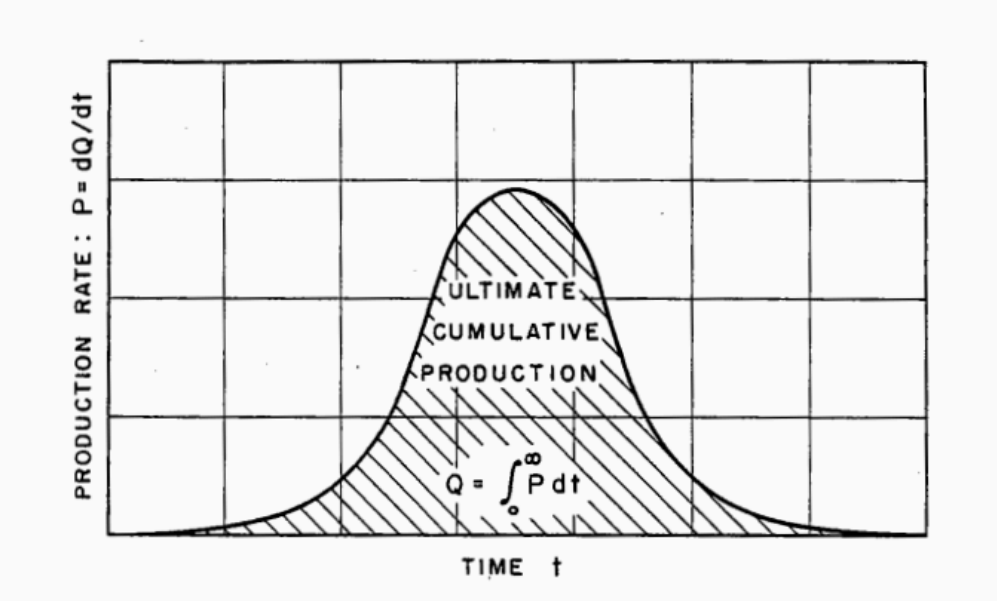

THE THEORY OF PEAK ADVERTISING AND THE FUTURE OF THE WEB

Working Paper by Tim Hwang and Adi Kamdar[1]
Nesson Center for Internet Geophysics
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[1] Hwang: Principal Investigator - Advertising Subduction Observatory (tim@timhwang.org), Kamdar: Cyber Tectonics Research Initiative (adikamdar@gmail.com).

INTRODUCTION

Advertising is the critical financial engine of the Internet. Despite numerous innovations over the past few decades, advertising remains by far the most dominant model supporting an entire ecosystem of professional content creators online. Advertising also drives the platforms that that frame our experience of the web. Everything from search engines to social media depends on a continuing stream of advertising revenue to survive and grow.

The fate of the Internet is therefore inextricably tied up in the fate of advertising. The needs of advertising will define the future shape of the web, and the health of the advertising industry will decide the health of many of the most important web services that millions of people rely upon everyday.

Worryingly, advertising is not well. Though companies supported by advertising still dominate the landscape and capture the popular imagination, cracks are beginning to show in the very financial foundations of the web. Despite the best efforts of an industry, advertising is becoming less and less effective online. The once reliable fuel that powered a generation of innovations on the web is slowly, but perceptibly beginning to falter.

Consider the long-term trend: when the first banner advertisement emerged online in 1994, it reported a (now) staggering clickthrough rate of 78%. By 2011, the average Facebook advertisement clickthrough rate sat dramatically lower at 0.05%.[2] Even if only a rough proxy, *something* underlies such a dramatic change in the ability for an advertisement to pique the interest of users online. What underlies this decline, and what does it mean for the Internet at large?

This short paper puts forth the argument for *peak advertising*—the argument that an overall slowing in online advertising will eventually force a significant (and potentially painful) shift in the structure of business online. Like the theory of Peak Oil that it references, the goal is not to look to the immediate upcoming quarter, but to think on the decade-long scale about the business models that sustain the Internet.[3]

This working paper is broken into four parts. First, we will introduce the basic model and argue why there is reason to believe that advertising will not be sustainable in the long term. Second, we will discuss some of the implications of the model—addressing how the slowing of advertising effectiveness has implications for privacy, market structure, and authenticity online. Third, we will address some common counterarguments, and why we believe them to be wrong. Fourth, we envision the possible futures that will come after Peak Advertising, as companies contend with the continuing contraction of online advertising.

I. THE THEORY OF PEAK ADVERTISING

The theory of Peak Advertising relies on a simple proposition: online advertising will continuously decline in effectiveness going into the future, to the extent that it makes existing models unsustainable.

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[2] Andrew Chen, *The Law of Shitty Clickthroughs,* @ANDREWCHEN (April 5, 2012), http://andrewchen.co/2012/04/05/the-law-of-shitty-clickthroughs/.

[3] *See* M. King Hubbert, *Nuclear Energy and the Fossil Fuels* (March 1956) *available at* http://www.hubbertpeak.com/hubbert/1956/1956.pdf

This will, in turn, eventually force a broad transition in the financial models supporting the web. There are a few reasons to believe that this will be the case.

First, the changing demographics of web users do not favor advertising.

For the perspective of advertising, not all users of the Internet are created equal. One 2013 paper conducted a controlled experiment on over a million customers to measure the causal effect of online advertising on sales. Researchers found that while customers "between the ages of 20 and 40 experienced little or no effect from the advertising...individuals aged 50 to 80 experience a sizable positive effect on sales."[4]

Perhaps most notably, customers older than 65 years of age, despite constituting only 5% of the experimental group, were responsible for 40% of the total effect observed as a result of the advertising. This was in spite of the fact that younger customers were more likely to see retailer advertisements and also saw more advertisements by simple virtue of their heavier Internet usage. Researchers, however, found no statistically significant effect on purchase behavior for younger subjects.[5]

This experiment suggests that there may be a generational gap in receptiveness to advertising online. Ironically, the generation most identified as the "Internet generation" are some of its worst supporters from a purely financial point of view. As demographics shift over time, particularly within the United States, the overall effectiveness of online advertising will fall.

Second, ad blocking is increasingly ubiquitous.

Studies estimate that between 9% and 23% of web users are now using ad blockers, and use of ad blocking is growing at the rate of 43% per year.[6] The threat that this increased usage poses is obvious: the software prevents a message from reaching the user even if the user would have been receptive to that messaging if it had reached them. This effectively erodes the value of all advertising inventory because media buyers know that the placement they have purchased never even results in an impression for some fixed percentage of users.

We can expect that the proportion of users blocking ads will continue to increase over time. It is nearly costless for users to implement. Indeed, Chrome and Firefox—which continue to gain in market share—are precisely those browsers whose users most frequently install ad blocking software.[7]

Third, click fraud remains a severe and growing problem.

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[4] Randall Lewis and David Reiley, *Advertising Effectively Influences Older Users* (January 2011) *available at* http://davidreiley.com/papers/AEIOU.pdf.

[5] Id. at 12.

[6] Kashmir Hill, *Use of Ad Blocking is on the Rise,* FORBES.COM (Aug 21, 2013), http://www.forbes.com/sites/kashmirhill/2013/08/21/use-of-ad-blocking-is-on-the-rise/.

[7] *See* Leo Mirani, *Over One-Fifth of People Use Ad-Blocking Software--And It's Beginning To Hurt,* QWARTZ (Sept 3, 2013), http://qz.com/120797/over-one-fifth-of-people-use-ad-blocking-software-and-its-beginning-to-hurt/; Emil Protalinkski, *IE9 Falls Below 10% Market Share*, THE NEXT WEB (Aug 1, 2013), http://thenextweb.com/insider/2013/08/01/ie9-falls-below-10-market-share-firefox-hits-50-month-low-and-chrome-again-gains-the-most/.

Click fraud is "a type of fraud that occurs on the Internet in pay per click online advertising when a person, automated script or computer program imitates a legitimate user of a web browser clicking on an ad, for the purpose of generating a charge per click without having actual interest in the target of the ad's link."[8] This distorts the data available about the effectiveness of advertising and promotional activity, and imposes costs on advertising buyers that purchase placement without any benefit.

Adometry estimates that, in the United States, click fraud was responsible for $53 million dollars of wasted ad spending in the first two quarters of 2013 alone.[9] One case in March 2013 cost display advertisers $6 million per month in fraudulent click-throughs generated through the use of botnets.[10] Mobile—often touted as a new frontier of advertising—has seen an explosion of click-fraud, with some reports placing the percentage of fraudulent or accidental clicks on mobile platforms at 40%.[11]

The problem of fraud increases the risks for those buying advertising online, and will hinder the continued growth of investment in it over time.

Finally, ever escalating advertising density may itself erode effectiveness.

The reason for this is simple: advertisers compete over the limited resource of attention online. Each has incentives to deliver as many advertisements to the user as possible, without causing the user to abandon the site in annoyance.[12] However, as the number of ads increase across all channels, advertisers effectively fight over ever smaller slices of user attention, potentially culminating in users ignoring advertising messaging altogether. This might account for the extremely high clickthrough rate of the first banner advertisement in 1994: it commanded high levels of attention because it was the only advertisement of its kind around. In this respect, the popularity of advertising in the intervening decade crowds out the success of any given ad.

Skeptical readers will argue that many of these concerns apply with particular force to display and search advertising, and do not necessarily generalize to the many other types of advertising online. This is true, but it misses the point. As of 2012, PwC estimates that these two sources alone still constitute 67% of the $37 billion dollar online advertising industry.[13] The decline of these two largest forms of online advertising alone would portend significant changes to the structure of business on the web, not to

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[8] Wikipedia, Click Fraud, http://en.wikipedia.org/wiki/Click_fraud (last accessed Oct 3, 2013).

[9] Adometry, Click Fraud Report Infographic: First Half 2013, http://www2.adometry.com/Click-Fraud-Report#.Ui51dmTXjE0 (last accessed Oct 3, 2013).

[10] Charles Arthur, *Botnet Fraud Costs Display Advertisers $6M a Month, Security Researchers Say,* THE GUARDIAN (Mar 19, 2013), http://www.theguardian.com/technology/2013/mar/19/botnet-costing-advertisers-6m-dollars-chameleon.

[11] Ryan Kim, *Report: 40 Percent of Mobile Clicks Are Fraud or Accidents,* GIGAOM (Aug 31, 2013), http://gigaom.com/2012/08/31/report-40-percent-of-mobile-clicks-are-fraud-or-accidents/.

[12] *See* Daniel Goldstein, et. al, *The Cost of Annoying Ads*, WWW 2013, *available at* http://www.dangoldstein.com/papers/goldstein_mcafee_suri_annoying_ads.pdf (measuring the monetary cost of this annoyance).

[13] Interactive Advertising Bureau, IAB Internet Advertising Revenue Report, Apr 2013, *available at* http://www.iab.net/media/file/IAB_Internet_Advertising_Revenue_Report_FY_2012_rev.pdf.

mention expanding markets like mobile advertising. The issue is whether or not other forms of online advertising will be sufficient to quickly fill the enormous hole in revenue that a significant decline in search and display advertising would imply.

In our minds, the market share of display and search advertising only sets the *floor* for industry contraction. If even some of the factors above apply to other channels of advertising online, the effect of Peak Advertising will only be greater. This might be the case: it is not unreasonable to believe that generational differences in receptiveness to display advertising might broadly apply to advertising in general. Moreover, factors like click fraud are particularly prominent in mobile advertising (9% of the market in 2012). These can only expand the projected impact of Peak Advertising.

II. IMPLICATIONS

The central importance of advertising to business online means that Peak Advertising will impact more than just media buyers and vendors. As the value of advertising inventory collapses, it will fundamentally change our experience of the web: everything from the diversity of services that we might choose from to our notions of privacy online will be affected.

This section looks at what we are likely to see now and going into the future, connecting many disparate phenomena to a single key causal nexus.

- **Market Structure**

Falling advertising revenue will encourage and reinforce monopolistic or oligopolistic markets for services online.

First, the hard facts: the value of advertising inventory is falling. Since Q3 of 2011, Google has reported ever declining prices for its advertising inventory each quarter.[14] Widespread price decline across multiple vendors has been reported on by commentators as early as 2008.[15]

Some may argue that this decline in price is simply related to temporarily anemic demand caused by the general economic downturn of the Great Recession. While this might be a factor, there is good reason to believe that this decline will continue over the long-run. The auctioning system for advertising delivery online is increasingly competitive and—in economic terms—an increasingly efficient marketplace.[16] As a

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[14] *See* Tim Peterson, *Google Still Suffering Ad Price Declines As Search Goes Mobile,* ADAGE (Jul 18, 2013), http://adage.com/article/digital/google-suffering-ad-price-declines/243185/; Rebecca Greenfield, *The Decline of Google (and the Internet) Ad Business,* ATLANTIC WIRE (Jul 20, 2012), http://www.theatlanticwire.com/technology/2012/07/decline-google-and-internets-ad-business/54835/; Matthew Creamer, *As Ad Rates Sink, More Websites Explore Ad-Free Business,* ADAGE (Mar 29, 2013), http://adage.com/article/media/online-ad-rates-falling-sites-explore-ad-free-business/240620/.

[15] *See* Claire Miller, *Prices Falling for Online Ads,* NYTIMES BITS (Oct 16, 2008), http://bits.blogs.nytimes.com/2008/10/16/prices-falling-for-online-ads/?_r=0.

[16] *See* Behind The Banner, http://cmsummit.com/behindthebanner/#sthash.a8mVcepW.gbpl (interactive visualization of the online advertising auction system); Darren Dahl, *Small Players Seek an Alternative to the Expense of Pay-Per-Click,* NEW YORK TIMES (Oct 17, 2012), http://www.nytimes.com/2012/10/18/business/smallbusiness/as-pay-per-click-ad-costs-rise-small-businesses-search-for-alternatives.html?_r=0 (describing the effect of increased competition on advertising inventory prices).

result, pricing for advertising inventory scales closely to its value, since more prominent and effective placement of messaging on sites are bid up by various buyers. As the factors driving Peak Advertising take effect, falling effectiveness of advertising will place continued downward pressure on the market price for advertising inventory.

Whatever the causes, the outcome of the downward price trend is very clear: vendors will need to sell increasingly large quantities of advertising volume in order to maintain the same amount of revenue flow. Indeed, if the price drops deeply enough, vendors will only be financially sustainable if they can offer (and sell) massive quantities of inventory.

To that end, Peak Advertising will drive the formation of highly monopolistic or oligopolistic market structures for advertising, since only the largest companies will have the scale of advertising inventory necessary to remain profitable. Smaller companies that are especially reliant on advertising will have difficulty remaining profitable and will face incentives to sell to companies with larger aggregate volume to sell.

Falling effectiveness also favors larger incumbents in another, less commented-on way. As a April 2013 study offered, strong statistical evidence for the effectiveness of online advertisements is nearly impossible to show because the effect of online advertisements is so comparatively small such that the necessary observations to improve confidence intervals is extremely high.[17] The article's authors argue that this fact indicates that larger vendors will have a competitive advantage in the future because only they possess access to the massive datasets necessary to truly show the success or failure of campaigns.

On both these counts, Peak Advertising point towards greater market consolidation and ever declining diversity of choice between service providers of all kinds online.

- **Privacy**

Data about users is one means by which an advertising vendor may bolster the effectiveness of their messaging. By itself, this does not seem too controversial: knowing the preferences of a user, for example, permits an advertiser to more effectively target messaging that the user may be receptive to.

Peak Advertising changes the landscape because it creates strong, growing monetary incentives for platforms to acquire ever-increasing quantities of data about users to deal with the threat of a general decline in advertising effectiveness. For one, such data enables better targeting, ostensibly bolstering the effectiveness and consequently the price commanded by existing advertising inventory.

Second, gathering unique types of data about users can help vendors differentiate themselves from competitors in the space. Location data—for instance—gives social platforms like Twitter, Foursquare, and Facebook an edge against more traditional banner advertising vendors that do not have a means of acquiring similarly granular information about audiences.

As the effectiveness of advertising declines along with its price, advertising vendors will continually need to collect more and new data about their users in order to simply run in place and maintain the value of the inventory they are providing. This economic pressure has broader societal implications, since the need

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[17] *See, supra* note 2 at 31.

to aggressively collect user data also means that platforms will increasingly invade the privacy of its users —aggregating information about users' interests, economic status, health information, and other "major life events" (like a wedding or a new baby). Indeed, a sufficiently large decline in advertising effectiveness may mean that a platform will *need* to invade user privacy in order to stay solvent.

Obviously, the advertising vendor faces conflicting pressures in engaging in this kind of behavior. Platforms attempting to engage in increased data gathering on their users also face the risks of consumer blowback. Platforms, naturally, will attempt to have their cake and eat it too. They may simply conceal increased data collection policies from users, or attempt to frame the increased collection as itself an attractive feature. They may also make it more difficult for users to easily exit these platforms prior to these efforts to soften the potential damage from these changes.[18] So long as advertising remains the primary revenue generator for these platforms, it will be difficult for them to credibly commit to maintaining certain standards of user privacy.

Notably, entities known as data brokers evade such consumer blowback. Operating almost completely behind the scenes, data brokers have contractual relationships with websites, advertisers, and social media platforms to collect enormous amounts of data about individuals in order to provide marketing analytics and suggestions across a number of channels. Already, companies' vacuuming and dissecting such data are skirting notions of privacy by staying outside of everyday consumers' frame of reference.[19]

Pressures to push the boundaries of privacy also favor consolidation and monopolization because larger services are more able to engage in these actions with impunity. For two reasons: first, larger platforms can afford lose large numbers of users without making a proportional dent in the number of “eyeballs” they are able to provide to advertisers. Facebook, for instance, would have to lose enormous masses of users before it appreciably affected their revenue. Second, insofar as these platforms are social platforms, network effects may make it difficult for users to find adequate substitute platforms that are less used by friends and other relations.

In a world of declining advertising effectiveness, these are strong, systemic advantages over smaller vendors. The very pressures that will push platforms to invade user privacy are those that will also support greater market consolidation over time.

- **Advertising Delivery**

Ad blocking is becoming increasingly popular and ever more sophisticated. This is bad news for advertisers: if a message is blocked at the browser-level, then it is prevented from ever reaching the consumer even if they would have been receptive to it. Compounding this problem is that consumers have

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[18] *See* Tim Hwang, *Das Zuckital,* BROSEPHSTALIN.COM (Jun 4, 2010), http://brosephstalin.com/2010/06/04/das-zuck-ital-the-economics-of-social-networks-and-the-collapse-of-privacy/ (describing a model for these pressures in more detail).

[19] *See* Lois Beckett, *Everything We Know About What Data Brokers Know About You*, PROPUBLICA (Sep 13, 2013), https://www.propublica.org/article/everything-we-know-about-what-data-brokers-know-about-you

learned to studiously ignore display and search advertising in many cases as the Internet has become ever more advertising-dense—we have developed our own mental ad blockers, in that sense.[20]

However, advertising can be designed to circumvent blocks both mental and digital. "Native advertising"—sponsored content made to look like editorial content, or content from other users—is more difficult for ad blockers to detect because it is not often delivered through an easily identifiable pattern of code.

It is also more difficult for users to ignore preemptively because it appears to be true "informative" content that a user may want to read. One example is particularly illustrative: in January 2013, the Atlantic ran a sponsored story about the Church of Scientology that closely resembled its normal editorial content. While the media backlash was substantive enough to elicit an apology from the publication, it is not so clear that other future publications will succumb to such pressure—or that such paid content will be identifiable at all.[21]

This transition may be accelerated by the numerous marketing and advertising agencies that work with clients to facilitate the sale of advertising inventory. Traditional display and search advertising has transparent and established metrics for success, so any decline in effectiveness will be very obvious to the clients of these agencies. In contrast, outcomes in these alternative forms of online advertising are more difficult to measure, so advertisers will be better able to manipulate client perceptions of their value and the ROI of their campaigns. It is not surprising that they have supported this transition and created metrics for success that capitalize on this fact.[22]

As Peak Advertising erodes the effectiveness of banner and display advertising, there therefore will be increasing pressures to transition the stock of advertising inventory to ever less detectable forms of promotion. The overall effect is an Internet which continuously creates content that is advertising but appears not to be—and transforms distinguishably non-advertising content into channels for advertising delivery.

The faster the implosion in the value of existing advertising inventory, the stronger the pressures for this blurring to occur will be. Peak Advertising suggests that the future will be one in which it is difficult for users—much less ad blockers—to determine the forces that influence and shape information found online.

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[20] *See* Laurie Sullivan, *Banner Blindness*, ONLINEMEDIADAILY (Mar 18, 2013), http://www.mediapost.com/publications/article/196071/banner-blindness-60-cant-remember-the-last-disp.html#axzz2ghVAwplW (summing up on study confirming this behavior).

[21] *See* David Carr, *Storytelling Ads May Be Journalism's New Peril*, NEW YORK TIMES (Sept 15, 2013), *available at* http://www.nytimes.com/2013/09/16/business/media/storytelling-ads-may-be-journalisms-new-peril.html?pagewanted=all&_r=0 (describing the trend - similar editorial initiatives in other advertising-driven venues include that of Twitter in supplying "Sponsored Tweets," and Buzzfeed in promoting sponsored content as editorial); David Pescovitz, *A Lifetime Car Lover Has Found His Match*, BOINGBOING (Apr 26, 2012), http://boingboing.net/2012/04/26/a-lifetime-car-lover-has-found.html (similar advertisement appearing on BoingBoing).

[22] *See, e.g.* Dan Zarrella, *How To Calculate the Value of a Like,* HARVARD BUSINESS REVIEW BLOG (Nov 26, 2012), http://blogs.hbr.org/2012/11/how-to-calculate-the-value-of/ (promising the means by which to measure the value of a Facebook "like"); Olivier Blanchard, *How Not To Measure The Value of a Like,* THE BRAND BUILDER (Nov 27, 2012), http://thebrandbuilder.wordpress.com/2012/11/27/how-not-to-measure-the-value-of-a-like/ (demonstrating the manipulablity of this formula).

Admittedly, there have been some attempts to resist the economic momentum towards this transition: the Federal Trade Commission has published guidelines on practices for bloggers and other advertising providers to follow when receiving compensation for content, and it is holding workshops on the "blurring of digital ads with digital content."[23] However, the effectiveness of these policies in changing the actual behavior of actors on the ground is yet to be seen.[24]

III. ADDRESSING COMMON CRITIQUES

There are a number of critiques of this theory and what it implies about the future state of the web. We rebut three of the most common challenges below:

"Assumptions of Peak Advertising Are True of All Advertising"

Most methods of advertising decline in effectiveness and value over time. Generational changes in consumer tastes, fatigue around certain types of messaging, and a changing media landscape, for instance, have required innovations in advertising long before the advent of the Internet.

Peak Advertising does not therefore identify something truly new: it merely notes a trend that has always existed in advertising, though it may have been less measurable in the past. The critique is, then, is simple: why should this timeless trend be a worthwhile consideration now?

The economics of advertising demand our special attention because as an industry it facilitates and underwrites much more than it used to. Google is perhaps the most striking example: a core business of advertising goes to support the provision of everything from web search to robotic cars. Indeed, it chases out existing businesses in these different sectors by offering free services subsidized by advertising. Advertising is also the financial core that funds the spaces in which communities form, as well. Social relationships and linked applications that are created and maintained on platforms from Facebook to Reddit rely on the continuous flow of advertising dollars to keep their servers running.

In short, transformations or upheavals in the marketplace for advertising will have broad implications for sectors and arenas of society not traditionally beholden to its rise and fall.

Moreover, while static channels of advertising have always run dry historically, the exceptional qualities of the Internet may make the usual decline particularly acute this go around. On one front, web advertising is measurable in ways that were entirely impossible in an earlier print and television era. While better transparency makes successes more clear, it also makes failures more obvious. As the effectiveness of existing ads continues to decline, the obviousness of that decline may make the market for those ads disappear more quickly than they have in the past.

Second, classic threats to the effectiveness of advertising like changes in consumer preference are now compounded by code. For a consumer, attempting to block advertisements in an era of print or television advertising would have been a costly and difficult endeavor. Today, ad-blocking software is freely

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[23] Federal Trade Commission, *FTC Native Advertising Workshop on December 4, 2013 Will Explore the Blurring of Digital Ads With Digital Content*, http://www.ftc.gov/opa/2013/09/nativeads.shtm

[24] Federal Trade Commission, *FTC Reboots .COM Disclosures,* http://www.business.ftc.gov/blog/2013/03/ftc-reboots-com-disclosures-four-key-points-and-one-possible-way-bypass-issue-altogethe.

distributable, effective, and spreading—and may pose a threat as it effectively prevents distributions of whole classes of advertising inventory.

Both of these facts suggest that the decline of online advertising will have particularly widespread reverberations through the economy, and that the decline will be pronounced in ways that it has not been before.

"Advertising Effectiveness is Poorly Measured"

One might also challenge the numbers. It has been argued—quite rightly—that metrics like clickthrough rate are poor indicators for whether or not advertising is effective or not. Even if the advertisement does not immediately drive a sale or even a click to the sponsor's website, the influence of online advertising might still have an invisible impact by influencing someone to purchase at another time or even off-line.

Peak Advertising might therefore be challenged as making mountains out of molehills: these unaccounted for sales might be quite large, and could justify continued demand for online ad inventory even in a world of falling clickthroughs.

Setting aside the fact that clickthroughs - as an industry standard - remain influential regardless of their actual measurement of underlying value, research refutes what may seem at first to be reasonable speculation.[25] We are benefitted by a 2013 paper "Add More Ads?" which conducted a controlled experiment to precisely measure the effect of online advertising across more than three million customers. The experimental design was able to overcome some of the statistical problems of measuring significance discussed above. Most notably, it tracked both off- and on-line purchases.[26]

What they find is comforting news: for a sufficient number of exposures, online sales will increase by close to 7%, with offline sales increasing by about 3%.[27] Clickthroughs aside, online advertising is generally worthwhile for businesses.

However, it is worthwhile *only* because the prices are so low for these advertisements. As noted above, those prices continue to fall.[28] While it remains profitable business strategy to invest in online advertising, this focus misses the bigger picture of what a drop in price does to the *suppliers* of advertising.

Even if demand remains the same or even grows, sufficiently rapid price declines mean that suppliers—who simultaneously are the very businesses maintaining the modern landscape of the web—face revenue streams that flat-line or shrink over time. It is this stalling of of revenue flow, and the actions taken in response to it, that give rise to Peak Advertising.

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[25] Antonio Garcia, *The Budding Google-Facebook-Twitter War*, MEDIUM (Sept 18, 2013), https://medium.com/how-to-use-the-internet/781cd8e0a7ba.

[26] Garret Johnson, et. al, *Add More Ads? Experimentally Measuring Incremental Purchases Due To Increased Frequency of Online Display Advertising,* May 20, 2013, *available at* http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2268215.

[27] *Supra,* p. 27.

[28] *See supra* note 12-13.

"Nature Always Finds a Way"

When all else fails, one might simply appeal to a leap of faith. One commenter confidently predicted on an early draft of this idea: "Advertising technology reminds me of a line from Jurassic Park where someone says 'nature always finds a way.' Marketers will always find a way to get their message out there. Along that vein, consumer internet companies will always find a way to make advertising work for them and their users."[29]

This challenge is admittedly difficult to counter in part because it is so speculative. But, perhaps this is where the homage to the theory of Peak Oil is most apt. It is possible, in a world of dwindling fossil fuel supplies, that innovation may produce an entirely alternative source of power that avoids catastrophe and permits current consumption patterns to continue.

However, this is at present speculative: the capital invested in existing energy infrastructure, and the cost of researching alternatives, all point to a situation in which innovation might not succeed in necessary time.

The same might be true here. Peak Advertising imagines a similar race between the declining value of a key resource and the ability for the industry to transition to some sufficiently robust financial substitute in time. Indeed, the implications for privacy, authenticity, and market structure are all symptoms of an industry already attempting to adjust to a new, challenging environment. Whether these changes are sufficient to preserve the same core business model that has sustained the web to date remains to be seen.

IV. FUTURE SCENARIOS / CONCLUSIONS

There are obvious adjustments that will prolong the life of advertising as the primary commercial driver of the web. Companies will engineer more opportunities to place advertising (e.g. Android) and develop ways of delivering ever-more advertising into existing channels (e.g. Facebook). Platforms will also make an effort to diversify their income sources, doing things like emphasizing paid "pro" accounts and selling physical merchandise. No doubt data (and lack of it) will also give breathing room to the industry: advertising will get better targeted, or, in the very least, the metrics will become amorphous enough to obscure from media buyers the falling value of the advertisements that they do buy.

Will these changes avert the decline of online advertising in the long run? Where will advertising (and the Internet it supports) eventually end up?

One can imagine some breakthrough innovation that eliminates this problem wholesale and maintains the status quo. Someone might develop a behavioral targeting system that perfectly delivers compelling ads to the right customer flawlessly. The current failure to do so even with massive data about user behavior seems to discount this scenario.

In the alternative, someone might innovate an entirely different business that provides margins and revenue flow comparable or better than advertising. It is likely that such a transition would require significant changes in how we experience the web. Go with the models that we know: an Internet where

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[29] Adi Kamdar, *The End of Ads,* STUFFTHOUGHT (Mar 31, 2013), http://stuffthought.com/blog/?p=772 (Victor Wong, CEO of advertising technology company PaperG, comments).

the most massive companies ran on subscriptions, for example, would grow significantly slower, be more subject to user demands, and would likely feature smaller user bases than the ones that we see today. This avoids the obvious issue, too, that not all existing businesses would be able to transition successfully in time, particularly those that have built the most successful businesses on advertising.

We may very well reach and pass the point of Peak Advertising without any significant innovation emerging to maintain and grow the flow of revenue supporting the Internet. What will be left with is a stagnant and ever eroding flow of revenue from the primary sources of advertising, and the inadequate substitution of new forms of advertising in its place. Of the few players that remain, they will produce a web experience that engineers the erosion of user privacy and the blurring of the line between real content and advertising.

The future we end up with is partially a matter of technological innovation, but also a matter of human choice. To those designing platforms and using those platforms, the issue is: what kind of Internet do we *want* to have?

Ultimately, what Peak Advertising suggests is that the fundamental economics of the web increasingly force this consequential decision on all participants, user and platform alike.