the Internet layer stack as a formal matter (and, from a computer organization perspective, often possessing a distinctively layered architecture themselves), Internet-enabled *devices* play a critical role in physically connecting their users to the Internet and enabling them to operate applications and engage with content.[120]

Important accessibility issues arise in and across each of these contexts, which I illustrate in the next Part.

III. A LAYER-CONSCIOUS APPROACH TO INTERNET ACCESSIBILITY

The primary instrumental objective of applying disability law in any context is to address discrimination against people with disabilities by way of accessibility mandates—and the details of those mandates are critical. As Alex Geisinger and Michael Stein have described, the "ambit of protection" of disability law depends on the extent to which the "attendant [regulatory scheme] details precisely what . . . must be altered and how."[121] With the previous Part's insights into questions of perspective in mind, I turn in this Part to augmenting the internal, place- and website-centric perspective of Internet accessibility with an external, layer-conscious view that contemplates what is necessary to ensure accessibility at and across each of the constituent layers of the Internet. This approach is consonant with the approach of Robin Malloy who, borrowing from the Internet-law concept of "network goods," has argued for approaching inclusive design in the context of land use planning with

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119. *See* Scott R. Peppet, *Regulating the Internet of Things: First Steps Toward Managing Discrimination, Privacy, Security, and Consent*, 93 TEX. L. REV. 85 (2014).

120. *See, e.g.*, ZITTRAIN, *supra* note 107, at 69–71; Grimmelmann & Ohm, *supra* note 107, at 926.

121. Alex C. Geisinger & Michael Ashley Stein, *Expressive Law and the Americans with Disabilities Act*, 114 MICH. L. REV. 1061, 1073–74 (2016). Scholars have observed, however, that scholars and courts spent much of the first two decades of the ADA's existence debating the scope of *disabilities* covered under the ADA, and the subsequent enactment of the ADA Amendments Act, which expanded the range of people who are protected by the ADA. BLANCK, *supra* note 5; Mark C. Weber, *Unreasonable Accommodation and Due Hardship*, 62 FLA. L. REV. 1119, 1122 (2010). The appropriate scope of disability coverage is beyond the scope of this Article, though the broad view of Internet accessibility discussed in this Article naturally implies support for accessibility requirements across at least the full range of disabilities covered by the ADA and ADAAA.

an understanding of the network goods, services, businesses, housing, neighborhoods, and civil and cultural activities of cities.[122]

As the foregoing sections of this Article imply, Geisinger and Stein's question of "what"—i.e., the relevant scope of Internet-enabled technology that is or must be covered by disability law—predominates this layer-conscious analysis. As this Part notes throughout, questions of the ultimate scope of Title III arise and must also be augmented by consideration of the role of other titles of the ADA, other disability laws, and other consumer protection laws,[123] particularly the provisions of telecommunications law administered by the Federal Communications Commission.

Geisinger and Stein's question of "how"—the technical details of the changes that accessibility requires, from screen reader compatibility to closed captions to audio description to intermediated relay services to plain-language versions of content—also enters the discussion to some degree,[124] though their technical complexity leaves a complete exploration beyond the scope of this Article. While the Title III cases discussed above are primarily focused on the basic issue of screen reader compatibility with websites, what is required to make the whole Internet accessible to people with a range of disabilities raises a broader set of questions about how to address the accessibility of the wide variety of content, applications, networks, and devices that comprise the Internet. Each of these details—and their causal relationship with enabling people with disabilities to use the corresponding "place of public accommodation," or not—fit neatly in what technology law scholars call "affordances" and "disaffordances" (i.e., how the relationship between a technology and its user facilitates or inhibits particular actions or behaviors by the user).[125]

Most importantly, though, this Part adds to the usual questions of "what" and "how" a significant focus the question of "who"—i.e., which people or entities bear the responsibility for accessibility mandates. While disability scholars and advocates often discuss accessibility in terms of a *right* for people with disabilities, to whom

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122. ROBIN PAUL MALLOY, LAND USE LAW AND DISABILITY 197–200 (Peter Blanck & Robin Paul Malloy eds., 2015).

123. *See generally* Jonathan Lazar, *The Potential Role of US Consumer Protection Laws in Improving Digital Accessibility for People with Disabilities*, 22 U. PA. J.L. & SOC. CHANGE 185 (2019) (discussing the possible roles of consumer protection law).

124. Geisinger and Stein note by way of example that "in the context of a medical provider's examination room, [Title III regulations] mandate[] exact details as to the height of examination tables, the amount of floor space (including wheelchair turning space), the width of doors, and appropriate examination tables, scales, radiographic equipment, lifts and gurneys, and the extent of staff training." Geisinger & Stein, *supra* note 121.

125. *See* Julie Cohen, *Turning Privacy Inside Out*, 20 THEORETICAL INQUIRIES L. 20.1 (forthcoming 2019) (manuscript at 12–13), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3162178 [https://perma.cc/GPN9-9LTD] (citing JAMES J. GIBSON, THE ECOLOGICAL APPROACH TO VISUAL PERCEPTION 127–37 (1979)); *see also* Laurence Diver, *Law as a User: Design, Affordance, and the Technological Mediation of Norms*, 15 SCRIPTED 4 (2018), https://script-ed.org/wp-content/uploads/2018/08/diver.pdf?d=10222019 [https://perma.cc/4VN8-USDA]; Mireille Hildebrandt, *Privacy as Protection of the Incomputable Self: From Agnostic to Agonistic Machine Learning*, 19 THEORETICAL INQUIRIES L. (forthcoming 2019) (manuscript at 2 & 2 n.2), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3081776 [https://perma.cc/7N9P-2746].

the corresponding *duty* belongs is a critical question.[126] While the answer is often the easily identified corporate proprietor of a website in Title III cases, the layered nature of the Internet means that the internal perspective of using an application or experiencing content may obscure that there are multiple actors involved in its provision. Because the question of who bears responsibility for accessibility—whether from a legal, normative, or architectural perspective—is perhaps the most sweeping addition to the usual set of disability law questions, this Part considers the Internet's layers in terms of the categorical actors most likely to be responsible for, and thus able to effectuate accessibility at, each layer of the stack.[127]

Accordingly, this Part aims to disentangle the application and content layers, which are often conflated in Title III scholarship and litigation, by first exploring the distinction between individual websites and the broader World Wide Web. It then turns to the underappreciated role of web hosting *applications* in making website *content* accessible. Moving beyond the web, it turns to the set of dominant platforms that intermediate the provision of content in a variety of applications beyond the web. This Part closes with a discussion of accessibility considerations specific to Internet service providers at the network and physical layers and devices that comprise the so-called Internet of Things.

A. Disentangling Content and Application: Website vs. Web Accessibility

Superficially, Title III website cases are relatively simple matters of imposing straightforward regulations on easy-to-identify entities operating discrete, self-contained applications. Most cases that successfully overcome Title III's websites-as-places barrier require the sole proprietor of a self-contained website, such as a restaurant chain providing menu information[128] or the ability to place delivery orders

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126. Jurisprudence scholars discuss these types of corresponding rights and duties as Hohfeldian "correlatives." *See* Wesley N. Hohfeld, *Fundamental Legal Conceptions as Applied in Judicial Reasoning*, YALE FAC. SCHOLARSHIP SERIES 710, 717 (1917), https://digitalcommons.law.yale.edu/cgi/viewcontent.cgi?article=5383&context=fss_papers [https://perma.cc/UCL5-VP68]. *See generally* Nikolai Lazarev, *Hohfeld's Analysis of Rights: An Essential Approach to a Conceptual and Practical Understanding of the Nature of Rights*, 2005 MUR U.E.J.L., http://classic.austlii.edu.au/au/journals/MurUEJL/2005/9.html#Right_T [https://perma.cc/7G86-JUFH] ("To say that X has a legal claim-right means that he is legally protected . . . against Y's withholding of assistance with respect to X's project Z. Conversely, Y, who is . . . required to provide assistance in connection with X's project Z, is under a correlative duty to do so. The correlativity stipulation commands that if X has a claim-right against Y, this entails Y owing a duty to X . . . . He who has the right must be able to pinpoint another person with a correlative duty . . . in terms of . . . assistance."); Pierre Schlag, *How to Do Things with Hohfeld*, 78 LAW & CONTEMP. PROBS. 185, 200 (2015) (describing the relations of jural correlatives).

127. Jacqueline Lipton has described these actors as "Internet intermediaries" who intermediate and facilitate essentially all online experiences. Lipton, *supra* note 74, at 1342–43.

128. *E.g.*, Markett v. Five Guys Enters. LLC, No. 17-cv-788, 2017 WL 5054568, at *1 (S.D.N.Y. July 21, 2017).

online,[129] an online retail store selling goods,[130] or a brick-and-mortar retail store providing a complementary website for its in-store services,[131] to remediate a website's structure to be compatible with screen reader software for users who are blind or visually impaired.[132] The *what*, *who*, and *how* seem on first blush to be relatively simple for these websites—Title III compels their proprietors to make them accessible to blind people.

But even for sole-proprietor websites, the questions of *who* and *how* are more complex, viewed from an external perspective, than they might initially appear from an internal perspective of the user's experience. While individual websites can be conceptualized as discrete *applications*, they can also be conceptualized collectively as the constituent *content* of the *World Wide Web as an application*.[133] While the web is decentralized in the sense that there is no single proprietor of every website, the web is centralized in the sense that websites use a common set of technologies, specified in standards developed by the World Wide Web Consortium (W3C) and other standards-setting organizations. These standards include Hypertext Markup Language (HTML) and Cascading Style Sheets (CSS), which enable the design of the universal web browsers we use to view websites without the need for specialized software specific to individual websites.[134]

The accessibility of individual websites, then, is dependent not only on the architecture implemented by their proprietors, but on the centralized development of standards that facilitate accessibility. The W3C has developed voluntary guidelines for web accessibility, called the Web Content Accessibility Guidelines (WCAG),

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129. *E.g.*, Robles v. Domino's Pizza, LLC, No. CV-16-06599, 2017 WL 1330216, at *1 (C.D. Cal. Mar. 3, 2017), *rev'd* 913 F.3d 898 (9th Cir. 2019), *cert. denied*, 140 S. Ct. 122 (2019).

130. *E.g.*, Andrews v. Blick Art Materials, LLC, 268 F. Supp. 3d 381, 386 (E.D.N.Y. 2017).

131. *E.g.*, Gorecki v. Hobby Lobby Stores, Inc., No. CV-17-1131-JFW, 2017 WL 2957736, at *1 (C.D. Cal. June 15, 2017); Gil v. Winn Dixie Stores, Inc., 242 F. Supp. 3d 1315, 1316 (S.D. Fla. 2017); Nat'l Fed'n of the Blind v. Target Corp., 452 F. Supp. 2d 946, 949–50 (N.D. Cal. 2006).

132. *See also* Feingold, *supra* note 51 (citing various settlement agreements involving integrated entities). *But see* Anderson v. Macy's Inc., No. 2:12-CV-00556, 2012 WL 3155717, at *4 (W.D. Pa. Aug. 2, 2012) (highlighting the complexity of litigation involving related corporate entities that are separately responsible for a company's linked brick-and-mortar and online presences).

133. The etymology of the World Wide Web traces back to Tim Berners-Lee's original WorldWideWeb browser application. Tim Berners-Lee, *The WorldWideWeb Browser*, W3.ORG, https://www.w3.org/People/Berners-Lee/WorldWideWeb.html [https://perma.cc/XFT9-JAJZ].

134. *See generally Standards*, W3C, https://www.w3.org/standards/ [https://perma.cc/RTS3-86Y6].

which generally specify how websites can be developed in a way that is accessible to people with disabilities.[135] The WCAG standards[136] require that websites be:

> 1. *Perceivable* by users with disabilities[137]—for example, by providing text alternatives for images for users who are blind or visually impaired[138] or avoiding the use of color contrasts that cannot be viewed by users who are colorblind;[139]
>
> 2. *Operable* by users with disabilities[140]—for example, by structuring the site to allow navigation with a keyboard so that users who are blind or visually impaired need not use a graphical input mechanism like a mouse[141] and avoiding the use of flashing graphics that might cause seizures for users with epilepsy;[142]
>
> 3. *Understandable* by users with disabilities[143]—for example, by providing a mechanism for identifying definitions of unusual idioms and jargon that may pose difficulty to users with cognitive or intellectual disabilities;[144] and
>
> 4. *Robust* in their compatibility with different assistive technologies.[145]

The standards are divided into three levels of "conformance"—A, AA, and AAA—which include increasingly rigorous requirements.[146]

At the outset, WCAG's governance raises an important disconnect: while the duty of website accessibility under U.S. law at least arguably falls on the proprietors of websites (*qua* places under Title III), the meaning of accessibility across the entire *web* is primarily set, if at all, by an international standards-setting organization that

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135. *See generally* LAZAR ET AL., *supra* note 6, at 60–65; *Web Content Accessibility Guidelines (WCAG) Overview*, W3C, https://www.w3.org/WAI/standards-guidelines/wcag/ [https://perma.cc/YL4W-MUG3]. Though their details are beyond the scope of this Article, the W3C has also developed additional guidelines for User Agents (UAAG) and Accessible Rich Internet Applications (ARIA).

136. For the most recent version of WCAG, see *Web Content Accessibility Guidelines (WCAG) 2.1*, W3C (June 5, 2018), https://www.w3.org/TR/WCAG21/ [https://perma.cc/9LUJ-36MD], though many website accessibility cases refer to the previous version of the standard, *Web Content Accessibility Guidelines (WCAG) 2.0*, W3C (Dec. 11, 2008), https://www.w3.org/TR/WCAG20/ [https://perma.cc/7CR2-QMT2].

137. *Web Content Accessibility Guidelines 2.1 Recommendation* § 1.0, W3C (June 5, 2018), https://www.w3.org/TR/2018/REC-WCAG21-20180605/#perceivable [https://perma.cc/J42V-Y53T].

138. *Id.* § 1.1.

139. *Id.* § 1.4.

140. *Id.* § 2.

141. *Id.* § 2.1.

142. *Id.* § 2.3.

143. *Id.* § 3.

144. *Id.* § 3.1.3.

145. *Id.* § 4.

146. *Id.* § 5.2.1.

is not subject to Title III. That is, the accessibility obligations of websites at the *content* layer are dependent on standards independently developed for the web at the *application* layer by an entity, the W3C, which is never a party to Title III website accessibility litigation.[147]

The role of the WCAG standards has raised nontrivial concerns about *what* exactly is required to make a website legally accessible. For example, the Central District of Florida in *Robles* recently dismissed a complaint against Domino's Pizza on due process grounds because of the lack of clarity on what standards would suffice for web accessibility[148]—though the holding was reversed[149] and other courts have reached the opposite conclusion.[150] The *Robles* district court cited the lack of resolution in the DOJ's now-withdrawn rulemaking for website standards,[151] which specifically raised (but did not resolve) the question of whether and which level of WCAG standards should be formally incorporated into the DOJ's Title III regulations for websites.[152] While advocates have cheered the reversal of *Robles*, the lack of clarity about the extent of WCAG's applicability has hindered the viability and longevity of other Title III victories when questions arise about the standard of conduct that Title III imposes on websites—highly technical questions which generalist federal court judges seem poorly equipped to answer.[153]

Even if WCAG is ultimately able to be incorporated into DOJ's rules and administered by federal courts, questions remain about its suitability. Peter Blanck has criticized reliance on WCAG and other standards alone as insufficient to serve the underlying goal of web "equality" for all people with disabilities, noting in particular that the approach of evaluating website compliance with WCAG standards emphasizes *accessibility* of website content for people with sensory disabilities at the expense of website *usability* for people with cognitive and intellectual disabilities.[154] And WCAG has substantive accessibility shortcomings in the area of *media* accessibility; for example, its standards for the quality of closed captions are substantially less detailed than those of the FCC's detailed regulations for closed captions on television programming.[155]

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147. No Title III cases to date have involved standards-setting bodies as defendants or intervenors, nor is it clear the circumstances under which such a case might arise.

148. Robles v. Domino's Pizza, LLC, No. CV-16-06599, 2017 WL 1330216, at *1, *5 (C.D. Cal. Mar. 3, 2017), *rev'd*, 913 F.3d 898 (9th Cir. 2019), *cert. denied*, 140 S. Ct. 122 (2019).

149. *Domino's Pizza*, 913 F.3d at 902.

150. *E.g.*, Access Now, Inc. v. Blue Apron, LLC, No. 17-CV-116-JL, 2017 WL 5186354, at *9 (D.N.H. Nov. 8, 2017).

151. *Robles*, 2017 WL 1330216, at *5.

152. Nondiscrimination on the Basis of Disability; Accessibility of Web Information and Services of State and Local Government Entities and Public Accommodations, 75 Fed. Reg. 43,460, 43,465 (proposed July 26, 2010) (to be codified at 28 C.F.R. pts. 35 & 36).

153. *See, e.g.*, David Titmus, *Viewers*, *'Queer Eye' Star Bring Caption Quality Concerns to Netflix*, VITAC.COM (July 3, 2018), https://www.vitac.com/viewers-queer-eye-star-bring-caption-quality-concerns-to-netflix/ [https://perma.cc/MUE3-36AN] (raising concerns about the quality of closed captions provided by Netflix under its Title III settlement with the National Association of the Deaf).

154. *See* BLANCK, *supra* note 5, at 45–52.

155. *Compare Web Content Accessibility Guidelines 2.1 Recommendation* § 1.2, W3C

While a full grappling with the governance and substantive advantages and disadvantages of WCAG is beyond the scope of this Article, it suffices to note that in terms of allocating responsibility, focusing Title III and its attendant legal institutions, including the federal courts and the DOJ in a rulemaking and settlement capacity, on the *content* layer of the web may leave significant shortcomings in the contours of the accessibility of the web as an *application*. At most, Title III has supported the importation of WCAG into the ADA—but neither the courts nor DOJ have demonstrated a significant ability to interrogate the suitability of WCAG in serving Title III's goals, to alter and augment the content of WCAG to serve the goal of website accessibility, or to provide sophisticated and muscular enforcement of its terms.[156] However well a place-centric approach to Title III can establish that websites must be accessible, the external perspective of websites as content and the web as an application raises questions about the ability for that approach to address the substance of accessibility requirements at the application layer.

B. Allocating Responsibility on a Platform-Based Web

Setting aside the desire for robust and consistent substantive requirements for accessibility across the web as an application, the internal perspective fostered by Title III's place centricity maintains a temptation to insist on holding individual websites wholly accountable for their accessibility failures. In terms of antidiscrimination theory, that website proprietors may be ignorant about what must be done to make their websites accessible is no less an economically driven choice—and a morally repugnant one—than a choice to knowingly and deliberately exclude people with disabilities from websites.[157]

But the layered architecture of the Internet—and the corresponding involvement of multiple entities in sculpting the user experience—will continue to raise questions about how, as a practical matter, to allocate responsibility and liability among these entities, even if the user is not actively aware that some of them exist and are playing a key role in intermediating the user's experience.[158] These questions are underscored by the reality that the majority of websites are not built from scratch by their

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(June 6, 2018), https://www.w3.org/TR/2018/REC-WCAG21-20180605/#time-based-media [https://perma.cc/EP5X-TZ7T] (providing limited specificity about the provision of captions), *with* 47 C.F.R. § 79.1(j)(2) (2018) (providing detailed standards for accuracy, synchronicity, completeness, and placement of closed captions). *See generally Closed Captioning of Video Programming, Telecommunications for the Deaf and Hard of Hearing, Inc. Petition for Rulemaking*, Report and Order, 29 FCC Rcd. 2221 (2014), https://docs.fcc.gov/public /attachments/FCC-14-12A1.pdf [https://perma.cc/MY7G-M8E9] (implementing the closed captioning standards).

156. *No Web Accessibility Regs? No Excuses*, LAW OFF. LAINEY FEINGOLD (Dec. 28, 2017), https://www.lflegal.com/2017/12/withdrawn-regs/ [https://perma.cc/39D6-J452].

157. *See* Bagenstos, *supra* note 14.

158. *See, e.g.*, Lipton, *supra* note 74, at 1342–43; *cf.* Martin Husovec, *The Promises of Algorithmic Copyright Enforcement: Takedown or Staydown? Which Is Superior? And Why?*, 42 COLUM. J.L. & ARTS 53, 73–80 (2018) (discussing the economics of different models for imposing responsibility on users and intermediaries/platforms in the context of copyright infringement).

proprietors, but instead by customizing elaborate commercial and open-source content management platforms like WordPress, Joomla, Drupal, Squarespace, and Shopify that abstract much of the underlying architecture to allow nontechnical proprietors to develop the content with limited or no knowledge of the code that is generated.[159] If the web can be said to have any centralized points of operational responsibility at the application layer, they are the platforms that serve the majority of the world's websites.

While some accessibility issues with websites hosted by these platforms are dependent on the code and content developed by their proprietors, such as adding alternate text tags to images for use by blind users or captions and other nonaural substitutes to audio content for users who are deaf or hard of hearing, many accessibility issues are rooted in the structure of the platforms themselves, the templates they provide users, and the tools they provide to author website content. The importance of authoring tools is so significant that W3C has developed a separate set of Authoring Tool Accessibility Guidelines (ATAG) aimed at platforms and other authoring tools.[160] ATAG requires platforms to support the production of accessible content by:[161]

> 1. Providing authors with behavioral nudges and facilities to make the content of their websites accessible from the outset[162] and remediate accessibility problems on existing websites.[163]
>
> 2. Making website templates and reusable content, such as stock photos, accessible by default.[164]
>
> 3. Ensuring that automatic authoring processes spit out accessible website code and preserve accessibility information, such as alternate text for images.[165]

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159. Of the top ten million websites, nearly fifty-five percent use a content management system. *Usage of Content Management Systems*, W3TECHS, https://w3techs.com/technologies/overview/content_management/all [https://perma.cc/D6MW-K5U3].

160. *Authoring Tool Accessibility Guidelines (ATAG) Overview*, W3C, https://www.w3.org/WAI/standards-guidelines/atag/ [https://perma.cc/S583-XZ8L] (Sept. 24, 2015). *See* LAZAR ET AL., *supra* note 6, at 65–68 (discussing ATAG); ANGEL ANTKERS, SUSAN MILLER, SOPHIA GALLEHER, BLAKE E. REID & BRIANNA L. SCHOFIELD, AUTHORSHIP AND ACCESSIBILITY IN THE DIGITAL AGE (2018), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3254959 [https://perma.cc/9AN6-2AS3] (discussing the shortcomings and improvement of digital content authoring tools).

161. *Authoring Tool Accessibility Guidelines (ATAG) 2*, W3C (Sept. 25, 2015) [hereinafter ATAG], https://www.w3.org/TR/ATAG20/ [https://perma.cc/3AQS-B76S].

162. *Id.* §§ B.2.1–B.2.3.

163. *Id.* § B.3.

164. *Id.* §§ B.2.4–B.2.5.

165. *Id.* § B.1.

4. Making authoring tools accessible by authors with disabilities[166]—a key step in related efforts to stop the proliferation of the false dichotomy between authors and people with disabilities.[167]

5. Promote the availability of accessibility features.[168]

Despite the development of ATAG, accessibility issues with website hosting platforms remain significant. For example, in 2018, the lead accessibility designer of WordPress, which hosts *more than a third* of the world's ten million most popular websites,[169] publicly resigned in protest because there were "*so many accessibility issues*" in Gutenberg, a newly developed version of WordPress's website editor, that "most testers [examining accessibility and usability issues] refused to look at [it] again."[170] And other leading platforms include in their support documents explicit disclaimers of compliance with website accessibility laws like Title III[171]—effectively seeking to leverage contract law to shift the responsibility for accessibility, at least in a legal sense, to the proprietors of websites that use the platforms.

Though the accessibility on a majority of the world's most popular websites is dependent in significant part on accessibility support of just half a dozen or fewer web hosting platforms, no significant litigation or settlement agreements have yet addressed website platforms. This is the case even though Title III litigation has undoubtedly targeted websites hosted on these platforms, rooted in problems caused by the platforms rather than the platform user/website proprietor.[172]

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166. *Id.* § A.

167. *See* ANTKERS ET AL., *supra* note 160, at 8. *See generally* RESISTANCE AND HOPE: ESSAYS BY DISABLED PEOPLE (Alice Wong ed., 2018), https://disabilityvisibilityproject.com/resist/ [https://perma.cc/PND8-URZ4].

168. *See* ATAG, *supra* note 161, § B.4.1.

169. *Id.*

170. Rian Rietveld, *I Have Resigned as the WordPress Accessibility Team Lead. Here Is Why.*, RIAN RIETVELD (Oct. 9, 2018), https://rianrietveld.com/2018/10/09/i-have-resigned-the-wordpress-accessibility-team/ [https://perma.cc/4LKP-XN3T] (emphasis in original).

171. *See Making Your Squarespace Site More Accessible*, SQUARESPACE, https://support.squarespace.com/hc/en-us/articles/215129127-Making-your-Squarespace-site-more-accessible [https://perma.cc/LR2W-VMEF] (last updated Apr. 8, 2019) ("Squarespace can't provide advice about making your site compliant with specific web accessibility laws or acts."); *Accessibility Statement*, JOOMLA!, https://www.joomla.org/accessibility-statement.html [https://perma.cc/XYX2-SLYJ] ("The Joomla! Project is not responsible for compliance with the standards of accessibility of applications and extensions created with and/or for the Joomla! CMS and Framework."). *But see Accessibility*, DRUPAL, https://www.drupal.org/about/features/accessibility [https://perma.cc/Z97L-PSSD] ("We have committed to ensuring that all features of Drupal core conform with the World Wide Web Consortium (W3C) guidelines."); *Accessibility Policy*, SHOPIFY, https://www.shopify.com/accessibility/policy [https://perma.cc/5HP9-KC5F] ("Shopify is committed to maintaining an accessible environment for persons with disabilities.").

172. *See, e.g.*, HortonGroup, *My Client Got Sued for ADA Compliance, How Compliant Are Your Websites?*, SQUARESPACE (May 10, 2018, 9:28 PM), https://web.archive.org/web/20190906023851/https://answers.squarespace.com/questions/218158/my-client-got-sued-for-ada-compliance-how-complian.html [https://perma.cc/RY5Q-G62G].

The lack of lawsuits against website hosting platforms likely is a dual function of Title III's doctrinal focus on places and the associated internal perspective on the user experience that focus demands. That is, it is unclear to an ordinary user that a website's inaccessibility stems from failures in the codebase of an underlying platform—a platform whose very existence may be unknown to the user. It may well be that Title III will be able to target website platforms as a doctrinal matter, but doing so will require a conception of Title III that goes beyond "places" and addresses the accessibility dimensions of the Internet's *infrastructure*.[173]

C. Application Accessibility Beyond the Web

Allocating responsibility among website proprietors and hosting platforms previews the broader challenge of addressing responsibility for accessibility across the diversity of non-web Internet applications. Since even the early days of the commercial Internet when the web dominated Internet use, the Internet has supported a significant quantity of non-web applications.[174] Today, the most popular of these applications include video streaming, gaming, social media, shopping, file sharing, and instant messaging,[175] the provision of which has come to be dominated by large "platform" companies such as Facebook, Google, Twitter, Netflix, and Amazon.[176]

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173. *Compare* Earll v. Ebay, Inc., 599 F. App'x 695, 696 (9th Cir. 2015) (rejecting Title III's application to eBay's auction platform), Cullen v. Netflix, Inc., 880 F. Supp. 2d 1017, 1024 (N.D. Cal. 2012), Young v. Facebook, Inc., 790 F. Supp. 2d 1110, 1115–16 (N.D. Cal. 2011) (same for Facebook's social media platform), *and* Ouellette v. Viacom, No. CV 10-133-M-DWM-JCL, 2011 WL 1882780, at *4–5 (D. Mont. Mar. 31, 2011) (same for platforms hosted by Google, Myspace, etc.), *with* Nat'l Fed'n of the Blind v. Scribd Inc., 97 F. Supp. 3d 565, 573–74 (D. Vt. 2015), *and* Nat'l Ass'n of the Deaf v. Netflix, Inc., 869 F. Supp. 2d 196, 200 (D. Mass. 2012) (applying Title III to Netflix, a platform for video programming).

174. *See supra* Section II.B.

175. *C.f., e.g.*, SANDVINE, THE GLOBAL INTERNET PHENOMENA REPORT 6 (2018), https://www.sandvine.com/hubfs/downloads/phenomena/2018-phenomena-report.pdf [https://perma.cc/YWB8-22FN] (measuring application popularity in terms of traffic).

176. I use the terms "platforms" and "intermediaries" interchangeably here simply to refer to Internet-enabled applications that intermediate access to content. But Internet law scholars have explored in much more significant depth the definitions of the terms "platform," "intermediary," and related terms. *E.g.*, Julie E. Cohen, *Law for the Platform Economy*, 51 U.C. DAVIS L. REV. 133, 143 (2017) (describing platforms as "represent[ing] infrastructure-based strategies for introducing friction into networks"); Tarleton Gillespie, *Platforms Are Not Intermediaries*, 2 GEO. L. TECH. REV. 198, 201 (2018) (describing the essential quality of platforms as offering moderation of content); Tarleton Gillespie, *The Politics of 'Platforms'*, 12 NEW MEDIA & SOC'Y 347 (2010) (examining discourse around the term "platform"); Lipton, *supra* note 74, at 1343–44 (defining an "Internet intermediary" as "any service provider that enables online interaction through either paid subscription or general availability to the public"); Frank Pasquale, *Tech Platforms and the Knowledge Problem*, II AM. AFFAIRS 3, 8 (2018) (characterizing the "largest, most successful firms" as "platforms [that] ran[k] and rat[e] other entities rather than directly providing goods and services"); Philip J. Weiser, *Law and Information Platforms*, 1 J. ON TELECOMM. & HIGH TECH. L. 1, 3–4 (2002) (defining "information platforms" in terms of "network standards around which complementary products must be developed"); *see also* Ben Thompson, *Defining Aggregators*, STRATECHERY (Sept. 26, 2017), https://stratechery.com/2017/defining-aggregators/ [https://perma.cc/4YPG-

For accessibility purposes, a critical distinction between the web and these other applications is that the user interacts with the *platform* as an application, which in turn intermediates access to the platform's *content*. That is, a user accessing a restaurant's website may have no idea that the website is hosted on WordPress or Squarespace, and a user watching a video on Netflix or YouTube might not know the identity of the entity or person responsible for creating the video. And even where a user knows the identity of the person responsible for creating content—for example, the person posting personal photos to a social media platform such as Facebook or Instagram—accessibility problems are likely to pervade classes of media across millions or billions of users on a platform. From an internal perspective, then, the logical target of a Title III lawsuit might likely be the platform operating the application rather than the entity or person responsible for creating the content.

Of course, a threshold issue for holding these platforms directly accountable for accessibility is whether they can be subject to Title III in the first instance. The limited litigation targeting platforms under Title III has led to mixed results, with some courts dismissing cases on the predictable grounds that platforms do not constitute physical places.[177] Even cases where courts have extended Title III liability to platform operators have focused on the portions of those applications accessible via their operators' *websites*,[178] and it remains unclear whether Title III will be sufficiently flexible to extend to the components of platform applications provided via native smartphone, tablet, and television/set-top box applications not so easily amenable to Title III's place metaphor.[179] It is unclear the extent to which other applications, such as video games, will fit within Title III[180] or regulations promulgated by the FCC.[181]

Questions of substance also abound. Just as legal requirements for making a website accessible to a user who is blind or visually impaired have been hashed out in significant depth,[182] the FCC has grappled with the contours of making video

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27PD] (defining "aggregators" as "hav[ing] a direct relationship with users," incurring zero marginal costs in serving users, and having by "[d]emand-driven [m]ulti-sided [n]etworks with [d]ecreasing [a]cquisition [c]osts").

177. *See supra* note 173.

178. *E.g.*, *Netflix*, 869 F. Supp. 2d at 200.

179. *But cf.* Robles v. Domino's Pizza LLC, No. CV 16-06599 SJO (SPx), 2017 WL 1330216, at *3–4 (C.D. Cal. Mar. 3, 2017) (applying Title III to Domino's Pizza's mobile application); Nat'l Fed'n of the Blind v. Scribd Inc., 97 F. Supp. 3d 565, 567 (D. Vt. 2015) (referencing Scribd's associated applications); Lainey Feingold, *First Addendum to MLB Settlement Agreement*, LAW OFF. LAINEY FEINGOLD (June 5, 2012), https://www.lflegal.com /2012/06/mlb-addendum/ [https://perma.cc/HE4U-8642] (describing a settlement agreement under a Title III case addressing the accessibility of Major League Baseball's mobile applications). *See generally* John Gruber, *Web Apps vs. Native Apps is Still a Thing*, DARING FIREBALL (Apr. 30, 2013), https://daringfireball.net/2013/04/web_apps_native_apps [https://perma.cc/CS42-V6GH] (describing the transition away from websites towards delivery of content via dedicated mobile applications for platforms like Apple's iOS and Google's Android).

180. *See, e.g.*, Stern v. Sony Corp. of Am., 459 F. App'x 609, 610–11 (9th Cir. 2011).

181. *See* 47 C.F.R. pt. 14 (2018). The Advanced Communications Services rules are discussed in further depth, *see infra* Sections III.D and III.E.

182. *See supra* Section III.A.

programming[183] and communications applications[184] accessible to people with different disabilities. Moreover, as Peter Blanck has suggested, making the broad array of Internet applications accessible to people with cognitive and intellectual disabilities is substantially underexplored and remains a significant academic challenge in the area of Human-Computer Interface (HCI) design.[185] Whether particular accessibility requirements ultimately will be sustained is not a given, either; the ADA's fundamental alteration doctrine, which excludes from accessibility mandates requirements that would "fundamentally alter" the nature of the covered public accommodation, raises questions about what accessibility efforts might in fact be required by Title III.[186]

But setting aside these threshold questions of *what* and *how* leaves the perhaps more significant question of *who*[187]—that is, how should disability law allocate responsibility between platform companies and the entities responsible for creating

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183. *See* 47 C.F.R. pt. 79 (2018) (laying out detailed regulations for closed captioning, audio description, accessibility of emergency programming, and accessibility features for TVs, computers, and other devices capable of playing back videos).

184. *See generally* 47 C.F.R. pt. 14.1(a) (2018). The FCC's advanced communications services rules are discussed in further depth, *see infra* Sections III.D & III.E.

185. BLANCK, *supra* note 5; *see also* Lawrence O. Gostin & Lance Gable, *The Human Rights of Persons with Mental Disabilities: A Global Perspective on the Application of Human Rights Principles to Mental Health*, 63 MD. L. REV. 20 (2004) (discussing the international dimensions of the human rights of people with cognitive and intellectual disabilities).

186. 42 U.S.C. § 12182(b)(2)(A)(iii) (2012); *see also* PGA Tour, Inc. v. Martin, 532 U.S. 661 (2001) (the leading fundamental alteration case, concluding that allowing a golfer with a disability to use a golf cart did not fundamentally alter the game of golf); BLANCK, *supra* note 5, at 131–36 (discussing in detail the intersection of *Martin* and fundamental alteration with web accessibility). Similar challenges have arisen in the context of the First Amendment, but many have been rejected by the courts. *Compare, e.g.*, Greater L.A. Agency on Deafness, Inc. v. CNN, 742 F.3d 414, 430–32 (9th Cir. 2014) (rejecting First Amendment challenges to a closed captioning mandate, including that the mandate unlawfully compelled speech, constituted a prior restraint, and should be subject to strict scrutiny), *Closed Captioning of Internet Protocol-Delivered Video Programming*, Report and Order, 27 FCC Rcd. 787, 803–04, (2012) [hereinafter *IP Closed Captioning Order*] (rejecting First Amendment challenges to the FCC's closed captioning rules), *and id.* at 897 (statement of Commissioner Mignon L. Clyburn) ("[T]he promise of this rulemaking is much more than closed captioning for Internet-delivered content. Its true aim is equal access for all Americans to the video programming that forms the lifeblood of our civil discourse and the marketplace of ideas embodied in the First Amendment.") (Jan. 13, 2012), *with* Motion Picture Ass'n of Am., Inc. v. FCC, 309 F.3d 796, 801–06 (D.C. Cir. 2002) (rejecting the FCC's implementation of video (audio) description rules on the grounds that the First Amendment implications required a narrow interpretation of the FCC's authority under the Communications Act). *See also* Gottfried v. FCC, 655 F.2d 297, 311 n.54 (D.C. Cir. 1981) (rejecting in dicta arguments that the First Amendment either compels the addition of or bars the requirement of closed captions by television broadcasters); *cf.* Lawrence O. Gostin, *The Americans with Disabilities Act and the Corpus of Anti-Discrimination Law: A Force for Change in the Future of Public Health Regulation*, 3 HEALTH MATRIX 89, 97–103 (1993) (noting in the context of health law the role of the ADA in augmenting the First Amendment rights of people with disabilities against overreach by public health authorities).

187. Of course, robots may play an increasing role in the improvement of accessibility.

content hosted by the platforms across a diverse array of arrangements?[188] Platforms such as Netflix, which purchases the rights to movies, television shows, and other video programming via sophisticated commercial transactions, pose a different set of challenges than platforms such as YouTube, Facebook, Instagram, eBay, Craigslist, and Wikipedia, which allow any user to submit content for intermediation at no direct cost.

Even platforms that exercise a high degree of control over the content they distribute raise non-trivial questions of responsibility for accessibility. By way of example, Netflix is subject to extensive closed captioning requirements to provide equal access to people who are deaf or hard of hearing under a number of legal regimes. First, the FCC's apparatus regulations require Netflix's website and applications to support the display of closed captions provided with video programming on its website and mobile and set-top box applications.[189] Second, the FCC's IP closed captioning regulations require Netflix to provide *closed captions themselves* for any television programming with captions,[190] which are required by the FCC for most television programming.[191] And even Netflix's original programming that has never been shown on television is subject to captioning obligations under a 2012 settlement agreement of Title III litigation with the National Association of the Deaf (NAD) that requires Netflix to caption all its content.[192]

Notwithstanding the array of closed captioning requirements facing Netflix, problems still arise with closed captions, including most recently a social media firestorm over the censorship in captions of curse words that were not bleeped out from the audio track in Netflix's reboot of the series *Queer Eye for the Straight Guy*.[193] This is because Netflix, in many cases, does not create the closed captions for its programming, but relies on the providers of the video programming it distributes to provide closed captions.[194] Netflix publicly describes an antagonistic relationship with these providers and threatens rejection of videos submitted with inferior or problematic closed captions.[195]

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188. Paul Ohm and I have categorized these questions in terms of the difference between "Platform/User" regulations that hold users responsible for content they place on a platform, and "Platform/Platform" regulations that regulate platforms directly. Paul Ohm & Blake Reid, *Regulating Software When Everything Has Software*, 84 GEO. WASH. L. REV. 1672, 1692 (2016).

189. 47 C.F.R. § 79.103(a) (2018).

190. *Id.* § 79.4(a)(1)–(2), (b).

191. *See id.* § 79.1.

192. *Landmark Precedent in NAD vs. Netflix*, NAT'L ASS'N OF THE DEAF (June 19, 2012), https://www.nad.org/2012/06/19/landmark-precedent-in-nad-vs-netflix/ [https://perma.cc/BGL3-V7MM].

193. Ace Ratcliff, *I Rely on Closed Captions to Enjoy a Show and I Don't Appreciate Netflix's Way of Censoring Them*, SELF (July 10, 2018), https://www.self.com/story/queer-eye-netflix-closed-captions [https://perma.cc/E66K-KPEE].

194. Netflix Partner Help Ctr., *Why Are Netflix's Standards for Subtitles and Closed Captions So High?*, NETFLIX, https://partnerhelp.netflixstudios.com/hc/en-us/articles/214969868-Why-are-Netflix-s-standards-for-Subtitles-and-Closed-Captions-so-high [https://perma.cc/4U3R-R3UU].

195. *See id.* Netflix even raised as a defense in the underlying litigation with NAD that it could not add captions to many of the videos that it distributed out of fear that doing so would

Addressing the allocation of responsibility among even sophisticated commercial providers and distributors of video programming is not a new issue for disability law outside the realm of Title III. For example, the FCC has struggled for more than two decades to apportion responsibility for the provision and quality of captions between the providers and distributors of video programming. The FCC's initial rules adopted in the late 1990s placed all responsibility for captioning on video *distributors* on the thinking that distributors would leverage their contractual relationships to force video providers to include high-quality closed captions.[196] But in 2016, the FCC reassigned responsibility for some parts of its captioning regulations to the *providers* of video programming, concluding that relying on contractual relationships had been ineffective and frequently resulted in missing or poor-quality captions that were primarily the fault of video programming providers.[197]

The sheer scale, economic configuration, and legal status of the largest Internet platforms, which are constructed to facilitate ordinary people sharing content at little or no cost, are almost certain to exacerbate these challenges for allocating responsibility. For example, Facebook, the leading social media platform, is used by more than two billion people each month,[198] who collectively post almost two billion images to Facebook each day.[199] More than a billion auctions are hosted on eBay at a given moment,[200] and more than eighty million ads a month are posted to

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expose Netflix to liability for copyright infringement. Nat'l Ass'n for the Deaf v. Netflix, Inc., 869 F. Supp. 2d 196, 202 (D. Mass. 2012)*; see also* BLAKE E. REID, THIRD PARTY CAPTIONING AND COPYRIGHT (2014) (discussing the copyright dimensions of third-party captioning efforts). YouTube likewise requires video owners to opt in to use of its automatic captioning requirements, presumably over copyright concerns. *See YouTube Help: Use Automatic Captioning*, GOOGLE, https://support.google.com/youtube/answer/6373554?hl=en [https://perma.cc/PC42-DU5Y]. Amazon also cited copyright issues raised by the Authors Guild in the context of failures to make Kindle e-book readers accessible in a dispute with the National Federation of the Blind. *See generally* Daniel B. Frye, *Fighting for the Right to Read: A Campaign to Preserve Unlimited Access to the Text-to-Speech Feature of the Kindle 2*, BRAILLE MONITOR (June 2009), https://nfb.org/sites/www.nfb.org/files/images/nfb/publications/bm/bm09/bm0906/bm090603.htm [https://perma.cc/TWC4-BTD2].

196. *Closed Captioning & Video Description of Video Programming*, Report and Order, 13 FCC Rcd. 3272, 3286 (1997) ("Although we are placing the ultimate responsibility [for closed captioning] on program distributors, we expect that distributors will incorporate closed captioning requirements into their contracts with producers and owners, and that parties will negotiate for an efficient allocation of captioning responsibilities.").

197. *Closed Captioning of Video Programming*, Second Report and Order, 31 FCC Rcd. 1469, 1480 (2016) ("[T]he responsibilities imposed by the contractual arrangements between [video distributors, producers, and owners] will not be as effective or efficient as direct responsibility on the part of video programmers to achieve compliance with the Commission's new closed captioning quality obligations.").

198. Third Quarter 2018 Results Conference Call Between Facebook Executives, Facebook, Inc. (Oct. 30, 2018), https://s21.q4cdn.com/399680738/files/doc_financials/2018/Q3/Q318-earnings-call-transcript.pdf [https://perma.cc/4LS9-FVW7].

199. Shaomei Wu, Jeffrey Wieland, Omid Farivar, & Julie Schiller, *Automatic Alt-text: Computer-Generated Image Descriptions for Blind Users on a Social Network Service* (2017), *in* CSCW '17 PROCEEDINGS OF THE 2017 ACM CONFERENCE ON COMPUTER SUPPORTED COOPERATIVE WORK AND SOCIAL COMPUTING 1180 (2011).

200. *Who We Are*, EBAY.COM, https://www.ebayinc.com/our-company/who-we-are/

Craigslist.[201] Users of YouTube, the leading video platform, now upload more than four hundred hours of video *every minute*.[202] Wikipedia's volunteer editors have posted more than 5.9 million articles, including multiple terabytes of images, video, and other media.[203]

As a result, disability law must grapple with how to allocate responsibility for accessibility between platforms and their users. The aforementioned principles of layer integrity and layer crossing minimization suggest targeting regulations at the layer of the stack where problems occur.[204] These principles suggest that, at a minimum, disability law should intervene at the application layer to require platforms to make their interfaces accessible and to require the provision of authoring tools to enable users to make their content accessible.

Some of these problems are solved in principle by the FCC's video player regulations,[205] which require televisions, computers, laptops, set-top boxes, tablets, smartphones, and other devices to display closed captions[206] and play back audio description and accessible emergency information.[207] Others are similarly addressed by the FCC's advanced communications service (ACS) regulations,[208] which require

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[https://perma.cc/7TZC-E8HP].

201. *Factsheet*, CRAIGSLIST.COM, https://web.archive.org/web/20160101050442/http://www.craigslist.org/about/factsheet (taken down as of Jan. 2, 2016, but available as of January 1, 2016).

202. Bree Brouwer, *YouTube Now Gets Over 400 Hours of Content Uploaded Every Minute*, TUBEFILTER (July 26, 2015), https://www.tubefilter.com/2015/07/26/youtube-400-hours-content-every-minute/ [https://perma.cc/843Z-8FU5] (quoting YouTube CEO Susan Wojcicki).

203. *Wikipedia:Data Download*, WIKIPEDIA, https://en.wikipedia.org/wiki/Wikipedia:Database_download [https://perma.cc/A656-EX2J].

204. *See supra* Section II.B.

205. 47 C.F.R. pt. 79, subpt. B (2018). *See generally Accessible Emergency Information & Apparatus Requirements for Emergency Information & Video Description*, Report and Order and Further Notice of Proposed Rulemaking, 28 FCC Rcd. 4871 (2013), *updated by* Second Report and Order and Second Further Notice of Proposed Rulemaking, 30 FCC Rcd. 5186 (2015) (describing in detail the FCC's apparatus requirements for video (audio) description and accessible emergency information); *Accessibility of User Interfaces & Video Programming Guides & Menus*, Report and Order and Further Notice of Proposed Rulemaking, 28 FCC Rcd. 17,330 (2013), *updated by* Second Report and Order, Order on Reconsideration, and Second Further Notice of Proposed Rulemaking, 30 FCC Rcd. 13,914 (2015) (describing in detail accessibility requirements for user interfaces for video playback apparatus); *Closed-Captioning of Internet Protocol-Delivered Video Programming*, 27 FCC Rcd. 787, 838–59 (2012) (describing in detail the FCC's apparatus requirements for closed captioning).

206. 47 C.F.R. §§ 79.101–103 (2018).

207. *Id.* §§ 79.105–79.106.

208. *Id.* pt. 14 (2018). *See generally Implementation of Sections 716 & 717 of the Communications Act of 1934*, Report and Order and Further Notice of Proposed Rulemaking, 26 FCC Rcd. 14,557 (2011) (describing in detail the commission's ACS rules).

Voice over IP (VoIP), text messaging, and video conferencing[209] services[210] and equipment[211] to be accessible.[212] Others might be solved by interpreting the ADA to apply WCAG or similar standards to the interfaces of the applications and Authoring Tool Accessibility Guidelines (ATAG) or similar standards to the authoring and hosting mechanisms provided by platforms.[213]

But what, then, about the accessibility of content itself—for example, the provision of closed captions and audio descriptions for video, alternate text tags for images, transcripts for audio files such as podcasts, and plain-language versions of textual articles? Layer integrity and crossing minimization would suggest that these are problems that manifest at the content layer, and thus should be solved there by requiring platform users to make their content accessible to people with disabilities.

This insight is also supported by the prospect that platforms will invoke Section 230 of the Communications Act, which exempts platforms from being treated as the publisher or speaker of content they host for the purpose of defamation and other laws,[214] as a defense against Title III claims that would make them responsible for the accessibility of content posted by their users, although Congress and Internet-law scholars have increasingly begun to debate the extent to which Section 230 should serve as a shield for platforms facilitating discrimination through the hosting of content.[215] The Department of Justice has also unhelpfully set regulations that excuse public accommodations from "alter[ing] [their] inventory to include accessible or special goods," including "Brailled versions of books, books on audio cassettes, [or]

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209. 47 U.S.C. § 153(1) (2012) (defining "advanced communications services" to include interconnected and non-interconnected VoIP, electronic messaging, and interoperable video conferencing services); 47 C.F.R. § 14.10(c) (2018) (same).

210. 47 C.F.R. § 14.21(a)(2) (2018) (requiring accessibility and usability for services).

211. *Id.* § 14.20(a)(1) (requiring accessibility and usability for equipment).

212. *Id.* § 14.21(b) (defining accessibility in terms of accessibility for people with various types of disabilities); *see id.* § 14.21(c) (defining usability). Where accessibility or usability is not achievable, vendors can alternatively provide compatibility with users' devices, including TTYs, through a "bring your own device"-style provision. *Id.* § 14.20(a)(3) (allowing compatibility where accessibility or usability is not achievable); *see also id.* at § 14.21(d) (defining compatibility). In 2016, the FCC updated the TTY compatibility rules to allow vendors to substitute for TTY the use of Real-Time Text (RTT) technology. *Id.* at § 14.21(d)(5). *See generally Transition from TTY to Real-Time Text Technology*, Report and Order and Further Notice of Proposed Rulemaking, 31 FCC Rcd. 13568 (2016).

213. The DOJ's withdrawn Title III website rulemaking, Accessibility of Web Information and Services of State and Local Government Entities and Public Accommodations, 75 Fed. Reg. 43,460 (July 26, 2010), did not address WTAG. *See supra* Part I & notes 55–57. Some platforms have begun to address the provision of authoring tools for accessible content more robustly, but problems persist. *See* ANTKERS ET AL., *supra* note 160.

214. 47 U.S.C. § 230(c)(1) (2012).

215. Though a full treatment of the Section 230 literature is beyond the scope of this article, one exemplary criticism of Section 230 comes from Danielle Keats Citron and Benjamin Wittes, who argue that the goal of Section 230 "was not to give [private actors] immunity from liability for helping third parties abuse each other." Danielle Keats Citron & Benjamin Wittes, *The Problem Isn't Just Backpage: Revising Section 230 Immunity*, 2 GEO. TECH. L. REV. 453, 456–57 (2018).

closed-captioned video tapes,"[216] though courts have alternatively accepted and rejected the application of this regulation in the context of technology accessibility cases.[217]

However, Title III contains a barrier to mandating accessibility at the content layer itself. The undue burden limitation relieves places of public accommodation from accessibility mandates where compliance would result in an undue economic burden.[218] Parallel to the fundamental alteration doctrine, undue burden is rooted in the notion that disability law should not achieve equal access to a public accommodation by forcing it out of existence and therefore leaving people with and without disabilities equally unable to access it.[219]

Undue burden features prominently in content accessibility primarily because adding accessibility features to content, including closed captions, video descriptions, text tags, and transcripts, can be nontrivially expensive relative to the cost of using a platform, access to which is often provided at no cost.[220] While some platform users are sophisticated commercial entities who can easily afford to make their content accessible—and in some cases are required to do so under FCC regulations[221]—many are ordinary people uploading pictures and videos of pets and children, selling household items, and writing articles and posting media about areas of personal interest—all relatively frictionless and effectively transactions on modern platforms. Though the issue has not been litigated in the context of Title III, some platform users may argue that the imposition of a requirement that they caption or describe a personal video at some cost, which they would otherwise upload at no cost, would impose an undue burden.[222]

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216. 28 C.F.R. § 36.307(a), (c) (2018).

217. *Compare* Report and Recommendation Regarding Defendants' Motion to Stay or Dismiss, No. 3:15-cv-30023-MGM, 2016 WL 3561622, at *11 (D. Mass. Feb. 9, 2016) (rejecting in a case under Title III of the ADA Harvard University's invocation of Rule 36.307(a) and (c) as an excuse for leaving inaccessible content on its website), *with* Order Granting Defendant's Motion to Dismiss, No. SACV 13-1387-DOC (RNBx), 2014 WL 1920751, at *10 (C.D. Cal. May 14, 2014) (rejecting the application of Title III to Redbox's streaming and physical video services by reference in part to Rule 36.307(a)), *and* Court Order, No. CV 09-7710 PA (FFMx), 2010 WL 8022226, at *3 (C.D. Cal. Feb. 8, 2010) (citing Rule 36.307(a) as an alternate basis for denying a Title III claim against Sony over the production of inaccessible video games).

218. *See* 42 U.S.C. § 12182(b)(2)(A)(iii) (2012).

219. *See* Gregory S. Crespi, *Efficiency Rejected: Evaluating "Undue Hardship" Claims Under the Americans with Disabilities Act*, 26 TULSA L.J. 1, 9, 15–18 (1990).

220. *See* Elisa Edelberg, *How Much Does Audio Description Cost?*, 3PLAYMEDIA (June 3, 2019), https://www.3playmedia.com/2017/04/14/how-much-does-audio-description-cost/ [https://perma.cc/Y3RQ-UPM3]; Sofia Enamorado, *How Much Does a Closed Caption Service Cost? (and Why Price Isn't Everything)*, 3PLAYMEDIA (July 25, 2019), https://www.3playmedia.com/2019/02/08/how-much-does-closed-captioning-service-cost/ [https://perma.cc/9ZT6-CRVT]; Saul Hansell, *Should YouTube Charge a Fee to Upload Video?*, N.Y. TIMES: BITS (July 16, 2009, 12:43 PM), https://bits.blogs.nytimes.com/2009/07/16/should-youtube-charge-a-fee-to-upload-video/ [https://perma.cc/Y8AQ-8F6S].

221. *See, e.g.*, 47 C.F.R. § 79.4(b) (2018).

222. The FCC has dealt for more than two decades with a significant proliferation of undue burden waiver petitions filed by producers of broadcast television programming. *E.g.*, *Anglers*

The question returns, then, to whether platforms might be compelled to make the content they host accessible. The question of undue burden aside,[223] automation may provide a solution.[224] Platforms and academic researchers are developing advanced algorithms to automatically generate captions for videos,[225] alternate text descriptions for pictures,[226] and even preliminary audio descriptions for video[227] and dynamically generated plain-language versions of websites accessible to people with intellectual and cognitive disabilities,[228] though significant quality problems persist with many of these techniques.[229] Relatedly, significant advances in recognizing both statutory exceptions and limitations in copyright law[230] and recognition by the

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for Christ Ministries, Inc., Memorandum Opinion and Order, Order, and Notice of Proposed Rulemaking, 26 FCC Rcd. 14,941 (2011).

223. On the flip side, the dynamic of at-scale accessibility raises the prospects of positive externalities, such as the use of closed captions for search engine optimization and ad targeting. While the familiar examples of closed captions in loud bars and quiet hospitals are widely known, the battle to capture the value of positive externalities of accessibility features is often contentious. *See, e.g.*, Fox News Network, LLC v. TVEyes, Inc., 883 F.3d 169, 173–74, 181 (2d Cir. 2018) (concluding that a media-monitoring service that indexed and enabled search of television clips at scale using closed-captioned text copied from broadcasts constituted copyright infringement).

224. In proposing this solution, I acknowledge that I risk violating "Felten's Third Law": "Given a difficult technology policy problem, lawyers will tend to seek technology solutions and technologists will tend to seek legal solutions," rejecting "non-solutions in [their] own area[s]" in the hope that "there must be a solution lurking somewhere in the unexplored wilderness of the other area." Ed Felten, *A Free Internet, if We Can Keep It*, FREEDOM TO TINKER (Jan. 28, 2010), https://freedom-to-tinker.com/2010/01/28/free-Internet-if-we-can-keep-it/ [https://perma.cc/2YAQ-B2D3].

225. *See, e.g.*, *YouTube Help: Use Automatic Captioning*, GOOGLE, https://support.google.com/youtube/answer/6373554?hl=en [https://perma.cc/Z7YD-GVHP].

226. *See* Wu et al., *supra* note 199.

227. *See* S R Sreela & Sunam Mary Idicula, *AIDGenS: An Automatic Image Description System Using Residual Neural Network*, *in* 2018 INTERNATIONAL CONFERENCE ON DATA SCIENCE AND ENGINEERING (ICDSE) (2018), https://ieeexplore.ieee.org/abstract/document/8527798 [https://perma.cc/D9PY-RY5M].

228. *See generally* CLAYTON LEWIS, IMPLICATIONS OF DEVELOPMENTS IN MACHINE LEARNING FOR PEOPLE WITH COGNITIVE DISABILITIES (2018), https://www.colemaninstitute.org/wp-content/uploads/2018/12/white-paper-coleman-version-1.pdf [https://perma.cc/Y768-X7DH].

229. For example, YouTube notes that "automatic captions might misrepresent the spoken content due to mispronunciations, accents, dialects, or background noise" and instructs users to "always review automatic captions and [manually] edit any parts that haven't been properly transcribed." *See YouTube Help: Use Automatic Captioning*, GOOGLE, https://support.google.com/youtube/answer/6373554?hl=en [https://perma.cc/ST4J-NKZ7].

230. *See* 17 U.S.C. §§ 121–121A (2012 & Supp. 2019) (the Chafee Amendment to the Copyright Act, providing for the remediation of texts for people with print disabilities, amended to be consistent with the Marrakesh Treaty to Facilitate Access to Published Works for Persons Who Are Blind, Visually Impaired, or Otherwise Print Disabled).

courts[231] and the U.S. Copyright Office[232] of wide latitude to make copyrighted works accessible consistent with the doctrine of fair use have helped remove copyright barriers to third-party accessibility efforts,[233] though questions remain about the extent to which third parties might be held responsible under the ADA or other disability laws for the creation of poor-quality remediation.[234]

While it is unclear how advances in automatic content accessibility technology ultimately will evolve to address this problem, it is worth considering economic interventions to incentivize the development of tools and services that will enable making large quantities of content accessible. One example is found in *Title IV* of the ADA, whose provisions are codified in the telecommunications section of the U.S. Code.[235] Title IV subsidizes third parties who provide relay services, which generally involve situating a human or automated communications assistant in the middle of a phone call to interpret between a nondisabled phone caller and another caller using sign language via video, provide captions, type out text communications, or one of several other variants.[236] Most importantly, the costs of providing the services are recovered from users of telephone services via their phone carriers and administered by the FCC.[237]

The important insight from Title IV is that it facilitates the accessibility of an application—voice communication—by subsidizing the creation of accessible content (signed, captioned, and other adapted versions of one caller's voice) that neither the content creator (the nondisabled caller) nor the application provider (the phone company) could ostensibly afford. It does so by requiring application providers to bake into the price of their service the cost of making it accessible, thereby spreading the cost among all users of an application. It also vests the FCC with the authority to structure the administration of the program to incentivize innovation that improves quality and drives costs down.[238]

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231. Authors Guild, Inc. v. HathiTrust, 755 F.3d 87, 102 (2d Cir. 2014) (recognizing copying made in service of the Americans with Disabilities Act as a fair use).

232. U.S. COPYRIGHT OFF., SECTION 1201 RULEMAKING: SEVENTH TRIENNIAL PROCEEDING TO DETERMINE EXEMPTIONS TO THE PROHIBITION ON CIRCUMVENTION 95–101 (2018), https://www.copyright.gov/1201/2018/2018_Section_1201_Acting_Registers_Recommendation.pdf [https://perma.cc/9EAV-Q6C4].

233. *See generally* REID, *supra* note 195 (describing the post-*HathiTrust* viability of third-party captioning efforts in the United States).

234. These questions of quality circle back to the threshold questions of whether platforms can be treated as "places" under Title III of the ADA and whether the DOJ's regulatory authority and the administration of ADA judgments and settlements by federal judges is sufficiently nuanced and granular to carefully consider issues around quality. *See supra* Part II.

235. 47 U.S.C. § 225(a)(3), (b)(1)–(2) (2012). *See generally* KAREN PELTZ STRAUSS, A NEW CIVIL RIGHT: TELECOMMUNICATIONS EQUALITY FOR DEAF AND HARD OF HEARING AMERICANS 90–144 (2006) (detailing the early history of the relay system).

236. *See Relay Services*, FCC (Dec. 1, 2015), https://www.fcc.gov/general/relay-services [https://perma.cc/4ZMT-TDMF].

237. *See* 47 U.S.C. § 225(d)(3)(B).

238. *Id.* § 225(d); *cf.* Daniel J. Hemel & Lisa Larrimore Ouellette, *Innovation Policy Pluralism*, 128 YALE L.J. 544 (2019) (discussing various innovation policy tools).

It is not clear whether such a model, or similar models such as the direct government funding of captioning[239] or remediation of inaccessible books,[240] would be workable for today's dominant Internet platforms, many of which provide services at no direct cost to users and instead derive revenue through the provision of advertisements targeted using the data of their users.[241] But these sorts of economic tweaks are one area of promise for unraveling the Gordian knot of allocating responsibility between the application and content layers of today's platform-dominated Internet ecosystem.

D. ISPs: Internet Access and Accessibility at the Physical and Network Layers

Disentangling the application and content layers of the Internet makes clear the need to consider the role of entities at all the layers of the Internet. And a user cannot access any application or content without connecting to the Internet via an Internet service provider (ISP).[242] ISPs intermediate access to all Internet-enabled applications through their control over the implementation of protocols at the network layer and their provision at the physical layer of the wired and wireless infrastructure that facilitates the literal connection of users to the Internet.

This Section explores the *accessibility* dimensions of ISPs' gatekeeping role over *access* to the Internet. Recalling the admittedly imperfect metaphor of the Internet as the "information superhighway,"[243] it is worth briefly conceptualizing the physical and network layers as the roads and sidewalks of cyberspace—the connective tissue between places of public accommodation. In the real world, this issue is often the province of federal, state, and local governments that are governed not by Title III, but by Section 504 of the Rehabilitation Act of 1976, which requires federal programs to be accessible,[244] by Title II of the ADA, which requires the same for

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239. In an amicus brief I coauthored with Brian Wolfman on behalf of numerous disability organizations in the *HathiTrust* case, we catalogued the history of government efforts to fund the universal accessibility of content. Brief for American Association of People with Disabilities et al. as Amici Curiae Supporting Appellees, Author's Guild, Inc. v. HathiTrust, 755 F.3d 87 (2d Cir. 2014) (No. 12-4547), 2013 WL 2702551, at *7–16; *see also* STRAUSS, *supra* note 235, at 205–08 (describing in detail early efforts to fund captioning through the Department of Health, Education, and Welfare (HEW) (now the Department of Health and Human Services (HHS)).

240. *See That All May Read*, LIBR. CONGRESS https://www.loc.gov/programs/national-library-service-for-the-blind-and-physically-handicapped/about-this-service/ [https://perma.cc/B2N4-TZPU].

241. Shoshana Zuboff, *Big Other: Surveillance Capitalism and the Prospects of an Information Civilization*, 30 J. INFO. TECH. 75, 79 (2015).

242. *Compare* Areheart & Stein, *supra* note 8, at 452 n.20 ("[W]ithout [website accessibility], knowing about the Internet's opportunities and signing up with an Internet service provider would be relatively meaningless."), *with* Lipton, *supra* note 74, at 1343 ("No one can interact online without contracting with an ISP."). *See also* Ekstrand, *supra* note 64, at 430 (acknowledging despite a focus on website accessibility that "the question of broadband access . . . is also important").

243. Jonathan H. Blavin & I. Glenn Cohen, *Gore, Gibson, and Goldsmith: The Evolution of Internet Metaphors in Law and Commentary*, 16 HARV. J.L. & TECH. 265, 269 (2002).

244. 29 U.S.C. § 701(c) (2012).

state and local government programs and services,[245] and by other federal laws.[246] But the provision of Internet access service is largely the province of private companies that, except in scenarios involving state or municipally provided broadband, are not subject to Title II. Instead, the accessibility dimensions of ISPs are generally governed by telecommunications law.[247]

Past is prologue in Internet policy, and telecommunications law's treatment of the accessibility of networks long predates the Internet. Of course, many telecommunications networks—including radio, broadcast television, and cable and satellite television—have served as single-"application" mechanisms, in Internet-law terms, for the one-way distribution of content to people. And as the previous Section explained, the accessibility of those networks has primarily been facilitated by FCC regulations focused on remediating content—generally through the provision of captioning to make audiovisual and audio programming accessible to people who are deaf or hard of hearing and the provision of audio description to make video programming accessible to people who are blind or visually impaired—and requiring video playback devices to render accessibility features.[248]

But even within these integrated-networks-as-video-applications, issues of *network protocol* have played an important role in facilitating accessibility for people with disabilities. For example, television networks have long opposed the inclusion of *open* captions—captions "burned in" and enabled for all viewers, which cannot be turned off—on the grounds that hearing viewers would find them distracting.[249] As a result, accessibility advocates and technologists facilitated the development of *closed* captions—which could be turned on or off by individual viewers—by developing standards for steganographically encoding captions into the invisible twenty-first scan line ("Line 21") of broadcast signals, which is transmitted but not displayed on most TVs, thereby enabling the development of caption decoders to parse the invisible information and render it on-screen for viewers who are deaf or hard of hearing.[250]

Nowhere has the role of network protocol accessibility been more critically important than in the network that preceded and effectively enabled the development

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245. 42 U.S.C. § 12131(1) (2012) (defining "public entit[ies]" in relevant part to include state and local governments and their subdivisions); *id.* § 12132 (prohibiting discrimination against people with disabilities by "public entit[ies]").

246. Robin Malloy has written extensively on the intersection of disability law and accessibility considerations with land use and zoning law. *See* MALLOY, *supra* note 122; Robin Paul Malloy, *A Primer on Disability for Land Use and Zoning Law*, 4 J.L. PROP. & SOC'Y 1 (2018); *see also* Schindler, *supra* note 15.

247. Paul Ohm and I have described the increasing convergence of disparate regulatory regimes as software proliferates throughout various sectors of society. Ohm & Reid, *supra* note 188; *cf.* Jacqueline Lipton, *A Framework for Information Law and Policy*, 82 OR. L. REV. 695, 778 (2003) ("[I]t may be that legal and policy matters that have more to do with regulating communications *networks* than regulating information per se properly belong to other fields of law.") (emphasis in original).

248. *See supra* Section III.C; STRAUSS, *supra* note 235, at 205–73 (describing the history of the development of the captioning system).

249. *See* STRAUSS, *supra* note 235, at 206.

250. *See id.* at 206–07.

of the commercial Internet[251]—the telephone network. Of course, the telephone network, like one-way video distribution networks, was initially an integrated network designed to facilitate a single application—bidirectional voice communication.[252]

The accessibility problems introduced by bidirectional voice communications are obvious in hindsight: an application that relies on both speech and hearing, without more, was certain to exclude people with speech and hearing disabilities. Karen Peltz Strauss has noted the cruel irony of the discriminatory nature of the telephone network, which grew out of the text-based telegraph system that Alexander Graham Bell had created specifically to help his deaf students, wife, and mother.[253] It took deaf and hard of hearing advocates and technologists more than ninety years after Bell's invention of the telephone network to begin the successful proliferation of the teletypewriter (TTY), which facilitates real-time, text-based communications by transmitting typed letters via audio tones over the phone line, that restored the access for deaf and hard of hearing people in the transition from the telegraph to the telephone.[254]

Though the full history of the accessibility of the telephone-network-as-voice-communication-application is beyond the scope of this article,[255] it is worth emphasizing that even the introduction of TTYs required overcoming discrimination against people with disabilities by AT&T, the proprietor of the phone network. Unlike the omissive failures described above,[256] the discrimination against TTY users was overt—AT&T leveraged its dominant control over the phone system to deny its customers the ability to attach third-party devices, including TTYs, to the telephone network as illegal "foreign attachments."[257]

A critical step in making the phone network accessible was the FCC's *Carterfone* order, which concluded that excluding third-party devices from the network was a violation of the prohibition on "unreasonable discrimination" in the Communications Act of 1934.[258] These important but underexplored antidiscrimination threads continued into the breakup of AT&T under antitrust law[259] and were later addressed by Congress in the requirements of Section 255 of the Telecommunications Act of 1996, which requires telecommunications services and equipment to be made

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251. *See* SHANE GREENSTEIN, HOW THE INTERNET BECAME COMMERCIAL: INNOVATION, PRIVATIZATION, AND THE BIRTH OF A NEW NETWORK (2015).

252. *See generally Kevin* Werbach, *The Song Remains the Same: What Cyberlaw Might Teach the Next Internet Economy*, 69 FLA. L. REV. 887 (2017).

253. STRAUSS, *supra* note 235, at 7.

254. *See id.* at 7–8.

255. Strauss has documented in significant detail the decades-long efforts to restore accessible communications to the telephone network. *Id.*

256. *See supra* Sections III.A–III.C.

257. *See* STRAUSS, *supra* note 235, at 9–10.

258. Use of the Carterfone Device in Message Toll Tel. Serv., 13 F.C.C.2d 420, 423 (1968); *see also* Hush-A-Phone Corp. v. United States, 238 F.2d 266, 269 (D.C. Cir. 1956); STRAUSS, *supra* note 235, at 9–10.

259. *See* STRAUSS, *supra* note 235, at 32–55 (discussing the history of accessibility issues during the AT&T breakup).

accessible to people with disabilities.[260] And as voice telephony transitioned to the Internet, the FCC extended Section 255 to VoIP applications.[261] Congress eventually gave the FCC extensive authority to regulate the accessibility of VoIP services under the advanced communications services provisions of the Twenty-First Century Communications and Video Accessibility Act of 2010 (CVAA),[262] and the FCC has begun to facilitate the transition from TTY services to next-generation real-time text (RTT) services.[263]

The broader lesson from the evolution of the accessibility provisions governing telephony is that telecommunications law has long played an important role in overcoming discrimination against people with disabilities, since even before the introduction of the ADA. That is, telecommunications law rightfully should be considered a first-order *disability* law alongside the ADA, and its anti-discrimination provisions should be embraced and engaged by disability advocates and scholars.

The important role of telecommunications law as disability law is more important as the prominence of the telephone network has given way to the Internet. This is no surprise, as the telephone network has transitioned from effectively serving only as a voice application to one of the key technological bases of the commercial Internet. The telephone network facilitated the rise of the commercial Internet by affording Internet access via dial-up Internet services, which featured modems that modulated digital IP-based communications into analog audio tones, transmitted them over the phone line, and reconverted them to digital signals for transmission over the Internet.[264] It has continued to do so through the use of digital subscriber line (DSL) technology, which along with cable, satellite, cellular, and various other wired and wireless services, now connects hundreds of millions of Americans to the Internet.[265]

Early in the rise of the commercial Internet, Internet-law scholars recognized that discrimination was a critical threat to the future of the Internet. In 2003's *Network*

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260. 47 U.S.C. § 255 (2012); *see also* STRAUSS, *supra* note 235, at 345–400 (discussing the enactment and implementation of Section 255).

261. *IP-Enabled Servs*., Report and Order, 22 FCC Rcd. 11,275 (2007) (leveraging the FCC's "ancillary jurisdiction" under Title I of the Communications Act).

262. Twenty-First Century Communications and Video Accessibility Act of 2010, Pub. L. No. 111-260, § 104, 124 Stat. 2751, 2755–61 (2010) (codified as amended at 47 U.S.C. §§ 617–618 (2012)).

263. *See supra* Section III.C & nn.208–212.

264. *See* Amos Joel, *Telecommunications and the IEEE Communications Society*, IEEE COMMS. MAG., May 2002, at 6, 164, https://ieeexplore.ieee.org/stamp/stamp.jsp ?arnumber=1006966 [https://perma.cc/KF3R-SUWB] ("Consumer access to data communication began in the early 1980s, before availability of the commercial Internet, with dial-up to various information services.").

265. *See* CAMILLE RYAN & JAMIE M. LEWIS, U.S. CENSUS BUREAU, COMPUTER AND INTERNET USE IN THE UNITED STATES: 2015 (2017), https://www.census.gov/content/dam /Census/library/publications/2017/acs/acs-37.pdf [https://perma.cc/FT6G-LPP9]; Giulia McHenry, *Majority of Americans Use Multiple Internet-Connected Devices, Data Shows*, NAT'L TELECOMM. & INFO. ADMIN.: NTIA BLOG (Dec. 7, 2015), https://www.ntia.doc.gov /blog/2015/majority-americans-use-multiple-Internet-connected-devices-data-shows [https://perma.cc/Z3YQ-ZJQJ]; *Internet/Broadband Fact Sheet*, PEW RES. CTR. (June 12, 2019), https://www.pewInternet.org/fact-sheet/Internet-broadband/ [https://perma.cc/563X-H2UZ].

Neutrality, Broadband Discrimination, Tim Wu called for "a direct scrutiny of broadband discrimination," famously coining the term "net neutrality"—the notion, broadly speaking, that ISPs should not be able to leverage their positions as gatekeepers of "terminating access monopolies" against their users to discriminate against users' access to the applications and content of their choice.[266] Considerable scholarly, regulatory, and popular attention has been devoted to the *Network Neutrality* half of Wu's title and its attendant implications for the economics and governance of—and innovation and free speech on—the Internet.[267]

However, some scholars have taken up the important but less explored focus of Wu's work: *Broadband Discrimination*—that is, the potential for noneconomic *discrimination* by ISPs and the possibility of antidiscrimination remedies.[268] Olivier

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266. Tim Wu, *Network Neutrality, Broadband Discrimination*, 2 J. ON TELECOMM. & HIGH TECH. L. 141, 142 (2003) (citing Hush-A-Phone Corp. v. United States, 238 F.2d 266, 269 (D.C. Cir. 1956)).

267. *E.g.*, BJ Ard, *Beyond Neutrality: How Zero Rating Can (Sometimes) Advance User Choice, Innovation, and Democratic Participation*, 75 MD. L. REV. 984 (2016); Derek E. Bambauer, *Against Jawboning*, 100 MINN. L. REV. 51, 79 (2015); Babette E.L. Boliek, *FCC Regulation Versus Antitrust: How Net Neutrality Is Defining the Boundaries*, 52 B.C. L. REV. 1627 (2011); Susan P. Crawford, *Network Rules*, 70 L. & CONTEMP. PROBS. 51 (2007); Daniel T. Deacon, *Common Carrier Essentialism and the Emerging Common Law of Internet Regulation*, 67 ADMIN. L. REV. 133 (2015); Rob Frieden, *Freedom to Discriminate: Assessing the Lawfulness and Utility of Biased Broadband Networks*, 20 VAND. J. ENT. & TECH. L. 655 (2018); Rob Frieden, *What's New in the Network Neutrality Debate*, 2015 MICH. ST. L. REV. 739 (2015); Justin (Gus) Hurwitz, *Neighbor Billing and Network Neutrality*, 11 VA. J.L. & TECH. 1 (2006); Justin (Gus) Hurwitz, *Net Neutrality: Something Old; Something New*, 2015 MICH. ST. L. REV. 665 (2015); Lawrence Lessig, *In Support of Network Neutrality,* 3 I/S: J.L. & POL'Y FOR INFO. SOC'Y 185 (2007); Daniel A. Lyons, *Net Neutrality and Nondiscrimination Norms in Telecommunications*, 54 ARIZ. L. REV. 1029, 1029 (2012); Lauren Moxley, *E-Rulemaking and Democracy*, 68 ADMIN. L. REV. 661, 672–90 (2016); Tejas N. Narechania, *Agency Boundaries and Network Neutrality*, 12 I/S: J.L. & POL'Y FOR INFO. SOC'Y 59 (2015); Jonathan E. Nuechterlein, *Antitrust Oversight of an Antitrust Dispute: An Institutional Perspective on the Net Neutrality Debate*, 7 J. ON TELECOMM. & HIGH TECH. L. 19 (2009); Howard A. Shelanski, *Competition Policy for Mobile Broadband Networks*, 3 J. ON TELECOMM. & HIGH TECH. L. 97 (2004); Deborah T. Tate, *Net Neutrality 10 Years Later: A Still Unconvinced Commissioner*, 66 FED. COMM. L.J. 509 (2014); Adam Thierer, *Are "Dumb Pipe" Mandates Smart Public Policy? Vertical Integration, Net Neutrality, and the Network Layers Model*, 3 J. ON TELECOMM. & HIGH TECH. L. 275 (2005); Philip J. Weiser, *The Future of Internet Regulation*, 43 U.C. DAVIS L. REV. 529 (2009); Christopher S. Yoo, *Beyond Network Neutrality*, 19 HARV. J.L. & TECH. 1 (2005); Christopher S. Yoo, *Innovations in the Internet's Architecture that Challenge the Status Quo*, 8 J. ON TELECOMM. & HIGH TECH. L. 79 (2010); Christopher S. Yoo, *Network Neutrality and the Economics of Congestion*, 94 GEO. L.J. 1847 (2006); Christopher S. Yoo, *Would Mandating Broadband Network Neutrality Help or Hurt Competition? A Comment on the End-to-End Debate*, 3 J. ON TELECOMM. & HIGH TECH. L. 23 (2004); Tim Wu, *The Broadband Debate, a User's Guide*, 3 J. ON TELECOMM. & HIGH TECH. L. 69 (2004); Vishal Misra, *Net Neutrality Is All Good and Fine; the Real Problem Is Elsewhere,* COLUMBIA.EDU (Nov. 2014), http://www.cs.columbia.edu/2014/net-neutrality/ [https://perma.cc/H7F8-HNE5].

268. *E.g.*, Susan P. Crawford, *Transporting Communications*, 89 B.U. L. Rev. 871 (2009) (arguing for a noneconomic conception of net neutrality); Jerry Kang, *Race.net Neutrality*, 6

Sylvain has conceptualized ISP discrimination along lines of race, ethnicity, and income in terms similar to those of disability scholars arguing for Internet accessibility, noting that the Internet "is the premier communications platform through which public life today is shaped" and that "[t]o be excluded from all of its affordances is either an act of defiance, ignorance, or the consequence of material misfortune and disadvantage."[269]

The potential for discrimination problems involving people with disabilities at the network and physical layers has come to bear in the context of debates over network neutrality. People with disabilities were unexpectedly thrust into the FCC's approach to network neutrality in 2014 when Mother Jones reported that Verizon lobbyists were urging members of Congress to spike then-pending FCC net neutrality rules on the grounds that they would hurt people with disabilities.[270] The vague argument insinuated that it was necessary to single out the Internet traffic of people with disabilities, creating special "fast lanes" for accessible communications, to ensure their ability to use the Internet on equal terms.[271] In effect, Verizon had argued for addressing one type of discrimination—the alleged performance shortcomings of a neutral Internet for accessible applications—with another, isolating applications used by people with disabilities for special treatment.

Verizon made the claims, however, without first consulting consumer organizations representing people with disabilities; the National Association of the Deaf (NAD), the National Federation of the Blind (NFB), and the American Association of People with Disabilities (AAPD) emphasized, on the record, that they had not been consulted.[272] A coalition of disability organizations and researchers—

J. ON TELECOMM. & HIGH TECH. L. 1 (2007) (highlighting the connection between racial discrimination and discrimination in the provision of Internet access); Lawrence Lessig, *Re-Marking the Progress in Frischmann*, 89 MINN. L. REV. 1031, 1042 (2005) ("The aim of those pursuing network neutrality, however, is not some imagined neutrality, but *rather the elimination of certain kinds of discrimination*.") (emphasis added); Tim Wu, *Why Have a Telecommunications Law? Anti-Discrimination Norms in Communications*, 5 J. ON TELECOMM. & HIGH TECH. L. 15 (2006) (unpacking the meaning of (anti-)discrimination on broadband networks); *see also* Adam Candeub, *Networks, Neutrality & Discrimination*, 69 ADMIN. L. REV. 125 (2017) (comparing broadband discrimination to more traditional legal conceptions of discrimination such as bans on interracial and same-sex marriage); Rob Frieden, *Internet Protocol Television and the Challenge of "Mission Critical" Bits*, 33 CARDOZO ARTS & ENT. L.J. 47, 50–53 (2015) (discussing the contours of discrimination for the purpose of quality of service); Barbara van Schewick, *Network Neutrality and Quality of Service: What a Nondiscrimination Rule Should Look Like*, 67 STAN. L. REV. 1, 16 (2015) (distinguishing between proponents of net neutrality as an antitrust concept and proponents of a broader conception that includes a "wider range of economic and noneconomic harms") (internal citations omitted)).

269. Olivier Sylvain, *Network Equality*, 67 HASTINGS L.J. 443, 447 (2016).

270. Erika Eichelberger, *Verizon Says It Wants to Kill Net Neutrality to Help Blind, Deaf, and Disabled People*, MOTHER JONES (June 13, 2014), https://www.motherjones.com/politics/2014/06/verizon-comcast-net-neutrality-blind-deaf-disabled/ [https://perma.cc/45ZF-G8X2].

271. *See* Klint Finley, *FCC Plans to Gut Net Neutrality, Allow Internet 'Fast Lanes'*, WIRED (Nov. 21, 2017, 3:36 PM), https://www.wired.com/story/fcc-prepares-to-unveil-plan-to-gut-net-neutrality/ [https://perma.cc/X63A-87TA].

272. *See* Eirchelberger, *supra* note 270.

which, in the interest of full disclosure, I represented at the FCC—quickly scrambled to investigate Verizon's claims.

The results of the coalition's investigations, reported in filings to the FCC, revealed that the need for disability-specific treatment of applications was, at a minimum, considerably overstated, a conclusion noted in a widely shared article entitled *Deaf Advocacy Groups to Verizon: Don't Kill Net Neutrality on Our Behalf*.[273] The coalition argued that making Internet-based applications accessible "is possible on an open network and without the need for broadband providers to specifically identify traffic from accessibility applications and separate it out for special treatment."[274] The coalition noted that accessibility concerns could be addressed, along with similar concerns that would apply to broad classes of applications through the FCC's allowance of non-discriminatory "reasonable network management" practices, and urged the Commission to reject using disability as a basis for allowing ISPs to discriminate among applications.[275]

The coalition argued not only that disability-specific fast lanes are unnecessary to achieve Internet accessibility, but also that affording ISPs the ability to discriminate could result in placing applications that people with disabilities relied upon in a slow lane—or blocking them altogether.[276] The coalition described how ISPs had blocked the use of video conferencing services, including Apple FaceTime and Google Hangouts, which are frequently relied upon by American Sign Language users to communicate with each other.[277] The coalition noted that ISP blocking and prioritization that hindered video communication by signers often occurred in places of employment and places of public accommodation, such as coffee shops and airports, arguably in violation of the ADA.[278] The coalition also noted the importance of nondiscrimination in the administration of Internet access plans, explaining that the data caps imposed on many plans, while sufficient for many users, hindered the ability for deaf and hard of hearing users to engage in basic communications over video while forcing them to pay extra for voice services that they could not use.[279]

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273. Jon Brodkin, *Deaf Advocacy Groups to Verizon: Don't Kill Net Neutrality on Our Behalf*, ARS TECHNICA (July 22, 2014, 1:06 PM), https://arstechnica.com/tech-policy/2014/07/deaf-advocacy-groups-to-verizon-dont-kill-net-neutrality-on-our-behalf/ [https://perma.cc/DZ7G-2FHY].

274. *Comments of Telecommunications for the Deaf and Hard of Hearing, Inc., National Association of the Deaf, Hearing Loss Association of America, Deaf and Hard of Hearing Consumer Advocacy Network, Rehabilitation Engineering Research Center on Telecommunications Access & Clayton H. Lewis*, GN Docket No. 14-28, 7 (2014), https://ecfsapi.fcc.gov/file/7521707584.pdf [https://perma.cc/T5A4-AMKZ]; *see also* Ex Parte of TDI, et al., *Re: Protecting and Promoting the Open Internet*, GN Docket No. 14-28, 1–2 (2014), https://ecfsapi.fcc.gov/file/60000986040.pdf [https://perma.cc/HB42-P6YY]; American Association of People with Disabilities & National Council on Independent Living, *In the Matter of Proposed Rulemaking to Protect Open Internet* (2014), https://ecfsapi.fcc.gov/file/7521701850.pdf [https://perma.cc/X5CH-E5QR].

275. *See* Comments of TDI et al., *supra* note 274, at 5 n.13.

276. *See id.* at 4–7.

277. *Id.*

278. *See id.* at 13–15.

279. *See id.* at 15–16.

In the landmark *2015 Open Internet Order*, the FCC ignored Verizon's arguments and adopted bans on application-based blocking, throttling, and other rules,[280] as well as specific transparency requirements aimed at ensuring that people with disabilities could evaluate the suitability of broadband plans for use with accessible applications.[281] However, the rules were reopened following the election of Donald Trump and his appointment of Ajit Pai as the Chairman of the FCC. Chairman Pai, who dissented from the 2015 Order,[282] immediately opened a rulemaking aimed at abolishing the rules.[283]

Net neutrality opponents again raised the specter of disability-specific prioritization as a justification for abolishing the rules,[284] but cited as evidence only a decade-old (and failed) experiment by the Welsh government to provide video calling to citizens with disabilities over prioritized connections.[285] The coalition of disability advocates and researchers urged the FCC to maintain the anti-discrimination rules, noting that there was no serious evidence of a need for disability-specific prioritization[286] and that the rules had effectively curtailed the discriminatory blocking of applications, yielding a slew of new high-bandwidth video conferencing and personal navigation applications[287] needed by people with disabilities.[288] The coalition again raised alarm bells over the increasing use of data caps by ISPs, which hindered the increasing usage of high-bandwidth applications

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280. *Protecting and Promoting the Open Internet*, Report and Order on Remand, Declaratory Ruling, and Order, 30 FCC Rcd. 5601, 5603 (Mar. 12, 2015) [hereinafter *2015 Open Internet Order*].

281. *Id.* at 5672 ("[T]he need for enhanced transparency is bolstered by the needs of certain user groups who rely on broadband as their primary avenue for communications, such as people with disabilities.") (citing *Comments of Telecommunications for the Deaf and Hard of Hearing, Inc. et al.*, GN Docket No. 14-28, 2–4 (2017)).

282. *Id.* at 5921 (dissenting statement of Commissioner Ajit Pai).

283. *Restoring Internet Freedom*, Notice of Proposed Rulemaking, 32 FCC Rcd. 4434 (2017).

284. *See Comments of Comcast*, WC Docket No. 17-108, 56 (2017), https://www.fcc.gov/ecfs/filing/107171777114654 [https://perma.cc/ZRV3-H2KM] (citing Brent Skorup, *The FCC's Misguided Paid Priority Ban*, TECH. LIBERATION FRONT (April 13, 2017), https://techliberation.com/2017/04/13/the-fccs-misguided-paid-priority-ban/ [https://perma.cc/UGP8-H6B2]); *see also* Martin Geddes, *Why You Should Demand #NetMorality Instead of #NetNeutrality*, GEDDES (Apr. 15, 2016), http://www.martingeddes.com/why-you-should-demand-netmorality-instead-of-net-neutrality/ [https://perma.cc/XC9M-9GSS] (suggesting that net neutrality is a barrier to "a world where the deaf can access cheap and reliable video sign language, without any legal barriers to its delivery").

285. *See Reply Comments of Telecommunications for the Deaf and Hard of Hearing, Inc., National Association of the Deaf,* GN Docket No. 14-28, 2–3 (Aug. 30, 2017), https://ecfsapi.fcc.gov/file/1083154418869/2017.08.30%20Consumer%20Groups%20%2B%20Researchers%20Open%20Internet%20Reply%20Comments%20Final.pdf [https://perma.cc/KQN5-6HZ5] (internal citations omitted).

286. *Id.* at 2–4.

287. These navigation applications allow people who are blind or visually impaired to transmit the world around them via a wearable video camera back to a service that provides real-time audio description of what is in front of them. *Id.* at 3–4.

288. *Id.* at 4–7.

by people with disabilities[289] and emphasized the danger of ISPs building their own proprietary video conferencing and navigation systems, tying people with disabilities who relied on those applications to specific network providers and increasing the incentives for discrimination against competing applications.[290] The FCC ignored these concerns, rescinding the blocking and throttling rules later in the *2017 Restoring Internet Freedom Order*.[291]

A full exploration of the implications of network deployment and operation policy at the physical and network layers for accessibility is beyond the scope of this article, and this article leaves unexplored, for example, important issues of broadband deployment to people with disabilities[292] and the impact of wireless spectrum policy on hearing aids.[293] But the net neutrality saga serves to underscore that Internet accessibility will require addressing issues of discrimination at the network and physical layers. Telecommunications law will continue to be an important complement to the ADA in the tangle of disability laws that must ultimately be applied to achieve Internet accessibility.

E. Accessible Devices and the Internet of Things

Finally, making the constituent layers of the Internet accessible will not suffice to make the whole Internet accessible if the devices that people with disabilities use to connect to the Internet and interact with Internet-enabled applications are not themselves accessible. As James Grimmelmann and Paul Ohm have explained, the value of applying non-discrimination principles to the Internet itself can be

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289. *Id.*

290. *See id.* at 12–14.

291. *Restoring Internet Freedom*, Declaratory Ruling, Report and Order, and Order, 33 FCC Rcd. 311 (Jan. 4, 2018) [hereinafter *2017 Restoring Internet Freedom Order*]. In 2019, the DC Circuit largely upheld the *Restoring Internet Freedom Order* but remanded to the FCC for further proceedings on several discrete issues where it concluded that the agency acted arbitrarily and capriciously. On Petition for Review of an Order of the Federal Communicaions Commission, Mozilla Corp. v. FCC, No. 18-1051 (D.C. Cir. Oct. 1, 2019), https://www.cadc.uscourts.gov/Internet/opinions.nsf/FA43C305E2B9A35485258486004F6D0F/$file/18-1051-1808766.pdf [https://perma.cc/MQ24-HSFZ].

292. *See 2015 Open Internet Order*, *supra* note 280, at 5826–27 ("Adoption of Internet access services by persons with disabilities can enable these individuals to achieve greater productivity, independence, and integration into society in a variety of ways."); FCC, CONNECTING AMERICA: THE NATIONAL BROADBAND PLAN 23 (2010), https://transition.fcc.gov/national-broadband-plan/national-broadband-plan.pdf [https://perma.cc/88U4-Q5G6] (noting lower rates of broadband adoption "[a]mong people with disabilities, who face distinctive barriers to using broadband"); Elizabeth E. Lyle, *A Giant Leap & A Big Deal: Delivering on the Promise of Equal Access to Broadband for People with Disabilities* 15–18 (FCC Omnibus Broadband Initiative, Working Paper No. 2, 2010) (articulating a strategy for increasing broadband adoption among people with disabilities).

293. *E.g.*, *Amendment of the Commission's Rules Governing Hearing Aid-Compatible Mobile Handsets*, 32 FCC Rcd. 9063, para. 42 (Oct. 26, 2017) (discussing standards for radiofrequency interference in the context of the FCC's hearing-aid compatibility (HAC) rules). *See generally* STRAUSS, *supra* note 235, at 293–320 (describing the history of the HAC rules).

significantly constrained by the failure to apply those same principles to the *devices that connect* to the Internet.[294]

The desire for accessible devices dates back to at least the early nineteenth century, when Pellegrino Turri invented a typing machine and carbon paper for Countess Carolina Fantoni da Fivizzano—his friend who was blind.[295] Thomas Edison likewise invented the phonograph for the express purpose of making books accessible in aural form to blind people.[296] But in the Internet age, the accessibility of personal devices is becoming increasingly important as the devices constituting the so-called "Internet of Things" (IoT)—i.e., devices that connect to the Internet—proliferate at an increasing scale. The National Telecommunications and Information Administration (NTIA) has noted predictions that the number of Internet-connected devices in the United States will increase from 2.3 billion to 4.1 billion between 2015 and 2020, "portend[ing] significant and in some cases revolutionary changes[] [and] offer[ing] the potential for industry, government, and individuals to reap benefits in terms of increased efficiency, safety, and convenience that were previously impossible."[297]

Though IoT devices have been described in terms of numerous and varying characteristics,[298] the most salient category for the purpose of this article is the devices that people use to interact with applications on the Internet, which range from desktop and laptop computers to phones and tablets to digital televisions to devices in clothing, cars, airplanes, and household appliances.[299] IoT devices enable a variety of input and output modalities, including speech and pressure-sensitive touchscreens and screen less devices that communicate with aural and/or tactile feedback.

These input and output modalities create significant potential for accessibility problems. For example, virtual assistant applications, including Amazon's Echo, Google's Assistant, and Apple's Siri, are embedded into so-called "smart speaker" devices that listen for verbal instructions and questions and respond with aural feedback.[300] While these devices can be a significant boon for people who are blind

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294. *See* Grimmelmann & Ohm, *supra* note, 107 at 926 (noting in the context of generativity and net neutrality that "[a] neutral network that connects only appliances isn't generative; an occasionally discriminatory network that connects PCs can be").

295. *See* LAZAR ET AL., *supra* note 6, at 23.

296. *See generally id.* at 23–25.

297. THE DEPARTMENT OF COMMERCE INTERNET POLICY TASK FORCE & DIGITAL ECONOMY LEADERSHIP TEAM, FOSTERING THE ADVANCEMENT OF THE INTERNET OF THINGS 3–4 (2017) [hereinafter *IoT Green Paper*] (citing *VNI Complete Forecast Highlights Tool*, CISCO (2016), http://www.cisco.com/c/m/en_us/solutions/service-provider/vni-forecast-highlights.html [https://perma.cc/M2RL-LKU7] ("Global" and "United States" selected)).

298. *E.g.*, Ohm & Reid, *supra* note 188, at 1676–77 (describing the proliferation of microprocessors in IoT devices). The NTIA noted in the *IoT Green Paper* that "[t]here was no consensus among commenters on a formal definition of IoT, or even on whether a common definition would be useful." *See* FOSTERING THE ADVANCEMENT OF THE INTERNET OF THINGS, *supra* note 298, at 5.

299. *See Mobile Accessibility at W3C*, W3C, https://www.w3.org/WAI/standards -guidelines/mobile/ [https://perma.cc/T4F8-QRJ5] (cited with approval in Andrews v. Blick Art Materials, LLC, 268 F. Supp. 3d 381, 394 (E.D.N.Y. 2017)). Accessibility dimensions of smart cities, smart homes, and autonomous vehicles may also prove important.

300. *See* Micah Singleton, *Nearly a Quarter of US Households Own a Smart Speaker,*

or visually impaired,[301] they can remain effectively inaccessible to people with hearing or speech disabilities who are unable to use the devices' input and output modalities.[302]

Internet-law scholars have raised significant concerns about the potential for discrimination in IoT devices.[303] But few scholars have addressed the potential for IoT devices to yield discrimination against people with disabilities,[304] largely focusing instead on discrimination rooted in the widespread collection of personal data by IoT devices and the attendant privacy, security, and economic harms resulting from the use of artificial intelligence, machine learning, and other technologies to exploit the data.[305] That is, scholars have largely focused on the

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According to Nielsen, THE VERGE (Sept. 30, 2018, 10:00 AM), https://www.theverge.com/circuitbreaker/2018/9/30/17914022/smart-speaker-40-percent-us-households-nielsen-amazon-echo-google-home-apple-homepod [https://perma.cc/9QDP-6JWU].

301. *See* Jacob Kleinman, *Smart Speakers Are a Great Tool for the Visually Impaired*, LIFEHACKER (Apr. 16, 2018, 1:45 PM), https://lifehacker.com/smart-speakers-are-a-great-tool-for-the-visually-impair-1825294036 [https://perma.cc/ALG8-ECKD].

302. Of course, some later iterations of these systems have adapted to include screens, touch input, and other modalities that may make them accessible, though this raises questions about the level of abstraction at which an ecosystem of related devices can be described as accessible—must every device in the system be accessible, or most, or many, or even one? *See* Ry Crist, *Amazon's Echo Show Makes Alexa More Accessible to the Deaf and Speech-Impaired*, CNET (July 23, 2018, 8:00 AM), https://www.cnet.com/news/amazon-tap-to-alexa-accessibility-feature/ [https://perma.cc/WKM4-4868] (describing efforts to make smart speakers more accessible).

303. *E.g.*, Peppet, *supra* note 119.

304. *Cf.* Mary Madden, Michele Gilman, Karen Levy & Alice Marwick, *Privacy, Poverty, and Big Data: A Matrix of Vulnerabilities for Poor Americans*, 95 WASH. U. L. REV. 53, 93 & n.203 (2017) (raising the role of social network data in associational discrimination against people with disabilities in employment contexts).

305. *See, e.g.*, Julie Brill, *The Internet of Things: Building Trust and Maximizing Benefits Through Consumer Control*, 83 FORDHAM L. REV. 205 (2014); Stacy-Ann Elvy, *Commodifying Consumer Data in the Era of the Internet of Things*, 59 B.C. L. REV. 423(2018); Margot E. Kaminski, Matthew Rueben, William D. Smart & Cindy M. Grimm, *Averting Robot Eyes*, 76 MD. L. REV. 983 (2017); Andrew Guthrie Ferguson, *The Internet of Things and the Fourth Amendment of Effects*, 104 CALIF. L. REV. 805 (2016); Steven I. Friedland, *Of Clouds and Clocks: Police Location Tracking in the Digital Age*, 48 TEX. TECH L. REV. 165 (2015); Meg Leta Jones, *Privacy Without Screens & the Internet of Other People's Things*, 51 IDAHO L. REV. 639 (2015); Madden, *supra* note 305; Margot E. Kaminski, *Robots in the Home: What Will We Have Agreed To?*, 51 IDAHO L. REV. 661 (2015); Irina D. Manta & David S. Olson, *Hello Barbie: First They Will Monitor You, Then They Will Discriminate Against You. Perfectly.*, 67 ALA. L. REV. 135 (2015); Christina Mulligan, *Personal Property Servitudes on the Internet of Things*, 50 GA. L. REV. 1121 (2016); Scott J. Shackelford, Anjanette Raymond, Danuvasin Charoen, Rakshana Balakrishnan, Prakhar Dixit, Julianna Gjonaj & Rachith Kavi, *When Toasters Attack: A Polycentric Approach to Enhancing the "Security of Things"*, 2017 U. ILL. L. REV. 415 (2017). Security concerns can intersect with accessibility when users with disabilities choose not to install security patches in operating system updates out of concern that doing so will break accessibility features. *See, e.g.*, *The Accessibility Bugs Introduced and Resolved in iOS 12 for Blind and Low Vision Users*, APPLEVIS (Sept. 14, 2018), https://www.applevis.com/blog/apple-ios-news/accessibility-bugs-introduced-and-resolved

extent to which IoT devices can indirectly result in discrimination, rather than the extent to which IoT devices can be *inherently* discriminatory by way of inaccessibility.[306]

Moreover, the accessibility of these personal devices has not been significantly addressed under Title III. Title III has been applied where devices bear a significant connection to a physical place of public accommodation, such as the accessibility of an ATM at a bank or other business, a computer at an Internet café, a registration kiosk at a hotel, or a point-of-sale device at a retail store.[307] Most recently, these types of cases have been brought against or contemplated in the context of so-called "sharing economy" companies such as Uber,[308] Bird, and Lime[309] that fail to make transportation services like cars and scooters accessible to people with disabilities.[310] Title III can also apply where a device is *itself contemplated as an means of accessibility* for an inaccessible place of public accommodation—in Title III's terminology, an "auxiliary aid"—such as an assistive listening device, a closed caption decoder, a telephone handset amplifier, or a screen reader or magnification software used to make the services of a place of public accommodation accessible.[311]

-ios-12-blind-and-low-vision-users [https://perma.cc/WL6Y-7N7A]. Likewise, security bugs can disable functionality relied upon by people with disabilities. *E.g.*, Nicole Perlroth, *Apple Was Slow to Act on FaceTime Bug That Allows Spying on iPhones*, N.Y. TIMES (Jan. 29, 2019), https://www.nytimes.com/2019/01/29/technology/facetime-glitch-apple.html [https://perma.cc/Y356-XMEH] (describing Apple's temporary shutdown of the FaceTime video-conferencing application, often relied upon by sign language users).

306. However, design scholars have analyzed some of the technical and social dimensions of IoT accessibility in the context of the Universal Design literature. *See, e.g.,* Vladimir Tomberg, Trenton Schulz, and Sebastian Kelle, *Applying Universal Design Principles to Themes for Wearables*, *in* UNIVERSAL ACCESS IN HUMAN-COMPUTER INTERATION 550, 554–55 (2015).

307. *See* Nondiscrimination on the Basis of Disability by Public Accommodations and in Commercial Facilities, Final Rule, 75 Fed. Reg. 56,236, 56,315 (Sept. 15, 2010) (to be codified at 28 C.F.R. pt. 35); *see also* Areheart & Stein, *supra* note 8, at 451 ("The ADA has played a central role in compelling the accessibility of a host of software applications, cell phones, ATMs, and e-book reading devices.").

308. *E.g.*, Crawford v. Uber, No. 17-CV-02664-RS, 2018 WL 1116725, at *1 (N.D. Cal. Mar. 1, 2018) (allowing Title III claims to proceed against Uber's Internet-enabled ride-sharing service for failure to provide vehicles accessible to wheelchair users).

309. *E.g.*, *Montoya et al. v. Bird Rides Inc. et al.*, DISABILITY RIGHTS CAL. (Jan. 9, 2019), https://www.disabilityrightsca.org/cases/montoya-et-al-v-bird-rides-inc-et-al [https://perma.cc/Z8CV-SW9R] (alleging a violation of Title III stemming from the abandonment of electric scooters in public places that impedes the ability of people in wheelchairs to navigate sidewalks and other thoroughfares). *See generally* Cyrus Farivar, *Bird, Lime Sued By Disability Rights Activists Who Claim Obstructed Sidewalks*, ARS TECHNICA (Jan. 22, 2019, 7:36 AM), https://arstechnica.com/tech-policy/2019/01/e-scooter-startups-city-of-san-diego-sued-by-local-disabled-plaintiffs/ [https://perma.cc/RCH2-PVP4].

310. Similar concerns have arisen in the context of room-sharing services such as Airbnb. Niraj Chokshi and Katie Benner, *Airbnb Hosts More Likely to Reject the Disabled, a Study Finds*, N.Y. TIMES (June 2, 2017), https://www.nytimes.com/2017/06/02/technology/airbnb-disability-study.html [https://perma.cc/U86S-MHQC].

311. *See* 28 C.F.R. § 36.303(b) (2018); *see also* Ekstrand, *supra* note 64, at 430 ("While the question of . . . *assistive devices* is also important . . . .") (emphasis added).

But Title III has not been significantly or directly applied to the accessibility of personal devices purchased by consumers. Indeed, the Department of Justice has declared that "the ADA does not apply directly to the manufacture of products," and that it "lacks the authority to issue design requirements for equipment designed exclusively for use in private homes."[312] And what, precisely, might be required to make devices accessible raises significant technical questions about the nature of accessible product design.

Non-ADA legal regimes have, to some degree, compensated for Title III's perceived inability to require device accessibility. Legal mandates for the accessibility of devices and software used for person-to-person communications date back to the pre-Internet Telecommunications for the Disabled Act of 1982, which mandated rudimentary accessibility for the telephone system, including compatibility between phones and hearing aids.[313] In the Internet era, Section 255 of the Communications Act[314] and the corresponding guidelines developed by the U.S. Access Board[315] and the FCC[316] directly mandated the accessibility of equipment used for telecommunications services, such as telephones, routers, switches, set-top boxes, and home networking equipment used to connect telephone and VoIP services.[317] Likewise, Sections 102 and 104 of the CVAA[318] and the corresponding regulations developed by the FCC extended Section 255 to new advanced communications services equipment used to facilitate electronic messaging, VoIP, and video conferencing services,[319] as well as to web browsers built into mobile phones.[320]

Likewise, non-ADA regimes have augmented Title III by requiring the accessibility of devices used to view video programming. These mandates date back to the Television Decoder Circuitry Act of 1990 (TDCA), which required televisions thirteen inches or larger to include closed-captioning decoders.[321] The TDCA's

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312. Nondiscrimination on the Basis of Disability by Public Accommodations and in Commercial Facilities, 75 Fed. Reg. at 56,315.

313. To Amend the Communications Act of 1934 to Provide Reasonable Access to Telephone Service for Persons with Impaired Hearing and to Enable Telephone Companies to Accommodate Persons with Other Physical Disabilities., Pub. L. No. 97–410, 96 Stat. 2043 (1983); *see also* STRAUSS, *supra* note 235, at 34–35.

314. 47 U.S.C. § 255(b) (2012); *see also* STRAUSS, *supra* note 235, at 345–84.

315. The Access Board is an independent agency of the U.S. government created in 1973 to help oversee the development of standards for the Architectural Barriers Act, a predecessor to the ADA that required making federal government facilities accessible. *See generally History of the Access Board*, U.S. ACCESS BOARD, https://www.access-board.gov/the-board/board-history [https://perma.cc/NFX5-YPW5].

316. 36 C.F.R. §§ 1194.2 & App'x B.

317. *Id.* §§ 1194.2 & App'x B (C103.4) (defining "customer premises equipment").

318. Twenty-First Century Communications and Video Accessibility Act of 2010, P.L. 111-260, § 104, 124 Stat. 2751 (2010).

319. *See supra* Section III.C & nn.206–10 (detailing the ACS rules).

320. 47 U.S.C. § 619(a) (2012); 47 C.F.R. § 14.60(b) (2018) (extending the ACS equipment accessibility rules and certain compatibility rules to web browsers on mobile phones). *See generally Implementation of Section 718 of the Communications Act of 1934*, Report and Order, 28 FCC Rcd. 5957 (2013) (implementing the web browser regulations).

321. To Require New Televisions to Have Built in Decoder Circuitry., Pub. L. No. 101–

provisions, updated by Sections 203 and 204 of the CVAA[322] and elaborated upon in the FCC's corresponding rules,[323] now require video playback devices of all sorts, including Internet-enabled video devices, to enable closed captions and video descriptions and to have accessible user interfaces.[324]

But the Section 255 guidelines, ACS rules, and video programming rules are not universally applicable and cover only limited classes of networking equipment, communications devices and software, certain web browsers, and video playback hardware and software, and do not fully cover a significant proportion of IoT devices with functionality that goes beyond these contours.[325] While the FCC contemplated extending its Section 255 and ACS rules further in its 2015 *Open Internet Order* by applying Section 255 to ostensibly all equipment connected to the Internet,[326] the 2017 *Restoring Internet Freedom Order* rescinded this broad application of Section 255.[327] The FCC has also routinely granted exemptions to its ACS and user interface rules for advanced communications services embedded in television sets and video players,[328] video game systems,[329] e-book readers,[330] and cars.[331]

431, 104 Stat. 960 (1990); *see also* STRAUSS, *supra* note 235, at 226–45 (describing the history of the TDCA's development).

322. §§ 203–04, 124 Stat. at 2772–74.

323. *See supra* note 205.

324. §§ 203–04, 124 Stat. at 2772–74; 47 C.F.R. pt. 79, subpt. B.

325. *Implementation of Sections 716 and 717 of the Communications Act of 1934, as Enacted by the Twenty-First Century Communications and Video Accessibility Act of 2010*, Report and Order and Further Notice of Proposed Rulemaking, 26 FCC Rcd. 14,557 (2011) (ACS Report and Order); *see also* 47 U.S.C. §§ 618–19 (2012); 47 CFR §§ 14.1–14.52 (2018).

326. *See 2015 Open Internet Order*, 30 FCC Rcd. at 5826-5831, ¶¶ 472–476.

327. 2017 *Restoring Internet Freedom Order*, 33 FCC Rcd. at 409, ¶ 164 & n.600.

328. *Consumer Electronics Association and National Cable & Telecommunications Association Peititons for Class Waivers*, Order, 27 FCC Rcd. 12,970, 12,975–76, 12,979–81 (2012) (granting waivers from the ACS rules for IP-based video players, televisions, and cable boxes that expired in 2015).

329. *Entertainment Software Association Petition for Class Waiver*, Order, 32 FCC Rcd. 10,448, 10,448–50 (2017) (granting a final one-year class waiver from the ACS rules for communication functionality in video game software, which the FCC had initially granted in 2012 for video game consoles, distributions, and software, and which was narrowed to video game software in 2015) (preceding history omitted).

330. *Coalition of E-Reader Manufacturers' Petition for Class Waiver*, Order, 31 FCC Rcd. 858, 861–62 (2016) (extending indefinitely a waiver of the ACS rules for communication functionality in certain e-book readers, which the Commission initially granted in 2014) (preceding history omitted). E-reader manufacturers provided a report on progress in making e-readers accessible in 2019. *See* Coalition of E-Reader Manufacturers Report, In re Implementations of Sections 716 and 717 of the Communications Act of 1934, No. 10-213 (Mar. 5, 2019).

331. *Accessibility of User Interfaces, and Video Programming Guides and Menus*, Memorandum Opinion and Order, 33 FCC Rcd. 4450 (2018) (granting a waiver to Honda for user interfaces on entertainment systems in cars); *Accessibility of User Interfaces, and Video Programming Guides and Menus*, Order, 32 FCC Rcd. 7275 (2017) (same for Chrysler). The FCC is presently in the process of considering a waiver request for the communications system in General Motors's autonomous vehicle ride-hailing service. FCC, *Consumer and Governmental Affairs Bureau Invites Comment on a Petition Filed by General Motors Holding*

Somewhat more promising in their scope are the Access Board's guidelines[332] implementing Section 508 of the Rehabilitation Act.[333] The guidelines contain relatively comprehensive accessibility guidelines that cover all "[i]nformation and [c]ommunication[s] [t]echnology (ICT)," including devices, broadly defined—and even software, applications, websites, and content.[334] However, Section 508's coverage is severely limited to ICT procured by federal government agencies,[335] meaning that it requires accessibility of devices only indirectly where vendors sell devices to the government.[336]

In short, there exists no legal regime that comprehensively mandates accessibility for IoT devices. While industry and disability organization representatives on the FCC's Disability Advisory Committee (of which I am a member) acknowledged the serious shortcomings of accessibility on IoT devices and recommended that the FCC conduct a sweeping study on IoT accessibility,[337] little action has been taken toward this end, and it remains to be seen what legal regimes will develop to address IoT accessibility—a critical component of a comprehensive approach to Internet accessibility.

CONCLUSION

At this point, some readers may expect a Part IV that lays out a series of solutions for how to navigate the accessibility challenges across the layers of the Internet stack. But I hope that this article has established, if nothing else, that these challenges are dramatically broader and deeper than a single article might address. While this article has sketched a framework for addressing the sufficiency of existing legal rudiments at the content, application, network, and physical layers, among devices that connect to the Internet, concerted future research, advocacy, policymaking, and technological development will be needed to apply, extend, and augment these rudiments to ensure the civil and human rights of people with disabilities to access the Internet on equal terms.

Disability scholars have already laid an important foundation for Internet accessibility, and Title III of the ADA, the disability provisions of telecommunications law, and other statutes and regulatory regimes provide helpful doctrinal bases for achieving it. But to fully understand what making the Internet accessible will entail, disability scholars and advocates will have to navigate the

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LLC for Partial Waiver of Real-Time Text Minimum Functionality Requirements, Public Notice (Jan. 25, 2018), https://docs.fcc.gov/public/attachments/DA-18-1301A1.pdf [https://perma.cc/YP5N-YZQ7].

332. *See* 36 C.F.R. § 1194.1, App'x A, B, D (2018).

333. 29 U.S.C. § 794d (2012).

334. 36 C.F.R. pt. 1194, App'x A (E103).

335. § 794d(a)(1)(A).

336. *See* LAZAR ET AL., *supra* note 6, at 93–95. This approach of accessibility via procurement has also been utilized in cases under Title II of the ADA and Section 504 of the Rehabilitation Act against universities. *See id.* at 85–88.

337. FCC Disability Advisory Committee, Recommendation of the FCC Disability Advisory Committee (Dec. 6, 2016), https://docs.fcc.gov/public/attachments/DOC-342526A1.pdf [https://perma.cc/9NVN-DVD6].

puzzles of perspective that have confounded Internet-law scholars for the past two decades.

Augmenting disability law's traditional internal perspective with an external view reveals new angles and challenges hidden within the Internet's layered architecture for accessibility. Considering disability law through the lens of perspectives also helps illuminate the important role that an internal perspective, like the one taken by disability scholars, can provide for illustrating the societal salience of the Internet and Internet-enabled technology for specific groups of people—and in turn, animating broad policy concerns that flow from their experience of the Internet—while showing that the external perspective can be helpful for designing comprehensive and granular regulatory schemes.