

MIDDLEWARE FOR DOMINANT  
DIGITAL PLATFORMS:  
A TECHNOLOGICAL SOLUTION TO  
A THREAT TO DEMOCRACY

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# MIDDLEWARE FOR DOMINANT DIGITAL PLATFORMS: A TECHNOLOGICAL SOLUTION TO A THREAT TO DEMOCRACY

*Although most critics emphasize the economic dangers that digital monopolists pose, at least equally if not more significant are their threats to democratic politics. We offer a technology-based solution: requiring the dominant platforms to allow users to install “middleware.” This would take editorial power away from a small number of technology platforms and hand it to a diverse group of competitive firms that would allow users to tailor their online experiences.*

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## INTRODUCTION

The internet economy has produced digital platforms of enormous economic and social significance. They have created a variety of enormous benefits for consumers, workers, producers, voters and other participants in civic life around the world. These platforms—specifically, Google, Facebook, Amazon, Twitter, and Apple—now play central roles in how millions of Americans obtain information, spend their money, communicate with fellow citizens, and earn their livelihoods. Their reach is also felt globally, extending to many countries around the world. They have amassed the economic, social, and political influence that very few private entities have ever obtained previously. Accordingly, they demand careful consideration from American policymakers, who should soberly assess whether the nation’s current laws and regulatory institutions are adequately equipped to protect people against potential abuses by platform companies.

Although most critics emphasize the economic dangers that these digital monopolists pose, at least equally if not more significant are their threats to democratic politics. Since 2016 there has been substantial discussion about fake news, filter bubbles, targeted political advertising, propagation of conspiracy theories, and the power of platforms to vastly amplify (or bury)

particular voices in democratic political debate. The ultimate fear is that the platforms themselves have amassed sufficient power that they could potentially sway an election, either as a matter of deliberate choice or as a result of being unwittingly manipulated by other political actors. These political harms have not yet been given sufficient attention in policy circles, especially with respect to possible remedies. We discuss those harms and potential remedies at considerable length in this report and conclude with policy recommendations.

In this regard, scale matters acutely. We expect democratic debate and politics to be pluralistic and to protect freedom of speech. But the scale of today's platforms gives them extraordinary power to reach broad audiences, much like the network television oligopoly of the 1950s and '60s, and their control over what appears and is disseminated on their platforms can shape both beliefs and behavior.

Consider also that the platforms—Facebook, Amazon, and Google in particular—possess information about our individual lives that empower them to engage in potentially damaging conduct that prior monopolists never had. They know what we buy, where we work, where we live, where we go, with whom we communicate, and what we value. They know our friends and family, our income and our possessions, and many of the most intimate details of our lives. What if a platform executive with corrupt intentions were to exploit embarrassing information to force the hand of a public official? Alternatively, imagine a misuse of private information in conjunction with the powers of the government, perhaps if Facebook were to team up with a politicized Department of Justice, or Twitter to be bought by an investor in an adversarial state. How can we ensure that the platforms' amassing of personal information will not corrupt government powers and the political process?

The platforms' ability to gather data and information and to curate content would not be as problematic if they were less dominant in their role as information filters—if, for example, there were a large number of important digital intermediaries for news and other information providers. In a more

competitive platform environment, such curation would be a unique selling point. Indeed, curation remains highly desirable in the aggregate, since a totally uncurated internet quickly becomes a miasma of disinformation, spam, pornography, and incivility.

We therefore introduce the concept of middleware to stem the control of dominant platforms over communication and political discourse. Middleware is software, provided by a third party and integrated into the dominant platforms, that would curate and order the content that users see. Users would choose among competing middleware algorithms, selecting providers that reflect their interests and have earned their trust, and thereby would dilute the platforms' editorial control over political communication. We urge the Biden Administration to explore the potential of middleware solutions with technology sector leaders and to develop the regulatory capacity within a specialized regulatory agency to make middleware possible.

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The growing political power of the current major digital platforms is like a loaded weapon sitting on the table in front of us. At the moment, we are reasonably confident that the people sitting on the other side won't deliberately pick up the gun and shoot us with it. The question for American democracy is whether it is safe to leave the gun on the table, where others with less good intentions—whether the owners of the platforms or outsiders

who figure out how to manipulate them for their purposes—could come along and pick it up. No liberal democracy is content to entrust concentrated political power to individuals based on assumptions about their good intentions or on the merits of their business models, which is why we place checks and balances on that power.

## **MIDDLEWARE AS A SOLUTION**

A variety of policy interventions have been proposed to combat the outsized power of these digital giants. Because much of the platforms' influence is connected to their monopoly positions, many have turned to antitrust laws to curtail the dominance of these digital platforms. Antitrust law, however, is designed to redress economic harms, and though antitrust enforcement actions might fruitfully bring economic benefits where competition is currently lacking, they would be ineffective in directly confronting the political harms that the platforms now pose. Some have consequently proposed expanding antitrust's domain beyond economic concerns to include a variety of political values, so as to retool the Sherman Act to confront a wider set of policy challenges in the platform age. However, we are concerned that reforming antitrust's consumer welfare standard would cause damaging policy incoherence, invite politically motivated and unprincipled actions, and erode support for procompetitive policies. Some alternatively have proposed requiring data interoperability, data portability, or privacy protections to curtail the political influence of the dominant platforms. Even if these proposed remedies have their respective merits, they overlook technical difficulties specific to individual platforms and might inadvertently undermine other policy objectives.

Very few policymakers have considered pursuing structural interventions to stem platform dominance over information content, but such technological interventions do offer very promising remedies. Specifically, we propose stimulating the creation of a competitive layer of companies offering middleware products. Although middleware is traditionally defined as computer software that provides services beyond those available from an operating system, including the software that connects operating systems

with applications, we use the term to include software and services that would add an editorial layer between the dominant internet platforms and internet users.

We view middleware as an opportunity to introduce competition and innovation into markets currently dominated by the principal internet platforms. A competitive middleware sector would help solve this problem by outsourcing content curation to organizations that enable consumers to tailor their feeds to their own explicit preferences. At the same time, middleware could be a superior alternative to structural remedies imposed by either courts or regulators because, among other things, it would directly respond to consumer preferences and market actors.

### ***The nature and function of middleware***

By “middleware,” we refer to software products that can be appended to the major internet platforms. These products would interconnect with Facebook, Amazon, Apple, Twitter, and Google APIs and allow consumers to shape their feeds and influence the algorithms that those dominant platforms currently employ. Middleware would offer a third-party service chosen by the consumer and would make editorial judgments that are currently provided (usually without transparency) by the platform. Middleware could be integrated into a platform without disintermediating the platform from the user, or it could offer an independent entry point into the platform (though the platforms would likely oppose losing the point of service to the customer). In either case, middleware can tailor the functionality of those websites to the preferences of their users.

We imagine a diversity of middleware products, designed to accommodate the individual platforms and meet specific demands of interested consumers, with transparent offerings and technical features so that users can make informed choices. Middleware can offer fact-checking services, news rankings, relevance priorities, information filters, or other services that supplement those currently supplied by the major platforms. Similarly, middleware could adjust news results from Google searches and Facebook pages. Middleware can also give users more control over commercial content

and privacy settings. For example, consumers could select middleware providers that adjust their Amazon search results to favor domestic production and eco-friendly products, or that make fine-grained choices on Facebook’s privacy settings dashboard. Trusted community organizations or preferred media outlets could offer, sponsor, or endorse middleware providers. Platforms could also offer their own middleware, on the condition that they do not favor their own product over those provided by third parties or make their own middleware a default choice. To learn more about the variety of interventions that middleware can offer, read our white paper [here](#).

### ***The benefits of employing middleware***

Middleware’s primary benefit is that it dilutes the enormous control that dominant platforms have in organizing the news and opinion that consumers see. Decisions over whether to institute fact-checking, remove hate speech, filter misinformation, and monitor political interference will not be made by a single company but will instead be controlled by a variety of informed and diverse intermediaries. For this reason, technology companies—who have expressed an eagerness to outsource some of these decisions—may be willing to embrace controlled offerings of middleware, since it will afford them the space to focus on their core mission, rather than having to determine (and defend) decisions that so significantly affect the information that millions of users consume. And since middleware should increase the value of the platform to consumers by more closely hewing to user preferences, it might generate economic rewards for the platform as well.

Additionally, middleware facilitates competition. It offers a new and distinct layer of potential competition for consumer loyalties and opens a pathway for innovations in managing information, including commercial information that might benefit firms otherwise disadvantaged by the platforms’ business models. It could also open lucrative markets both for technology companies that can improve platform functionality and for civic organizations that want to participate in political and social discourse.

Finally, a middleware system could offer services that many in our society deem to be urgently needed, such as a robust system of fact-checking and hate-speech moderation. Current platforms hesitate to provide these services

because they know their decisions are so consequential and that various people do not trust the motives of the fact-checker. When these services are instead offered by a diversity of providers, no one player exercises outsized power in making fine-grained decisions over content, and users can select providers they trust. Allowing users to choose from multiple middleware providers offers a blueprint for bringing transparency and flexibility to privacy settings, terms of service, and other services that users care about.

Although many platforms already tailor algorithms and customize feeds to meet users' interests and past practices, our middleware proposal is far more transparent than these current practices. Middleware enables users to avoid being dependent on the platforms' currently enormous editorial control over organizing political content and labeling or censoring speech, and it enables new providers to offer and innovate in services that are currently dominated by the platforms.

### ***Questions to be answered for middleware markets***

Although we are enthusiastic about middleware solutions, we explicitly acknowledge that we offer here only a conceptual outline of a middleware approach and that much thinking remains to be done. To start, we highlight three aspects of a new middleware architecture that will require careful elaboration.

First, the role and function of middleware must be determined. We emphasize that, whether by statutory authority or by some other lawful regulation, we consider it necessary to mandate that dominant search engines and social media companies allow users to choose among third-party filters. Moreover, the platforms might be compelled to alert users to the option of installing middleware and to require users to explicitly opt out of middleware use. Middleware can serve its intended purpose only if it is used widely, and a default option that allows users to never consider installing middleware would severely limit its uptake.



Even under these mandatory rules to encourage middleware adoption, the division of responsibility between the dominant platforms and the middleware filters could vary. At one extreme, the middleware performs all of the essential functions—such as procuring content, sequencing results, and distributing feeds—and the underlying platform serves as little more than a neutral pipe. At the other extreme, the platform continues to curate and rank the content with its standard algorithms, and the middleware could do no more than serve as a supplemental filter to the platform’s output, such as by tagging specific pieces of content with labels or warnings. It is unlikely that either of these extreme arrangements would be satisfactory; the former would likely prompt aggressive resistance from the current platforms because it would undermine their business and revenue models (and perhaps future innovation), while the latter would likely be inadequate to curb the dominant platforms’ power in curating and disseminating content. An intermediate role would probably be preferable, perhaps one in which middleware is able both to provide filters for specific news stories and to develop ranking and labeling algorithms selected by the users. Developing this intermediate role would require further reflection, both from a regulatory point of view and in terms of technical architecture.

Second, a business model for middleware providers must be sufficiently attractive to induce an adequate supply. The most logical approach would be to establish revenue sharing arrangements between the dominant platforms and the third-party providers of middleware. If a middleware product enhances the value of the platforms to users, the platforms might be able to generate increased advertising (or maybe, in the future, user fee) revenues that could be shared with the middleware provider. Alternatively, the middleware provider might be able to charge user fees or sell advertising directly.

If a middleware product reduces the value of the platform by, for example, making it harder for the platform to optimize the targeted advertising or by diverting advertising revenues to middleware providers, the platforms will predictably resist a middleware requirement. Middleware might have to be offered as an alternative to more onerous regulatory requirements or

legal risk related to the platforms' role as providers of political or otherwise offensive information. If middleware providers are themselves able to obtain advertising revenues or user fees, they might be expected to share their revenues with the platforms. If the parties are unable to agree on a fee sharing arrangement, the terms of such revenue sharing might have to be established by regulators. The fee sharing must navigate a balance between encouraging the development of a robust supply of trustworthy middleware while also inducing the cooperation of (or avoiding hostile refusals from) dominant platforms and preserving their rewards for investment in and innovation on the platforms.

Third, a technical framework must be developed that would invite a diversity of middleware products. The technological requirements for a vibrant middleware market might be demanding. Middleware developers must be able to easily deploy their products to work with the various dominant platforms, each of which exhibits different architectures, as well as with other closely related platforms. At the same time, the specifications for middleware access to the platforms should be sufficiently simple that a diversity of technologists and nonprofits can sponsor offerings. Moreover, middleware must be prepared to assess at least three different kinds of content: widely accessible public content, including news stories with RSS feeds and tweets from public officials, that already have an identification system for searches and aggregators; public content generated by users of social media networks and search engines that is curated on those platforms, which the platforms must make available and cognizable to third-party providers; and content that is not public but nonetheless might attract the attention of either middleware or platform monitors, such as WhatsApp messages that promote hate speech or individual Facebook posts that encourage violence. Third-party providers will have to identify these different kinds of content and then offer their assessments of, for example, veracity, relevance, or centrality to whatever metric the middleware provider is applying. Because the middleware provider will not have access to private content, middleware services may have to provide labeling algorithms on top of features provided by the platform. Navigating these categories of content and providing consistent services will pose a challenge to third-party providers.

It is critical to get these technical elements right. The middleware intervention would be appropriately questioned if it generated an inadequate supply and diversity of third-party providers, became another tool to capture control over public discourse, or introduced more technological bottlenecks. We believe that a middleware solution has the potential to reduce informational and economic concentration, as long as the technical solutions offer an intuitive and open architecture that fosters a diversity of middleware suppliers and products.

### ***A Specialized Agency***

Our middleware proposal, if adopted, heightens the need for additional agency expertise. Prior calls for a specialized agency—for example, by the Stigler Center, the Shorenstein Center, and a high-profile report submitted to the United Kingdom’s Competition and Markets Authority—have identified the need for greater regulatory proficiency in understanding the economics

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of digital markets, appreciating the many uses of personal data and associated threats to privacy intrusions, anticipating the pace and direction of technological change, and recognizing the industry-and economy-wide benefits of establishing common technological and consumer protection standards. In addition to these needs, our middleware proposal would also demand of regulators the capacity to ensure, or if necessary, mandate, the availability of platform APIs to middleware providers, platform compliance

with other conditions necessary to allow middleware providers to offer their products, and fair revenue sharing and adherence to rules that allow middleware business models to thrive. Even more challenging, administrators of our middleware proposal will need to work with industry leaders to chart out the assorted responsibilities and prerogatives for both middleware providers and the platforms and to design the technical framework that will allow middleware offerings to thrive.

It is unlikely that there is authority under any existing statute or court-ordered remedy under existing law to establish the kind of regulation we envision, even if the regulation were housed in an existing administrative body like the FTC or FCC. We expect that Congress would have to pass new legislation that authorizes an existing agency, or establishes a new specialized agency, to exercise the regulatory functions to foster a middleware market. The new statutory authority does not need to be expansive, nor would it be necessary to disrupt or reorganize the operations of other parts of government. An advantage to the middleware proposal is that it leaves most other policy instruments unchanged.

## CONCLUSION

The public should be alarmed by the growth and power of dominant internet platforms, and particularly by their control over political speech. The First Amendment envisioned a marketplace of ideas where competition, rather than regulation, protected public discourse. Yet in a world where large platforms amplify, suppress, and target political messaging, that marketplace breaks down.

Today, governments are launching actions against Big Tech platforms under existing antitrust law in both the United States and Europe, and the resulting cases are likely to be litigated for years to come. But while antitrust law may be effective in mitigating certain economic abuses, it is not likely to fundamentally reduce the size of the major platforms or to require material changes in their business models. Antitrust enforcement is therefore unlikely

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to provide an effective remedy for unique political threats to democracy created by platform scale. Straightforward state regulation, data portability, and privacy law have all been advanced as alternative tools to deal with platform scale.

Middleware is another potential solution to this problem, and one that has not been adequately explored. It can take editorial power away from a small number of technology platforms and hand it not to a single government regulator, but to a diverse group of competitive firms that would allow users to tailor their online experiences. This approach would not prevent hate speech or conspiracy theories from circulating, but it would ensure that no single harmful idea will receive the amplification of a dominant information platform. It also ensures, in a way that aligns with the original intent of the First Amendment, that no one idea, whether disseminated by a platform or by those who manipulate them, will drown out all other speech. Today, the content that the platforms offer is determined by murky algorithms generated by artificial intelligence programs. With middleware, platform users would be handed the controls over what they see. They—and not some invisible artificial intelligence program—would determine their ultimate online experience. We believe that this approach deserves further elaboration and testing and should ultimately become the basis for new public policies.

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