

Big Tech and Democracy:

The Critical Role of Congress

Key Policy Considerations to
Address Tech Platforms



HARVARD Kennedy School
BELFER CENTER
for Science and International Affairs



HARVARD Kennedy School
SHORENSTEIN CENTER
on Media, Politics and Public Policy

PAPER
APRIL 2019

Technology and Public Purpose Project

Belfer Center for Science and International Affairs
Harvard Kennedy School
79 JFK Street
Cambridge, MA 02138

www.belfercenter.org/TAPP

Platform Accountability Project

Shorenstein Center for Media, Politics and Public Policy
Harvard Kennedy School
124 Mount Auburn Street, 2nd Floor, South Elevators
Cambridge, MA 02138

www.shorensteincenter.org

Statements and views expressed in this report are solely those of the authors and do not imply endorsement by Harvard University, Harvard Kennedy School, the Belfer Center for Science and International Affairs, or the Shorenstein Center for Media, Politics and Public Policy.

Design and layout by Andrew Facini

Cover photo: Adobe Stock

Copyright 2019, President and Fellows of Harvard College

Printed in the United States of America

Big Tech and Democracy:

The Critical Role of Congress

Key Policy Considerations to Address Tech Platforms

Bogdan Beleï

Toni Bush

Maeve Campbell

Ash Carter

Lucy Chase

Mignon Clyburn

Bennett Craig

Daniel Gastfriend

Dipayan Ghosh

Gene Kimmelman

Heidi Legg

Laura Manley

Nicco Mele

Hong Qu

Amy Robinson

Philip Verveer

Tom Wheeler



Co-Sponsoring Organizations

The Technology and Public Purpose (TAPP) Project at the Harvard Kennedy School's Belfer Center for Science and International Affairs works to ensure that emerging technologies are developed and managed in ways that serve the overall public good. Led by Belfer Center Director, MIT Innovation Fellow, and former Secretary of Defense Ash Carter, the TAPP Project leverages a network of experts from Harvard University, MIT, and Stanford, along with leaders in technology, government, and business. For more information, visit: www.BelferCenter.org/TAPP

The Platform Accountability Project at the Harvard Kennedy School's Shorenstein Center for Media, Politics and Public Policy aims to address issues at the intersection of internet policy and economic regulation through academic research and expert analysis. The world's leading internet firms currently operate in a largely unregulated environment. While the American disinclination to industry regulation is premised on a longstanding and well-intentioned preference to let the industry innovate and allow the open market to efficiently serve consumers, some things have gotten out of hand. A handful of large digital platforms dominate the online world and make decisions on a range of issues that affect the public sphere—including disinformation, hate speech, and extremist content. New thinking is required to understand the business model that sits behind the veneer of the internet and prompts these negative externalities—and to develop new ideas for the regulatory policies that can address public harms. For more information, visit: www.ShorensteinCenter.org

Table of Contents

Summary Report	1
Executive Summary	1
Key Insights	4
Gaps in Governance Authority and Coordination	4
A Healthy Mix of Self-Regulation and Government Policy	6
Congressional Hearings Are Underutilized	9
Today’s Tech Debates Are Still ‘Pre-Partisan’	10
Continuing the Conversation	11
Event Briefings	13
Big Tech and Democracy: Policy Approaches to Address Tech Platforms	13
Root of the Matter: Data and Duty, Common Law Approaches to Data Privacy	18
Internet-based Advertising and Media Platforms: Enablers of Disinformation	20
Policy Options: Disinformation	23
Platform Accountability and Contemporary Competition Law	25
To Make the Tech Sector Competitive, Antitrust Is Only Half the Answer	27

Big Tech and Policy Approa Tech Platform

Thursday, March 21, 2019
9:30 AM – 2:30 PM

Capitol Visitor Center, 209-
Washington, D.C.

Former Secretary of Defense, current Belfer Center Director, and Director of the Belfer Center's Technology and Public Purpose Project Ash Carter speaks at a "Big Tech and Democracy" event on Capitol Hill, March 21, 2019.

Summary Report

Executive Summary

Technology has reached a critical juncture in American society. The unfettered optimism of recent decades is now tempered by rising concerns over privacy and security, the impact of disinformation campaigns, and increasing calls for digital accountability. It is clear that the 116th Congress will face pressure to shape technological innovation through policies that protect and serve the best interests of their constituents.

In March 2019, two projects at Harvard Kennedy School—the **Technology and Public Purpose (TAPP)** Project at the Belfer Center for Science and International Affairs and the **Platform Accountability Project** at the Shorenstein Center for Media, Politics and Public Policy—hosted a workshop for Congressional staff to identify and discuss policy approaches to the dilemmas of big tech platforms. Rather than seeking consensus or prematurely delving into specific solutions, the day-long educational workshop sought to create an open space for discussion among congressional staffers and experts in the field. Underscoring the interest in this topic, the workshop included Chiefs of Staff, Committee Counsels, and Legislative Directors from both Senate and House offices.

At the outset, former Secretary of Defense and Belfer Center Director **Ash Carter** emphasized the responsibility that policymakers have in shaping emerging technology. By drawing parallels to other “disruptive tech” from the past, such as nuclear technology, Carter stressed the historic opportunity to shape today’s technology for the human good: “Once invented, it can’t be undone.” Secretary Carter proceeded to lay the groundwork on how case studies from other revolutionary communication technologies, such as the postal service, telegraph, radio, and telephone, can provide insight into the existing toolbox of self-regulation, antitrust, and regulatory solutions.

The opening panel featured several experts who were centrally involved with some of the major reforms in telecommunications and media. The similarities in these historical parallels suggested that today's Congress ought to seek 21st century solutions for 20th century problems. Representing a wide range of expertise regarding antitrust, the private sector, and regulatory agencies, the panel included: **Toni Bush**, former Senate Commerce Senior Counsel; **Mignon Clyburn**, former FCC Commissioner; **Dipayan Ghosh**, Pozen Fellow at the Shorenstein Center and former privacy and public policy advisor at Facebook; **Gene Kimmelman**, former Chief Counsel of the Justice Department's Antitrust Division; **Hong Qu**, Program Director for Technology at the Shorenstein Center and former User Interface Designer at YouTube; and **Tom Wheeler**, former FCC Chairman.

The panelists explored the multitude of issues at play in the big tech space, namely competition, content accountability, privacy and security, accessibility, and protection of civil rights and liberties [*See the full event briefing packet for an in-depth discussion of these key issues*]. However, the panel expressed concern over issue identification. "It always worries me that we are addressing the symptoms and not the malady," said Clyburn. As part of their discussion, the speakers debated whether market shortcomings related to key issues of democracy could be emanating from the fundamental economics of digital platforms (e.g., network effects, economies of scale and scope) as well as big tech's underlying business model, which centers on user data exploitation. As a result, the panelists agreed that any path toward sustainable policy solutions must first begin through a public and national debate. Congress has a critical role in setting this agenda by launching a concerted effort of hearings and engaging a diverse set of actors.

During the event, congressional staff were able to further delve into specific questions and concerns regarding tech policy issues through facilitated breakout groups that were joined by expert panelists.

The discussion surfaced four key insights on the tech policy challenges facing Congress and how legislators could more effectively engage with the dilemmas of big tech:

1. **The digital marketplace and new business models are creating gaps in governance authority and coordination**

The digital marketplace and emerging business models within the tech industry have disrupted the traditional structures of regulation and oversight. While certain issues span across the jurisdictions of Congress or regulatory agencies, others are novel and evidence authority gaps. This has complicated problem identification within an under-resourced Congress.

2. **A healthy mix between self-regulation and government policy is necessary**

There is a variety of corporate and government policy options available to address issues related to big tech and democracy—ranging from self-regulation to antitrust enforcement and regulatory reform. History offers many examples, such as the corporate restructuring of AT&T and the Cable Act of 1992, where similar problems were addressed with vastly different solutions.

3. **Congressional hearings are underutilized on technology-relevant topics**

Congress has a critical role in advancing the public debate on tech policy issues through thematic and granular hearings. In recent years, however, there has been a substantial reduction in the number of Congressional hearings, and the hearings that are held are increasingly used as opportunities for political messaging instead of investigative opportunities to inform policy making. More substantive and frequent hearings can increase policymaker awareness, hold companies accountable to the public interest, and inform the American people.

4. Tech policy debates are still ‘pre-partisan’

The American people, regardless of their political allegiance, are negatively affected by non-competitive markets, privacy breaches, and inequitable access, bias, and discrimination. The current tech policy environment is nascent and it presents a rare opportunity to advance sustainable solutions through a united, bipartisan front.

This is a historic opportunity to guide the Information Age toward a promising future. The educational workshop adds to a vibrant, deliberate, and increasingly growing conversation among congressional leaders and the public to frame big tech policy solutions. Now, our leaders must spark the urgency of this moment in order to protect American consumers, promote innovation and competition as pillars of American enterprise, ensure an informed citizenry, and preserve our democratic values.

Key Insights

Gaps in Governance Authority and Coordination

The evolution of technology has not always aligned with the structure of governments. In recent decades, the digital marketplace and technological developments that have caused sectors to appear, disappear, and merge has complicated Congressional legislation and oversight.¹ The emerging business model of today’s tech economy has resulted in gaps in governance authority. For instance, the ambiguous identity of platform companies has clashed with the traditional responsibilities of publishers and content providers. In some particular cases, such as tech platform interoperability or data transparency, there is no agency with direct governance authority over the issue.

In Congress, this issue has contributed to a number of overlapping jurisdictions and frustrated coordination efforts where policy questions about specific technologies are often being considered simultaneously in multiple

¹ Venkat Alturi, Miklos Dietz, and Nicolaus Henke, “Competing in a world of sectors without borders,” McKinsey Quarterly, July 2017. [Accessible online.](#)

committees and/or subcommittees. These duplicative efforts further limit Congress' ability to effectively leverage their oversight capacity over Executive branch agencies, where it is often unclear which agency holds the appropriate authority. The combination of these challenges has contributed to an unfocused definition of the problems at hand.

In order to advance the conversation on public good and big tech, it is crucial to clearly and precisely identify the problem that needs to be addressed. As the panelists and participants expressed, this can be difficult due to the wide range of issues, such as content accountability, privacy, security, accessibility, and civil rights and civil liberty protections. Yet as many of the panelists cautioned, these might all be indicators of the larger problem of a business model centered on data. "I think the key is to follow the money," Toni Bush advised. "Fake news, misinformation, etc. are all larger symptoms of the fact that these are advertising platforms and their decision making is driven by revenue." Therefore, the inconvenient truth could be that the incentives of the marketplace are presently misaligned with consumer interests.

The problem identification dilemma is further complicated by Congress' resource constraints. In the past couple of decades, there has been a consistent decline in the number of Congressional staffers in both personal and committee offices. This reduced workforce works on myriad issues and frequently cite a lack of bandwidth and the need to be 'a mile wide and an inch deep' as a challenge when trying to engage on new and technical policy issues. This bandwidth challenge is compounded by a lack of constituent focus and/or pressure on science and technology (S&T) issues like big tech platforms. Many staffers note that Congress tends to be reactionary—in large part due to their resource constraints—so without pressure from constituents on S&T issues, it is significantly less likely that proactive policy concerning big tech platforms will be pursued.

Ambiguous jurisdiction, an unfocused definition of the problem, and significant resource constraints have stalled the path to progress.

A Healthy Mix of Self-Regulation and Government Policy

Leibniz's Law states that no two objects have exactly the same properties. The same principle could be applied to policy prescriptions. Market concentration is not a new phenomenon. The history of U.S. competition law dates back to the late 19th century. Tom Wheeler, former FCC chairman, emphasized this familiar history in his remarks: "We have been here before. We have dealt with these kinds of issues before. The lesson we must take away from these past experiences is that fleeing the challenge is failure. You have to confront it." Congress should indeed confront this history and extract lessons from the many similarities. Yet when addressing today's tech challenges, there is a full range of options varying from self-regulation, to policy guidance, legislative and administrative regulation, and antitrust reform for Congress to explore. Considering a healthy mix of options will ensure that each issue can be addressed with an appropriate solution.

The telephone and cable industries provide two key case studies that demonstrate the outcomes of deploying different policy options to similar problems.

The breakup of the telephone industry manifested in the Department of Justice's antitrust lawsuit against AT&T in 1974 [See *insert box Case Study 1*]. While the case ultimately resulted in the separation of AT&T's long-distance telephone service from regional telephone service, the divestiture case took almost a decade from start to finish. It ended up being a drawn-out and complicated process for a corporate structure, and its accompanying assets, that was comparatively much simpler than the structure of today's big tech companies [See *event briefing for "Big Tech Company Functions"*]. In addition, the success of this divestiture is debated as the regional telephone companies, known as Baby Bells, were ultimately reintegrated and long distance competitors folded back into their corporate control. However, the divestiture did introduce greater interoperability in the telephone marketplace that was crucial for technological innovation and future internet competition.

Case Study 1: AT&T Breakup

By the late 20th Century, AT&T had commandeered the telecommunications market as a natural monopoly. By leveraging vertical integration, AT&T controlled both the telephone service and telephone equipment. In order to open up the monopoly bottleneck, the Department of Justice filed an antitrust lawsuit against AT&T in 1974. Drawn out over the course of a decade, the vertical divestiture case ultimately resulted in AT&T relinquishing control of its local telephone service. The *United States v. AT&T* case also successfully promoted greater interoperability by requiring AT&T to interconnect with rival telephone networks.

While much of the focus on the breakup of AT&T was on the Department of Justice's antitrust case, Congress played a crucial role. In addition to holding a multitude of hearings throughout the process and moving legislation to restructure the AT&T monopoly, Congress took an active role after the breakup pushing regulators to hold down prices and open the door to greater market competition. The AT&T case also sparked a ten year Congressional effort to pursue more holistic reform that resulted in the Telecommunications Act of 1996.

Case Study 2: Cable Act of 1992

Competition was slow to develop as the cable industry boomed in the 1980s. The vertical integration of cable companies—controlling both the transmission lines and the content material—led cable providers to discriminate against local broadcasters and promote their own channels. This resulted in artificial limits on the number of voices and news services available to consumers.

Since diverse ownership, including local origination, of programming and news services is vital to fostering an informed electorate and citizenry, Congress sought regulatory solutions to rein in exorbitant cable rates for consumers and enforce non-discrimination policies in programming. As a result, Congress passed the Cable Television Consumer Protection and Competition Act of 1992 (Cable Act of 1992) which required cable companies to carry local broadcast stations, preserve opportunities for independent programmers and prohibited discrimination against satellite and similar competitors.

The Cable Act of 1992, on the other hand, represents a regulatory policy solution to promote competition. Similar to the breakup of AT&T, the Cable Act sought to address the vertical integration of cable companies that controlled both the cable service and the content of their channels. By enforcing nondiscrimination in the sale and distribution of content, Congress used the Cable Act to promote diversity in information sources and news. This is analogous in many ways to how several big tech platforms operate as both the marketplace owner and a participant, prioritizing their products and/or content over their competitors.

Accordingly, policymakers can draw many parallels and distinctions between the tools used to address problems that the AT&T breakup and the Cable Act of 1992 were designed to tackle. As Dipayan Ghosh, Pozen Fellow at the Shorenstein Center, noted, “At the highest level there is no difference between AT&T and these contemporary companies, as they are also natural monopolies and vertically integrated.” Ghosh went on to say it is worth dissecting how these companies operate and says it is very simple to see how three tenets drive the business model that governs the consumer internet:

1. The creation of tremendously engaging platform services that collectively concentrate power amongst the largest firms in the sector and limit competition over the consumer internet;
2. Uninhibited collection of personal information that allows them to create behavior profiles on individual users without affording them control or access over their data; and
3. The creation of highly sophisticated but opaque predictive algorithms that curate content in our social feeds and target ads back at the end consumer.

Both Qu and Ghosh, respectively former Google and Facebook employees, termed such algorithms as potentially dangerous. Ghosh added that it is this precise business model that has generated negative externalities including the disinformation problem and the spread of hate speech, and that a triumvirate of corporate and regulatory policies could be considered to effectively respond to overextended companies that implicate the public’s interest: consumer privacy, competition policy, and algorithmic transparency.

Congressional Hearings Are Underutilized

Apart from its legislative function, Congress holds an exploratory and investigative power through Congressional hearings. Congressional hearings played a crucial role in understanding and investigating both AT&T's corporate structure, as well as the cable industry in the 1990s. In both instances, Congress brought more information and expertise to the conversation, including insights from a broad spectrum of potential competitors, innovators, academics, and the public interest community. In describing the process leading up to the AT&T case settlement, Gene Kimmelman, former Chief Counsel for the U.S. Department of Justice's Antitrust Division, recalled that, "In 1981, the House Telecommunications subcommittee held 11 hearings in 6 months to put together a report." This report then served as the basis for both Senate and House bills.

However, Congressional hearings are being used less and less to inform the policy making process. There has been a notable decline in the number of hearings Congress holds. In the 1970s, Congress held roughly 6,000 hearings per year. By 1994, Congress held just over 4,000 hearings. Today, Congress holds just over 2,000 hearings annually.² In recent years, there has also been a marked shift in the way in which Congress utilizes the hearings they do hold. According to a 2015 study examining 40 years of committee hearings, sessions used to be used to solicit input from experts and explore potential policy solutions. The study found that today, however, hearings are more frequently used as a public communication tool to spotlight issues in a manner that is consistent with members' partisan leanings.³ Not only are there substantially fewer hearings where Congress can leverage their exploratory and investigative power, but today's hearings are less frequently featuring substantive discussions to inform policy.

Among the event participants, there was widespread appetite to reverse this trend. Granular hearings, clearly tied back to the problem's definition and organized thematically, could increase policymaker awareness, hold companies accountable to the public interest, and better inform the

2 Pacrell Jr., Bill. "Why is Congress so dumb?" *The Washington Post*, January 11, 2019. [Accessible Online](#).

3 Jonathan Lewallen et. al. "Congressional dysfunction: An information processing perspective," *Regulation and Governance*, May 8, 2015. [Accessible Online](#).

American people. The importance of diverse perspectives in this process cannot be overstated. As Hong Qu, Program Director for Technology Shorenstein Center, noted, “In order to accomplish norms toward the public good, it needs to be a multi stakeholder process.” A series of hearings would provide ample opportunity to allow consumers, workers, and industry representatives to voice their positions. In particular, when inviting companies, Congressional members should avoid only inviting C-level executives. The engineers and business managers, those who manage the company’s day-to-day operations, will be particularly insightful in providing more technical and granular information on department-level business incentives, predictive models, and algorithms.

Throughout the event, the panelists and participants raised a variety of potential hearings topics, including but not limited to: an examination of big tech’s data collection; how to define privacy; agency enforcement; algorithmic transparency and the impact on credit scores, housing, banking, employment, education, and the judicial system; the impact of foreign cyber regulatory regimes; data portability and social media; the impact of big tech on childhood development; and the risks of a decimated local news ecosystem.

Today’s Tech Debates Are Still ‘Pre-Partisan’

The issues of the Information Age—such as protecting consumer privacy, preventing disinformation campaigns, and non-competitive, overly concentrated markets—affect the constituents of each and every Congressional member. The nascent nature of today’s debates over Big Tech and related policy issues presents a rare opportunity for healthy and honest partisan debate in service to the consent of the governed. From the Trump Administration’s [creation of an FTC competition task force](#) to Senator Elizabeth Warren’s [‘Breaking Up Big Tech’ proposal](#), there is already interest to address these issues from both sides of the aisle.

The leadership for big tech policy solutions must reflect this reality through bipartisan engagement and a united front. As Toni Bush explained, “The important feature of the Cable Act of 1992 was that it was a bipartisan effort.

In fact, it was the only successful veto override in the Bush administration.” Likewise, the divestiture of AT&T began under Republican President Gerald Ford, continued under Democratic President Jimmy Carter, and came to a resolution under Republican President Ronald Reagan.

Continuing the Conversation

The Belfer and Shorenstein Center’s “Big Tech and Democracy” workshop fostered a space for congressional staffers to express their most-pressing concerns, inquiries and insights regarding tech policy issues. It added depth to the ongoing discussion of how to bring both policymakers and technical experts to the same table, undertake problem identification, and build a unified bipartisan front. The Belfer and Shorenstein Centers will continue to carry this momentum by providing additional resources to support congressional policy solutions. While an examination of past case studies built a foundation for discussion and policy frameworks, policymakers will need to consider a menu of technical, market-based, social, and regulatory solutions to adapt these historical observations into a blueprint for addressing today’s tech marketplace.

To stay up to date on upcoming Big Tech and Democracy workshops from Harvard Kennedy School, sign up at: www.BelferCenter.org/TAPP#Contact and follow [@TAPP_Project](https://twitter.com/TAPP_Project) and [@ShorensteinCTR](https://twitter.com/ShorensteinCTR) on Twitter.



Mignon Clyburn speaks on a panel at a “Big Tech and Democracy” event on Capitol Hill, March 21, 2019.

Event Briefings

Big Tech and Democracy: Policy Approaches to Address Tech Platforms

Defining Big Tech Platforms

There is no consensus on the definition of a “big tech platform.” People generally use the term “big tech” to refer to Google (parent company Alphabet), Apple, Facebook, and Amazon, which have been dubbed the “Gang of Four,” GAFA (the acronym of their names), or the “Big Five” when including Microsoft. In general, “big tech” refers to multi-hundred billion dollar companies that have increasingly inordinate social and economic impact. Despite some overlap, each of the Gang of Four has carved out a specialized market—search (Google), devices and music (Apple), social media (Facebook), and commerce (Amazon).⁴ In addition to cornering specific markets, all of these companies are “platform businesses” that connect vendors and customers.⁵ The term “tech platform” can be applied to startups that have also successfully deployed the platform model, such as Airbnb, Uber, Lyft, and TaskRabbit, as well as companies that don’t fit the traditional “big tech” mold, such as Walmart, the world’s largest company with an e-commerce platform.⁶ While there is no simple definition, these widely-adopted frameworks for categorizing tech companies help contextualize the larger discussions of big tech and democracy.

Key Policy Issues

Due to big tech platforms’ extensive reach, any policy solutions must account for a wide range of key policy issues—namely competition, accountability, as well as privacy and security. This list is not intended to be exhaustive but rather provide a roadmap of challenges and considerations.

4 Schonfeld, Erick. “Eric Schmidt’s Gang Of Four: Google, Apple, Amazon, And Facebook.” *TechCrunch* (blog), 2011. [Access online](#).

5 Herrman, John. “Platform Companies Are Becoming More Powerful — but What Exactly Do They Want?” *The New York Times*, January 20, 2018, sec. Magazine. [Access online](#).

6 Staley, Oliver. “There’s a New List of the World’s Largest Companies and Tech Isn’t on It.” Quartz. Accessed March 10, 2019. [Access online](#).

Competition

Mergers: Big tech companies have purchased both adjacent companies, as well as companies in different lines of business, as a means of developing an ecosystem of services. As an example of acquiring adjacent companies, Facebook purchased photo-sharing Instagram and messaging service Whatsapp.⁷ Similarly, Google purchased YouTube (before developing Google Video), Waze (potential competitor to Google Maps), and ad company DoubleClick (potential competitor to Google Ads).⁸ As an expansion of its ecosystem, Amazon purchased shoe retailer Zappos and grocery chain Whole Foods.⁹ The question is whether or not these companies would have truly grown into competitors in the future.

Marketplace Owner & Participant: Many platform companies both operate the platform, or marketplace, while also engaging as a participant. This then may give the platform company an unfair advantage in promoting its own goods. For instance, Amazon allegedly uses data from other businesses' performance on Amazon to create Amazon brand goods;¹⁰ Google search results allegedly rank Google ratings of restaurants, shops, etc. over Yelp ratings, even when a user specifies "Yelp" in their search;¹¹ and Apple may have used push notifications to promote Apple music, breaking its own rule that push notifications cannot be used for advertising purposes.¹²

This is analogous to early days of cable television when cable providers leveraged their control over content to block competition. The policy response to this situation, **the Cable Act of 1992**, required cable companies that also owned programming channels to sell those channels to potential competitors under "reasonable prices, terms and conditions." This issue is closely

7 Morris, Betsy, and Deepa Seetharaman. "The New Copycats: How Facebook Squashes Competition From Startups." *Wall Street Journal*, August 9, 2017, sec. Tech. [Access online](#).

8 Warren, Elizabeth. "Here's How We Can Break up Big Tech." *Team Warren* (blog), March 8, 2019. [Access online](#).

9 "From Audible To Zappos, Amazon's Empire Stretches Far And Wide." *CBS*, November 13, 2018. [Access online](#).

10 Smith, Noah. "Amazon's Winner-Take-All Approach to Small Business." *Bloomberg*, February 19, 2019. [Access online](#).

11 Dougherty, Conor. "Inside Yelp's Six-Year Grudge Against Google." *The New York Times*, April 20, 2018, sec. Technology. [Access online](#).

12 Porter, Jon. "Apple Bends Its Own Rules by Using Push Notifications to Promote Apple Music." *The Verge*, February 18, 2019. [Access online](#).

related to the common law notion of “**Duty to Deal**,” which would require big tech to open up bottlenecks in the marketplace.¹³

Interoperability: By putting in place common standards, interoperable platforms can interface with one another, facilitating users to interact across platforms. Historically, interconnection principles in telecommunications have enabled consumers to move from phone company to phone company, use the same phone number across carriers, and share traffic across networks owned by different companies. The landmark case *United States v. AT&T* resulted in the breakup of the Bell Telephone Company and required Bell to interconnect with rival telephone networks. Some obstacles to interoperability among tech platforms stem from technical challenges or lack of coordination, while other obstacles arise from unwillingness to work with competitors.¹⁴

Data Portability: While not as seamless as interoperability, data portability offers an additional tool for consumers to move between platforms. With data portability, a user can export data from one platform and move it to a comparable platform (similar to how one moves a contact list from one email provider to another).

Content Accountability

Platform companies are responsible for ranking content, as well as removing inappropriate content, such as child pornography and exploitation. However, platform curation often faces a tension of allowing **first amendment** protected free speech, while simultaneously keeping **hate speech** and **misinformation campaigns** in check. While current law states that websites are not responsible for the content their users post, platform companies have begun to take a more active role in curation to match public sentiment. For example, in 2018, Facebook, Apple, YouTube, Spotify, and Twitter banned Alex Jones’ Infowars, citing abusive behavior.¹⁵

13 Wheeler, Tom. “The Root of the Matter: Data and Duty.” Shorenstein Center, November 1, 2018. [Access online.](#)

14 Furman, Jason, Diane Coyle, Amelia Fletcher, Derek McAuley, and Marsden. “Unlocking Digital Competition: Report of the Digital Competition Expert Panel,” March 2019. [Access online.](#)

15 Hern, Alex. “Facebook, Apple, YouTube and Spotify Ban Infowars’ Alex Jones.” *The Guardian*, August 6, 2018, sec. Technology. [Access online.](#)

The revelation that Russians engaged in misinformation campaigns to influence the 2016 presidential election has prompted increased scrutiny of **social media bots** and **black hat SEO**, which dominate search results by tricking search engine algorithms. While misinformation campaigns are not new, social media amplifies their impact and enables effective and precise targeting.¹⁶ Further exacerbating the social repercussions, about two-thirds of Americans rely on social media for news.¹⁷

Social media feeds, search engines, and image recognition rely on algorithms and machine learning, thus **algorithmic fairness and auditability** has also drawn considerable attention. Algorithms tend to prioritize “engaging” content, but this can result in promoting incendiary posts and fear-mongering. In addition, algorithms can echo and amplify societal biases, racism, and sexism.

Privacy & Security

The Internet’s core business model relies on harvesting user data to resell for targeted advertising.¹⁸ This data, which includes purchasing history, behavioral tracking, and GPS location, enables **microtargeted advertising** and fuels precision campaigns. Vast collections of sensitive data also make users susceptible to data breaches, demonstrated by a recent hack that compromised 50 million Facebook user accounts.¹⁹

One cannot expect the business model of the Internet to change, but safeguards and controls can help empower consumers. While U.S. privacy legislation remains piecemeal, Europe recently enacted the cohesive **General Data Protection Regulation (GDPR)**. GDPR codifies the “**right to be forgotten**”²⁰—the ability to erase data no longer necessary for its original

16 Ghosh, Dipayan, and Ben Scott. “Digital Deceit II: A Policy Agenda to Fight Disinformation on the Internet.” Shorenstein Center, October 2, 2018. [Access online.](#)

17 Matsa, Katerina Matsa, and Elisa Shearer. “News Use Across Social Media Platforms 2018.” Pew Research Center, September 10, 2018. [Access online.](#)

18 Wheeler, Tom. “The Root of the Matter: Data and Duty.” Shorenstein Center, November 1, 2018. [Access online.](#)

19 “Facebook Security Breach Exposes Accounts of 50 Million Users.” *The New York Times*. Accessed March 13, 2019. [Access online.](#)

20 “Right to Be Forgotten.” *General Data Protection Regulation (GDPR)*. Accessed March 12, 2019. [Access online.](#)

purpose—and requires data portability and **opt-in consent**.²¹ By specifying the importance of writing opt-in policies in plain language, GDPR also highlights the importance of “**meaningful consent**.” While Americans are outside of its jurisdiction, GDPR still shapes big tech’s privacy policies, as U.S.-incorporated companies must comply to serve European consumers. It has also sparked state initiatives, such as **California’s Consumer Privacy Act (CCPA)**.²² GDPR and CCPA have prompted some big tech companies to favor federal privacy legislation over fragmented, state-specific privacy policies.²³

Policy Options

The frameworks of competition, content accountability, privacy, and security are useful guides in approaching federal policy options. These key issues also demonstrate that policymakers can look to historical examples, assess existing toolkits, and recognize that many of these tools are not mutually exclusive. The following policy options, loosely ordered from least to most substantial government intervention, demonstrate the spectrum of paths forward in big tech regulation:

Status Quo: Maintaining the status quo relies on trusting that new entrepreneurs will inject competition into the market and disrupt current big tech. Several historical examples support this trend of new players routinely overtaking incumbent technology companies in the past without federal regulation: Yahoo gave way to Google, Blackberry to iPhone, and MySpace to Facebook.²⁴

Self-Regulation: Government and regulators face a significant information gap compared to companies, which have a more comprehensive understanding of the technical landscape. Self-regulation would enable big tech to set industry standards in line with technical realities. In addition,

21 Ghosh, Dipayan, and Ben Scott. “Digital Deceit II: A Policy Agenda to Fight Disinformation on the Internet.” Shorenstein Center, October 2, 2018. [Access online.](#)

22 “California Consumer Privacy Act.” Accessed March 12, 2019. [Access online.](#)

23 Temple-Raston, Dina. “Why The Tech Industry Wants Federal Control Over Data Privacy Laws.” NPR.org, October 8, 2018. [Access online.](#)

24 Larry Downes, “How More Regulations for U.S. Tech Could Backfire,” *Harvard Business Review*, February 9, 2018. [Access online.](#)

the momentum of public pressure has already led to many big tech companies injecting public purpose into their businesses. For instance, Microsoft, Google, Facebook, and Twitter are all contributors of the Data Transfer Project, which seeks to improve data portability across platforms.²⁵

Pro-Competition Regulation: Federal regulation can be a means of fostering competition by crafting policies that promote interoperability requirements, greater data portability, and consumer protections. Examples from the past, such as the Cable Act of 1992, illustrate how federal regulation successfully opened up marketplace bottlenecks.

Merger & Antitrust Enforcement: Merger controls serve as an effective tool in managing the scale and scope of big tech before one company captures a market through anti-competitive behavior. Antitrust enforcement, on the other hand, is less useful as a preventative tool, but can challenge big tech's existing scale and scope resulting from competition due to network effects derived from size.²⁶ While antitrust enforcement has traditionally analyzed markets by emphasizing product quality/quantity, and input or consumer price, it can be a flexible tool that potentially accounts for broader considerations, such as privacy and wage impacts.

Public Utility Regulation: Utility regulation is generally applied to a service that is deemed both vital for consumers and a natural monopoly with barriers to entry, such as electricity and telephone service. Utility regulation comes with government oversight in matters such as price, quality of service, and consumer protection.

While there are many policy options to consider for big tech, any successful policy will need to empower the consumer, maintain innovation, promote competition, align with our democratic values, and be sufficiently forward-looking to account for the fast-paced nature of big tech. In addition, any domestic policy should be paired with a global dialogue and coordination in order to ensure cohesive and meaningful impact.

25 "Data Transfer Project." [Access online](#).

26 Furman, Jason, Diane Coyle, Amelia Fletcher, Derek McAuley, and Marsden. "Unlocking Digital Competition: Report of the Digital Competition Expert Panel," March 2019. [Access online](#).

Additional Resources

Ghosh, Dipayan, and Ben Scott. "#DigitalDeceit: The Technologies Behind Precision Propaganda on the Internet." Shorenstein Center. January 23, 2018.

Ghosh, Dipayan, and Ben Scott. Digital Deceit II: A Policy Agenda to Fight Disinformation on the Internet." Shorenstein Center. October 2, 2018.

Verveer, Phillip. "Platform Accountability and Contemporary Competition Law: Practical Considerations." Shorenstein Center. November 20, 2018.

Wheeler, Tom. "The Root of the Matter: Data and Duty." Shorenstein Center. November 1, 2018.

Wheeler, Tom. "Time to Fix It: Developing Rules for Internet Capitalism." Shorenstein Center. August 16, 2018

Root of the Matter: Data and Duty, Common Law Approaches to Data Privacy

Over the years, the steady flow of data privacy controversies has pushed policymakers to scrutinize how big tech companies collect and use consumer information. Americans' privacy rights have evolved on an ad hoc basis: Congress has granted statutory rights (e.g., privacy of medical records); the Supreme Court has identified constitutional rights (e.g., privacy rights of the accused); and regulation has applied authority delegated by Congress (e.g., the Federal Communications Commission's rules for telephone network privacy). Privacy can also be protected by contract (e.g., a non-disclosure agreement). Unlike the European Union, however, prevailing law in the United States does not generally recognize that an individual's information is their personal property. We need a cohesive legal framework for data privacy.

Common law principles as the framework

The framework for data privacy already exists and is embedded in the principles of common law. Companies have responsibilities: a “duty of care” to not cause harm, and a “duty to deal” to prevent monopoly bottlenecks.

Duty to Deal: The current marketplace allows for platforms to collect and hoard vast amounts of information about users, and then gain and maintain dominance based on the control of that data. An entity that controls access to a fundamental asset should have an obligation to make that asset available—not for free, but there should be nondiscriminatory access.

Duty of Care: The harvesting of personal information—often without the individual's knowledge—infringes on the sovereignty of the individual and their personal privacy. Just as government once established rules to protect the collective good by assuring safe food and drugs, and clean air and water, we now have a collective interest in overseeing how the internet allows companies to collect and exploit personal information. Internet companies—both service platforms and the networks that deliver them—should have a “duty of care” as to the effects of their actions on personal

privacy. The creation of online privacy protections for American consumers should be based on three building blocks: transparency, control and responsible forethought.

Transparency: Consumers should know what is being collected, how it is being collected, and how the information is being used, including what information is being stored for subsequent reuse. Informing consumers about the data being collected is not absolution. Specific disclosure as to how the data is used and to whom it is available are essential to the meaningful enrichment of any transparency. Most important, however, is giving the consumer control over their own information and establishing for the companies specific expectations about their activities and responsibilities.

Control: Ninety-two percent of Americans believe companies should gain permission before sharing or selling their online data. Today so-called “consent” can be coercive (i.e., unless you agree you can’t use the app) or buried in thousands of words of legalese. Being able to “opt-out” after data collection has begun is not adequate privacy protection, it merely shifts the burden to the consumer to attempt to recover their own privacy.

Digital Forethought: Mark Zuckerberg was candid in his congressional testimony when he said the design of digital platforms often proceeded without consideration of the effect of that design. “We didn’t take a broad enough view of our responsibility,” he told the United States Senate. What has been missing, thus far, in the internet era has been exactly that kind of planning ahead to identify the possible effects of a specific digital activity.

Internet-based Advertising and Media Platforms: Enablers of Disinformation

Disinformation discussions tend to focus on the advertising technologies developed and operated specifically by Google, Facebook, and Twitter. However, the digital tools available to disinformation campaigners are far from limited to the services offered by these three firms. These platform companies are at the center of a vast ecosystem of services that enable highly targeted political communications that reach millions of people with customized messages that are invisible to the broader public. The ecosystem includes an entire toolbox suited to precision propaganda including:

- Behavioral data collection
- Digital advertising platforms
- Search engine optimization
- Social media management software
- Algorithmic advertising technology

This combination of interconnected tools is a brilliant technological machine that serves to align the economic interests of advertisers and the platform companies. The more successful the advertising campaign, the more money everyone makes. In this marketplace, all advertisers are essentially alike, whether they are pushing retail products, news stories, political candidates, or disinformation. When it comes to the application of these tools, all advertisers seek to emulate the most successful strategies. That means all the tools of behavioral data collection available for the purpose of targeting communications into highly responsive audiences—i.e. pre-filtered segments of demographically similar people that are easier to engage and persuade—are applied to the task of political disinformation.

When disinformation operators leverage this system for precision propaganda, they harm the public interest, the political culture, and the integrity of democracy in ways distinct from any other type of advertiser. Studying the entire marketplace of digital advertising in order to find the best ways to constrain bad actors and minimize harm to the public presents a more

complex, and perhaps more disturbing, picture of the problem. Absent this wider perspective, we cannot prepare policies to effectively deter disinformation operations.

Election law, privacy regulations, and consumer protection law are the likely primary avenues for establishing legal restrictions to address this problem. How those areas of law can or should be applied will vary across national jurisdictions and legal systems, and will in part turn on their interaction with legal protections for free expression.

Political Campaigns and Elections: The lowest hanging fruit in this agenda is to require more transparency for campaigns and other political actors that use internet platforms to advertise. These rules exist for campaigns (though they have not been effectively enforced), but the scope of inquiry here should consider the platforms' responsibilities as well. The FEC has recently taken a small step in this direction.

Privacy: The roots of disinformation campaigns draw on behavioral data collection to filter audiences into highly responsive segments that can be isolated and misled. The problem is not objectionable political speech, but rather the exploitation of social data to apply precision propaganda without the knowledge of the user. For this reason, we focus on the question of whether and how to restrict data collection or ad targeting on political issues and elections-related topics. In addition, there may be useful reforms to the current practice of what constitutes informed consent for the collection and use of data. In the dawning age of AI and autonomous decision-making, it may be that the long absent political will to address the invasiveness of consumer data mining emerges not in response to the harms to personal privacy but to the damage inflicted by behavioral targeting on the body politic.

Consumer Protection and Competition Policy: The sheer size of the user base for the largest internet platform companies—and their market dominance—has raised novel theories of how to analyze and shape their relationship to democracy. They are worthy of careful review. For example, the vertical integration of behavioral data collection and advertising networks in markets with little competition raises questions about how best to inform and protect consumers from harm. These questions, combining

concerns about consumer privacy, consumer choice, and the absence of market competition, have recently been raised by European regulators. It is a theme that has also been raised in recent commentary from prominent technology leaders.

Freedom of Expression: Despite our deep concerns about political disinformation, we must be mindful of the privileged role granted to political speech in American law—including anonymous and pseudonymous speech—by the First Amendment and the human right to free expression. There are clear civil liberties and human rights concerns with any regulatory approach where the state requires platforms to delete or block access to speech— or to hold them liable for such speech—without due process of law. In general we do not favor such censorship-based approaches.

Toward a New Political Economy for Digital Media: The simple fact that disinformation campaigns and legitimate advertising campaigns are effectively indistinguishable on leading internet platforms lies at the center of our challenge. They use the same technologies to influence people—reaching a share of the national market with targeted messages in ways that were inconceivable in any prior media form. But if the market continues to align the interests of the attention economy with the purposes of political disinformation, we will struggle to overcome it. The path forward is to explore effective ways to limit the exploitation of personal data—social profiles gleaned from online behavior—for the purposes of precision propaganda, isolating and manipulating audiences with commercialized political disinformation. This could be done through limits on data collection, rules about how it is applied, and measures to increase consumer transparency and control. Our task is to chart a course to a new social contract with technology. The technologies of precision propaganda do not distinguish between commerce and politics. But democracies do.

There are no easy answers, and this has not been done before. But the American political resilience has through the ages hinged on our implicit commitment that markets must take a backseat to democracy. A combination of new policies, corporate practices, technical product features, public education, data security, and citizen empowerment will all be needed to achieve this goal.

Policy Options: Disinformation

The crisis for democracy posed by digital disinformation demands a new social contract for the internet rooted in transparency, privacy and competition. This is the conclusion we have reached through careful study of the problem of digital disinformation and reflection on potential solutions.

Digital media platforms did not cause the fractured and irrational politics that plague modern societies. But the economic logic of digital markets too often compounds social division by feeding pre-existing biases, affirming false beliefs, and fragmenting media audiences. The companies that control this market are among the most powerful and valuable the world has ever seen. We cannot expect them to regulate themselves. As a democratic society, we must intervene to steer the power and promise of technology to benefit the many rather than the few.

We have developed here a broad policy framework to address the digital threat to democracy, building upon basic principles to recommend a set of specific proposals.

Transparency: As citizens, we have the right to know who is trying to influence our political views and how they are doing it. We must have explicit disclosure about the operation of dominant digital media platforms, including:

- Real-time and archived information about targeted political advertising;
- Clear accountability for the social impact of automated decision-making;
- Explicit indicators for the presence of non-human accounts in digital media.

Privacy: As individuals with the right to personal autonomy, we must be given more control over how our data is collected, used, and monetized especially when it comes to sensitive information that shapes political decision-making. A baseline data privacy law must include:

- Consumer control over data through stronger rights to access and removal;
- Meaningful consent and transparency for the user of the full extent of data usage;
- Stronger enforcement, with resources and authority for agency rule-making.

Competition: As consumers, we must have meaningful options to find, send and receive information over digital media. The rise of dominant digital platforms demonstrates how market structure influences social and political outcomes. A new competition policy agenda should include:

- Stronger oversight of mergers and acquisitions;
- Antitrust reform including new enforcement regimes, levies, and essential services regulation;
- Robust data portability and interoperability between services.

There are no single-solution approaches to the problem of digital disinformation that are likely to change outcomes. Only a combination of public policies—all of which are necessary and none of which are sufficient by themselves—that truly address the nature of the business model underlying the internet will begin to show results over time. Despite the scope of the problem we face, there is reason for optimism. The Silicon Valley giants have begun to come to the table with policymakers and civil society leaders in an earnest attempt to take some responsibility. Most importantly, citizens are waking up to the reality that the incredible power of technology can change our lives for the better or for the worse. People are asking questions about whether constant engagement with digital media is healthy for democracy. Awareness and education are the first steps toward organizing action to build a new social contract for digital democracy.

Platform Accountability and Contemporary Competition Law

The very strong market positions enjoyed by the major digital platform companies naturally raise the possibility that antitrust law could be deployed either to restrain their conduct or to force restructurings that would make space for additional competitors.

While a thorough government investigation might lead to a prosecutable case against one or more of the major platform companies, practical considerations weigh against relying on antitrust enforcement as the principal means of social control.

The practical considerations inhibiting the use of antitrust include:

- The inherent uncertainties surrounding the outcome of any litigation. The uncertainties are underscored by the trajectory of antitrust law and policy, which for forty years has been guided by Chicago School noninterventionist perspectives.
- The multi-year time-frame required to mount and litigate a major antitrust case to a conclusion.
- The dynamic nature of the tech sector, affected by and reflecting rapid changes in technology, business models, and consumer preferences, that predictably would substitute new realities and issues even as displaced ones were being litigated.
- The difficulty of identifying remedies that are certain to produce more benefits than costs.
- The opportunity costs to the Federal Trade Commission and/or the Antitrust Division, both of which are seriously resource constrained.

The considerations involved in deploying the antitrust laws—here thinking principally of the Sherman Act Section 2 and its Federal Trade Commission Act Section 5 counterpart—against internet platform power raise a very significant question of whether it would be better to look elsewhere for legal mechanisms securing society's interests in the operation of the platforms.

The principal implication is that legislation is a more promising approach than antitrust litigation. Beyond the practical considerations found within the framework of competition law as presently construed is the further reality that many of the platform-related concerns lie outside of its reach—privacy, political or cultural influence, and national security, among others.

There are antitrust approaches separate from a full-scale monopolization case that could be brought forward. The two most interesting are the use of Clayton Act Section 7 against consummated acquisitions and the use of Section 5 against monopoly leveraging. These, of course, are subject to the previously noted litigation uncertainties.

To Make the Tech Sector Competitive, Antitrust Is Only Half the Answer

It seems antitrust is finally having a new moment in the sun. From Senator Elizabeth Warren, to Attorney General Nominee Bill Barr, to Congresswoman Alexandria Ocasio-Cortez, to and even President Trump, everyone is talking about antitrust in the context of Internet platforms. While antitrust is a powerful tool, and essential to the proper functioning of the economy, antitrust alone cannot eliminate the full array of harms caused by highly concentrated markets. The excessive market concentration and corporate power we see today resulted not only from conservative jurisprudence and lax antitrust enforcement, but also excessive deregulation. Antitrust is not sufficient to rectify the very real problems reform advocates identify.

I, Gene Kimmelman, have tried to rein in the power of telecommunications, media, and cable giants for more than 30 years. In these important industries, strong antitrust has only worked when paired with equally strong regulations that promote competition and markets. The goal of antitrust is to preserve competition and free flowing markets, but some industries have no competition to preserve, and instead need regulation to help competition flourish. Antitrust enforcement can punish companies that are out of line, but often not in time to save competition, and strong regulation is the best and fastest way to revive competition.

Our History

Even in the “golden age” of trust busting in the first half of the 20th century, antitrust was never seen as enough to protect consumers on its own. That’s why the first wave of comprehensive consumer protection law was developed in the same period. Louis Brandeis’ arguments in favor of the creation of the Federal Trade Commission emphasized the need for additional authority to protect consumers as a necessary supplement to antitrust. And even in the heyday of antitrust (ca. 1940-1970), it also took regulatory agencies being created and active to constrain the abuses of airline, pharmaceutical, and agricultural behemoths.

Regulation was crucial to the survival of U.S. Department of Justice's effort to breakup AT&T. Once broken up, the local phone companies sought almost \$20 billion in rate increases, claiming the antitrust case made this necessary. Fortunately, state regulators blocked the price hikes and helped consumers navigate a smooth path to a competitive marketplace. Regulation provided basic rules for interconnecting telecom networks and nondiscrimination for access to the internet. And today, regulation is the best tool to protect our privacy from overzealous advertising practices.

As the makeup of the Supreme Court has changed over the last few decades, antitrust law's broad language has been constrained substantially to limit enforcement. A series of important cases narrowed the definition of what can be considered an antitrust violation. Economic theories adopted by the courts, such as the idea that barriers to entry are generally low, tipped the scale toward under-enforcement. At the same time, a deregulatory ethos has restrained regulation. In the past two decades mergers in the cable and telecom industries—as well as the airline, agricultural and pharmaceutical industries—have been approved that once would have been rejected.

The Problem

As today's digital marketplace has exploded, the tech sector, in particular, is starting to look a little like the old cable and telecom world, with a few firms growing enormous and facing limited competition. Yet unlike cable and telecom, or virtually any other industry sector, no regulatory agency is empowered to deal with the broad public interest questions facing tech companies. The Federal Trade Commission, which enforces consumer protection across the economy, has been in the lead on privacy, but it has no rulemaking or fining authority and its purview is limited.

The broader public interest requires ensuring small innovators can compete fairly in markets dominated by large platforms, and even challenge the platform itself if they want. The public interest means content creators, journalists, bloggers, and individuals can be compensated for their work and are not kept from the public square by overzealous moderators or by unchecked harassment. Antitrust alone cannot create competitive markets in these industries characterized by heavy network effects and sometimes perverse

incentives. And competition alone cannot foster innovation and entrepreneurship, personal privacy, diversity of media and content ownership, or the integrity of individual speech, which is essential to democratic discourse.

Solutions

We need new tech sector-specific guardrails to open the door to new competition, ensure diversity of ownership and viewpoints in our public discourse and prevent dominant companies from abusing their power—both economic and political. In markets dependent upon digital platforms, where the platform also owns services riding on the platform, we may need non-discrimination requirements, rules against exclusive dealing, and obligations to carry independent content to combat integrated firms' gatekeeper power and harm to small start-ups and innovators. We need rules governing data flows, both for consumer privacy and for fair competition. Rules requiring interoperability protocols could make competition feasible in the face of strong network effects that make customers feel locked into dominant incumbents.

We can learn from the history of the 1992 Cable Act. Just as Comcast should not favor NBC programming over independent networks like the Discovery Channel, maybe Amazon should not favor Amazon Basics products in its Marketplace and maybe Google should not discriminate against others' apps. Just as AT&T, the owner of DirecTV, should not charge an inflated price to Dish, DirecTV's biggest competitor, for its Turner Network programming, maybe Facebook, the owner of Oculus, should not charge extra to HTC for advertising its Vive VR headset.

If we can galvanize support for stronger antitrust, then surely we can create the additional accountability tools and enforcement practices needed to thoroughly challenge the dangers of economic and political concentration of power. One tool is not enough—we need a full array of public oversight to begin undoing past mistakes and meeting new challenges posed by digital platforms in ways that promote competition, transparency, and democratic values. Achieving more competitive economic markets that expand the marketplace of ideas and protect our democracy requires both antitrust law and regulation working hand in hand.



Technology and Public Purpose Project

Belfer Center for Science and International Affairs

Harvard Kennedy School

79 John F. Kennedy Street

Cambridge, MA 02138

www.belfercenter.org/TAPP