

REGULATING INFORMATIONAL
INFRASTRUCTURE:
INTERNET PLATFORMS AS THE NEW PUBLIC
UTILITIES

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INTRODUCTION

It's not easy being an Internet giant. Once the darlings of the innovation economy, the major technology companies—Amazon, Google/Alphabet, and Facebook—have in recent months found themselves suddenly on the back foot. From the firestorm surrounding the proliferation of “fake news” and hate speech on Facebook and YouTube, to Google's long-burning dispute with Yelp over the former's alleged skewing of search results to favor its own products, to Amazon's various disputes with publishers and retailers alike,¹ the technical wizardry, convenience, and efficiency promised by these firms no longer seems benign.

These various conflicts, while complex in their own right, are each symptomatic of a deeper problem posed by these dominant firms. The root problem is that Google, Facebook, and Amazon are not ordinary companies selling goods and services on the market. Rather, these firms are better understood as *infrastructural* firms. They increasingly operate as

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¹ See Conor Dougherty, *Inside Yelp's Six-Year Grudge Against Google*, N.Y. TIMES (July 1, 2017), <https://www.nytimes.com/2017/07/01/technology/yelp-google-european-union-antitrust.html> [<https://perma.cc/L674-KTZ5>].

the foundational, backbone platforms upon which economic and social activities and transactions all take place. Yet this infrastructure remains privately-controlled for the ultimate interest and profit of these firms themselves. And through their control of this infrastructure, Amazon, Google, and Facebook possess a problematic concentration of power. Their internal policies and decisions effectively govern the flow of information, goods, and services in our increasingly digitized economy and society. Conceptualizing these firms as (private) infrastructure clarifies the nature of the current legal, policy, and political debate around these private actors: if these informational platforms are effectively governors of much of our informational, economic, and political life, how then should our public policy govern them?

This paper develops an infrastructural view of information platforms, drawing out some implications for how we might diagnose and then remedy problematic concentrations of power enabled by the infrastructural nature of these firms.

Part I defines the concept of infrastructure, and links it to a historical, legal, and regulatory tradition of “public utility regulation,” where reformers developed a compelling approach to diagnosing and remedying the problem of private power over the essential infrastructure of the industrial economy, from railroads to finance. This concern about arbitrary private power, concentrated through the control of vital infrastructure, informed a range of legal and regulatory innovations that ultimately helped forge what we now recognize as the modern regulatory state. This public utility tradition suggests some useful *methods* through which we can diagnose, and then contest, concentrations of private power over infrastructure.

A key challenge, however, is that modern information platforms on the surface do not necessarily look like classic monopolies of the late nineteenth century, insofar as technology and the Internet often appear as decentralized, diffuse systems that are dynamic, prone to disruption and therefore less like the classic dominating monopolies of yesteryear. But beneath this appearance of dynamism and decentralization lie more modern—and perhaps even more troubling—concentrations of power. Part II adapts the public utility and infrastructure concepts to identify three specific forms of infrastructural power exercised by information platforms like Google, Facebook, and Amazon: *gatekeeping power*, *transmission power*, and *scoring power*. These distinct, though often related, forms of power arise from these firms’ control over informational infrastructure.

What then should law and policy do to address these forms of power? In Part III, the paper again recalls and modifies classic public utility regulatory tools for addressing the problem of disparate power and control over infrastructure. Here too, there are distinct strategies for

assuring checks and balances of private power. First, we might imagine new forms of *oversight and accountability*, animated by public utility-style values such as norms of nondiscrimination, common carriage, and public safety. Crucially, such oversight might take the form of public, regulatory monitoring, or regimes of private self-governance—or both. Yet both public and private oversight ultimately depend on assumptions about the capacity, accountability, and responsiveness of the regulators themselves. By contrast, the public utility tradition suggests a second set of reform strategies that we might think of as being more *structural*, focused on prophylactically limiting the power and conflicts of interest that make privately controlled infrastructure most dangerous. These structural tools include measures like antitrust restrictions, “firewalls” that limit the corporate structures and investment vehicles permitted for certain kinds of infrastructural firms, and the like. Finally, there is a third regulatory model which combines elements of the first two: the creation of *public options*. Public options provide a structural limit on private infrastructural power, by providing a “plain vanilla,” non-profit alternative to the potentially exploitative or unfair management of private informational infrastructures, thus providing users a way to opt out of unfair business practices and introducing a kind of competitive pressure keeping private actors honest. Furthermore, by virtue of their “publicness,” these public options could also themselves be governed and administered in accordance with explicit values such as transparency, accountability, nondiscrimination, and responsibility to the public interest.

Part IV concludes with some reflections on the stakes of these challenges for our broader values of democracy and economic freedom.

I. THE CONCEPT OF INFRASTRUCTURE AND THE PUBLIC UTILITY TRADITION

Ordinarily when we think of infrastructure we think of physical objects, roads, and bridges. These are goods and services that are foundational, and that we expect the public to provide—or at least oversee. In economic terms, public control over infrastructure is warranted in conditions of natural monopoly, where high sunk costs and increasing returns to scale suggest that private market competition is likely to under-supply the good in question. But infrastructure can be conceptualized in much broader terms. Specifically, we can define infrastructure through a combination of three conditions.²

First, there is the condition of *scale*: infrastructure operates at, and must be supplied at, scale for all to use, raising economic concerns about

² This part builds on my earlier work: K. Sabeel Rahman, *The New Utilities*, CARDOZO L. REV. (2018).

production and supply. In economic terms, “natural monopoly” arises where high sunk costs and increasing returns to scale mean that efficient supply requires monopolistic or near-monopolistic provision. Thus, the social value of a road network or an electrical grid increases as more of the country is connected. The sheer expense of building these roadways or laying telephone cable suggests a role for public investment and provision, since competition is unlikely on its own to provide adequate alternatives.

But as Brett Frischmann has suggested,³ this supply-side account of infrastructure must be complemented by a “demand-side” view. Focusing on demand highlights a second set of conditions for infrastructural goods and services: infrastructure in this view connotes those goods and services that enable widespread “downstream uses” as inputs into a plethora of economic and social uses and activities.

The importance of infrastructure to these downstream uses points to a third feature of infrastructural goods and services: the tendency of their provision to concentrate in a few actors and their centrality to so many downstream uses create a potentially problematic power disparity, a *vulnerability* to the abuse of end users by those actors who control the infrastructure itself. It is this vulnerability that creates the most troubling policy challenges. Those who control the terms of access to, and administration of, infrastructure are in a position to dominate those who depend on that infrastructure.

The problem of arbitrary power controlling infrastructure—and through this control, dominating end users—is not new. In the late nineteenth century, industrialization created new technologies from gasworks to electricity to railroads to the telegraph—technologies that rapidly became the backbone of the modern economy and society. But these transformations also created tremendous social upheaval and, most troublingly, glaring disparities of power between the corporations that dominated these new technologies and the range of constituencies at the mercy of these new mega-firms. The pressures of these new forms of corporate power provoked a rich intellectual transformation in legal thought and forced the innovation of new regulatory institutions and techniques. Indeed, the central concern for these Progressive Era reformers was the problem of concentrated corporate power. As legal realist thinkers like Morris Cohen or Louis Brandeis argued, corporations were quasi-sovereign, exercising a power and influence over others akin to the state itself, yet without the checks and balances expected of democratic, republican state institutions.⁴

³ BRETT M. FRISCHMANN, *INFRASTRUCTURE: THE SOCIAL VALUE OF SHARED RESOURCES* (2012).

⁴ See generally K. SABEEL RAHMAN, *DEMOCRACY AGAINST DOMINATION* (2016).

As Bill Novak has argued, one of the most important and influential intellectual transformations of this period lay in the innovation of the public utility.⁵ As reformers looked at these new forms of corporate power, it was private, arbitrary control over the necessities of life that seemed to pose the most glaring threat to democracy and economic liberty. If farmers depended on banks for credit and railroads for shipping goods to market, or if consumers depended on new corporate producers for basic food and milk, these firms had to be overseen and held accountable to the public good. Concern for holding private power accountable, particularly in the context of necessities, gave rise to the modern techniques of law and regulation as progressive reformers innovated administrative institutions to assure transparency and consumer safety, fair prices, and, at the limit, outright public provision of these goods by nationalizing or municipalizing private firms into public utilities.⁶ The classic public utility battle took place in the context of the railroads and the telegraph, as reformers sought to break the stranglehold that corporate titans like the Vanderbilts and the Goulds had on the modern economy through their control of these new, yet now absolutely critical, forms of infrastructure upon which the rest of society depended.⁷ Key to the legal response was the development of public utility regulations: common carriage requirements, rate-setting, and other consumer protection regulations. But the public utility idea extended well beyond these archetypical cases, informing the state chartering of utilities and public oversight in everything from milk to ice to transportation to finance.

Today the public utility idea is often dismissed as an archaic form of regulatory overreach, one that created conditions ripe for regulatory capture and industry rent-seeking, protectionism, and self-dealing.⁸ Industries extracted rents by securing public utility status, deploying their charters as a weapon against competition; courts struggled to maintain a clear line between those industries that were “affected with the public interest” such that they warranted such regulatory control, and ordinary

⁵ See generally William J. Novak, *Law and the Social Control of American Capitalism*, 60 EMORY L.J. 377 (2010).

⁶ *Id.*; NAOMI R. LAMOREAUX & WILLIAM J. NOVAK, *CORPORATIONS AND AMERICAN DEMOCRACY* (2017).

⁷ See e.g., RICHARD JOHN, *NETWORK NATION* (recounting the history of public utility debates around the rise of telecommunications networks in the nineteenth century); see also Novak, *The Public Utility Idea and the Origins of Modern Business Regulation*, in *THE CORPORATION AND AMERICAN DEMOCRACY* (Naomi R. Lamoreaux & William J. Novak eds., 2017) (describing the rise of public utility administration in a variety of contexts)

⁸ See e.g., William Boyd, *Public Utility and the Low-Carbon Future*, 61 UCLA L. REV. 1651–58 (2014).

industries that did not.⁹ But the public utility moment was, in fact, a tremendous success. The challenge of regulating private power and assuring fair and equal access to these foundational goods catalyzed the creation of new administrative agencies at the state and local level, and created a generation of lawyers and policymakers now skilled in these new legal tools and techniques, in effect setting up the creation of the modern administrative state.¹⁰

Even more than its effect on any particular industry, public utility was influential and powerful in its broader ethos: the sense of regulatory innovation in the face of technological change and disparate power, and the aspiration to secure meaningful democracy and economic liberty in the face of private actors whose control over foundational infrastructure would otherwise create a form of arbitrary power and domination.¹¹ Central to this public utility ethos was a highly empirical and context-specific attempt to diagnose particularly troubling concentrations of power within the control of infrastructure and to tailor legal interventions accordingly.

Consider some brief examples:

In 1858, the Wisconsin Supreme Court canceled certain provisions of a contract for service between an individual shopkeeper and a city-chartered, but privately run, gasworks after the plaintiff had been denied service by the gas company.¹² The court reasoned that while the company had “full right to govern itself,” it had “no right to govern the people at large.”¹³ While the firm could make “all such needful rules and regulations” it deemed fit in its contractual terms of service with end users, those rules had to be “reasonable, just, lawful, not capricious, arbitrary, oppressive, or unreasonable,” for otherwise “the whole net work [sic] of pipes and machinery would be at the mercy of the careless, the fraudulent or the malignant.”¹⁴ In particular, the court voided specific aspects of the user contract, including those that allowed the gas company to “capriciously select” whom to serve, and those that permitted the company to arbitrarily and without notice invade the privacy of the home of the user for inspections or to arbitrarily cut off service.¹⁵ Similarly, in

⁹ See Horace Gray, *The Passing of the Public Utility Concept*, 16 J. LAND & PUB. UTIL. ECON. 8 (1940). See generally Novak, *supra* note 5; Boyd, *supra* note 8, at 1614.

¹⁰ Novak, *supra* note 5.

¹¹ See, e.g., Boyd, *supra* note 8, at 1619; Novak, *Social Control*, at 399–400.

¹² *Shepard v. The Milwaukee Gas Light Co.*, 6 Wis. 539 (1858).

¹³ *Id.* at 542.

¹⁴ *Id.* at 548.

¹⁵ *Id.* at 548–49.

the famous 1876 case of *Munn v. Illinois*, the U.S. Supreme Court approved state police power legislation and regulation covering grain warehouses, invoked the concept of common carriage,¹⁶ and held that the warehouses were critical “gateway of commerce” akin to tolls on transitways¹⁷ and thus could not exploit this power to deny service and access arbitrarily.

By the early twentieth century the public utility concept had developed into a “workable consensus” among courts and legislatures that businesses affected by the public interest were those that “met an important human need” and that “some feature of the relevant market presented the risk of oppression.”¹⁸ Necessity here functioned as a “broad concept . . . linked not to bare survival but to ideas of dependence, expectation, and reliance.”¹⁹ The fact that individuals and communities depended on these goods created power imbalances and justified regulatory interventions to redress issues like fraud, barriers to access, information asymmetries, and bargaining disadvantages.²⁰

This conceptualization of private power, particularly when manifested through control over necessities and vital infrastructure, offers a compelling way to approach the contemporary challenges of information platforms and our modern technological infrastructure. Indeed, it is difficult to read these historical materials in 2018 without seeing the resonances with modern-day concerns of the Internet economy: Amazon and Google search as “gateways” to commerce; the ways in which technology companies often rely on murky and opaque terms of service that include various unreasonable provisions, particularly those that allow for arbitrary cutoffs or invasions of user privacy; and crucially, that all this takes place in a context where one’s access to and ability to function on these platforms are increasingly necessary for modern economic and social activity. The next Part adapts these public utility concepts to diagnose particular forms of infrastructural power exercised by information platforms, in ways that evoke and adapt these historical analogies.

II. INFORMATIONAL INFRASTRUCTURE(S)

Information platforms in the modern Internet economy exhibit these characteristics of infrastructure. First, many of these platforms

¹⁶ *Munn v. Illinois*, 94 U.S. 113, 129 (1876).

¹⁷ *Id.* at 131–32.

¹⁸ Nicholas Bagley, *Medicine as a Public Calling*, 114 MICH. L. REV. 57, 75 (2015).

¹⁹ *Id.* at 76.

²⁰ *See id.* at 77 (on Wyman’s broad conception of unchecked power leading to public utility-style regulations).

operate at scale: their value is largely premised on maintaining widespread user adoption. Indeed, it is important to note that the dynamics of natural monopoly can occur even in technological contexts where the startup costs may in some sense be small. While laying railroad track or telegraph cabling is incredibly costly—especially at the start—it is relatively cheap to build a new app or to develop new code. Yet the reality is that these information platforms exhibit strong *network effects*: the value of the service increases radically as more users engage on the platform.²¹ An information platform with no users and no information on it may be relatively cheap to build, but is worthless because no one actually transacts on the platform. In the current economy, while another company might create a new social media platform, the likelihood of it displacing Facebook—which has become so widely used—is low, precisely because of Facebook’s network effects.

The scale that these network effects make possible contributes much to the value of these platforms. An information platform is more valuable the more people use it. Furthermore, the value of these platforms lies in part in the kinds of downstream uses they make possible. Google is indispensable for search, as is Amazon for retail and Facebook for information flows. As these platforms become more widely used, they become more necessary for access to information. Much of our economic, social, and cultural life now flow through these conduits. Finally, the very scale and necessity of these platforms creates the third condition of vulnerability. As the concerns about skewed search results, fake news, or unfair competition suggest, consumers, businesses, and the public at large are beholden to the policy decisions of these private firms as they set the rules for their own platforms.

We are accustomed to thinking of the Internet and information platforms as fluid, dynamic, and decentralized. It is not as if Facebook literally owns and directly controls private media companies, or Google or Amazon owns the companies that are trying to reach consumers through online search. Critically, however, these information platforms represent key *nodes* in economic, social, and informational flows. Control over these nodes thus affords Google, Amazon, or Facebook tremendous power over the larger ecosystem of media, economic actors, and even our politics.

But what exactly is “infrastructural” about these platforms? Part of the challenge is that information platforms exercise multiple distinct, but related, forms of power through their position as informational infrastructure. Identifying these distinct forms of power is important to

²¹ For a discussion of network effects and their social and moral value, see, e.g., Yochai Benkler, *THE WEALTH OF NETWORKS* (2007).

mapping legal and institutional remedies tailored to assuring fair and equal access to flows of economic, social, and cultural information. Three distinct forms of power in particular stand out: *gatekeeping power*, *transmission power*, and *scoring power*.

1. Gatekeeping power. Here, the control over entry to (and exit from) the platform provides a distinct type of power for infrastructural firms. In general, as networks become more dominant, membership in them (or access to them) becomes more valuable. This allows the entities controlling the terms of access to impose conditions on aspiring entrants, extracting rents or inducing widespread changes in behavior.²² In the context of information platforms like Google, Facebook, and Amazon, the anxieties produced by gatekeeping power explain many of the controversies these companies generate. Thus, content producers can't afford not to engage with Facebook's News Feed to get their content across, just as booksellers and other retailers increasingly must play in the online retail marketplace structured by Amazon, even if the prices of entry (such as the cut Amazon takes from sales or the "sponsored content" fees charged by Facebook) might be steep.

2. Transmission power. A related but distinct form of power exercised by information platforms is the way in which these platform companies can structure—and manipulate—the flows of information and activity among participants once they enter into the platform or network. This is the central concern nineteenth century farmers had with the railroads: even if farmers could pay the inordinate prices to get their goods on the track, they were at the mercy of the way the firms routed and manipulated the flow of goods and services.²³ Today, similar concerns about transmission power manifest in our discussions about information platforms. In the Net Neutrality context, for example, much of the concern for advocates has been the worry that Internet service providers (ISPs) would throttle, block, or degrade some kinds of data while speeding up others, potentially in exchange for higher fees. Such "paid prioritization" is only possible given the ability of ISPs to manipulate the flow of information once it is on their platform. Similar concerns arise in context of Facebook's control of its newsfeed, or Google's control of its search results. The algorithms that rank results and shape the flow of content can, in practice, enable different forms of prioritization and ranking that could

²² This is the kind of "network power" theorized by David Grewal in a variety of contexts from standard-setting to membership in the World Trade Organization. See DAVID S. GREWAL, NETWORK POWER: THE SOCIAL DYNAMICS OF GLOBALIZATION (2009).

²³ See Boyd, *supra* note 8, at 1641–42.

potentially be leveraged to disfavor some content and promote other content.

This ability to manipulate transactions and flows is a key part of the growing critique of Amazon's dominance as the infrastructure of the online retail market.²⁴ As some studies indicate, Amazon will often deploy its vast trove of consumer data to identify successful third-party products which it can then displace through its own branded versions, priced at predatorily low levels to drive out competition. This manipulation concern informs other concerns about the ways in which Google, Facebook, or Amazon can manipulate search results, favoring some competitors over others.²⁵ These information platforms are the virtual conduits for knowledge, culture, and economic activity; they thus possess the means to manipulate those flows for their own gain.

This ability to manipulate and structure flows of information also animates the recent controversies over the political and social repercussions of information platforms and the problems of polarization, radicalization, and "fake news." Subtle changes in the ranking of search results or quiet "nudges" favoring sponsored or paid content, especially if not branded as such, can produce wild swings in end user behavior. Google and Facebook have shown they are able to drive wild swings in voter turnout by minor tweaks in their search and news algorithms.²⁶ As information platforms become the dominant conduit for news and culture, individuals now operate in an informational environment that is effectively produced, curated, and edited by the background algorithms of these information platforms. As a growing number of scholars have argued, platforms like Facebook and YouTube are designed to maximize attention spent on the site rather than accuracy.²⁷ Every such platform has

²⁴ See, e.g., Lina M. Khan, *Amazon's Antitrust Paradox*, 126 YALE L.J. 564 (2017); ARIEL EZRACHI & MAURICE E. STUCKE, VIRTUAL COMPETITION: THE PROMISE AND PERILS OF THE ALGORITHM-DRIVEN ECONOMY (2006).

²⁵ See, e.g., FRANK PASQUALE, THE BLACK BOX SOCIETY (2015); see also Rory Van Loo, *Rise of the Digital Regulator*, 66 DUKE L.J. 1267 (2017).

²⁶ See Jonathan Zittrain, Response, *Engineering an Election: Digital Gerrymandering Poses a Threat to Democracy*, 127 HARV. L. REV. F. 335 (2014), <https://harvardlawreview.org/2014/06/engineering-an-election/> [<https://perma.cc/4J3Q-KQQQ>].

²⁷ See, e.g., Zeynep Tufekci, *It's the (Democracy-Poisoning) Golden Age of Free Speech*, WIRED (Jan. 16, 2018, 6:00 AM), <https://www.wired.com/story/free-speech-issue-tech-turmoil-new-censorship/> [<https://perma.cc/7QH4-SFQN>]; Tim Wu, *Blind Spot: The Attention Economy and the Law*, 82 ANTITRUST L.J. (forthcoming 2018); Jack M. Balkin, *Free Speech in an Algorithmic Society: Big Data, Private Governance, and New School Speech Regulation*, 51 U.C. DAVIS L. REV. 1149 (2018); Kate Klonick, *The New Governors: The People, Rules, and Processes Governing Online Speech*, 131 HARV. L. REV. 1598 (2018); Nabihah Syed, *Real Talk About Fake News: Towards a Better Theory for Platform Governance*, 127 YALE L.J.F. 337 (2017),

a built-in engine feeding users steadily more extreme (and engaging) content, thus exacerbating biases, polarization, misinformation cascades, filter bubbles, and the overall fragmentation of the public sphere.²⁸

3. Scoring power. A third form of infrastructural power exercised by information platforms is *scoring power*. Scoring power combines aspects of both gateway and transmission power in a different form. The mechanism here is the following: some information platforms convert their vast stores of data into a boiled-down index or score, which then becomes widely used to shape online and offline decisions by independent actors. As a result, the entity defining the score can exercise tremendous power on a whole ecosystem of firms and constituencies *without any formal control*.

In the case of online information platforms like Google, Amazon, or Facebook, scoring power is baked into the way the algorithmic control of transmission operates: for example, through relevance scores, background search algorithms or recommendation algorithms. But scoring power is not limited to these online firms. Any kind of rating or standard-setting entity can potentially exercise scoring power. The Equifax disaster is an example of scoring power gone awry. Similarly, the problem of credit ratings for consumers and investment ratings for securities reflect scoring power on the part of credit ratings agencies.²⁹ These indices can have tremendous impacts on the economic and social futures of individuals and companies. Additionally, they create opportunities for rent extraction and market manipulation: as in the case of transmission power, entities that control the index can provide a better rating in exchange for payoffs or rents. This is exactly what afflicted the credit ratings agencies, who offered favorable ratings to various subprime and “toxic” assets in the build-up to the financial crisis.³⁰

Digital information platforms and digital markets magnify these concerns about manipulation and outsized power.³¹ Furthermore, these scoring systems are rapidly proliferating as the rise of big data is fueling

<http://www.yalelawjournal.org/forum/real-talk-about-fake-news> [<https://perma.cc/9Y5H-LJQL>].

²⁸Tufecki, *supra* note 27.

²⁹ See, e.g., Brian Fung, *Equifax's Data Breach Keeps Getting Worse*, WASH. POST (Mar. 1, 2018), <https://www.washingtonpost.com/news/the-switch/wp/2018/03/01/equifax-keeps-finding-millions-more-people-who-were-affected-by-its-massive-data-breach/> [<https://perma.cc/JQ9X-CYXZ>].

³⁰ See, e.g., Andrew Verstein, *Benchmark Manipulation*, 56 B.C.L. REV. 215 (2015) (discussing the potential manipulability of banking indices like LIBOR); John C. Coffee, Jr., *Ratings Reform: The Good, the Bad, and the Ugly*, 1 HARV. BUS. L. REV. 231, 237 (2011) (describing the problems of manipulated investment ratings).

³¹ Ryan Calo, *Digital Market Manipulation*, 82 GEO. WASH. L. REV. 995 (2014).

the creation of risk scoring in everything from criminal justice decisions on bail and parole to employer screening of potential employees.³² As these databases and scores become more widespread, their influence extends to more and more areas of life, creating “databases of ruin” where transactions in some markets feed into metrics that might manifest in completely different and opaque denials of service, loans, or other transactions.³³ Scoring algorithms magnify the concerns of public and private surveillance—which increasingly interact in ways that are hidden from view and accountability.³⁴

It is important to note that one problem with these scoring systems lies in the degree to which they codify stereotypes, flawed information, or inaccuracies that can magnify racial, gender, and other forms of discrimination.³⁵ But even if these scoring systems were responsible and relatively accurate, their outsized influence would still pose a problematic concentration of power, leaving many social actors dependent on the benevolence and good faith of these information systems.

These three forms of power—gatekeeping, transmission, and scoring—are not mutually exclusive. They often interact and combine. Nor do these forms of power exhaust the dangers of dominant information platforms. As a growing number of scholars and advocates have suggested, part of the danger of information platforms lies not just in the power they exercise now, but in the ways in which their current influence on economic and social activity can spill over, enabling dominance in adjacent markets and areas of activity.³⁶ Thus Amazon’s dominance over retail makes it easier to colonize adjacent markets—as with its entry into the grocery business through its acquisition of Whole Foods. Similarly, Google and Facebook have also been aggressive in acquiring competitors and complementary services.³⁷ As more and more of the modern economy

³² See Danielle K. Citron & Frank A. Pasquale, *The Scored Society: Due Process for Automated Predictions*, 89 WASH. L. REV. 1 (2014); CATHY O’NEIL, WEAPONS OF MATH DESTRUCTION (2016); PASQUALE, *supra* note 25.

³³ Paul Ohm, *Broken Promises of Privacy: Responding to the Surprising Failure of Anonymization*, 57 UCLA L. REV. 1750 (2010).

³⁴ See, e.g., Frank A. Pasquale, Professor of Law, Univ. of Maryland, Testimony Before the United States Senate Committee on the Banking, Housing, and Urban Affairs 10 (Sept. 12, 2017 10:00 AM) (transcript available at <https://www.banking.senate.gov/imo/media/doc/Pasquale%20Testimony%209-12-17.pdf> [<https://perma.cc/N5ZT-7BCK>]).

³⁵ See, e.g., Mary Madden et al., *Privacy, Poverty, and Big Data: A Matrix of Vulnerabilities for the Poor*, 95 WASH. L. REV. 53 (2017).

³⁶ See Kahn, *supra* note 24; EZRACHI & STUCKE, *supra* note 24.

³⁷ See e.g., Erin Griffith, *Will Facebook Kill All Future Facebooks?*, WIRED (Oct. 15, 2017, 7:00 AM), <https://www.wired.com/story/facebook-aggressive-moves-on-startups-threaten-innovation> [<https://perma.cc/9XY5-Z3WM>]; Matt Reynolds, *If You Can’t Build*

operates through online informational platforms, algorithms, and big data analytics, information platforms are uniquely positioned to leverage their control over data to drive attempts to establish dominance in other markets as well.

III. REGULATING INFORMATIONAL INFRASTRUCTURE

A. The goals of regulating informational infrastructure

The rich debate over technology platforms and regulation has yielded a number of valuable suggestions identifying key goals for policies aiming to regulate information platforms. We can group these different goals into three types.

First, there are a set of goals around assuring *fair access and treatment*, including goals of non-discrimination, neutrality and common carriage, fair pricing and non-extractive terms of service, and the like.

A second related set of values stems from the desire to assure *protection* of users. For example, Jack Balkin suggests establishing fiduciary duties with respect to users' data and privacy, and protections against "algorithmic nuisance."³⁸ These ideas of protection could also extend to misinformation and "fake news" as a kind of contaminant in the information stream that should be mitigated.

A third set of policy goals involves the need to create forms of *accountability* for platforms to hold them to these substantive aspirations for fair access and protection. Thus, proposals around transparency, accountability, and due process systems would help create accountability mechanisms through which values of access and protection can be assured.

B. Managerialist regulation through oversight

But how then should these goals be achieved? One response involves what we might call a *managerial* approach to regulation. In a managerial approach, these values of access, protection, and accountability can be sought through the regulatory oversight of information platforms by expert, public-interested administrative bodies. Scholars have suggested a variety of regulatory institutional designs to implement this kind of oversight, from Consumer Subject Review

It, Buy It: Google's Biggest Acquisitions, Mapped, WIRED (Nov. 25, 2017), <http://www.wired.co.uk/article/google-acquisitions-data-visualisation-infoporn-waze-youtube-android> [<https://perma.cc/74R7-7U3V>].

³⁸ See, e.g., Balkin, *supra* note 27.

Boards,³⁹ to algorithmic impact statements,⁴⁰ to a Federal Search Commission.⁴¹

A key challenge here lies in the familiar problems of regulatory capacity and capture—the long-running fear that interest groups will exercise undue influence over regulatory bodies.⁴² The problem of lobbying and interest group influence is a familiar challenge for regulatory policy. But there are more subtle mechanisms which can undermine regulatory efficacy. In complex industries, regulators can often find themselves at an epistemic disadvantage, lacking access to technical data and dependent on industry actors themselves for the information needed to design and enforce regulations.⁴³ This complexity can compound familiar problems of “revolving door” influence, particularly as regulators are drawn from a common pool sharing social, educational, and professional backgrounds and networks with industry leaders, creating more subtle forms of influence by and preference for industry leader views.⁴⁴ Regulatory capacity challenges are especially acute in the world of information and technology platforms: as more of the action moves to code and software, the demands on regulators will be harder and harder to meet.⁴⁵

There are legal hurdles to clear as well. These kinds of regulatory oversight would likely require new statutory authorities for existing or new regulatory bodies. When it comes to information platforms in particular, there are also First Amendment concerns because information platforms themselves might be able to claim speech protections against federal regulation.⁴⁶

³⁹ Ryan Calo, Response, *Consumer Subject Review Boards: A Thought Experiment*, 66 STAN. L. REV. ONLINE 97 (2013), <https://www.stanfordlawreview.org/online/privacy-and-big-data-consumer-subject-review-boards/> [<https://perma.cc/J876-YVGJ>].

⁴⁰ Andrew D. Selbst, *Disparate Impact in Big Data Policing*, 52 GA. L. REV. 109 (2018); see also Solon Barocas & Andrew D. Selbst, *Big Data's Disparate Impact*, 104 CAL. L. REV. 671 (2016).

⁴¹ Frank A. Pasquale & Oren Bracha, *Federal Search Commission? Access, Fairness, and Accountability in the Law of Search*, 93 CORNELL L. REV. 1149 (2008).

⁴² For a discussion of regulatory capture, see DANIEL CARPENTER ET AL., PREVENTING REGULATORY CAPTURE: SPECIAL INTEREST INFLUENCE AND HOW TO LIMIT IT (2013);

⁴³ Dan Awrey, *Complexity, Innovation, and the Regulation of Modern Financial Markets*, 2 HARV. BUS. L. REV. 235 (2012).

⁴⁴ James Kwak, *Cultural Capture and the Financial Crisis*, in PREVENTING CAPTURE: SPECIAL INTEREST INFLUENCE IN LEGISLATION, AND HOW TO LIMIT IT (Daniel Carpenter & David Moss eds., 2013).

⁴⁵ See, e.g., Paul Ohm & Blake E. Reid, *Regulating Software When Everything Has Software*, 84 GEO. WASH. L. REV. 1672 (2016) (describing the challenges faced by regulators and coders given the proliferation of software and code).

⁴⁶ See, e.g., Balkin, *supra* note 27.

Another variation of the regulatory approach might involve private, hybrid, or self-governing practices that could emerge within the technology sector itself. Other industries employ a range of self-regulatory and hybrid regulatory regimes, from certification to professionalization to private standard-setting and monitoring. Indeed, one could imagine a very different professional training and culture for leading information platform companies and engineers, oriented around a sense of public responsibility and industry standard norms for fairness and accountability. It is not a coincidence that in the early twentieth century, as mass media came to be dominated by a few concentrated firms, we saw the rise of professionalized standards for journalism, as the broadcast and media conglomerates took on an ethos of public responsibility partly out of shared values and partly as a way to legitimate their role in shaping the public sphere.⁴⁷ Similar shifts could be pursued in Silicon Valley, though this would require a fairly radical change from the prevailing ethos of innovation and engineering. Nevertheless, we could imagine a more diverse range of professional backgrounds within these firms incorporating training from ethics, sociology, anthropology, and history, and creating a common set of norms, standards, and mechanisms across firms to set industry standards for access, protection, and accountability.

Yet while such professionalized norms and standards might be valuable, they raise a potential problem of their own in that they depend for their impact on the goodwill of the private actors themselves. In a sense, this leaves us still in the same position of dependency on the benevolence of infrastructural firms, as noted earlier. This points to a broader problem with managerial solutions in general. Whether manifested through public oversight or through private/hybrid oversight, managerial approaches to regulation ultimately rely on our faith in the efficacy and accountability of the overseers themselves. There are many reasons why this faith may be misplaced, including concerns about regulatory efficacy and capture noted above.

C. Structuralist regulation

By contrast, we might instead (or in conjunction) adopt a *structuralist* approach to regulation. Here the goal is prophylactic: to limit the very structure and business models of these firms and to alter the dynamics of the markets in which they operate, thereby reducing at the source the incentives and conflicts of interest that magnify risks of exploitation, extraction, and fraud. Structuralist regulation still requires some forms of oversight, but it represents a more strategic, systematic, and

⁴⁷ See Balkin, *supra* note 27, at 1203.

targeted form of oversight designed to have maximum impact on the sector while economizing scarce regulatory skill, talent, and resources.

Thus, we might think of proposals to implement strict privacy requirements or to tax the use of big data as structuralist forms of regulation. It is not that these policies wouldn't require regulatory oversight and implementation—they would. But in a sense, these interventions take place further “upstream” from attempts to regulate immediate, surface-level interactions between platforms and users, instead creating a more systematic limit on what these firms can do (and at what cost). The theory is that such structural regulations would change the incentives in a way that makes the more problematic downstream practices less profitable and thus less likely.

Another form of structuralist regulation comes from the antitrust and public utility traditions, involving structural shifts to the business models and corporate structure of information platforms themselves. Thus, we might “firewall” some services away from others. Just as 1930s financial regulations like the Glass-Steagall Act separated investment from retail banking in an effort to prevent tainting basic banking services with excess risk and potential for fraud,⁴⁸ we might limit the kinds of adjacent businesses into which information platforms can move. Similarly, we might impose antitrust-style limits on mergers and acquisitions. Or, following the model of the Public Utility Holding Company Act⁴⁹ in the electrical utility context, we might prevent the concentrated ownership over multiple information platforms and related services into too few investor hands.

A third variation on structuralist regulation involves the creation of “public options.” Here, rather than fully nationalizing platforms, we might provide a basic, “plain vanilla” public option. For example, following the systematic conflicts of interest that skewed the credit ratings agencies in the run-up to the financial crisis, some proposed publicly run ratings firms that would compete alongside the private ratings industry. Similarly, we could imagine other forms of public information platforms and indices that operate under clear rules for access, protection, and accountability. These public options would provide alternatives for users, while also exerting competitive pressure on otherwise-dominant information platforms, forcing those platforms to take seriously the need to provide services in a different way.

⁴⁸ For a discussion of Glass-Steagall and its modern variations, see e.g., Prasad Krishnamurthy, *Reviving Glass-Steagall?* (Feb. 24, 2017) (discussion at *Revisiting the Public Utility: A Research Roundtable at Vanderbilt Law School*; additional information located at <https://law.vanderbilt.edu/academics/academic-programs/constitutional-law/lg-news-events.php> [<https://perma.cc/9J7S-KUUV>]).

⁴⁹ 42 U.S.C. §§ 16451–16463 (2012).

These structuralist approaches are not foolproof, but they do seem to offer an important alternative, or at least a complement, to more managerial approaches. First, structuralist regulation acknowledges the limits on regulator capacity, resources, and efficacy. We can think of structuralist regulation essentially as a way to economize scarce regulatory capacity, focusing it on those interventions that have more widespread effect on the business models, market dynamics, and problematic incentives that produce the risks posed by information platforms in the first place. Rather than chasing individual violations—and always falling behind because of volume, scale, complexity and industry sophistication—regulators on the structuralist approach could target their efforts “upstream.” Furthermore, structuralist, antitrust-style limits on firm structure, size, and organization could bypass some of the First Amendment difficulties that might arise in the context of direct attempts to regulate information platforms by federal overseers.

Crucially, structuralist regulation is also not cost-free. These regulatory approaches would significantly reduce profits for information platforms and limit some forms of innovation. But it is important to note that this is a feature, not a bug, of structuralist regulation. Indeed, part of the conceptual challenge we face now is precisely over the question of *what kinds* of information to collect, control, and pursue. As the dangers of concentrated control over information and the power disparities that this control can generate increase, it seems prudent to ask whether we might want to deliberately limit certain kinds of innovation and certain types of business practices.

IV. CONCLUSION

The infrastructural view on information platforms thus helps reframe current debates offering two key contributions. First, it helps diagnose more sharply the underlying factors driving the myriad problems posed by information platforms. From fake news to anticompetitive practices, the root cause of all these concerns lies in the way these platforms operate as modern economic and social infrastructure, particularly how they exercise gatekeeping power, transmission power, and scoring power. Second, the infrastructural view suggests some possible approaches to regulating such infrastructural power. Like public utility reformers of old, we might create new administrative bodies to oversee these platforms and assure values of access, protection, and accountability. We might also help induce parallel forms of self-governance and industry standard-setting. Finally, we might pursue more structuralist regulations that, following the public utility and antitrust traditions, aim to alter the very business model and market dynamics of

the firms in question to head off potential downstream conflicts, power disparities, and likelihood of exploitation.

These infrastructural regulatory concepts are not new, even in the technology context. The recent fights over net neutrality, in particular, represent an initial skirmish over precisely these questions of gatekeeping, transmission, and scoring—and the need to create both regulatory oversight for neutrality principles and more structural mechanisms. The core problems that net neutrality speaks to with respect to the Internet service providers are now metastasizing and proliferating to other contexts, as information platforms, big data, algorithmic systems, and artificial intelligence evolve rapidly. Whether the politics of reform can keep up with these transformations remains to be seen.