Title: Problems Posed by Ad-blockers

Description: Browsing the web without ads or popups stealing your screen or auto playing video ads making the page load as slowly as if it were being dialed up in the 1990s is a pleasant experience, so it's understandable that so many people these days choose to use ad blockers when surfing the internet. But what problems are posed to businesses by using ad-blockers?

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Introduction

Ad blocking is software that removes or alters advertising content on a web page, most commonly in the form of browser extensions. It allows the user to either block websites or allow sites through by whitelisting them. Ad Blocking has been around for the past 15 years, having first become popular with Firefox and then becoming more popular on other systems and browsers such as Googles' Chrome and Kali Linux.

Research in this report investigates the types of ads and the different methods and benefits of ad blocking itself. I will also consider the effects it has on websites that rely on ads for revenue, the long term effects it has on both sides and the web at large, performances issues, tracking, methods of fighting ad blockers and the future of ads on the internet. I am interested in what effect ad blocking will have on the way revenue models change and what is the most effective.

Before beginning into the research, I will define some of the key names of ads and ad blocking terms used throughout this paper. Whitelist describes sites that will not be ad-blocked.

Several important types of ads include:

1. Web banner advertising
2. Wallpaper advertisement:
3. Frame ads
4. Pop-ups ads
5. A floating ad,
6. News Feed Ads (social)
7. A text ads [1] [2]

Video/Audio adverts, as seen on YouTube and Spotify can be broken into the following categories:

1. **In-Stream Video Ads** are the major type of video advertisement. They play in the video player before, during or after a piece of video content.

2. **Linear Video Ads** are ads which are commonly called pre-roll ads. This type of ad can give the user a choice of which advert to watch or when to watch the ad.

Ad blocking throughout this paper will be classified as a term not limited to a platform or device.
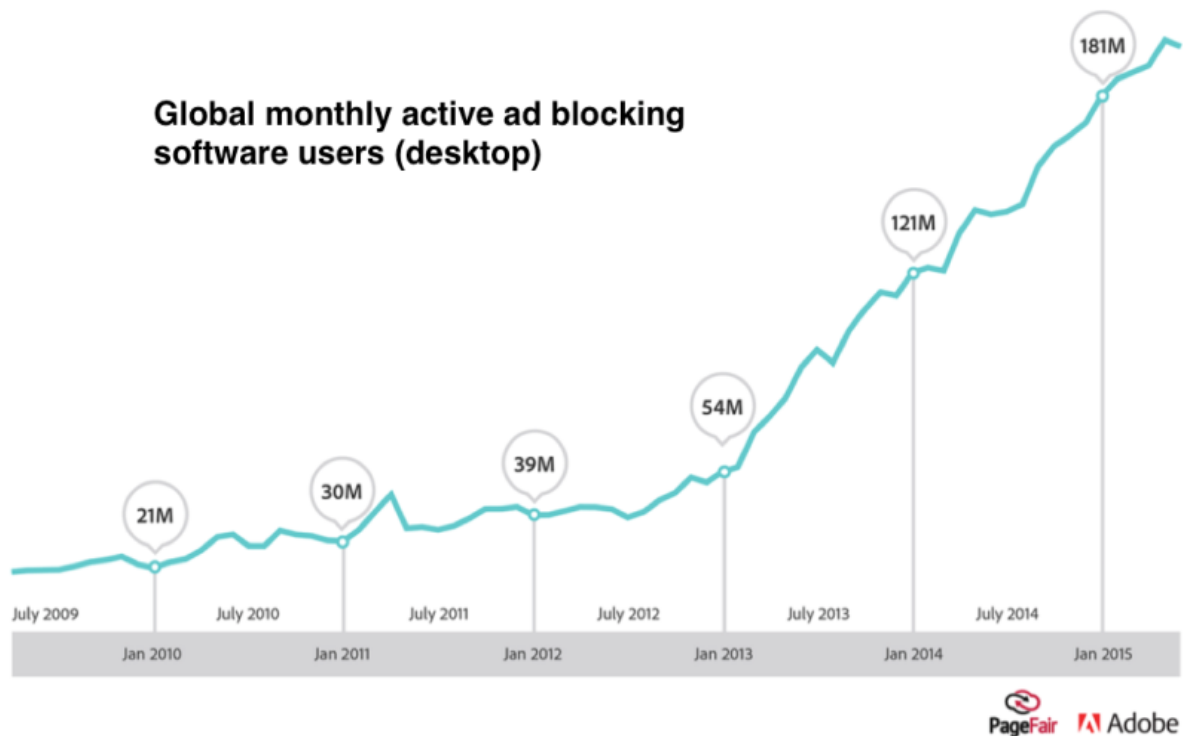
Research Summaries

In the following research summarize section will first look at the benefits of using adblockers for the user, before moving on to their short terms effects, followed by the long term effects of adblockers and the future of web advertising.

What is Ad blocking

In ad blocker is a piece of software designed solely to remove advertisements from website or web applications. Many modern web browsers such as Chrome and Mozilla Firefox block pop-up adverts by default. The use of browser extension ad blockers to prevent adverts or elements which exhibit similar behaviors characteristics to that of advertisements from loading is also common. It has been estimated that 9% of all website views come from browsers with ad-blocking extensions installed [3], and for some publishers, 40%+ of their visitors are using adblockers. [4]

There are several ad blockers available, but the most popular is Adblock Plus. Adblock Plus has no core functions; however, it does come bundled with pre-selected lists of what to block, known as filter lists. Filter lists are normally an extensive set of rules that tell Adblock Plus which parts of a website to block. You can add any filter list you want, for example, block tracking or malware. You can also create your filter lists. Almost all filters are open source. Many filter lists have been established by Internet users. [5]

Global monthly active ad blocking software users (desktop)

21M · 30M · 39M · 54M · 121M · 181M

July 2009 · Jan 2010 · July 2010 · Jan 2011 · July 2011 · Jan 2012 · July 2012 · Jan 2013 · July 2013 · Jan 2014 · July 2014 · Jan 2015

PageFair · Adobe

Ad blocking as a whole has seen a 41% growth year over year, which demonstrates how dramatically its popularity has increased [6] In the US alone, it grew 48% and as of January 2016 has 45 million active users in the U.S. between Q2 (April) 2014 and Q2 2015 for mobile and desktop users. [7]

Benefits to The User

Ad blockers are extremely practical. They block or hide offensive material and other unpleasant things and they can also prevent malicious code from being run.

Ads on the web can be very annoying, but some people, prefer not to block every ad they see, as advertising is how most websites make their money, so that they can keep providing free content.

However, even if you don't block ads, it may be worthwhile to install an ad blocker as it allows for quicker loading of webpages, cleaner looking webpages, which makes it easier to read for those with reading disabilities. As ad free web pages use up less resources, battery life is extended on mobile phones, which leads to substantial energy savings. The financial benefit in filtering an ad before it can load is also significant for users who pay for total transferred bandwidth, like most mobile users worldwide.

Ad blockers also represent an important security improvement. Online advertising exposes users to a higher risk of infecting their devices than surfing pornographic sites [8], which I will discuss later in the report.

Performance Issues by using Adblockers

Using an Ad blocker has a significant impact on loading speeds [9], but improved loading does not come without some side effects, such as memory or RAM hogging (an acronym for random access memory, a type of computer memory which can be randomly accessed. It governs the overall speed of the computer) [10].

As stated by Mozilla developer Nicholas Nethercutt, having Adblock Plus running in the background on Firefox 40 (not including Google's Chrome) results in a memory hit in the range of 80-100MB. However, the biggest problem is the process by which Adblock Plus blocks ads. [11]

Simply put, Adblock Plus inserts a huge CSS stylesheet, roughly taking 4MB of RAM into every single web page that you visit, stripping out the ads and overriding existing style sheets.

With the web being in the era of the modern era also know as web 2.0, it is very common for a web page to have lots of iframes and different loading of elements and API calls, which are separate, individual web pages that are loaded and embedded within the page which the user is currently viewing. The most widely used example is that of feature loaded social sharing widgets such as on Facebook.

When you add a widget to your site, it is made up of an iframe containing a separate web page hosted on Facebook's servers. Given that web pages are growing ever more complicated, having an ad blocker which takes up 4MB of RAM per tab is simply not sustainable.

In Nethercote's testing, he used TechCrunch as an example. The site used around 194MB of RAM without ABP enabled but that doubled to 417MB with ABP enabled, after triggering all of the social widgets and plugins.

I was curious and upon emulating his experiment, I found ABP had the same effect on RAM use in Chrome, producing very similar results.

However, despite the regrettable effect ad blocking has on RAM, the decrease of loading ads (pre-rendering the page and injecting the CSS) results in an enormous performance improvement, i.e. loading time, as can be seen in the results of the test below on the homepage of the popular website The Los Angeles Time. [12]

The Los Angeles Times	With Adblock	Without Adblock
Loading Times (seconds)	11	4
Size of page (mb)	5.7	1.5mb

It is evident that ad blocking has a significant effect on the loading and rendering of web pages.

Developers

Given the fact that download speed is such a crucial issue for users, I decided to carry out some informal research on developer's attitudes to ad loading. [13]
In my poll, I asked developers whether they optimize the loading of ads on their web pages, using the tools such as Async loading.

In computer programs, asynchronous operation means that a process operates independently of other processes [14]. According to my results, the majority of web developers do not prioritize this, so it is easy to see why users would opt for adblockers, as the developers are not considering the time taken for loading ads in their apps or websites.

Security

Third party advertisements can present a serious threat to computer security. For example, in a high-profile case, malware was distributed through advertisements provided to YouTube by a malicious customer using Google's Doubleclick [15] and in August 2015, a 0-day exploit in Firefox browsers was discovered in an advertisement running on a website. [16]

The website Forbes requires users to disable ad blocking before viewing their website, however, in one incident, some of the website's users were served with pop-under malware once they had disabled their adblockers [17]. These examples all demonstrate that adblockers not only make surfing the internet more comfortable for the user but also safer.

Another reason why people use ad blockers is that some advertisements abuse of privacy by making use of snippets of code that perform functions on a web page. This can be easily exploited to gain access to users' cookies which can have sensitive information.

Advertising platforms take advantage of tracking which profiles user behavior based on the sites they visit, content blockers are popular with people who do not want their online browsing history sold to advertisers and advertising networks. This is what makes add-ons like Adblock Plus so popular among users who want privacy.

Problems posed by ad blockers

The economic consequences which ad blocking entails for online business were reported by Adobe/PageFair, which said that the cost to publishers in 2016 alone could be as much as €22 billion. [18]

For example, if an ad is running on a website but is snubbed by the user because their ad-blocker is hiding it, this ad provides no value to the web owner. If users ignore advertisements, advertisers perceive little value in putting brands in front of them. As a result, sites are rarely paid "per click". Instead, the standard metric for selling web display ads is "CPM", or "cost per mille"—the cost for a thousand views. [19] [20]

The majority of websites on the Internet would not exist without advertising. Millions of websites, from soccer moms' personal blogs to huge online magazines such as Wired, depend on advertising revenues to keep running the website as a living.
Ad blockers have been available for years, but now Apple has endorsed them, allowing people to produce ad blocking technology for their app store. [21]

For one of the largest technology companies in the world to openly support ad blocking is big news because it sets the stage for ad blockers' user base to grow at an even greater rate. With Apples' user base of 1.2 Billion [22], this will introduce ad blocking to a whole new set of users on a larger scale.

According to data from Adobe and PageFair, the adoption of desktop ad blockers has risen in recent years, from approximately 21 million users in 2010 to more than 181 million users in January 2016. [23]

Opinions on Ad blockers' potential impact on advertisers loss of revenue are mixed. The same report by Adobe and PageFair states that the rise of ad-blocking technology will cost advertisers more than $40 billion by 2016 [24]. It's hard to say how bad the damage could be, however, I believe it be lower and closer to 1 billion mark.

It is inevitable that the rise of ad blockers will affect advertisers, therefore, the real question is how they will be affected, and in what numbers. Some advertisers may soon notice a huge impact on the performance of their price per click campaigns whereas others won't notice any change at all.

This development can be compared to Google's algorithm updates [25] during which some sites are badly affected by changes in the ordering and display of search results.

Ad blockers affect the display of price per click and text based ads across Google AdWords and other advertising networks, meaning any active campaign could potentially be affected by increased adoption of these software programs.
For example, if you're running a price per click campaign targeting mobile users on devices such as Apple's, and they have an ad blocker installed, they won't see your ads. It doesn't matter what extensions you're using, how many ads or how good they are, they won't see your ads.

On the other hand, it is important to remember that the majority of people browsing the web don't have any ad blocker installed at all, and just because the option is there and growing in popularity does not mean that all users are going to radically change their behavior and install an adblockers.

According to an official blog post (September 30th of 2015), Google will no longer charge display network advertisers for impressions which are not viewable to users. [26] [27]

Simply put, if an ad isn't seen by the user, whether that is due to an ad being in another tab, or scrolled out of view or if the ad is being blocked by an ad blocker, the advertiser won't be charged. This move is likely to be a reaction to the concerns about the adoption of ad blockers in both iOS and browser extensions, as the problems stated in the blog post have been an issue for advertisers for some time.

There are still many potential problems caused by ad blockers, for example, some reports suggest that it will push sites to end free content or decrease the quality of content in order to increase clicks, as seen in click bait articles. This means that users will only have access to incomplete information on these sites and will also result in a loss of revenue and the inability to understand the customer because of their anonymity.

These issues stem from adblockers because publishers are being forced to try other means to increase revenue, for example, by increased use of paywalls, which will be discussed in greater detail later, and by pushing out more articles and sacrificing quality for quantity as a result.

Fighting Adblockers

When Apple announced that it will allow ad blocking in Safari for iOS 9.3 last September, it brought a conflict that had been building in the web community for years to the fore.

Some sites try to prevent users from accessing their content while their ad blocker is enabled. For example, Forbes.com is one of many sites which do not allow to access the site without disabling the extension or whitelisting the website.

Not everyone is convinced by this method, for example, Johnny Ryan of PageFair believes ad blocking walls are relatively easy to bypass [28]. and he is right. "Often publishers only update their code, forcing the ad blocking community to get working again. It is a coding tug of war," he stated.

PageFair, among other sites, has been employing more user friendly methods of circumventing ad blockers. They enable publishers to display "respectful and unobtrusive ads" that do not get blocked by ad blockers.

Another approach to the war on ad blockers is exemplified by former Mozilla co-founder Brendan Eich, who launched a browser called Brave [29]. This browser replaces ads on websites with safe, non tracking ones which do not take users' data or slow downloading speeds. He stated that they plan to pay publishers a higher proportion of ad revenues generated by not going through a third party middleman.

Privacy app Ghostery shows users which ad-serving technologies a website or web app is being used, and then Ghostery offers the option to blacklist (block) or whitelist those ad-serving technologies.

Another method of fighting adblockers is showing the users a variety of messages designed to make them think about using adblockers or asking them to whitelist the website. A great example of this is the New York times [30], who show users with ad blockers enabled the following message: "The best things in life aren't free. You currently have an ad blocker installed. Advertising helps fund our journalism. To continue to enjoy The Times, please support us in one of the following ways."

Other solutions include subscribe to the publication, or to "whitelist" it so that the ad blocker stops working for the website in question.

Going Native

As a result of ad-blocking, many advertisers have turned to developing native advertising [31]. Native ads look a lot like that of the content produced by the web publishers, but they usually carry some kind of design or banner feature to distinguish it from non-sponsored content normally at the end of the article.

According to the Association of Online Publishers, companies also need to display ads that don't annoy consumers in the first place. [32]

This is why mobile video is proving so popular as an ad format because it is engaging if done well, therefore, better change of the viewer watching all of it. Mobile video will account for 87% of global advertising spend by 2018, according to ZenithOptimedia.

Websites such as WIRED and FORBES, which will not let users view their website if they are using an adblockers of some kind, offer the following alternatives:

1. You can simply add WIRED.com to your ad blocker's whitelist, so you view ads. When you do, we will keep the ads as "polite" as we can, and you will only see standard display advertising.
2. You can subscribe to a brand-new Ad-Free version of WIRED.com. For $1 a week, you will get complete access to our content, with no display advertising or ad tracking.

Possible solutions and the Future of Advertising

Advertisers are expected to spend $23 billion on social media campaigns, a 33% increase from the last year of 2014, according to research from eMarketer.

It would be possible to improve the use of ad blockers by optimizing delivery of ads on websites using an Async tag as stated by earlier in this report, or by integrating them into the site in such a way that it is not annoying to the user.

Possible solutions

The Freemium Model (Paywall)

Freemium is a pricing strategy by which a product or service such as software, games or web services are provided free of charge, but money(premium model) is charged for proprietary features, functionality, extra content or virtual goods.

Subscription Model

The subscription based model is a business model where a customer must pay a subscription price to have access to the product/service. The model is now used by many businesses, websites and magazines.

Go Native

Native advertising is a form of paid media where the ad experience follows the natural form and function of the user experience in which it is placed. [33]

Pay the Ad Blockers

Where the publisher pays the ad blocker companies to not run the ad blocker on there website.

Ask Audiences for Sympathy

Ask Audiences for Sympathy method enloves asking the visitor though a use of an popup if there will think about whitelisting of disabling adblockers on the site there visiting and exampling how it effects them.

Block Content from People Who Use Ad Blockers

Blocking content from people who use ad blockers is becoming more and more popular, this evolves removing content or links from the user and displaying an advert about it.

Offer Ads Free versions

Offer Ads Free versions allows for the user to support the website or web application. It removes adverts while supporting the services.

As the methods of fighting ad blockers are not particularly successful, it would be better to change the adverts themselves so that they are less irritating and harmful to users.

As stated by Google's former senior vice president of advertising, Susan Wojcicki [34], the future of ads depends on whether advertisers choose to follow the suggestions, which would encourage users not to rely on adblockers. She stated that Ad views will be voluntary, Users will participate in the ecosystem if we provide enough value and control, Ads will be more interactive and beautiful–at scale and that ads will help people live their lives on the go.

Some websites have adopted these futurist, interactive ad formats, with a great deal of success, such as with engagement ads, which show standard ad formats, when users hover their mouse over the add more features come up. This gives users an opportunity to be more creative and involved in the advertising process, which makes them more popular. This method has been used very effectively by companies such as Samsung, who live streamed their 90-minute Galaxy S4 launch event via multiple channels, including ads [35].

Susan Wojcicki also advocates advertising where the user is choosing to view an ad, so that publishers are paid on a cost-per-click basis. It's up to the ad network and the publisher/developer to show the right ad at the right time to the user.

TrueView ads on YouTube follow this model. About 70% of ads on YouTube are now classed as TrueView which has lead to a reduction of 40% in drop off of ad viewing. One ad on YouTube got 33 million views, an ad by Pepsi featuring nascar car driver Jeff Gordon, going undercover to buy a car. It got 33 million views even though it was four minutes long because it was entertaining and relevant. [36]

According to many other reports, a good advert on a website should follow these guidelines:

- Not annoying.
- Not disrupting or distorting the page content the user is trying to read.
- Transparent with the user about being an ad.
- Effective without shouting at the user.
- Appropriate to the site that the user is on.

Unfortunately, many websites do not follow these rules and with the ever changing landscape of the internet, it remains impossible to predict what exactly ads should be in future.

Conclusion

As stated throughout my report, it is difficult to define exactly what the future of adverts on the web should be. However, it is possible to attempt to follow the above mentioned set of rules in order to make ads less annoying and ensure that users won't have to use ad blockers as much.

In the ever changing landscape of web advertising and the ad blocking world, it is up to both the developers and the advertisers to better understand their target audience and to improve their engagement with the user, thus making them more likely to click on the ad than to be annoyed. Ideally, advertisers should follow the guidelines suggested by Susan Wojcicki. However, different sites host different content and therefore should employ different methods, be that a request for whitelisting, a paywall or native apps.

At the end of the day, it is impossible to prevent people from using ad blockers, therefore publishers and advertisers must make it worth the user's while to surf the web without this software, by creating entertaining, non-invasive adverts tailored to their needs and interests.

On the other hand, users need to be aware that they cannot expect free content if they do not also accept a certain amount of advertising, therefore the future of web advertising hinges on the willingness of both sides to compromise.

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