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Middleware Technologies: Towards User-Determined News Curation in Social Media

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MIDDLEWARE TECHNOLOGIES: TOWARDS USER-DETERMINED NEWS CURATION IN SOCIAL MEDIA

By: *Jose M. Marella*

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Digital platforms have ushered in a brave new world. Former Twitter Chief Executive Officer Dick Costolo was once asked, “how does it feel to be the voice of the press in the 21 century?”¹ Statements such as this signify the centrality of social media platforms in terms of news curation, distribution, and even content creation—matters which were traditionally reserved to media professionals and organizations. From the perspective of choice architecture, criticisms have been levied against how platforms skew news feeds to favor the providers’ own core businesses, diminishing user autonomy over online news consumption in the process and distorting the overall quality of online discourse.²

Specifically, user choice is rendered “illusory when dominant companies are able to impose their practices on individuals by exploiting information asymmetries.”³ Users are already limited in their access to and ability to process

¹ Craig Silverman, *Twitter CEO Says Curation Tools for Newsrooms Are Coming*, POYNTER (Sept. 21, 2012), <https://www.poynter.org/reporting-editing/2012/twitter-ceo-says-curation-tools-for-newsrooms-are-coming/>.

² JACQUES CRÉMER ET AL., FAIRNESS AND CONTESTABILITY IN THE DIGITAL MARKETS ACT 6 (Yale Tobin Ctr. for Econ. Pol’y ed., 2021); *see generally* RICHARD H. THALER & CASS R. SUNSTEIN, NUDGE: IMPROVING DECISIONS ABOUT HEALTH, WEALTH, AND HAPPINESS (2d ed. 2021) (discussing implications of behavioral economics for public policy).

³ INGE GRAEF, EU COMPETITION LAW, DATA PROTECTION AND ONLINE PLATFORMS: DATA AS ESSENTIAL FACILITY 294 (2016).

information and even become inert in a barrage of platform-imposed information flows.⁴ Through interface design tactics—for instance, between ticked or unticked option boxes, or varied placements of approval and rejection buttons—choice architecture can be structured in ways that reduce users into merely passive input.⁵ Social media platforms have actualized Professor Yochai Benkler’s misgivings that, “as connected sensors and controllers . . . become pervasive, an increasingly larger portion of Internet use will not be conscious at all.”⁶

To re-orient platform-dictated dynamics towards user-determined exchanges, and as an alternative to antitrust and regulatory strategies, “middleware”—software services that would be appended to major digital networks to curate information flows—is increasingly touted as a promising solution.⁷ A Stanford Cyber Policy Center Report, led by Professor Francis Fukuyama, advanced middleware as a structural solution that would “offload controversial decisions to a far more competitive and diverse ecosystems of firms[.]”⁸

Still, many of the technicalities, virtues, and challenges of using middleware—especially as applied to social media news consumption—remain unarticulated; this work seeks to fill such gaps. To be sure, middleware solutions already exist; the present work provides more compelling arguments for developing these technologies as a focused agenda to orient social media news consumption around user choice. Doing so can enable more purposeful navigation of the social media space and foster more worthwhile engagements and interactions therein.

Part I proceeds by discussing how social media has reshaped the news landscape, highlighting that these novel trends are largely influenced by a platform’s pursuit of its core business. Part II defines middleware and—by surveying existing technologies that fit such definition—articulates the virtues and nuances thereof. Part III anticipates the role that the European Union’s recent Digital Services Act will play in facilitating the viability of middleware. Before concluding, Part IV outlines some existential challenges to the focused

⁴ AMELIA FLETCHER ET AL., CONSUMER PROTECTION FOR ONLINE MARKETS AND LARGE DIGITAL PLATFORMS 4–5 (Yale Tobin Ctr. for Econ. Pol’y ed., 2021).

⁵ *See id.* at 17.

⁶ Yochai Benkler, *Degrees of Freedom, Dimensions of Power*, 145 DÆDALUS 18, 21 (2016).

⁷ *See* FRANCIS FUKUYAMA ET AL., REPORT OF THE WORKING GROUP ON PLATFORM SCALE 30–38 (Stan. Cyber Pol’y Ctr. ed., 2020); Daphne Keller, *The Future of Platform Power: Making Middleware Work*, 32 J. DEM. 168, 168–69 (2021); Asher Schechter & Filippo Lancieri, “*A Loaded Weapon*”: *Francis Fukuyama on the Political Power of Digital Platforms*, PROMARKET (Dec. 4, 2020), <https://www.promarket.org/2020/12/04/francis-fukuyama-political-power-digital-platforms-middleware/>.

⁸ FUKUYAMA, *supra* note 7, at 18–19.

development and deployment of middleware.

I. “NEW” NEWS MARKETS VIS-À-VIS A PLATFORM’S CORE BUSINESS

In the traditional news market, whether through print or broadcast, content creators like journalists and news programs provide material to publishers or radio and television networks for distribution.⁹ Even then, such entities were organized as two-sided markets, catering to the consumption of readers or viewers, all while selling print space and airtime to advertisers.¹⁰ By design, digital platforms facilitate an exchange between producers and consumers.¹¹ Not only have platforms disrupted the networks through which content is distributed and accessed by audiences,¹² but now also impact the creation of content.

As of August 2022, at least 70% of U.S. adults obtain their news from social media in varying frequencies.¹³ Facebook facilitates the online news consumption of roughly a third of U.S. adults, whereas YouTube caters to a quarter of U.S. adults.¹⁴ Other platforms distributing online news include Twitter, Reddit, Instagram, Snapchat, LinkedIn, WhatsApp, and TikTok, with the percentage of TikTok’s users who regularly obtain news therefrom notably increasing from 22% to 33% between 2020 and 2022.¹⁵

Thus, news distribution and consumption now largely occur within, and are subject to the dynamics dictated by, social media platforms. What was traditionally a one-way communication flow from paternalistic mass media companies towards general audiences has now been supplanted by a distributed yet uneven conversation, with social media playing a central role in parsing through and distributing content across a shared digital space.¹⁶

⁹ See generally Ambarish Chandra & Ulrich Kaiser, *Newspaper and Magazines*, in HANDBOOK OF MEDIA ECONOMICS 409–10 (Simon Anderson, Joel Waldfogel & David Strömberg eds., 2015); BARRY RUSSELL LITMAN, THE VERTICAL STRUCTURE OF THE TELEVISION BROADCASTING INDUSTRY: THE COALESCENCE OF POWER 19–31, 34–40 (1979).

¹⁰ Chandra & Kaiser, *supra* note 9, at 416–22; LITMAN, *supra* note 9, at 31–34.

¹¹ ALEX MOAZED & NICHOLAS L. JOHNSON, MODERN MONOPOLIES: WHAT IT TAKES TO DOMINATE THE 21ST-CENTURY ECONOMY 110–13 (2016).

¹² See Naomi Forman-Katz & Katerina Eva Matsa, *News Platform Fact Sheet*, PEW RSCH. CTR. (Sept. 20, 2022), <https://www.pewresearch.org/journalism/fact-sheet/news-platform-fact-sheet/>; Adam Grundy, *Service Annual Survey Shows Continuing Decline in Print Publishing Revenue*, U.S. CENSUS BUR. (June 7, 2022), <https://www.census.gov/library/stories/2022/06/internet-crushes-traditional-media.html>.

¹³ *Social Media and News Fact Sheet*, PEW RSCH. CTR. (Sept. 20, 2022), <https://www.pewresearch.org/journalism/fact-sheet/social-media-and-news-fact-sheet/>.

¹⁴ *Id.*

¹⁵ *Id.*

¹⁶ DIANA BOSSIO, JOURNALISM AND SOCIAL MEDIA: PRACTITIONERS, ORGANISATIONS AND INSTITUTIONS 48–49 (2017); Axel Bruns, *Gatewatching and News Curation: Journalism, Social Media, and the Public Sphere*, in 113 DIGITAL FORMATIONS 1, 156 (2018).

Particularly, many of the structures and patterns in social media news production and consumption are determined largely by a platform's core business. At the heart of any platform is its core transaction, or the process that primarily facilitates the exchange of value between consumers and producers.¹⁷ For instance, Facebook's and Twitter's core transactions are targeted advertising, for which user time and data are vital input.¹⁸ Consequently, the platform—as owner and operator of the means of connection—can extract much of the value in the transactions it brokers. As such, a platform's business strategy consists of “maximiz[ing] user engagement, retention, and data collection.”¹⁹

To boost these core transactions platforms create audiences, facilitate matching, provide core services, and set interaction standards.²⁰ In these ways, social media platforms, through their algorithms, influence the creation and distribution of online news, as well as actively shape news consumption in ways that diminish content neutrality and user agency.²¹

To begin with, the personalization of user profiles is fundamental to platform choice architecture²² and news distribution:

It is a loop where “about” and “of” me also informs, through a sophisticated use of data, what is created “for” me: a catering for, but also an *anticipation of* what I “like”. And this anticipation of what “I like” was not just an audience strategy, but also a major revenue model for social news outlets²³

Coupled with personalization is the core platform tenet of “flow,” or the need to keep audiences continually engaged through an endless stream of associative content.²⁴ With superior monitoring and analytics of personalized user profiles, platforms write algorithms to classify, filter, assign viewing priorities to, and

¹⁷ See generally Forman-Katz & Matsa, *supra* note 12; see generally Grundy, *supra* note 12.

¹⁸ See Andrew Burt, *Can Facebook Ever Be Fixed?*, HARV. BUS. REV. (Apr. 8, 2019), <https://hbr.org/2019/04/can-facebook-ever-be-fixed>; David Boyd, *How Does Twitter Make Money?*, FINTY, <https://finty.com/us/business-models/twitter/> (Aug. 18, 2022).

¹⁹ Daniel A. Hanley, *A Topology of Multisided Digital Platforms*, 19 CONN. PUB. INT. L.J. 271, 301 (2020).

²⁰ MOAZED & JOHNSON, *supra* note 11, at 45–46.

²¹ Joelle Swart, *Experiencing Algorithms: How Young People Understand, Feel About, and Engage with Algorithmic News Selection on Social Media*, SOC. MEDIA & SOC'Y, Apr.–June 2021, at 1–2.

²² EDWARD HURCOMBE, SOCIAL NEWS: HOW BORN-DIGITAL OUTLETS TRANSFORMED JOURNALISM 105 (2022).

²³ *Id.* at 108.

²⁴ Jay David Bolter, *Social Media are Ruining Political Discourse*, ATLANTIC (May 19, 2019), <https://www.theatlantic.com/technology/archive/2019/05/why-social-media-ruining-political-discourse/589108/>.

actively shape the distribution of, news material.²⁵ For instance, Twitter easily generates and processes large user datasets since 95% of its user accounts are publicly viewable.²⁶ Thereafter, the Twitter hashtag functions as a news curation tool which coordinates user attention toward, and rallies *ad hoc* publics around, content deemed newsworthy.²⁷

Essentially, social media platforms have co-opted what was traditionally the journalist's gatekeeping function, or the responsibility of determining which information is fit to cover and publish to audiences.²⁸ In contrast to Myspace's limited profile-to-profile networking, Facebook's and Twitter's layouts feature a "semi-public fora" model, allowing platforms to project an interconnected space within which discourse could take place.²⁹ To thrive in the attention economy,³⁰ news content creators have to contend with "social media platforms that . . . do not guarantee—and in their current structures perhaps even work against—a potential for all users' contributions to become equally visible, or a possibility for their debates to be conducted right across entire societies."³¹ In this regard, the way social media platforms organize content is crucial to user engagement,³² which can be determined by "a measurement of the aggregate preferences of a given Website's readership [or] . . . complex interaction between the activities of other actors in the user's network and the organizing and display algorithms in use at a given social media platform."³³ Consequently, journalists are constantly renegotiating their roles and output, amid economies of clicks and likes, to ensure that dialogue would be circulated.³⁴

Apart from distribution, user engagement maximization also influences news content creation. Given the promise of wide audience reach over social media, content that is "purposely divisive or inflammatory" can be quite lucrative.³⁵ Digital news outlets like Upworthy and BuzzFeed glorify user engagement as a core operating principle,³⁶ employing strategies like click baiting and curiosity

²⁵ BOSSIO, *supra* note 16, at 96.

²⁶ BRUNS, *supra* note 16, at 9.

²⁷ *Id.* at 115.

²⁸ See Weiai Wayne Xu & Miao Feng, *Talking to the Broadcasters on Twitter: Networked Gatekeeping in Twitter Conversations with Journalists*, 58 J. BROAD. & ELEC. MEDIA 420, 420–21 (2014); see generally Neil Weinstock Netanel, *Mandating Digital Platform Support for Quality Journalism*, 34 HARV. J. L. & TECH. 473 (2021).

²⁹ HURCOMBE, *supra* note 22, at 42.

³⁰ BOSSIO, *supra* note 16, at 104 (citing Taina Bucher, *A Technicity of Attention: How Software 'Makes Sense'*, 13 CULTURE MACHINE 1, 13 (2012)).

³¹ BRUNS, *supra* note 16, at 141.

³² HURCOMBE, *supra* note 22, at 48.

³³ BRUNS, *supra* note 16, at 134–35.

³⁴ BOSSIO, *supra* note 16, at 57.

³⁵ HURCOMBE, *supra* note 22, at 52.

³⁶ *Id.* at 41.

gaps.³⁷ BuzzFeed, in particular, regularly employs “listicles” to insinuate content is trending while also inviting maximum engagement.³⁸ The desire to viralize sensational content has sometimes led to perverse outcomes, for instance, content editors encouraging graphic and insensitive depictions of crime or disaster stories.³⁹

Another fundamental shift from traditional mass media practices is the abandonment of impersonal, generalized language in favor of a more embodied and personable tone.⁴⁰ For example, Junkee, a popular Australian pop culture website, once released a feature entitled “Science Says Dump Him and Get a Dog”,⁴¹ which is written in the first person, largely subjective and opinionated (even if made to appear empirical—“Science Says”), and relies on more conversational text, *e.g.*, preceding discussion points with prompts like “*deep breath*.”⁴²

More broadly, on the quality of discourse, the maximization of a platform’s core transactions produces incentives that often sacrifices meaningful deliberation in favor of user engagement. Under the pretext of “customized experiences”, user activity is closely monitored and—rather than being exposed to a wide diversity of opinions—information flows only reinforce pre-existing biases.⁴³ For purposes of market segmentation and targeted advertising, audiences are amassed and fragmented,⁴⁴ in the process creating information silos.⁴⁵ Professor Jonathan Knee has dubbed Facebook the digital “Hotel California,” given its mastery of customer captivity, by increasing frequency of use and lowering willingness to switch.⁴⁶ From a cultural standpoint, contrary to early hopes that technology would level the communicative playing field, digital

³⁷ *Id.* at 43.

³⁸ *Id.* at 45.

³⁹ BRUNS, *supra* note 16, at 228 (citing Edson Tandoc, Jr., *Journalism Is Twerking? How Web Analytics Is Changing the Process of Gatekeeping*, 16 *NEW MEDIA & SOC’Y* 559, 568 (2014)).

⁴⁰ HURCOMBE, *supra* note 22, at 44–45.

⁴¹ Mitch Feltscheer, *Science Says Dump Him and Get a Dog*, JUNKEE (Nov. 30, 2018), <https://junkee.com/sleeping-next-to-dogs-is-better-than-men/184631>.

⁴² *Id.*

⁴³ See Mary Anne Franks, *Beyond the Public Square: Imagining Digital Democracy*, 131 *YALE L.J. FORUM* 427, 430 (2021); see also GRAEF, *supra* note 3, at 130.

⁴⁴ ASTRA TAYLOR, *THE PEOPLE’S PLATFORM: TAKING BACK POWER AND CULTURE IN THE DIGITAL AGE* 33, 189–90 (2014); see Olivier Sylvain, *Platform Realism, Informational Inequality, and Section 230 Reform*, 131 *YALE L.J. FORUM* 475, 508 (2021).

⁴⁵ Lisa Schmeiser, *The Effect of Facebook’s Social Media Silo on Itself and You*, *OBSERVER* (May 3, 2017), <https://observer.com/2017/05/facebook-social-media-silo-effect-social-discourse/>.

⁴⁶ JONATHAN KNEE, *THE PLATFORM DELUSION: WHO WINS AND WHO LOSES IN THE AGE OF TECH TITANS* 74 (2021).

platforms have instead carried over the discursive consolidation, centralization, and commercialization that beset prior media systems.⁴⁷

The very business of communication entails significant network effects to maximize audience reach and attract advertisers.⁴⁸ Such dynamics drove significant horizontal consolidation and vertical integration in traditional news industries,⁴⁹ and are the underlying logic of digital platforms' desire to grow and continuously engage users.⁵⁰ In both traditional and digital news, consolidation and integration often raise concerns about diminished viewpoint diversity and the dominance of a few voices.⁵¹

Of course, platform algorithms do not solely and definitively control social media discourse: "This is not to suggest that algorithms are deterministic of behavior—rather, that they are relational, being enacted and stabilized by representations of their neutrality, but also open to the manipulation and re-interpretation by other stakeholders in the representation of public dialogue."⁵² Still, by setting the terms of engagement in online discourse, the objectives of maximizing user engagement, along with growing and maintaining the platform network, predominates the ways that online news is produced, distributed, and consumed over social media.

II. MIDDLEWARE AND ITS MAKINGS

The Stanford report defines middleware as "software and services that would add an editorial layer between the dominant internet platforms and consumers."⁵³ These products would be "appended to the major internet platforms[,]" thereby allowing "consumers to shape their feeds and influence the

⁴⁷ TAYLOR, *supra* note 44, at 7.

⁴⁸ MIRIAM VAN DER BURG, CONSOLIDATION OF OWNERSHIP IN MEDIA INDUSTRIES: SURVIVAL STRATEGIES OF NEWSPAPER PUBLISHERS AND REGULATION IN THE DIGITAL ERA 38–39 (2017).

⁴⁹ *See generally id.* (discussing horizontal and vertical integrations).

⁵⁰ *See* MOAZED & JOHNSON, *supra* note 11, at 99–100 (discussing data that shows how platforms are growing in the past ten years and plan to continue growing).

⁵¹ *Id.* at 127–28; Mary R. Hornak, *Media Consolidation & Political Polarization: Reviewing the National Television Ownership Rule*, 90 FORDHAM L. REV. 909, 920 (2021); *see generally* Hallvard Moe, Jan Fredrik Hovden & Kari Karppinen, *Operationalizing Exposure Diversity*, 36 EUR. J. COMM'N 148 (2021).

⁵² BOSSIO, *supra* note 16, at 99.

⁵³ FUKUYAMA ET AL., *supra* note 7, at 30. The term had figured prominently in *United States v. Microsoft*, 253 F.3d 34 (D.C. Cir. 2001), pertaining to software that would expose an operating system's routines or protocols (known as Application Programming Interfaces or "API"), thus enabling software developers to port into such systems and code their applications thereon. Microsoft had supposedly excluded Java and Netscape, then-emerging middleware that had hoped to unlock enough Microsoft APIs to use as platforms for application development. *Id.*

algorithms that those dominant platforms currently employ.”⁵⁴ Termed “middleware,” the technology serves precisely to intermediate the operations and functions between the user and a social media platform. Such descriptions suggest a tripartite system comprising: the primary digital platform, where the core exchanges take place; middleware, which would re-orient information flows in the primary platform; and the user, who directs how the information flows will be re-oriented.

These definitions encompass several existing technologies that specifically or tangentially implicate the market for news in social media, particularly by promoting user choice.⁵⁵ In a 1998 Report to the U.S. Congress, the Federal Trade Commission referred to choice as “giving consumers options as to how any personal information collected from them may be used.”⁵⁶ Further to this, a Yale Tobin Center study posits that choice consists of four A’s: users must be able “to *attend* to . . . the market . . . *access* relevant information . . . *assess* . . . and then *act on* that information.”⁵⁷

Surveying these existing technologies, four choice-enhancing virtues of middleware are observed, in that such technologies: equip users with more information about their online news choices, allow more careful deliberation in consumption, improve user agency in social media platforms, and have the capacity to effect lasting behavioral changes among users.⁵⁸

NewsGuard is but one example. Dubbed the “Internet Trust Tool,”⁵⁹ it is an internet news watchdog service⁶⁰ offering a browser extension which rates articles along nine journalistic criteria,⁶¹ and labels these articles according to

⁵⁴ *Id.* at 31.

⁵⁵ *Id.* at 32.

⁵⁶ U.S. FED. TRADE COMM’N, *PRIVACY ONLINE: A REPORT TO CONGRESS* 8 (1998).

⁵⁷ FLETCHER ET AL., *supra* note 4, at 4.

⁵⁸ FUKUYAMA, *supra* note 7, at 32–34.

⁵⁹ Grayce Mores & Madison Latiolas, *NewsGuard: The Internet Trust Tool*, LA. STATE UNIV., <https://faculty.lsu.edu/fakenews/resources/newsguard.php> (last visited Apr. 14, 2023).

⁶⁰ Jason Perlow, *NewsGuard Becomes Free for All Microsoft Edge Users*, ZDNET (May 14, 2020), <https://www.zdnet.com/article/newsguard-becomes-free-for-all-microsoft-edge-users/>.

⁶¹ *Rating Process and Criteria*, NEWSGUARD, <https://www.newsguardtech.com/ratings/rating-process-criteria/> (last visited Apr 14, 2023), (states their criteria for judging news entities: “[1] Does not repeatedly publish false content . . . [2] Gathers and presents information responsibly . . . [3] Regularly corrects or clarifies errors . . . [4] Handles the difference between news and opinion responsibly . . . [5] Avoids deceptive headlines . . . [6] Website discloses ownership and financing . . . [7] Clearly labels advertising . . . [8] Reveals who’s in charge, including possible conflicts of interest [and] . . . [9] The site provides the names of content creators, along with either contact or biographical information[.]”).

credibility.⁶² A green label means a website adheres to basic standards of credibility, red if it does not, yellow to distinguish humor or satire sites, and grey to identify the website as a platform.⁶³ NewsGuard has green-labeled The New York Times and Vox's Recode!,⁶⁴ and had red-labelling RT, for spreading Kremlin-backed misinformation,⁶⁵ Fox News, for frequently publishing uncorrected significantly false news,⁶⁶ and MSNBC, for failure to responsibly gather and present information.⁶⁷ Thus, middleware like NewsGuard equips users with better information, in that users are given a sense of what not to read owing to accessible information on content credibility.⁶⁸

On this front, middleware helps users navigate the torrent of social media information by providing derivative credibility signaling for news outlets.

Compared to the rather monolithic and top-down relationship of traditional mass media and their audiences, social media has created a demotic environment, whereby ordinary and everyday social media users assume roles previously reserved only to professional media persons.⁶⁹ Now, by being able to post, share, and re-post content, almost anyone in social media can engage in some semblance of a public service announcement or informative dissemination. Given the reduction in the barriers to entry of traditional media,⁷⁰

for the ordinary user the process of participation in news and politics has

⁶² *NewsGuard Ratings*, NEWSGUARD, <https://www.newsguardtech.com/solutions/newsguard/> (last visited Apr. 14, 2023).

⁶³ NEWSGUARD, *supra* note 61.

⁶⁴ Rani Molla, *It Will Take More than NewsGuard's Team of Journalists to Stop the Spread of Fake News*, VOX (Feb. 13, 2019), <https://www.vox.com/2019/2/13/18220746/real-journalists-fake-news-newsguard>.

⁶⁵ Ted Johnson, *RT America to Halt Production and Lay Off Most Staff After Being Dropped by Major U.S. Distributors*, DEADLINE (Mar. 3, 2022), <https://deadline.com/2022/03/rt-america-to-halt-production-and-lay-off-most-staff-after-being-dropped-by-major-u-s-distributors-1234970503/>.

⁶⁶ Jason Easley, *Fox News Loses Trusted News Source Rating From Journalism Watchdog*, POLITICUSUSA (July 21, 2022), <https://www.politicususa.com/2022/07/21/fox-news-not-trustworthy.html>.

⁶⁷ Bron Maher, *Fox News and MSNBC 'Fail to Adhere to Basic Journalistic Standards', Says Credibility Rater NewsGuard*, PRESS GAZETTE (July 22, 2022), <https://pressgazette.co.uk/fox-news-newsguard/>.

⁶⁸ *See NewsGuard's Online Source Rating Tool: User Experience*, GALLUP (2019), <https://www.newsguardtech.com/wp-content/uploads/2019/01/Gallup-NewsGuards-Online-Source-Rating-Tool-User-Experience-1.pdf>, (explaining how NewsGuard alleviates the uncertainty of online information consumption, allowing users to be well-informed on online sources, and boosting confidence in identifying reliable news.); *see also* Maher, *supra* note 67.

⁶⁹ Anthea Garman, *Ordinary People and the Media: The Demotic Turn*, 35 AFRICAN JOURNALISM STUD. 109, 110 (2014) (book review).

⁷⁰ *See* Mark Nadel, *Editorial Freedom: Editors, Retailers, and Access to the Mass Media*, 9 HASTINGS COMM. AND ENT. L.J. 213, 235 (1986).

become a great deal easier and more natural; at least until the growing prominence of a given topic leads the user to realize that they are potentially speaking to an audience well beyond their own followers, the steps from gatewatching (identifying interesting news items) through news sharing (disseminating those news items) to news curation (organizing the continuing stream of news items) are now simple and present comparatively few obstacles.⁷¹

However, one consequence of leveling the traditional media space is the diminution of the previously recognizable and enduring brands of longtime news entities. To illustrate, especially among social media's younger audiences, news from a traditional outlet such as CNN may not necessarily possess stronger persuasiveness compared to a born-digital news outlet like BuzzFeed, although the former employs more rigorous journalistic standards than the latter. In essence, "because all of these activities are taking place in the shared space of the social media platform, professional and citizen journalists are operating side by side here and cannot necessarily draw on any fundamental competitive advantage that stems from their institutional positioning."⁷²

Middleware like NewsGuard can signal audiences on which sources are legitimate, credible, and reliable. Given the endless stream on a user's news feed, the pressure to keep updated often comes at the expense of the extra effort on behalf of content producers to verify if content is of a certain quality. Taken to its extreme, this dynamic has benefited populist causes. For example, with its viral and vibrant content distribution, TikTok recently served as a misinformation super-spreader influencing thousands of Filipino youth to elect as President the son of a former dictator.⁷³

With content-labeling middleware, as users continuously scroll through their screens, sources will no longer be presented as if in parity in terms of content quality; rather, those marked legitimate will stand out to the viewer's eyes, while others not marked as such—although still available for viewing—could be relegated into the background. As an analogy, the Instagram "blue check" badge is bestowed upon verified profiles, causing users to veer away from mimic accounts.

It is unclear how effective such signaling might be. In social media discourse, the "populism in metrics" seems inevitable as content creators and distributors themselves are "reactive and opportunist" to social media trends, and often

⁷¹ BRUNS, *supra* note 16, at 156.

⁷² *Id.* at 117.

⁷³ Tim Culpan, *TikTok is the New Front in Election Misinformation*, BLOOMBERG (June 28, 2022), <https://www.bloomberg.com/opinion/articles/2022-06-28/bongbong-benefited-from-tiktok-in-philippines-election-watch-out-for-midterms>.

succumb to simply displaying what people want to see.⁷⁴ Meanwhile, users themselves tend to self-select and flock to whatever their pre-existing preferences, ideologies, and beliefs prompt them towards.⁷⁵

Still, in this sense, middleware would perform standard-setting and accreditation functions, albeit in a privatized manner.⁷⁶ Much like licensing in the context of professional regulation,⁷⁷ middleware solutions would serve as arbiters determining which sources hurdle certain quality standards, thereafter stamping reputational markers and instilling accountability. At the very least, just as financial institutions employ mechanisms to scrutinize credible borrowing,⁷⁸ middleware can significantly reduce verification costs for users inclined to dig further into news sources. This standard-setting and accreditation aspect would serve particularly useful in repeat engagements, so that in future news consumption, users gain familiarity with different entities, and set apart credible from substandard content.

It is one thing to possess more nuanced information about one's news choices, but entirely separate matters to be able to deliberate and act on such alternatives. Middleware also holds such promises. To illustrate, a platform's comments section is also material to social media news engagements. The ability of user comments to reinforce user opinions, drown out minority viewpoints, and manufacture perceptions⁷⁹ has led to the proliferation of bots on social media comments sections. This is where software developer Arwen steps in. Users can authorize Arwen to collect Facebook, Twitter, or Instagram data in order to score and classify comments and manage the viewability and accessibility of these

⁷⁴ BRUNS, *supra* note 16, at 238.

⁷⁵ Sudhir Venkatesh, et al., *In a New Light: Social Media Governance Reconsidered*, 23 YALE J. L. & TECH. 1 (2021) (“[T]hese algorithms reinforce systematic biases of the individuals and organizations training, building, and deploying them. At worst, feedback loops in algorithms can inadvertently magnify these biases further marginalizing individuals or groups.”).

⁷⁶ Other jurisdictions have explored the idea of a government body that will vet social media information flows for misinformation. For instance, the Philippines once considered a legislative proposal for an Institute for the Integrity of Information. See Florin Hilbay, *Needed: An Institute for the Integrity of Information to Counter the Death of Truth*, VERA FILES (Oct. 7, 2017), <https://verafiles.org/articles/institute-integrity-information-counter-death-truth>.

⁷⁷ See Jonathan Rose, *Professional Regulation: The Current Controversy*, 7 LAW & HUM. BEHAV. 103, 103–04 (1983).

⁷⁸ Ronald Mann, *Verification Institutions in Financing Transactions*, 87 GEO. L.J. 2225, 2230 (1999).

⁷⁹ See Eun-Ju Lee, et al., *When and How User Comments Affect News Readers' Personal Opinion: Perceived Public Opinion and Perceived News Position as Mediators*, 9 DIGITAL JOURNALISM 42, 42–43 (2021).

comments.⁸⁰ Arwen has partnered with the digital content unit of rugby team Northampton Saints to detoxify its Twitter page of harmful comments, in turn allowing the Saints to promote a positive and inclusive online presence so supporters and followers can more meaningfully engage with their content.⁸¹

Media organizations can employ the same technology to manage their social media presence, preventing bots from polluting their publications' comments sections, and more clearly conveying their news reports to their audiences. In turn, audiences can more properly process not only the main content published by media organizations, but the subsidiary discussions that follow in a post's comments section. Moreover, netizens who would otherwise veer away from toxic comments sections would be encouraged to engage others thereon meaningfully and actively.

Cyacomb—a company born from a technological research project for safer online spaces⁸²—provides safety and forensics products whereby, when social media users attempt to upload content, a filtering technology scans the content, cross-checks the same with “blocklisted” content from an independently accredited database, thereafter withholding harmful information while clearing acceptable ones.⁸³

Cyabomb's technology will serve particularly useful in filtering out extremist and terrorist recruitment propaganda masquerading as news and public information. Recently, the Islamic State, a jihadist extremist group, has technologically evolved its propaganda efforts by assuming news organization-esque online identities such as “World News,” and—instead of disseminating propagandist text which would easily be taken down per content moderation rules—propagating emojis that convey violent ideologies.⁸⁴

Similarly oriented are research-led technology startup Raven's video software intelligence tools, which find, analyze, and classify video content to filter out extremist propaganda.⁸⁵ Raven assists social media companies in rapidly identifying and taking down videos that violate community moderation

⁸⁰ *How Arwen Works*, ARWEN, <https://arwen.ai/> (Feb. 5, 2023).

⁸¹ Sport Industry Group, *Developing a Community in the Digital Age*, SPORT INDUSTRY DAILY (Dec. 19, 2022), https://www.sportindustry.biz/news-categories/features/developing-a-community-in-the-digital-age/?utm_medium=email&utm_campaign=Sport%20Industry%20Daily%20%20191222&utm_content=Sport%20Industry%20Daily%20%20191222+CID_6df25a4f769d1ffe5bb734d9f8d8f673&utm_source=Email%20marketing%20software&utm_term=Read%20more.

⁸² *Our Story*, CYACOMB, <https://www.cyacomb.com/company/our-story-values/>.

⁸³ *Cyacomb Safety*, CYACOMB, <https://www.cyacomb.com/products/cyacomb-safety/>.

⁸⁴ Mark Scott, *Islamic State Evolves 'Emoji' Tactics to Peddle Propaganda Online*, POLITICO (Feb. 10, 2022), <https://www.politico.eu/article/islamic-state-disinformation-social-media/>.

⁸⁵ *About Raven*, RAVEN SCIENCE, <https://ravenscience.com/>.

standards, among other norms.⁸⁶

Finally, if middleware is to truly effect profound changes, it should not stop at simply assisting audiences in navigating social media on a case-to-case basis. Middleware also holds the lasting potential of improving the quality of people's social media news consumption behavior, engagements, and interactions.

Albeit discussed in the context of a platform's own content moderation system, some scholars have clamored for a "social epistemology perspective" in content labeling.⁸⁷ Social epistemology "studies knowledge as arising at the societal and communal levels, from individual relations interconnected to others."⁸⁸ This perspective "asks how groups or communities of agents can best pool their evidence-gathering resources and profit from dialectical exchange and debate."⁸⁹

According to these scholars, labeling should not simply lead audiences away from harmful content, but should improve the ways in which audiences perceive, scrutinize, and discern information streams.⁹⁰ For instance, will the labeling prompt users to alter their sharing behavior, *e.g.*, to urge others to steer clear of harmful content?⁹¹ At its core, social epistemology instills a consciousness that one's actions, *i.e.*, creating or sharing content, over a distributed network will affect interconnected stakeholders.⁹² From this perspective, middleware would only be the starting point for more responsible participation in social media. Thus, shaping the behavior of younger, more impressionable, and morally malleable generations is crucial.

Lightspeed Systems, an education innovation firm, aims to do precisely that through a range of technologies.⁹³ The company's Lightspeed Filter is a solution that allows school administrators to block or limit the use of social media. This product aims to instill responsible digital citizenship early on. Another of Lightspeed's products, SmartPlay, is an instructional tool that blocks inappropriate videos, thumbnails, and recommended content on YouTube. Lastly, Parent Portal keeps parents updated on their children's social media activities.⁹⁴ This way, younger generations who have been exposed to

⁸⁶ *Use Cases*, RAVEN SCIENCE, <https://ravenscience.com/>.

⁸⁷ See John Wihbey, et al., *Informational Quality Labeling on Social Media: In Defense of a Social Epistemology Strategy*, 23 YALE J. L. & TECH. 153, 184-88 (2021).

⁸⁸ Paul Callister & Dana Nescu, *An Ecological and Holistic Analysis of the Epistemic Value of Law Libraries*, 113 LAW LIBR. J. 241, 249 (2021).

⁸⁹ William Talbot & Alvin Goldman, *Games Lawyers Play: Legal Discovery and Social Epistemology*, 4 LEG. THEO. 93, 99 (1998).

⁹⁰ Wihbey et al., *supra* note 87, at 184-85.

⁹¹ *Id.* at 188.

⁹² Callister & Nescu, *supra* note 88.

⁹³ *About Lightspeed Systems*, LIGHTSPEED SYSTEMS, <https://www.lightspeedsystems.com/about/>.

⁹⁴ *Top 3 Ways Lightspeed Systems Helps Schools Foster Digital Citizenship*,

technology and social media all their lives can develop and exercise discretion in their social media engagements.

Ultimately, by allowing users to “tailor the functionality”⁹⁵ of digital platforms, middleware can enable them to actively “reshape the terms of engagement”⁹⁶ threat. The Stanford report envisions middleware as “cater[ing] to the preferences of individual consumers while providing significant resistance to unilateral actions by”⁹⁷ digital platforms. These projections recast Professor Michael Porter’s articulation of how buyers (platform users) can shift competitive forces in their favor and advance their choices over those of businesses (digital platforms).⁹⁸

III. THE DIGITAL SERVICES ACT

Given middleware’s disruptive potential, social media platforms would expectedly resist these technologies. Professor Daniel Crane posits that these technologies will commoditize platforms’ proprietary and lucrative channels.⁹⁹ Again, by controlling the means of connection between users and developers, platforms are able to extract much of the transactional value. But with middleware, the ability to influence the terms of engagement in social media would be diffused, making users and developers indifferent as to which systems they are on.¹⁰⁰

Such concerns are reminiscent of *U.S. v. Microsoft* where Microsoft viewed Netscape and Java as threats that would “usurp the operating system’s platform function and might eventually take over other operating system functions[.]”¹⁰¹ This would have diminished the ascendancy of Microsoft’s operating system, and its ability to capture much of the users and application developers.

On this front, the European Union’s digital revolution legislative package, by far the most focused agenda addressing tech dominance, holds much promise. This package consists of the Digital Markets Act,¹⁰² which harmonizes data protection and competition standards, for a fairer and more contestable digital

LIGHTSPEED SYSTEMS, <https://www.lightspeedsystems.com/blog/how-to-foster-digital-citizenship/>.

⁹⁵ FUKUYAMA ET AL., *supra* note 7, at 31.

⁹⁶ Benkler, *supra* note 6, at 20.

⁹⁷ FUKUYAMA ET AL., *supra* note 7, at 32.

⁹⁸ MICHAEL PORTER, *COMPETITIVE STRATEGY: TECHNIQUES FOR ANALYZING INDUSTRIES AND COMPETITION*, 3–5, 26–27 (The Free Press ed., 1980).

⁹⁹ Daniel Crane, *Ecosystem Competition and the Antitrust Laws*, 98 NEBR. L. REV. 412, 415 (2019).

¹⁰⁰ *Id.*

¹⁰¹ *United States v. Microsoft Corp.*, 253 F.3d 34, 53 (D.C. Cir. 2001).

¹⁰² Commission Regulation 2022/1925 (“Digital Services Act”), 2022 O.J. (L 265) 1.

economy; the Digital Services Act¹⁰³ (“DSA”), to regulate the activities of content intermediaries; and the proposed Data Act,¹⁰⁴ to economize the use and access of user data.

In particular, the DSA—which entered into force on November 16, 2022—regulates information intermediaries, acknowledging that algorithmic recommender systems “play an important role in the amplification of certain messages, the viral dissemination of information and the stimulation of online behavior.”¹⁰⁵ While written primarily to protect EU residents, the law will ripple across the globe, causing social media platforms to rewrite worldwide content moderation policies.¹⁰⁶

Notably, much of middleware’s thrusts—the capacity to inform users and empower them to assert their autonomy in the digital space—is mirrored in the DSA’s objectives:

Consequently, online platforms should consistently ensure that recipients of their service are appropriately informed about how recommender systems impact the way information is displayed, and can influence how information is presented to them. They should clearly present the parameters for such recommender systems in an easily comprehensible manner to ensure that the recipients of the service understand how information is prioritized for them. These parameters should include at least the most important criteria in determining the information suggested to the recipient of the service and the reasons for their respective importance, including where information is prioritized based on profiling and their online behavior.¹⁰⁷

To achieve these, Article 3(g) of the DSA first defines “intermediary services” as any of the following:

(i) a ‘mere conduit’ service, consisting of the transmission in a communication network of information provided by a recipient of the service, or the provision of access to a communication network;

¹⁰³ *Id.*

¹⁰⁴ *Proposal for a Regulation of the European Parliament and of the Council On Harmonized Rules On Fair Access To and Use of Data (Data Act)*, COM (2022) 68 final (Feb. 23, 2022) 5.

¹⁰⁵ Regulation 2022/2065 of the European Parliament and of the Council of 19 October 2022 on a Single Market For Digital Services and amending Digital Services Act, 2022 O.J. (L 277) pt. 70.

¹⁰⁶ Jared Schroeder, *Meet the EU Law That Could Reshape Online Speech in the U.S.*, SLATE (Oct. 27, 2022), <https://slate.com/technology/2022/10/digital-services-act-european-union-content-moderation.html>.

¹⁰⁷ Regulation 2022/2065 of the European Parliament and of the Council of 19 October 2022 on a Single Market For Digital Services and amending Digital Services Act, 2022 O.J. (L 277) pt. 70.

(ii) a ‘caching’ service, consisting of the transmission in a communication network of information provided by a recipient of the service, involving the automatic, intermediate and temporary storage of that information, performed for the sole purpose of making more efficient the information’s onward transmission to other recipients upon their request;

(iii) a ‘hosting’ service, consisting of the storage of information provided by, and at the request of, a recipient of the service;

Article 3(i) then defines an “online platform” as “a hosting service that, at the request of a recipient of the service, stores and disseminates information to the public” whereas a “recommender system” is defined in Article 3(s) as

[A] fully or partially automated system used by an online platform to suggest in its online interface specific information to recipients of the service or prioritize that information, including as a result of a search initiated by the recipient of the service or otherwise determining the relative order or prominence of information displayed[.]¹⁰⁸

Social media platforms squarely fit within these definitions. TikTok hosts users that create and exchange content, not just personally, but broadcasted to a collective audience. Facebook’s feed manifests an underlying recommender system that curates content deemed relevant considering a user’s personalized information, as well as viewing and clicking patterns.

Most importantly, the DSA’s capacity to facilitate interconnection between social media platforms and middleware technologies, stimulate the growth and development of the latter, and empower user choice, lies in Articles 25(1) and 27(1), respectively providing:

Providers of online platforms shall not design, organize or operate their online interfaces in a way that deceives or manipulates the recipients of their service or in a way that otherwise materially distorts or impairs the ability of the recipients of their service to make free and informed decisions.¹⁰⁹

Providers of online platforms that use recommender systems shall set out in their terms and conditions, in plain and intelligible language, the main parameters used in their recommender systems, as well as any options for the recipients of the service to modify or influence those main parameters.¹¹⁰

Reference to “any options for the recipients of the service to modify or

¹⁰⁸ *Id.* at art. 3(s).

¹⁰⁹ *Id.* at art. 25(1).

¹¹⁰ *Id.* at art. 27(1).

influence those main parameters”¹¹¹ need not be narrowly construed to mean that only the online platform itself must provide such features. Emphasis on “any options” could pave the way for platforms to accommodate tripartite models such as one involving middleware.

The foregoing provisions do not exactly mandate a positive obligation for social media platforms to allow middleware to interconnect with them. Still, especially if installing middleware will aid users “to make free and informed decisions[,]”¹¹² the statutory language can be construed as prohibiting platforms from obstructing the effective functioning of middleware on their operating systems, as this “materially distorts or impairs” the user experience.¹¹³ Additionally, Article 23a(3) empowers the European Commission to issue guidance on the above-quoted provisions, possibly in ways that would facilitate middleware potency. Such guidance might even go so far as the Commission constituting a technical panel to broker a socially-acceptable arrangement between platform providers and middleware technologies.¹¹⁴

Saliently, these provisions promote transparency, allowing users to uncover the factors which influence their news feeds. For online news consumption, middleware can enable users to gain an awareness of the other choices that do not make it into their feeds because of what platforms might have initially dictated. Moreover, these provisions promote autonomy, allowing middleware to provide users with options on how to tailor their viewing experiences, rather than social media platforms imposing these choices on them.

With the DSA in place, experts anticipate that Elon Musk’s Twitter will be among the new law’s early test cases.¹¹⁵ The platform’s organizational shakeup poses implications for its capacity to keep up with stricter content moderation standards.¹¹⁶ Its perceived online surveillance of its users, for purposes of targeted advertising, will also likely come under scrutiny.¹¹⁷ All these predictions share a common premise—that Twitter is a major player in the digital information space, and reining in its strength is key to attaining a more

¹¹¹ *Id.*

¹¹² *Id.* at art. 25(1).

¹¹³ *See, e.g.,* United States v. Microsoft Corp., 253 F.3d 34, 49, 51, 64 (D.C. Cir. 2001) (where Microsoft’s deliberate design to crash its operating system each time engineers sought to customize the software was deemed anticompetitive.).

¹¹⁴ This model was proposed relative to the design of an “equitable interoperability” framework among platforms and rival service providers. *See* FIONA SCOTT MORTON, ET AL., *EQUITABLE INTEROPERABILITY: THE “SUPER TOOL” OF DIGITAL PLATFORM GOVERNANCE* (2021).

¹¹⁵ *Twitter’s ‘Collision Course’ with EU*, FIN. TIMES (Nov. 16, 2022), <https://www.ft.com/content/a8281bf4-bd83-42ac-875f-9061ee1b357b>.

¹¹⁶ *Id.*

¹¹⁷ *Id.*

contestable and pluralistic digital landscape.¹¹⁸

While the DSA directly regulates platform activity to the extent that it affects European Union residents, some experts anticipate the law's spillover effects on greater transparency—insights gained into these platforms inner workings will quickly spread to other jurisdictions.¹¹⁹ Other anticipate a reduction in disinformation as content taken down means aborted circulation even in digital spaces access by other parts of the world.¹²⁰ From a regulatory perspective, others view the EU as a global standard-setter for regulators across the globe.¹²¹

IV. FUNDAMENTAL CHALLENGES & CONCLUSION

Apart from the nuanced challenges in deploying middleware alluded to above, the use of such technologies faces some rather existential hurdles. For one, Professor Fukuyama's cyber policy team anticipates concerns over middleware's technological feasibility and profitability. Specifically, even given the expected support from the DSA, conflicts will arise over the allocation of editorial control between platform providers and middleware technologies, with the former unwilling to cede authority to the latter.¹²² Thus, it seems unlikely that social media platforms would roll out their services already with middleware plug-ins and extensions already in place. Moreover, as middleware technologies will themselves be proprietary in nature, the question of a sustainable business model¹²³—one not run on the improvident maximization of user engagement—remains.¹²⁴

Relative to the latter point, a tech lawyer has expressed concern that middleware's functionality involves curating massive volumes of content, and

¹¹⁸ *Id.*

¹¹⁹ See Daphne Keller, *The EU's New Digital Services Act and the Rest of the World*, VERFASSUNGSBLOG (Nov. 7, 2022), <https://verfassungsblog.de/dsa-rest-of-world/>.

¹²⁰ See Molly Killeen, *Global view key in assessing DSA impacts, say stakeholders*, EURACTIV (Mar. 29, 2022), <https://www.euractiv.com/section/digital/news/global-view-key-in-assessing-dsa-impacts-say-stakeholders/>.

¹²¹ Asha Allen & Ophélie Stockhem, *A Series on the EU Digital Services Act: Ensuring Effective Enforcement*, CENT. DEM. & TECH. (Aug. 18, 2022), <https://cdt.org/insights/a-series-on-the-eu-digital-services-act-ensuring-effective-enforcement/>; Joan Barata, *The Digital Services Act and Its Impact on the Right to Freedom of Expression: Special Focus on Risk Mitigation Obligations*, DSA OBSERVATORY (July 27, 2021), <https://dsa-observatory.eu/2021/07/27/the-digital-services-act-and-its-impact-on-the-right-to-freedom-of-expression-special-focus-on-risk-mitigation-obligations/>.

¹²² FUKUYAMA ET AL., *supra* note 7, at 36–37.

¹²³ *Id.* at 37.

¹²⁴ Future research might consider studying the business models, revenue trends, and entrepreneurial strategies of technologies that could be classified as middleware.

building formidable yet accurate databases, upon which to build their services.¹²⁵ Indeed, technologies like those of Cyabomb and Raven, even if eventually powered by artificial intelligence, would have required several human individuals going through numerous propaganda material, designing codes for classification which still allow for human intervention in case of machine error, and constantly recalibrating the technology given evolving propaganda tactics.¹²⁶ Furthermore, even middleware would be subject to the same misgivings about data privacy as with social media platforms.¹²⁷

However, a more fundamental hurdle remains: in the first place, why should users ever adopt middleware? As they are, social media platforms deliver tremendous personal and economic benefits; also, not all users might be interested in a multi-perspective selection of quality news content,¹²⁸ and are simply satisfied with their respective information silos. In the context of fighting misinformation, a director of a journalism lab said, “[i]f you’re a person who has the NewsGuard extension on your browser, you are just not the problem.”¹²⁹

Ultimately, social media platforms are but a single—albeit a significant—factor driving the novel dynamics of news production and consumption: “deterministic perspectives on platform power can neglect the ways in which users, journalists, and news organizations negotiate with platforms. By centering platforms, we could be erasing the agency of those who use them. For, social news content has not been purely determined by platforms.”¹³⁰ Individuals—whether media professionals or audiences—must exercise their civic duties in combatting online propaganda and abuse.¹³¹ Harnessing these virtues, middleware solutions are promising proposals that could intermediate between users and social media platforms, thereby refocusing editorial control to the user, and making for a more engaging and personalized exposure to online news. The pathways towards socially-progressive technological advancement are not always clear, but it is essential that society moves forward.

¹²⁵ Keller, *supra* note 7, at 169–71.

¹²⁶ See UNITED NATIONS OFFICE OF COUNTER-TERRORISM & UNITED NATIONS INTERREGIONAL CRIME AND JUSTICE RESEARCH INSTITUTE 30 (2021) (“In this regard, automated content moderation can or rather should not be truly fully automated. Human oversight of the review and decision-making processes remains a necessity. Notwithstanding the limitations, automated content moderation solutions are increasingly considered indispensable in the private sector in light of the sheer amount of content published online each and every day.”).

¹²⁷ Keller, *supra* note 7, at 171–72.

¹²⁸ BRUNS, *supra* note 16, at 5, 46, 57.

¹²⁹ Maher, *supra* note 67.

¹³⁰ HURCOMBE, *supra* note 22, at 50.

¹³¹ BRUNS, *supra* note 16, at 11.

