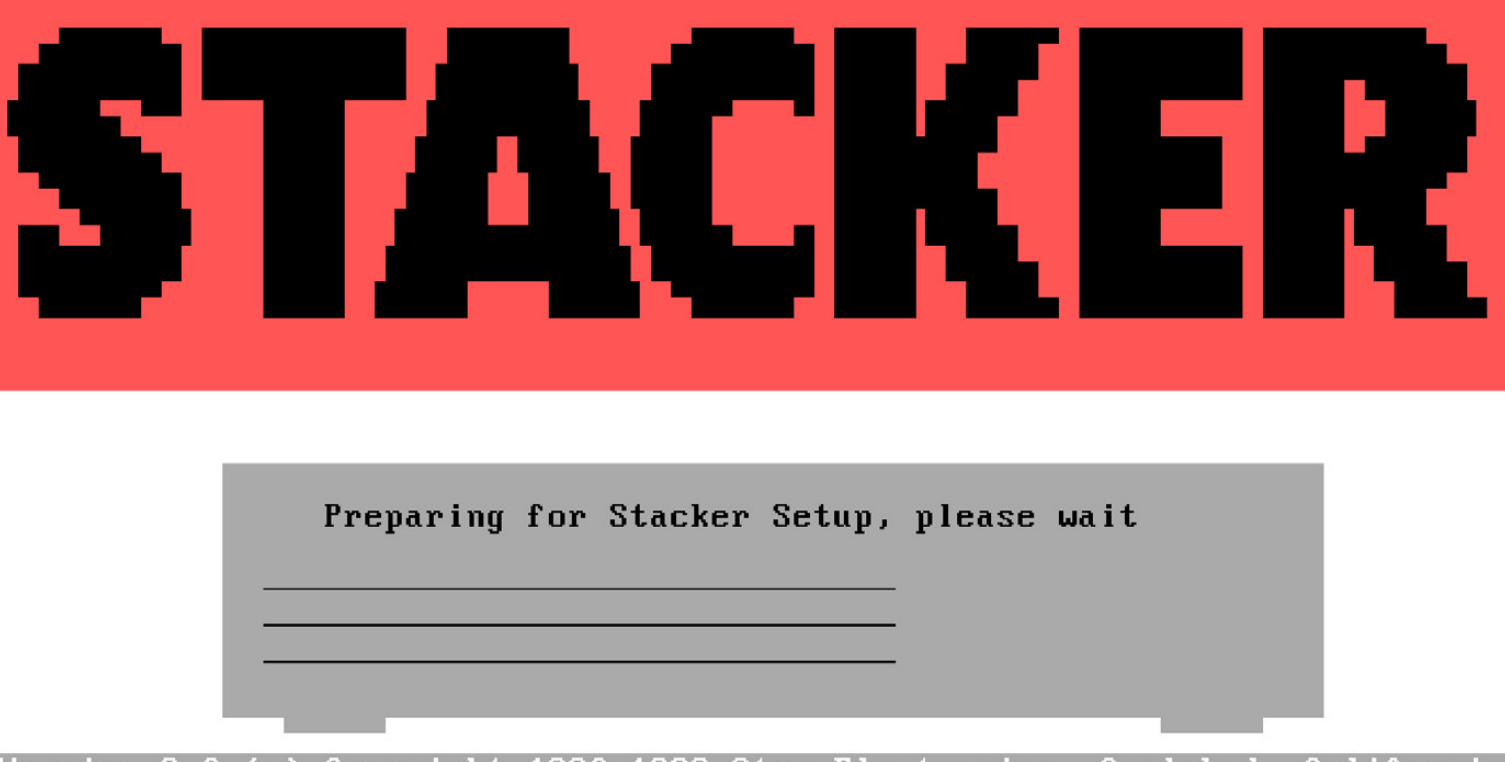
REMEMBER STACKER? ANOTHER LOOK AT "KILLER" ACQUISITIONS IN THE DIGITAL ECONOMY



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I. INTRODUCTION

In 1990, a small software corporation, Stac Electronics, released a drive compression software called Stacker that doubled PC hard drives' volume. At that time, hard drives had limited capacity and were expensive. Unsurprisingly, the drive compression software was hugely successful. In 1993, Microsoft released version 6.0 of its flagship operating system, MS-DOS, which included its own compression software. This led to a long legal battle between Microsoft and Stac Electronics, at the end of which Microsoft had to remove its drive compression feature from MS-DOS and compensate Stac Electronics.

Today, perhaps Microsoft would simply buy Stac Electronics and spare itself the legal headache.

Would that be a bad outcome? Maybe not. Economists have long debated the relationship between incumbency, market power and innovation, with no unambiguous answer to date. Incumbents and monopolists may have less incentive to innovate[2] (the so-called "replacement effect"), but may also be better at innovating[3] (the so-called "efficiency effect"). Arguably, in this case, Microsoft could have improved an already valuable product (drive compression software) by better integrating it with its operating system, and making it more readily available to consumers.

Of course, if a hard drive manufacturer had acquired Stac Electronics with an intention to discontinue the software, consumers would have been forced to continue to buy expensive hard drives, at least until another software developer could offer an alternate non-infringing solution. Such an outcome could have been a textbook "killer acquisition," as recently characterized by scholars.[4]

2 Kenneth J. Arrow, "Economic Welfare and the Allocation of Resources for Invention," in *Readings in Industrial Economics*, ed. by C. K. Rowley (London, UK: Palgrave, 1972), pp. 219–36.

3 Richard Gilbert & David Newbery, "Preemptive Patenting and the Persistence of Monopoly," *American Economic Review*, 72.3 (1982), 514–26.

4 The expression "killer acquisition" has been used recently in a working paper by Cunningham, Ederer & Ma (Colleen Cunningham, Florian Ederer, & Song Ma, *Killer Acquisitions*, Working Paper, London Business School and Yale School of Management, 2018.)

II. KILLER ACQUISITIONS AND THE DIGITAL ECONOMY

In a killer acquisition, an incumbent acquires a potential competitor, often at an early stage of the development of an innovative project and discontinues, or "kills" the potential competitor's innovation. A killer acquisition is thus the opposite of one in which the acquired product is further developed with the potential benefit of an expanded platform and increased financial means of the acquirer.

In a recent report on the digital economy, a group of experts argue that in many cases, transactions characterized as killer acquisitions are, in fact, not killer acquisitions.[5] On a perhaps related note, Bryan and Hovenkamp note that innovative startups are frequently acquired by powerful incumbents at an early stage without attracting antitrust scrutiny from the authorities.[6] This may be because antitrust authorities focused on consumer welfare anticipate that these acquisitions will be beneficial. Some commentators, however, have questioned whether antitrust is in need of reform with respect to such transactions.

Past mergers and acquisitions in the digital economy have rarely (if ever) led to the disappearance of products. Instead, the acquired products have most often been incorporated in the acquirer's offering.[7] Nonetheless, the specific nature of platforms, may require a different examination of acquisitions to assess whether they are in the "kill zone" or, instead, enhance consumer surplus.

The value of platforms is typically driven by their size and the associated network externalities. Switching costs and network effects which enhance consumer surplus may also make it difficult for new entrants to challenge successful incumbents.[8] Users on an incumbent platform, because others are on that same platform, may see no point in joining another platform providing a similar set of features, unless others also migrate to that platform. However, because users have difficulty coordinating a joint move to another platform,[9] switching may be hindered even if the new platform has superior characteristics. So a platform entrant hoping to displace an existing platform needs to overcome the positive externalities that result from users being on the incumbent platform that other users have also selected.[10] These externalities explain why, as long as platforms maintain their value to consumers, they are likely to develop a dominant position. That dominance may maximize consumer welfare if the consumer experience is similar to what a competitor may offer since the incumbent offers the additional benefit of the presence of many other consumers.

In digital platforms, the threat to incumbents comes from new entrants competing *for* the market, that is, trying to replace the incumbent rather than competing for market shares. Furthermore, traditional metrics used by antitrust authorities might be difficult to apply or even meaningless in the digital context. Vertical and horizontal mergers and acquisitions in the platform context can put traditional antitrust metrics to the test. We examine these issues using as examples Amazon's acquisition of Kiva Systems and Microsoft's acquisition of Hotmail.

5 Jacques Crémer, Yves-Alexandre de Montjoye & Heike Schweitzer, *Competition Policy for the Digital Era* (Brussels, Belgium, 2019) https://ec.europa.eu/competition/publications/reports/kd0419345enn.pdf [accessed April 8, 2020]. Note however that the panel of experts of the UK's Competition and Markets Authority on the digital economy appears to disagree with that conclusion. See Jason Furman and others, *Unlocking Digital Competition: Report of the Digital Competition Expert Panel*, *2019*, HM Treasury (London, UK, 2019) https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/785547/unlocking_digital_competition_furman_review_web.pdf [accessed April 8, 2020].

6 Kevin A. Bryan & Erik Hovenkamp, "Startup Acquisitions, Error Costs, and Antitrust Policy," *University of Chicago Law Review*, 2020, 331–56.

7 Axel Gautier & Joe Lamesch, *Mergers in the Digital Economy*, CESifo Working Paper No. 8056, 2020.

8 Crémer, de Montjoye, &Schweitzer.

9 Crémer, de Montjoye, & Schweitzer.

10 Some scholars have argued that network effects may not necessarily result in market dominance. For example, Catherine Tucker notes that network effects can lead to quicker destabilization of a market leader position, network effects can be localized, and that in some instances network effects can be negative whereby the addition of certain users can have negative effects for the relative attractiveness of that platform. See Catherine Tucker, "Network Effects and Market Power: What Have We Learned in the Last Decade?," *Antitrust*, Spring, 2018, 72–79.

III. VERTICAL MERGER: AMAZON'S ACQUISITION OF KIVA SYSTEMS

Kiva Systems was a company founded and developed by Mick Mountz, a German-born MIT graduate. In 1999, Mountz had joined Webvan, a dot-com company that delivered grocery products to customer homes. Unfortunately, Webvan went bankrupt in July 2001 because, according to Mountz, the company could not pick, pack and ship products in a cost-effective way.

In traditional fulfilment centers at that time, employees retrieved the goods ordered by consumers from well-defined places in the warehouse, before boxing them and placing them on conveyer belts. Hence, warehouse staff walked kilometers every day to retrieve, pack, and ship the ordered goods. In such a fulfillment center, 70 to 80 percent of the labor was devoted to picking and packing. Of this, 60 to 70 percent of a worker's day was spent walking among the shelves in the warehouse.[11] Consequently, in traditional fulfillment centers, workers were being paid half the time merely to walk around! And this made operating costs prohibitive, particularly for inexpensive and/or low value-added goods.

Building on his experience, Mountz teamed with a group of engineers and founded Distrobot (later renamed Kiva Systems). The idea behind Kiva was simple: have robots locate the shelf where the goods to be shipped are stored and bring that shelf to the worker, instead of having the worker walk around the warehouse to retrieve the goods. The technology was a resounding success.

In May 2012, Amazon acquired Kiva Systems for 775 million USD, with no objections from antitrust agencies. Amazon ceased commercializing Kiva Systems' products, renamed the company Amazon Robotics, began investing substantial resources to further develop Kiva's technology, and ended product support for existing deployments. At the time, there were limited options available to Amazon's competitors to replace Kiva deployments. Not until 2017 were any credible alternatives available. During that period, Amazon's share of U.S. online sales went from 30 percent to more than 40 percent.

There are two possible interpretation of the facts as they unfolded. On the one hand, Amazon was able to marry its superior operations with an efficient robotic approach to retrieve goods for delivery. That resulted in an immediately available efficiency, which might explain in part Amazon's growth during this period. On the other hand, one could argue that Kiva's innovative technology could have become available for Amazon and its competitors, thereby introducing efficiencies without providing an advantage to Amazon. Determining which of the two hypotheses is correct would require a careful empirical analysis to assess how easily the technology could be developed by others, how well the technology might have served competitors given different approaches to online sales, and what impact the technology had on Amazon's prices compared to a world in which the technology became available more broadly.

IV. HORIZONTAL MERGER: MICROSOFT'S ACQUISITION OF HOTMAIL

Hotmail was an online e-mail platform launched by Sabeer Bhatia and Jack Smith in July 1996. It was ad-funded, free for users and within two years, attracted close to 10 million subscribers. In December 1997, Hotmail was acquired by Microsoft and was integrated into Microsoft's MSN platform. At the time, it is fair to say that Hotmail as an e-mail platform had experienced limited success. At that same time, Microsoft faced fierce competition (both actual and potential) from the likes of Netscape, whose web browser Navigator had a dominant position; AOL, the largest ISP in the US; and Yahoo!, one of the largest Internet companies offering a wide array of services, including e-mail.

By the end of 2007, Hotmail had grown to 250 million accounts, as the service was integrated into Microsoft's Windows Live platform. Under its new livery, Hotmail won accolades and continued to increase its user base.

This evolution is, on its face, the opposite of a killer acquisition. Since it was acquired by Microsoft, Hotmail went from a platform with limited success, both in terms of scope and popularity, to a key component of Microsoft's online strategy. Yet, in the context of competition "for the market," some may suggest that the acquisition was predatory and argue that, Hotmail, on its own, may have become a true competitor for the Internet giants, past or current, and may have turned into a behemoth, like Google today. However, the economically relevant question from an antitrust standpoint is whether consumers were harmed by the acquisition; the evidence suggests the opposite. Hotmail undeniably provided a foothold to Microsoft in Internet services. But under the stewardship of Microsoft, Hotmail also turned from an English-only service with limited scope into a stable, global platform through which many of Microsoft's online consumer services were delivered. The Hotmail transaction in its own right may have also created incentives for other Internet entrepreneurs to develop pioneering services in the hope of a rewarding transaction, and may have increased the overall pace of innovation.

11 Mick Mountz, "Kiva the Disrupter," *Harvard Business Review*, 90.12 (2012), 74–80.

V. MERGERS, ACQUISITIONS, AND COMPETITION FOR THE MARKET

With several hundred million users, Hotmail (now known as Outlook.com) is alive and well. Kiva's technology has helped propel Amazon to its status as a worldwide online retail leader. Why then use these two examples in a discussion of killer acquisitions?

Kiva's robots have been developed into impressive tools that have fostered Amazon's productivity, and helped it achieve the success it enjoys now. From a competition standpoint, this observation raises two questions.

First, would Kiva's robots have developed so quickly and efficiently, but for Amazon's acquisition? Even though, as we noted, Amazon did not have in 2012 the market share it commands today, it had the infrastructure and financial means to accelerate the development of the Kiva technology, thereby securing for all its customers the productivity advantages that the technology and Amazon's subsequent improvements created. Kiva alone may have found alternative investment sources and may have developed into an automation supplier. However, there is little doubt that the speed of development would have been slower. In addition, Amazon's acquisition allowed it to customize the technology and secure greater efficiencies than would have been realized had Kiva continued its development alone. In other words, Amazon's know-how is likely to have been a key factor in the success of the Kiva technology.

Second, did Amazon's acquisition of the technology prevent other platforms from competing on an equal footing with Amazon? As discussed above, this depends on the replicability of the Kiva technology, the role of Amazon's know-how in the development of the Kiva technology to suit Amazon's needs, Amazon's ability to develop Kiva-like technology absent the acquisition, and the value of Kiva to other potentially interested parties. The success of new e-commerce competitors such as Wayfair and Zalando, and the growth of traditional competitors such as Walmart and Ikea all suggest that Amazon's position may be less secure than one might think based on its current success. Furthermore, Amazon's current position may owe less to Kiva's technology than to the network-driven dynamics of the market which is likely to result in a few winners, rather than a fragmented market, and to do so to the benefit of consumers, all else equal.

The Hotmail acquisition raises similar issues. But for its acquisition by Microsoft, could Hotmail have become such a large e-mail platform? The development of Gmail and other mail server systems as well as Microsoft's continued presence as an operating system suggest that an e-mail system associated with Microsoft's technology was likely inevitable, and that absent Hotmail, an alternative solution would likely have emerged for Microsoft and succeeded in securing a share of the consumer e-mail market. Admittedly, this is an empirical question that would require careful analysis, but the arguments for Hotmail and Kiva Systems as enhancing acquisitions rather than "killer" ones seem strong.

Both for Kiva and Hotmail, the acquisitions provided a lucrative "exit strategy" which is not lost on would-be venture capitalists and startup entrepreneurs for whom such an outcome provides a strong incentive to initiate research and risk capital in anticipation of a reward by acquisition.[12] Of course, this also means that startups are biased towards innovations that are likely to catch the incumbent's eye, rather than looking into truly disruptive technologies, but that may also be welfare enhancing by reducing moon shots with low probability of success.[13] This is another factor that may reduce the overall competitive impact of killer acquisitions even if they are aimed at suppressing technological innovation.[14]

12 Mark A. Lemley & Andrew McCreary, *Exit Strategy*, Stanford Law and Economics Olin Working Paper No. 542, 2019.

13 Kevin A. Bryan & Erik Hovenkamp, "Antitrust Limits on Startup Acquisitions," *Review of Industrial Organization*, Forthcoming, 2020, 1–22.

14 Gautier & Lamesch.

VI. HOW ARE COMPETITION AUTHORITIES RESPONDING?

The preceding discussion may help clarify why recent purported killer acquisitions in the digital industry have raised little to no reactions from antitrust authorities thus far. The trade-off between the immediate benefit from an acquisition by an established platform trying to enhance its efficiency, and the longer term potential harm that may result from the technology not being available to other competitors or not competing with the would-be acquirer, is a difficult calculus for regulators.

These trade-offs have prompted several competition authorities to revisit the issue of killer acquisitions. While some go as far as claiming they could reconsider some past acquisitions they failed to oppose,[15] the general focus amongst most authorities is the development of an appropriate framework to better evaluate the dynamics of the digital industry.

As noted by Crémer, de Montjoye & Schweitzer, revisiting the policy towards acquisitions in the digital industry raises at least two issues. First, finding a way to make these acquisitions reviewable is challenging. Startup acquisitions typically do not meet the size threshold to be reviewed. Second, the importance of these startups resides not just in their reality, but also in their potential. And this potential is hard to evaluate *ex ante*.

VII. CONCLUSION

Recent literature has defined the concept of "killer" acquisitions as the acquisition of an innovative product or process by an incumbent for the purpose of discontinuing it to protect or strengthen the incumbent's position.[16]

In the digital economy, especially in the case of platforms, competitive dynamics are different from what they are in the traditional economy. New entrants frequently do not fight for market shares. Instead, they compete to dislodge the incumbent and take over the market. Therefore, some scholars argue that, in these markets, the definition of a "killer" acquisition should be extended to cover any merger or acquisition that significantly reduces the ability for an insurgent (existing or potential) to threaten the incumbent and take over the market.[17] By this definition, the acquisition of Kiva Systems by Amazon and that of Hotmail by Microsoft, two examples that we briefly discussed, may qualify as killer acquisitions. Of course, that definition also means that any pro-competitive acquisition that strengthens an incumbent by improving its efficiency or the quality of its product is also a killer acquisition. The pro-competitive acquisition becomes an anti-competitive act.

Despite some recent proposals,[18] there is no simple solution to the problems raised here. Ultimately, if competition authorities are concerned that the acquisition of a new entrant, real or potential, may have anti-competitive consequences, they must carefully weigh the pro-competitive benefits of these transactions against their potential detrimental effects. There is no short cut.

15 Gilad Edelman, "Why the FTC Wants to Revisit Hundreds of Deals by Big Tech," *Wired*, 2020 https://www.wired.com/story/ftc-special-order-review-big-tech-killer-acquisitions/ [accessed April 8, 2020].

16 Cunningham, Ederer, & Ma.

17 Carl Shapiro, "Antitrust in a Time of Populism," *International Journal of Industrial Organization*, 61 (2018), 714–48.

18 Crémer, de Montjoye, & Schweitzer; Furman & others.

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