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**The Costs of Free: Commodification,
Bundling and Concentration**

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Abstract

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1. Introduction

Contemporary content and technology markets enjoy abundant “free stuff”. Literary, musical and visual content is widely available at a zero price, open source code is widely available in software markets, and virtually all internet browsers and search engines are distributed for free. This continuous flow of free informational assets might appear to be a net welfare gain. Content and software markets apparently support robust output even when informational assets are widely unpriced, which seems to cast doubt on the view that secure intellectual property (“IP”) rights are necessary to sustain innovation. Scholarly discussion often adopts this skeptical approach, lauding or showing indifference to the unauthorized use of IP assets and advocating legal changes that would weaken (or resisting legal changes that would strengthen) IP holders’ ability to exert control over those assets (Boldrin and Levine (2008); Benkler (2006); Lessig (2004)). In content markets in particular, these arguments rely on the view that firms can often develop adequate positive-revenue models without IP rights (Lemley 2010, 2015; Raustiala and Sprigman 2012; Breyer 1970).

In this paper, I re-examine this “free is good” proposition. I argue that the unpriced distribution of informational goods imposes a potentially significant social cost as compared to positively priced production and distribution models, even if some firms can develop business models that generate positive revenues in a weak IP environment. Giveaways encompass both voluntary commoditization that takes place by choice under strong IP regimes and involuntary commoditization that takes place by compulsion under weak IP regimes.¹ In digital content markets, IP commoditization tends to support concentrated markets led by a handful of intermediaries, or a single intermediary, that enjoys a dominant position in a complementary goods market² from which revenues can be extracted, notwithstanding zero-price conditions in the primary informational goods market. The complementary good could be any excludable good, such as hardware, live performance, or the focus of this paper, content aggregation and advertising services (what I will call “curatorial” services). In commoditized content markets, dominant intermediaries appear to enjoy not only high market shares but some entry protection as a result of scale economies, network effects, weak inventory constraints, ecosystem effects and learning effects.

It is natural to assume that weakening IP protections reduces access costs for users and lowers entry barriers for competitors. But this is only one of multiple possible outcomes. Content commoditization does not necessarily eliminate industry rents and associated deadweight losses; rather, it may transfer rent-seeking opportunities from upstream content

¹ “Commoditization” is used in this paper to refer to any practice by which informational goods are distributed at a zero or nominal price.

² The concept of complementary goods was originated by Teece (1986), who emphasizes the ability of firms to capture returns from innovation through a menu of “appropriability mechanisms”, which is defined broadly to include all assets that are complementary to the primary good.

producers to intermediaries that aggregate and distribute content within a suite of complementary goods and services. Concentrated conditions at the intermediary level may result in adverse welfare effects through short-term output distortions in the complementary curatorial and advertising services markets and, given the absence of secure IP protections, longer-term output distortions in the primary content goods market. Hence, even if some entities have access to alternative monetization mechanisms in the absence of IP rights, there is no assurance that zero-price content environments result in a net welfare improvement, taking into account competitive effects within the broader market ecosystem. Those concerns provide the basis for re-articulating the economic case for secure copyright even in digital environments in which content output appears to be “adequate” and widely accessible.

The paper proceeds as follows. Section 2 describes the types of, and rationales for, IP giveaway strategies. Section 3 analyzes the link between content commoditization and market concentration, illustrated by preliminary evidence. Section 4 analyzes the welfare effects of the “commoditization plus concentration” sequence in digital content markets and discusses implications for copyright policy. Section 5 concludes.

2. Free Stuff Strategies

2.1 Free Stuff Strategies: Voluntary and Involuntary

It is important to distinguish between voluntary and involuntary giveaway strategies. In the involuntary case, the IP holder has no technological or legal means to control use of its informational assets and therefore must adopt a giveaway strategy. In the voluntary case, those means are available but the IP holder declines to use them.

2.1.1 Involuntary Giveaways. Since the advent of the Internet and related technological advances, the costs of copying and distributing literary, audio and visual content have fallen dramatically, often with little quality degradation relative to the original. Naturally, the incidence of unauthorized copying and distribution has increased dramatically. Given that it is infeasible to pursue each individual infringer, and generous judicial interpretations of the “501(c) safe harbor” under the Digital Millennium Copyright Act (“DMCA”) tend to relieve online intermediaries of responsibility to police user infringement³, content holders struggle to deter online infringement. This is an example of an involuntary giveaway compelled by technological and legal conditions that increased the costs of protecting informational assets.

2.1.2 Voluntary Giveaways. IP holders often voluntarily adopt giveaway distribution strategies, even when closed distribution is technologically and legally feasible. This strategy has been adopted in the case of some of history’s most valuable innovations: the Ethernet local area network technology (Xerox, Intel, DEC), the Universal Serial Bus (Intel),

³ For a representative decision, see *Viacom International Inc. v YouTube, Inc.*, 940 F.Supp.2d 110 (S.D.N.Y. 2013).

Bluetooth (IBM, Intel, Ericsson, Nokia, Toshiba), the Unix operating system (AT&T) and the Java programming language (Sun), were made available at zero or nominal fees (Barnett 2011: 1864, 1871-1872, 1891; on Bluetooth, see Barnett 2014: 32). A striking example is the Linux operating system (“OS”), which is released under an open-source, royalty-free license and relies on contributions by volunteer programmers. Contrary to common perceptions, however, most volunteer contributors are employees of large technology companies, which reportedly provide extensive financial and logistical support to the Linux project (Barnett 2011: 1907-08, 1910, citing data in Linux Foundation 2009, 2010). In 2015, over 80% of all contributions to the Linux “kernel” were from developers affiliated with a corporate employer (Linux Foundation 2016: 12). This too is a voluntary giveaway: rather than developing a proprietary OS, those employers elected to invest in the development of an open-source OS that is available at a zero price.

2.2. Rationales for Free Stuff Strategies

Free stuff IP strategies promote two related objectives: (i) to generate the user base that is a precondition for realizing the network effects that *create* value in informational asset markets; and (ii) to shift the locus of profit extraction within the “value chain” to a segment in which the commoditizing firm enjoys a competitive advantage, which *shifts* value.

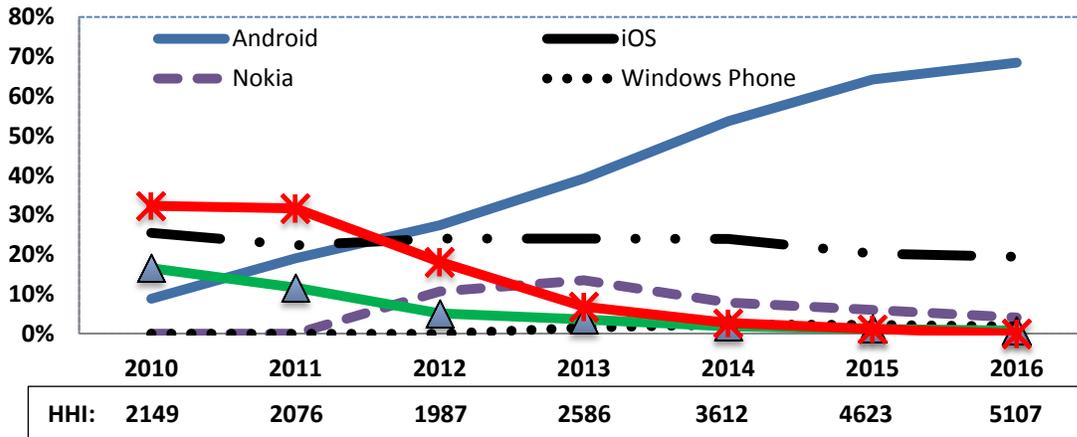
2.2.1 Installed Base and Credible Commitment

A network good is defined as a good the value of which increases as a positive function of the number of users of the good. Any provider of a technology that has network-good characteristics must persuade users to make the specific investments required to adopt the technology. In particular, this requires that the firm assure users that (i) it will attract a sufficient user base to achieve network effects; and (ii) once users have made specific investments in the technology and those network effects have been realized, the firm will not change the terms of access to its advantage. This commitment strategy can be implemented through free distribution coupled with contractual and reputational mechanisms that protect users against future adverse changes in the terms of access (Barnett 2011:1884-88). The Linux project can again illustrate. The open source license under which Linux is distributed prevents the project’s corporate sponsors from limiting access to the source code or derivatives of the code. Additionally, the Linux Foundation’s charter limits sponsors’ governance rights (Barnett 2011:1905-06). By limiting their control rights, the sponsors bind themselves against deviation from the free distribution policy, which encourages user adoption and promotes the network effects that result from a large user base.

These zero-price distribution strategies, and associated commitment devices, appear to be effective. Linux has achieved significant penetration in the enterprise computing OS market (Enterprise Linux Insights 2016) and, as shown below, through the Linux-based Android OS (distributed under an open source license), has rapidly overtaken Apple’s closed-source iOS system to dominate the smartphone OS market. As reflected by the Hirschman-Herfindahl

(“HHI”) index, the free Android system has rapidly secured high shares in the smartphone OS market.⁴ From 2010-16, a market supporting multiple OS providers has evolved into a market supporting only two competitors, with the leader (Android) now enjoying almost 70% market share.

Figure I: Market Share in the Global Smartphone Operating Systems Market (2010-2016)⁵

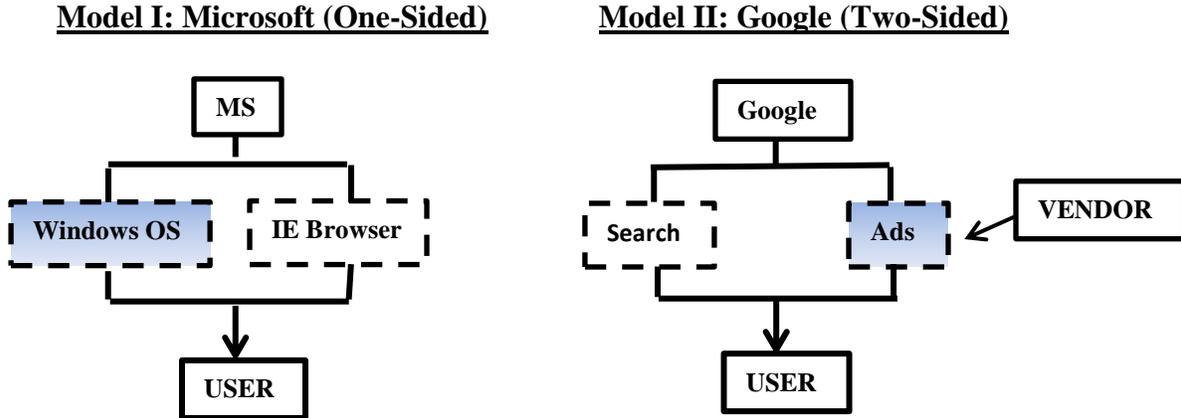


2.2.2 Bundling and Revenue Generation

Free distribution, coupled with a contractual and reputational commitment that limits deviations from that policy, can enable a firm to secure the user base that is a precondition for achieving network effects. However, without modification, this giveaway approach is incompatible with a positive revenue model. Hence, free distribution in informational goods markets is typically part of a bundling strategy in which the zero-price good acts as a complement to a positively priced good. By securing a user base through zero-price distribution, the firm extracts revenues through the sale of excludable complementary goods, either to the same users to whom the free good is being distributed or another set of users. The first variant (same users) is a one-sided bundling strategy; the second variant (different users) is a two-sided bundling strategy. These two strategies are depicted below – the first having been adopted by Microsoft in the PC OS market, the second by Google in the general-purpose search engine market.

⁴ U.S. antitrust agencies consider HHI levels above 1500 to indicate a moderately concentrated market and above 2500 to indicate a highly concentrated market. These are presumptive determinations that can be rebutted by other factors, such as low entry costs (U.S. Department of Justice 2010).

⁵ Source: StatCounter. StatCounter measures global market share based on the number of page views drawn from a representative sample of more than 2.5 million sites (StatCounter 2016). The graph does not show operating systems that StatCounter designates as “Other”, “Unknown”, or “Samsung”, which have negligible shares; however, the HHI scores reflect all firms in the StatCounter data (treating “Unknown” as a single entity).

Figure II: Bundling Strategies⁶

In a one-sided market strategy, the firm distributes both elements of the bundle to the same user population. To illustrate, consider the bundle at issue in the antitrust prosecution of Microsoft: (i) the Windows OS, which was distributed at a positive price; and (ii) the Internet Explorer (“IE”) browser, which was distributed at a zero incremental price.⁷ In a two-sided market strategy, the firm distributes each element of the bundle to a different population. To illustrate, consider the bundle constituted by Google’s search engine and advertising services. This is a two-sided distribution model in which the firm (i) provides consumers with the search element of the bundle at a zero price and (ii) provides firms with the advertising element of the bundle at a positive price. This two-sided advertising-based model has long been used in terrestrial radio and broadcast television and is now probably the most prevalent distribution model for online content.

2.2.3 Bundling and Value Shifting

Coupling free distribution of IP assets with positive pricing of complementary goods can do better than simply conform free distribution with economic rationality. A bundling strategy can enable the commoditizing firm to *shift* revenue streams from other segments of the relevant market, so that in the most successful case it extracts the entire available rent pool from all other competitors.⁸ Consider the “value stack” constituted by the PC and other essential components at issue in the Microsoft antitrust litigation. That stack consisted of (among other elements): (i) hardware (motherboard, keyboard, screen, etc.), (ii) the microprocessor, and (iii) the OS.

⁶ Legend: Solid-line box: provider; dashed-line box: IP asset; shaded box: priced; blank box: non-priced (free).

⁷ I recognize that Microsoft’s strategy may be considered a two-sided strategy given that the Windows OS intermediates between users and third-party developers (that is, between end-users and intermediate users).

⁸ Farrell and Katz (2000) discuss a related strategy in which a monopolist ties a competitively produced good to the tying good with respect to which it has a monopoly position. The result is as discussed above: all available rents flow toward the monopolist, although there is no net change in the total price charged to end-users since any increase would reduce the monopolist’s profits. That is: this is a mere wealth transfer among firms.

Microsoft enjoyed a competitive advantage in the OS segment—Windows being protected by copyright, know-how and the installed base of users and developers—while Intel enjoyed a competitive advantage in the microprocessor segment. All hardware elements had been commoditized because the pioneer, IBM, was unable to block cloning of its PC hardware by second-movers, so all rents in the value chain flowed to Microsoft, as the owner of the OS, and Intel, as the owner of the microprocessor.

Netscape’s innovation, the internet browser, threatened this rent allocation. To preserve it, Microsoft executed a commoditization strategy: it approximated the functionality of the Netscape browser with the Internet Explorer (“IE”) product and massively outperformed on price.⁹ Just prior to Microsoft’s entry, Netscape had reportedly priced the Navigator browser at approximately \$50-\$70 for at least some users (CNET 1998).¹⁰ By contrast, Microsoft included IE in the Windows OS bundle at a zero incremental cost. As the government argued, the “OS+IE” bundle effectively neutralized Netscape, which lacked complementary products from which to extract significant revenue and therefore could not match Microsoft’s zero-price strategy. In 1996, when Microsoft entered the market, Netscape represented 79% of the browser market and Microsoft represented 18% (as measured by users); in 1999, Netscape represented 42% and Microsoft represented 56%; in 2004, Netscape represented 2.1% and Microsoft represented 90% (Noam 2009: 283, Tbl. 12.4). Note how IE’s rapid dominance of the browser market resembles Android’s dominance of the smartphone OS market: in both cases, free distribution enabled the late mover to rapidly seize market share from the early mover.

3. The Potential Harms of Giveaway Strategies: Digital Content Markets

In the short term, the value shifts induced by bundling and commoditization strategies in zero-priced markets represent a wealth transfer among entities situated at different points in the value chain (for example, Netscape at the browser level, which was commoditized, lost out to Microsoft at the OS level, which was not). This may simultaneously result in significant consumer welfare gains. As Microsoft argued in the antitrust litigation, its browser giveaway resulted in cost savings for consumers by converting a paid product to a free product without any offsetting increase in the total price for the Windows system. This constitutes a short-term welfare gain since it eliminates the deadweight losses inherent to positive pricing of a nonrivalrous good. In this Part, I focus on the potential and mostly longer-term welfare *harms* that may arise from IP giveaways—specifically, the link between the commoditization of upstream content markets and extreme concentration in downstream aggregation markets.

⁹ I am neither rejecting nor endorsing the claim, made by the government in the antitrust prosecution of Microsoft, that Netscape threatened to commoditize the Windows component by establishing the Navigator browser as the dominant computing platform. I am simply making the weaker assumption that Netscape could have diverted significant rents from the Windows OS segment so long as Netscape retained a dominant position in the browser segment.

¹⁰ Klein (1998: 225 n.5) states that Netscape initially distributed its Navigator product at a zero price but, during 1995-1997, adopted a positive pricing policy (ranging between \$40-\$50). In January 1998, it lowered the price to zero to match Microsoft.

3.1 The Commoditization of Content

Google's search engine relies on a two-sided giveaway model in which the firm distributes content assets to individual users at a zero price¹¹ and advertising services to business users at a positive price. In this model, the intermediary maximizes revenues by minimizing its content input costs, which maximizes the user base, which enhances the intermediary's ability to "sell" user data to advertisers. Content input costs are a function of licensing and related transaction costs, which are in turn a function of the content's commercial value and the strength of the content holders' IP rights, financial resources and resulting litigation threat. The intermediary can undertake three primary strategies to distribute content or other informational goods at a zero or low price. First, the intermediary can acquire or develop content and then give it away. This approximately describes Microsoft's actions in response to Netscape's pioneering browser: it developed a comparable-quality browser at a significant cost and distributed that product to users at a zero incremental price, which promoted sales of its positively-priced OS product. This also approximately describes Google's actions with respect to at least some of its special-purpose search engines, such as Google Books and Google Images, in which it makes available to users portions of third-party content without having obtained the owners' authorization. Whereas Microsoft's free distribution strategy was extremely costly (since it developed the IP asset that it gave away), Google's is not (since it produces little content and typically does not pay for using content produced by others).¹² Second, the intermediary can elect not to obstruct users' unauthorized distribution and consumption of content on its platform. Third, the intermediary can pursue political influence activities to weaken IP protections for content owners, which reduces those owners' litigation threat and the fees they can demand from users of their content.

The first and second strategies rely on the success of the third. If content owners can wield a credible legal threat against infringing users, or against intermediaries indirectly, that would raise the effective price to the intermediary (in the first strategy) and users (in the second strategy) of accessing content. That in turn would limit the size of the user base on the free side of the market and the revenues that can be extracted from advertisers on the pay side. As shown below, Google has been involved in cases that have secured legal precedents that limit the litigation threat posed by content holders to online platforms and platform users. Additionally, in 2012, Google was among several firms that led a lobbying effort to block legislation that would have increased online platforms' exposure to indirect liability for copyright infringement by users (Fahrenthold 2012).

¹¹ I am ignoring the implicit payment a user may make in the form of data disclosed to the search engine.

¹² Google does incur significant operational costs in designing and implementing the technology required to digitize, display and distribute content (Newman 2016:14, 17-18) and its YouTube subsidiary does sometimes pay content holders a portion of its advertising revenue (Pessach 2013: 846-47).

Table I: Commoditization by Litigation and Lobbying

<u>Project</u>	<u>Case(s)/Legislation</u>	<u>Outcome</u>
Google Images	<i>Perfect 10 v. Amazon et al.</i> , 487 F.3d 701 (9 th Cir. 2007)	No direct copyright infringement liability (fair use exemption). Remanded for consideration of indirect infringement liability subject to DMCA safe harbor.
Google search engine and related activities	<i>Stop Online Piracy Act</i> ¹³ (“SOPA”) (proposed statute to expand copyright infringement liability for search engines, internet service providers and other third parties)	Not enacted.
YouTube	<i>Viacom International v. YouTube Inc.</i> , 940 F.Supp.2d 110 (S.D.N.Y. 2013)	No indirect copyright infringement liability (DMCA safe harbor).
Google Books	<i>Authors Guild et al. v. Google, Inc.</i> , 804 F.2d 202 (2d Cir. 2015); <i>Authors Guild Inc. v. HathiTrust et al.</i> , 755 F.3d 87 (2 nd Cir. 2014)	No direct copyright infringement liability (fair use exemption).

Examining two of these actions in more detail illustrates how they have reduced input costs for distribution intermediaries in digital content markets. First, the “Google Books” cases, decided in 2014 and 2015, adopted the principle that search engines fall within the fair use exemption to copyright infringement, thereby enabling Google to escape liability for having copied without authorization millions of copyright-protected books for purposes of a search engine for literary content. Similarly, in 2007, an appeals court applied the fair use exemption to Google Images (a search engine for visual content), which had been sued for (among other things) reproducing and displaying “thumbnails” of copyright-protected images without having obtained the owners’ consent. Both decisions adopted a broad application of the fair use exemption to search engine activities, a position for which Google had advocated in an *amicus* brief filed in a previous litigation (Google 2002). Second, multiple rulings (including a ruling concerning Google’s YouTube affiliate) from influential courts have defined broadly the “512(c)” safe harbor under the DMCA for websites that host content uploaded and distributed by users without authorization from the copyright owner.¹⁴

¹³ H.R. 3261 (introduced Oct. 26, 2011).

¹⁴ *Viacom Int’l v. YouTube Inc.*, 940 F.Supp.2d 110 (S.D.N.Y. 2013); *UMG Recordings v. Shelter Capital Partners, LLC*, 667 F.3d 1022 (9th Cir. 2013).

The practical effect of these decisions is that search engines and other online intermediaries generally have significantly reduced liability so long as the intermediary refrains from actively encouraging the use of pirated content and removes that content upon notice from the content owner. Given owners' high costs in identifying individual acts of infringement, users' low costs of engaging in those acts, and the ineffective deterrent force of Section 512(c)'s "notice and takedown" mechanism, this has substantially diminished the deterrent force of the copyright laws in the case of individual users. Content holders' weak enforcement powers are illustrated by the fact that many now waive their statutory takedown rights in exchange for a share of advertising revenue offered by the platform owner (Pessach 2013: 846-47)—effectively, a preemptive settlement of the content holder's tepid litigation threat. The end-result of these actions is a substantial depropertization of content in online environments, which benefits search intermediaries by reducing input costs, reducing intermediaries' and users' liability exposure, and, for both reasons, increasing the size of the intermediaries' content portfolio, which expands the user population (and associated data) available to be sold to advertisers.

3.2 Revisiting the "Uneasy" Case for Copyright

For online intermediaries and individual users, content giveaways represent an unambiguous private gain. It remains to consider whether this constitutes a *social* gain, especially in the longer term. Following the standard welfare analysis of IP rights, that outcome depends on a tradeoff between (i) the short-term gains attributable to eliminating the deadweight losses inherent to positive pricing of non-rivalrous goods, and (ii) the long-term losses attributable to reduced innovation and commercialization incentives under a weakened IP regime. Some commentators argue that such losses are likely to be minimal or even nonexistent because content producers often have alternative strategies by which to recover returns even under weak-IP conditions (Lemley 2010, 2015; Raustiala & Sprigman 2012; Benkler 2006).

This type of argument has a long pedigree and is often attributed to an article by now-Justice Stephen Breyer, in which he argued that the incentive case for copyright was "uneasy" due to the ability to earn a "reasonable" profit even without IP rights (Breyer 1970). In particular, Breyer observed that, during the late 19th-century, foreign works were unprotected by U.S. copyright but yet U.S. publishers made payments to British authors and earned profits from the sale of those works. Breyer attributed this outcome to lead-time advantages and predatory pricing (so-called "fighting editions") to deter copiers (Breyer 1970: 299-302). Given those alternative mechanisms, Breyer argued that the incentive argument for copyright lacked a strong foundation.

This argument is incomplete. That is because it fails to ask whether the alternative revenue models that content holders are compelled to adopt under zero or weak IP regimes are more or less efficient than the stand-alone sale of content assets that remains viable under secure IP regimes. In fact, concerning Breyer's historical example, Khan (2005: 280-83) and Liebowitz (2016: 554-56) have showed (expanding upon Plant (1934: 171-72)) that the largest

U.S. publishers adhered to a “trade courtesy” regime under which the first U.S. publisher of a work by a British author was informally protected from copying by other large publishers that adhered to this custom-based regime.¹⁵ Khan (2005: 280) and Leibowitz (2016: 555) observe further that this regime recognized publishers’ exclusive rights not just to a particular work, but to the *author* of that work. This suggests that publishers were only able to enjoy profits from the sale of unprotected foreign works because they entered into an informal cartel that allocated among its members quasi-exclusive rights to literary talent, enforced by predatory pricing to deter internal and external threats to cartel stability (Khan and Sokoloff 2001). This rent-allocation mechanism anticipates in certain respects a private quasi-IP regime implemented during 1932-1941 by “high-end” fashion designers in response to the proliferation of “knock-off” designs and courts’ resistance to copyright infringement claims against those designs. The arrangement was terminated by an antitrust prosecution (*Fashion Originators’ Guild of America v. F.T.C.*, 312 U.S. 457 (1941)).

In both the book publishing and fashion apparel examples, the state’s failure to supply robust IP rights did not eliminate industry rents as might be intuitively assumed; rather, it induced firms to secure rents through alternative forms of IP protection involving another barrier to entry. Firms that produce new IP assets must secure supracompetitive rents through some mechanism in order to earn a positive return on their fixed innovation costs. Without further analysis, there is no reason to believe that the publishers’ or fashion designers’ cartel-like arrangements yielded net positive welfare effects as compared to a market in which IP rights would have been more securely protected and those substitute mechanisms would have been unnecessary. This observation can be generalized. *A priori* it is inherently ambiguous whether the relaxation of IP protections, and the resulting commoditization of the relevant pool of informational goods, results in net positive welfare effects without considering the efficiency characteristics of alternative rent-capture mechanisms that firms will adopt in response.

3.3 Commoditization and Concentration

It is intuitive to suppose that commoditizing content through zero-price distribution lowers entry barriers and relieves market concentration by eliminating input costs for intermediate users. But the opposite outcome may arise. This possibility has already been suggested by the examples of Microsoft’s IE in the browser market and Google’s Android in the smartphone OS market, both of which were distributed under zero-price strategies, displacing early movers and achieving high market shares. That pattern recurs in digital content markets. As discussed below, those markets tend to follow a sequence in which IP protections falter in the primary content market, firms respond by extracting revenue in a complementary excludable goods market, and firms that are most successful in doing so enjoy high market shares.¹⁶

¹⁵ Breyer acknowledges the evidence of a “tacit understanding” among the larger publishers, but argues that it “seems to have been disregarded fairly often” (Breyer 1970: 300 n.79).

¹⁶ Barnett (2013) and Pessach (2013, 2017) observe that digital environments in which content is freely accessible are often dominated by advertising-based search entities. My analysis shows how these intermediaries

3.3.1 Curatorial Business Models

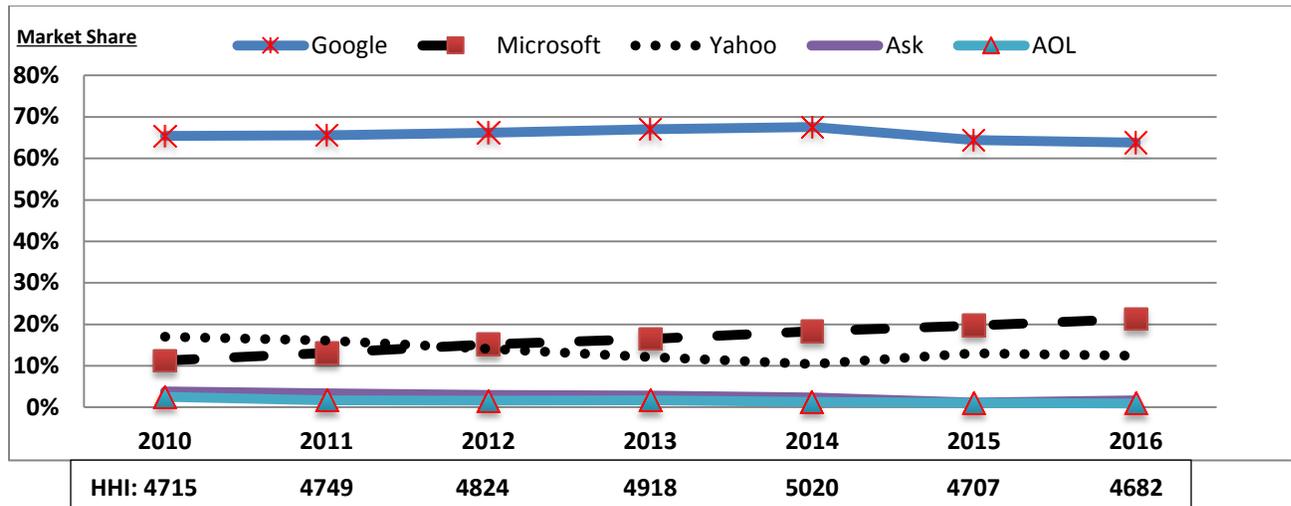
For analytical purposes, I assume a fully commoditized environment in which it is not possible to cost-effectively regulate third-party use of content.¹⁷ However, this does *not* mean that content consumption is costless. Users must still incur costs to locate and evaluate preferred content. In a commoditized environment, users most likely experience significantly *increased* search and evaluation costs. There are three reasons. First, since all content is now available at a zero price, users' content menu is no longer subject to any budget constraint. Second, the total volume of content increases, due both to weakened copy protections, which enables increased pirated content, and reduced production and distribution costs, which enables increased original content (Barnett 2013:419). Third, the increased volume of content likely exhibits increased dispersion in quality absent the screening function traditionally performed by content publishers and distributors in a more fully propertized environment. In response to these increased search costs, commoditized content markets invite entry by entities that specialize in supplying users with search, indexing and matching services. Those entities implement a two-sided bundling strategy in which free distribution of content and curatorial services is used to attract a user base, which supplies the data that attract paying advertising clients. This is a two-sided bundle since the curator is supplying the primary good (curated content) and the complementary good (advertising services) to different populations. The curator seeks to maximize the size of the content pool, which maximizes the size of the user pool from which data can be extracted and delivered to advertising clients. Alternatively, the curator may seek to influence the type distribution of the content pool insofar as doing so attracts users that are valued by advertisers.

3.3.2 Concentration in Curatorial Intermediary Markets

Curatorial services markets in digital content environments are widely characterized by (i) the use of bundling strategies comprising zero-priced content and positively-priced advertising services, and (ii) strong tendencies toward high concentration in the curatorial intermediary segment. As shown below, Google has maintained approximately the same market share (approaching 70%) at least since 2008 through the present and, during that period, the U.S. core search engine market has exhibited high concentration, as indicated by the HHI index. Google does face competition in certain special-purpose search engine markets (e.g., Yelp in local business reviews, Expedia and TripAdvisor in travel, LinkedIn and Monster in job postings), where it sometimes lags (Manne & Wright 2011:32-33).

strategically pursue content commoditization as a rent-shifting strategy, situates those commoditization strategies within a larger set of bundled IP giveaway strategies, and describes the net efficiency effects of those strategies.

¹⁷ In more realistic scenarios, content holders would sometimes retain the ability at least to partially regulate third-party usage through technological controls, which then enables subscription business models involving positive pricing or mixed business models involving zero-priced and positively priced "premium" options. Even in those scenarios, however, sophisticated non-institutional users may defeat such controls.

Figure II: Market Share in the U.S. Core Search Engine Market (2010-2016)¹⁸

Other digital content markets show similar tendencies toward high concentration:

- *Online social networking:* Facebook (including its recent acquisition, Instagram) dominates, having displaced the pioneer, MySpace, which had been the market leader as of 2008 (Kallas 2016). As of 2016, Facebook is used by almost 78% of U.S. smartphone users (comScore 2016b). It lags LinkedIn (acquired by Microsoft in 2016) for certain professional networking functions (Team 2015).
- *Online video and music services:* Google’s subsidiary, YouTube (used by more than 59% of U.S. smartphone users as of 2015 (comScore 2016b)), dominates the online video market. For higher-valuation users, it may face competition from paid music and video streaming services (for example, Pandora or Apple Music (iTunes), used by 42% and 28%, respectively, of U.S. smartphone users (comScore 2016b)).
- *Online mapping services:* Google Maps (including Waze, acquired in 2013) dominates the market for online mapping services for consumers, in use by almost 48% of U.S. smartphone users (as compared to 28% for Apple Maps) (comScore 2016b). In the consumer market, Google Maps displaced stand-alone online mapping services, including most notably, the pioneer MapQuest (Weber and Sutton 2014, Vuong 2014).

The recurrent pairing of zero-priced bundling and extreme concentration in significantly commoditized content markets is not accidental. Commoditization promotes concentration in two steps. First, zero pricing of content assets distorts the survival probabilities of different

¹⁸ Source: comScore.com. comScore measures market share on the basis of “explicit core searches”, which “excludes contextually driven searches that do not reflect specific user intent to interact with the search results” (comScore 2016a).

types of organizational forms. In evolutionary terms, a zero-price environment selects against entities that derive revenue principally from the stand-alone delivery of content goods and selects for intermediaries that adopt a bundled strategy in which the intermediary supplies zero-priced curatorial services that match a large pool of content assets with a large pool of users, which then generates revenue from paying advertising clients. Second, curatorial intermediary markets tend to converge upon winner-take-all outcomes in which the market is dominated by one or two firms that enjoy some protection against entry threats.

There are four potential reasons for these winner-take-all tendencies, each of which may differ in intensity in any particular informational goods environment.

- (1) *Scale economies.* The curator incurs a substantial fixed cost to assemble the hardware, software and human capital required to locate, organize and store content, as well as to acquire and match users and advertisers, but a low variable cost for each additional content asset, user and advertiser (which, in some contexts, are “acquired” through an automated process in which marginal costs approach zero). These powerful scale economies promote dominance by the most efficient firm.
- (2) *Network effects; weak inventory constraints.* Curatorial intermediary markets exhibit two complementary network effects: (i) on the free side, users minimize search and communication costs by using a single site with the maximal number of other users, rather than navigating across multiple sites; on the pay side, advertisers prefer the most popular site (or a certain distribution of user types) and are disinclined to migrate to sites that lack a comparable user base. In the digital environment, these network effects are magnified by weak inventory constraints. Given that any single platform can feasibly host large volumes of content, users minimize search costs by accessing all content through one or a few platforms (rather than navigating multiple channels that each offers exclusive content, as could be the case in a content environment that is more fully propertized and has strong inventory constraints).
- (3) *Ecosystem effects.* Curatorial intermediaries often offer users an interlinked ecosystem of complementary products and services across a single platform. While this may reduce users’ search costs, it imposes switching costs for any user that migrates to another platform¹⁹ and inflates entry costs by compelling any competitor to approximate the suite of products and services offered by the incumbent platform.
- (4) *Learning effects.* Curatorial services markets exhibit a type of learning effect that favors incumbents that have accumulated a difficult-to-replicate stock of user data,

¹⁹ It should not be assumed that users always experience high switching costs in moving to another platform. While migrating from a social networking site may involve significant switching costs depending on data portability, a user incurs insignificant switching costs when using another search engine.

which enhances the accuracy of the matching technology that the intermediary can offer both advertisers and individual users. Replicating an incumbent's existing stock of data raises entry costs for potential competitors.

3.3.3 Strategic Commoditization

Firms that adapt successfully to a zero-priced content environment stand to earn significant market returns as a dominant curatorial intermediary. We should therefore expect that intermediaries would attempt to strategically drive content markets toward commoditization and resist efforts to preserve IP protections for content holders. This can be achieved through formal and informal commoditization strategies, respectively: (i) advocate for legal changes that raise content holders' enforcement costs (as discussed previously (see *supra* Part 3.1; Tbl. 1)); and (ii) adopt zero-price distribution strategies with respect to the relevant pool of content assets. Strategic commoditization achieves two objectives. First, it minimizes users' content consumption costs, which expands the user base and associated pool of user data, which drives advertising fees from the pay side of the market. Second, it shifts the locus of profit extraction from the content production segment of the value chain, in which the intermediary has a competitive disadvantage, to the content aggregation and indexing segment (including associated advertising or other complementary goods segments), in which the intermediary has an advantage.

This commoditization plus rent-shifting strategy is illustrated by two Google projects.

- *Google Books*. Google expended considerable resources to (i) digitize over 20 million books, including public domain and copyrighted works, which were then made freely available in excerpted “snippet” form²⁰; and, as discussed previously, (ii) litigate (successfully) to secure precedents that protected its commoditization strategy against legal challenge.²¹ By contrast, prior digitization efforts by Microsoft and Yahoo! had only covered public domain works or in-copyright works for which consent had been obtained from copyright owners (Mills 2005)—that is, there was no effort undertaken to attempt to “push” the law in the curatorial entity's preferred direction.
- *Google Images*. This project followed a similar sequence: content acquisition and a giveaway to users, followed by a successful defense against infringement litigation.²² In response to the widespread availability of zero-cost images, even the largest firm in the stock photography market, Getty Images, elected to distribute a

²⁰ *Authors Guild et al. v. Google, Inc.*, 804 F.2d 202 (2d Cir. 2015). The decision notes that Google later elected to honor requests from copyright holders to remove books from “snippet view”.

²¹ *Authors Guild et al. v. Google, Inc.*, 804 F.2d 202 (2d Cir. 2015); *Authors Guild Inc. v. HathiTrust et al.*, 755 F.3d 87 (2nd Cir. 2014).

²² *Perfect 10, Inc. v. Amazon.com, Inc., A9.com Inc. and Google, Inc.*, 508 F.3d 1146 (9th Cir. 2007).

large portion (35 million images) of its portfolio at a zero price for noncommercial purposes (Brandon 2014). Consistent with the link between commoditization and concentration, the market for digital photographic images is currently dominated by a handful of platforms (Getty Images, Shutterstock, Corbis, and Fotolia) that offer users low-cost access to large stocks of images (Keller 2015) or, in the case of Google Images, at no price at all.

In both cases, Google made efforts to digitize and give away content assets, which presumably expanded the user base and promoted the firm's advertising revenue, and then defended its actions in litigation that ultimately eroded the legal threat posed by copyright holders who would otherwise have increased Google's content acquisition costs. Going beyond the free distribution model used for decades by the radio and broadcast TV industries (which offered users zero pricing but always incurred positive costs for content production and acquisition), Google's actions provide a dramatic example in which a single firm has used zero-priced distribution strategies and political influence activities to commoditize a massive stock of content assets.

4. Digital Dictators or Benign Monopolists?

The above discussion has identified a potential link between zero-price distribution and extreme concentration in digitized content markets. It remains to consider whether these apparent effects of content commoditization on market structure give rise to welfare concerns from an economic point of view.²³ Put differently, the question is whether the vertical reallocation of rents from content producers to aggregators, which is otherwise merely a distributive effect, raises any adverse welfare implications as an efficiency matter.

4.1 Why Digital Monopolies May Be Harmless

Two factors may mitigate welfare concerns relating to high concentration in digital intermediary markets. First, assuming the dominant intermediary does not alter its pricing policy on the free side of the market, a monopoly position would not translate into adverse pricing effects for individual users. This is not a satisfactory observation, however, since commoditizing the free side of the market may protect the curator's position, and hence its pricing power, on the pay side of the market, potentially resulting in a net aggregate welfare loss within the broader market ecosystem. Second, even extreme market shares held by digital intermediaries may not be a sound proxy for pricing power if entry barriers are low and large market shares are therefore short-lived. Multiple incumbents have rapidly fallen from dominance in online and related technology markets: AOL (internet portal), Blackberry (smartphone), Palm Pilot (portable media device), and Netscape (browser) (Barnett 2011: 1877-88). Cases of such transient dominance can be observed in the internet browser market, where

²³ On the antitrust implications of "free goods" markets, with particular focus on the implications for market definition and predation analysis, see Newman (2015), Evans and Schmalansee (2013), Evans (2011), Gal and Rubinfeld (2005), and, in the context of the Microsoft litigation, Klein (1999).

the leading position has moved from Netscape (estimated 79% market share in 1996) to Microsoft (estimated 90% market share as of 2004) (Noam 2009: 283, Tbl. 12.4) to Chrome (Google) (estimated 61% market share in 2016 (StatCounter 2016)). However, market power in digital intermediary markets is sometimes especially durable. MS Windows has maintained its dominance of the PC operating systems market since 1993 (estimated 85.7% market share (Miller 1998)) through 2016 (estimated 78% market share (StatCounter 2016)).²⁴ As shown above in Figure II, Google has similarly maintained its dominance in the U.S. core search engine market, consistently enjoying a market share approaching 70% from (at least) 2010 through 2016.

4.2 Why Digital Monopolies May Be Harmful

Both sound antitrust analysis and technology history reject any conclusory view that dominant intermediaries enjoy market power, or otherwise give rise to adverse welfare effects, simply by virtue of holding large market shares over substantial periods of time. Nonetheless there remain two important grounds for concern, in each case subject to further empirical inquiry. The first concern, which I do not address, is the extent to which a dominant curatorial intermediary can inefficiently block entry. For example, there is an ongoing debate as to whether Google's dominance in the general-purpose search market enables it to "illegitimately" disadvantage competitors in special-purpose search and other complementary markets. Other commentators have addressed this point (Manne & Wright 2011, finding no material ground for concern), as did the Federal Trade Commission in its now-closed investigation of Google (FTC 2012, 2013) and as is the European Union in its ongoing investigations. As a policy matter, any such concern would recommend a response through antitrust law. The second concern, which I discuss below, is whether commoditized content markets, in which IP protections are unavailable and market rents mostly flow to curatorial intermediaries, can support the efficient production and commercialization of content and other IP assets by upstream entities. Any such concern would recommend a response through copyright and other IP rights.

4.2.1 Output Distortions in Commoditized Content Markets

Contemporary digital markets do not support the simple prediction that the lack of secure copyright necessarily results in a reduction in content output. While the empirical debate is far from settled, Waldfogel (2012) found that popular music markets experienced significantly reduced sales since the onset of mass piracy but no decline in new output. Setting aside certain methodological complexities²⁵ (as well as the applicability of these findings to more cost-intensive creative segments), these results do not exclude the possibility that, even

²⁴ For methodology, see *supra* note 5.

²⁵ Measuring changes in pre-digital and post-digital musical output is complex because (i) a significant portion of post-digital output consists of amateur output that would not have been observed in pre-digital markets; and (ii) a significant portion of post-digital output consists of singles, whereas pre-digital output consisted primarily of albums. Both factors could artificially increase observed output in the post-digital period. Additionally, there is no obvious methodology for adjusting output to reflect quality.

absent a total output reduction, commoditization may distort investment allocations across content types. In fact, there is a strong theoretical case that this would occur, which tracks suggestive observations of contemporary digital markets.

Generally speaking, the disincentive effects of content commoditization on content production in any particular medium are a function of two variables: (i) production and commercialization costs, and (ii) commercial life (that is, the expected time during which returns can be extracted from those investments). The interaction of these two factors yields two broadly defined content categories in which commoditization will likely have dramatically different output effects. First, commoditization will likely have a neutral or positive effect with respect to content goods that exhibit low capital requirements. This will be exacerbated in the case of goods that have short commercial lives, in which case quality-equivalent copying may not be sufficiently rapid to erode returns. This applies especially to amateur users who may have non-economic motivations and might have been foreclosed from the market due to higher production and distribution costs in a more fully propertized, pre-digital environment. Consistent with this theoretical expectation, commoditized digital markets exhibit an abundance of user-generated content that necessitates low capital requirements and is highly perishable. Second, commoditization will likely have a negative output effect with respect to content goods that require significant capital, especially goods that have extended commercial lives. The capital requirement condition is satisfied in the motion picture market, in which hundreds of millions of dollars are now typically invested in feature films (Barnett 2013), and the television market, in which an episode can cost several millions of dollars (Seigemund-Broka and Bond 2015). In some cases, those content assets may have significant expected commercial lives.

Given these countervailing effects, IP commoditization is likely to distort the distribution of content production by favoring low-cost, short-lived content over high-cost, long-lived content, for the simple reason that only in the latter case can returns be extracted with reasonable confidence.²⁶ Even absent declines in total output, this represents a potential social loss compared to a market in which IP protections were secure and firms efficiently allocated resources across the total universe of possible content investments.

4.2.2 Is the Case for Copyright So “Uneasy”?

The likely distortion in content output in commoditized IP markets appears to provide at least a preliminary economic case for secure copyright protection. Nonetheless it might be argued that a curatorial intermediary would have incentives to fund higher-cost, longer-lived content production if doing so would attract higher-valuation users and, indirectly, advertisers.

²⁶ These output distortions may not arise in digital content segments in which content holders have technological means to regulate access. This may be the case, for example, in cable television, although even in that market, technological controls are subject to evasion and, hence, some distortion as described above should be expected to occur.

But this solution is at best partial. In a weak-IP environment, any individual intermediary will underfund content production since, even assuming it earns positive revenues through complementary advertising sales, it still cannot fully capture the gains arising from its investment. The result would again be a distortion in content output relative to a more fully propertized environment. Alternatively, intermediaries may deviate from the zero-pricing model by adopting contractual or technological access-control mechanisms in order to frustrate unauthorized use and capture a greater portion of the gains generated by their investment in higher-cost content production. Consistent with this expectation, Google has sometimes deviated from zero-price distribution in both the content and OS markets. In the content market, Google's YouTube subsidiary has launched proprietary channels in which users subscribe to certain video content for a fee (Stelter 2013). In the smartphone OS market, Google has deviated from its open-source, zero-cost distribution of the Android OS by providing handset carriers and telecom companies with early access to new versions of Android in exchange for contractual commitments (known as "Mobile Application Distribution Agreements") to include Google applications or treat those applications as "default" options on the handsets delivered to consumers.²⁷

Given Google's (and other intermediaries') apparent ability to substitute contractual and technological controls for IP protections, it might be argued that, even in the case of high-cost content assets, IP commoditization does not raise output concerns since firms can regulate third-party usage through contractual or technological devices, which generate the revenue streams required to support production. This would repeat the faulty reasoning behind the "uneasy" case for copyright described earlier (*see supra* Part 3.2). Suppose that a given content market historically operated under robust IP rights but now operates without those rights and has developed transactional models that sustain adequate content output. That would appear to cast doubt on the economic case for secure IP rights. But that conclusion only follows if those alternative models are equally or more efficient relative to previously existing monetization structures that relied on IP rights to capture returns on content production. Even if the new weak-IP regime supports comparable output, the market may have achieved that objective using second-best models that are less efficient relative to the mechanisms that prevailed under the lapsed strong-IP regime, resulting in a net welfare loss.

In fact, there is a presumptive reason to believe that this would be true of *any* alternative revenue model observed in content markets that appear to function adequately even after the erosion of robust IP rights. The reason is that those same alternative revenue models had been available even in the lapsed stronger IP environment, which enables content providers to, but does not require that they *do*, exert maximal control over use of their IP assets. As

²⁷ See, e.g., Mobile Application Distribution Agreement between Google Inc. and Motorola, Inc., Dec. 31, 2011; Mobile Application Distribution Agreement between Google Inc. and HTC Corporation, Jan. 1, 2011; Mobile Application Distribution Agreement between Google Inc. and Samsung Electronics Co., Ltd., Jan. 1, 2011. All agreements were filed as exhibits to SEC filings.

observed previously (*see supra* Part 1.1.2), voluntary forfeiture of IP assets has been a recurrent strategy in technology markets as well as the radio and broadcast TV industries. If, under a strong IP regime, it had been more efficient to give away content and earn revenues on complementary goods, it would follow that profit-seeking content holders would have elected to do so (and, as in radio and broadcast TV, *have* partially done so). Absent entry barriers, regulatory intervention, transactional frictions, or other factors that cause distortions away from competitive outcomes, it is expected that content markets would converge on the most efficient mix of monetization structures. Under a weak IP regime, this expectation is no longer justified because firms face a truncated transactional choice set that excludes stand-alone content-delivery structures. Hence, in general, it is inherently ambiguous whether the apparently successful revenue models developed by some firms in response to content commoditization represent a net welfare improvement or a merely adequate second-best adaptation to an insecure IP environment. It is precisely that uncertainty which ultimately grounds the economic case in favor of presumptively secure copyright protections even in zero-price content markets that appear to support “reasonable” output levels. From an efficiency perspective, this is not because maximal control over content is uniformly welfare-maximizing but because the *availability* of reliable IP protections maximizes firms’ latitude in efficiently setting the access terms with respect to those firms’ assets.

5. Conclusion

Digital content markets exhibit two recurrent characteristics: abundant free content and extreme concentration among content aggregation intermediaries. These two characteristics are linked. Zero-price content environments promote concentration by shifting rent-extraction opportunities from content production markets to content aggregation markets characterized by scale economies, network effects, weak inventory constraints, ecosystem effects and learning effects that promote winner-take-all outcomes. It remains an open question whether those concentrated conditions, and the associated reallocation of industry rents, are likely to translate into net adverse welfare effects. At a minimum, it is clear that content commoditization is not “free” from a social point of view. Rather, eroding IP protections compels firms to adopt bundled structures in order to monetize content investments, which may result in output distortions in the intermediary services markets and, in the longer term, the content goods market. The growing enthusiasm for relaxed IP rights in digital markets deserves a closer look.

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