

# Adblocking Goes Mobile

PageFair 2016 Mobile Adblocking Report, revised November 2016



in partnership with PRIORI DATA

# Revised Report, November 2016

This is a revised edition of the 2016 Mobile Adblocking Report that takes into account corrections for a reporting error affecting Global StatCounter's data, which was used to estimate mobile web browser figures. Mobile web browser figures are the only figures in this report that required revision. The following symbol † denotes revisions.

Access the original report [here](#).

## The Global StatCounter/UC Browser revision

Global StatCounter discovered that it was incorrectly recording multiple pageviews for some versions of UC Browser, a prominent mobile web browser in Asia Pacific. As a result, Global StatCounter made several changes to how it measures UC Browser traffic between 1 June and 15 July 2016. Based on these changes and the observed traffic levels after the fix was finalized, our web browser figures are revised by -27% from Dec 2014–March 2016.

1. June 1, 2016: "Some version of UC Browser were incorrectly sending an extra page view request with every valid one. We deployed an update on the 1st June 2016 to remove these extra page view requests from being tracked." Source: [Global StatCounter](#)

2. June 15, 2016: "Further to changes on 1st June 2016, some additional versions of UC Browser were also detected to be incorrectly sending an extra page view request with every valid one. We deployed a second update on the 15th June 2016 to remove these extra page view requests from being tracked." Source: [Global StatCounter](#)

3. July 15, 2016: "The bug in UC browser that was sending duplicate hits has now been resolved. The duplicate hit filter for UC Browser that was applied by Global Stats from the 1st June 2016 has now been turned off. This will result in a slight increase for UC Browser as some valid hits were removed as part of the duplicate hit filter." Source: [Global StatCounter](#)

# How adblocking is migrating to mobile

In this report, PageFair, in partnership with Priori Data, reveals how adblock adoption is spreading to mobile devices across the globe. This analysis is based on empirical data, and demonstrates that twice as many people are blocking ads on mobile browsers than on desktop browsers worldwide.

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# Foreword

Adblocking is now the most hotly discussed topic in the digital media industry. In August 2015 we published a widely-cited joint report with Adobe, which showed that nearly **two hundred million people** around the world were using adblocking software on their desktop and laptop computers. Since then, a complex landscape of mobile adblocking has evolved, accompanied by much conjecture and hyperbole. We believe that any constructive industry response to adblocking must be based on facts, not opinions. Therefore, we have partnered with the mobile app intelligence firm *Priori Data* to produce this report, which maps the **real trajectory of adblocking usage as it shifts to mobile devices**. Unlike other reports on mobile adblocking, we are presenting findings based on empirical data, not surveys of user-stated adblocking adoption.

People are installing adblock for different reasons, many of which are indisputably valid. If the open web is to survive, these reasons must be fundamentally addressed. PageFair's technology can power a new kind of advertising experience for the "blocked web" – ads that thoroughly address privacy, security and UX concerns, while simultaneously protecting publishers and the open web from unwarranted adblocking. I hope this report helps our industry move beyond debating the facts, to addressing the root cause of adblocking adoption while taking action to ensure that good ads get seen.



**Sean Blanchfield**  
CEO & Co-Founder, PageFair  
May 2016

# Key Insights

At least 309 million+ people are blocking ads on smartphones  
(this number excludes content blocking apps, in-app adblockers, and opt-in browser adblockers)

- There are **50% more**<sup>†</sup> mobile adblockers than desktop adblockers.
- Mobile adblocking is most popular in emerging markets, such as China, India, Pakistan and Indonesia. **27%**<sup>†</sup> of smartphone users in Asia-Pac are blocking ads on the mobile web.
- **16%**<sup>†</sup> of the world's 1.9 billion smartphone users are blocking ads on the mobile web.

Adblocking browsers are the dominant method of mobile adblocking

- In March 2016, **298 million**<sup>†</sup> people used an adblocking browser on their smartphones.
- Adblocking browser usage more than **doubled**<sup>†</sup> during 2015.
- Despite the hype, content blocking apps on iOS have had only **4.5 million** downloads, making a limited contribution to adblocking usage globally.

Mobile adblocking is less developed in North America and Europe

- In March 2016 there were **8.9 million**<sup>†</sup> monthly active users of adblocking browsers in Europe and North America. In total, **4.9 million** content blocking and in-app adblocking apps were downloaded from app stores in Europe and North America since September 2014.

In-app ads can now be blocked



**309M**

mobile adblockers  
globally<sup>†</sup>



**102%**

global growth  
Jan 2015 – Jan 2016<sup>†</sup>



**16%**

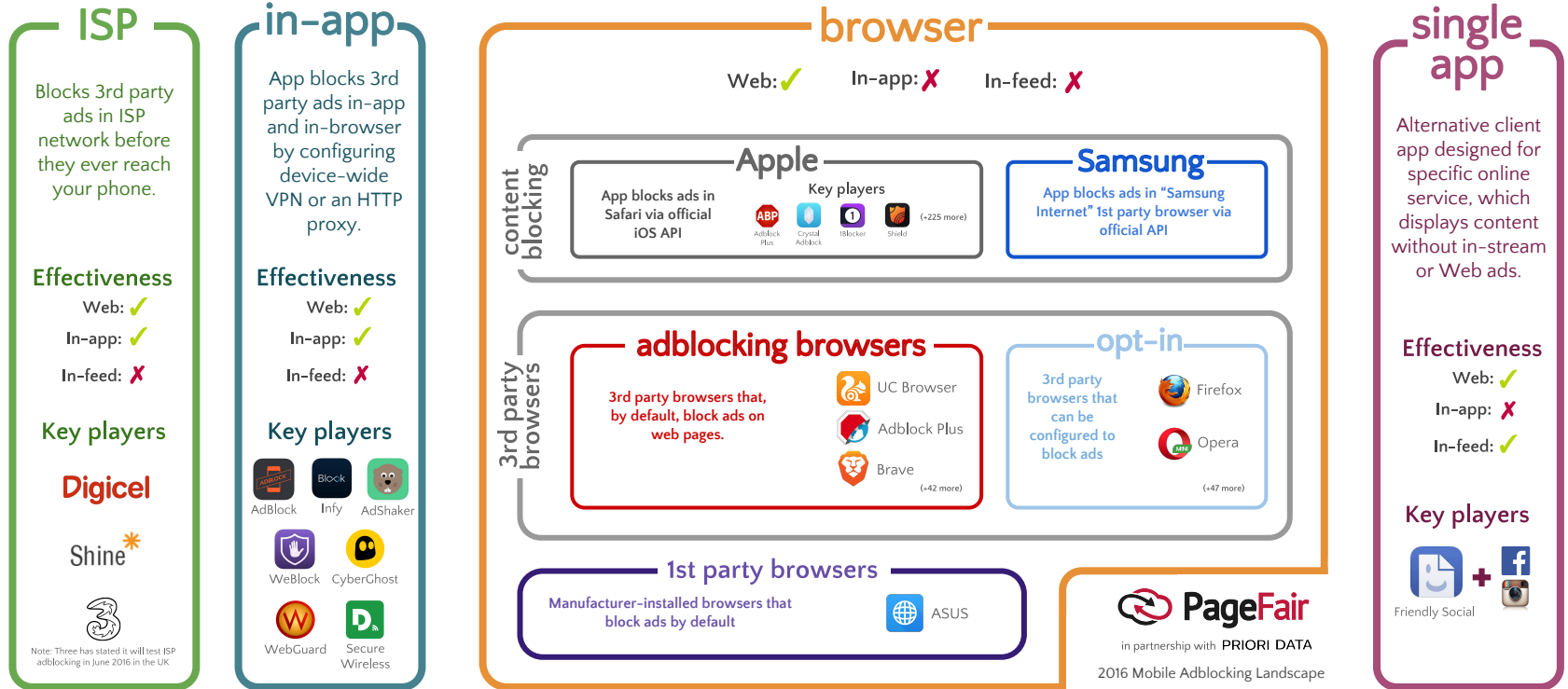
global smartphone  
users blocking adst<sup>†</sup>



**4.5M**

downloads of iOS  
content blockers

# 2016 Mobile Adblocking Landscape



# Adblocking browsers

## Mobile browsers that block ads by default

### Key findings

- We identified **45** different adblocking browsers available for download on iOS and Android.
- These browsers offer users significant savings on mobile data costs.
- Alibaba-owned UC Browser (in its many versions) has more users than all other forms of adblocking combined.
- In Dec 2015, ASUS partnered with Adblock Plus to provide an adblocking browser on **30 million** new handsets in 2016.

### Prediction

With regional offices in China, India, Vietnam, Russia and Indonesia, UC Browser is likely to continue to succeed in its global expansion strategy. Adoption may be further accelerated by manufacturers following ASUS' lead by pre-installing an adblocking browser on new handsets.

## TOP 5 ADBLOCKING BROWSERS

(ranked by cumulative downloads, Dec 2014–Mar 2016)

 PageFair in partnership with PRIORI DATA



### 1. UC Browser – Fast Download

*by UCWeb Inc.*



### 2. UC Browser Mini – Smooth

*by UCWeb Inc.*



### 3. UC Browser HD for Tablet

*by UCWeb Inc.*



### 4. UC 浏览器 HD

*by UCmobile Ltd.*



### 5. Adblock Browser for Android

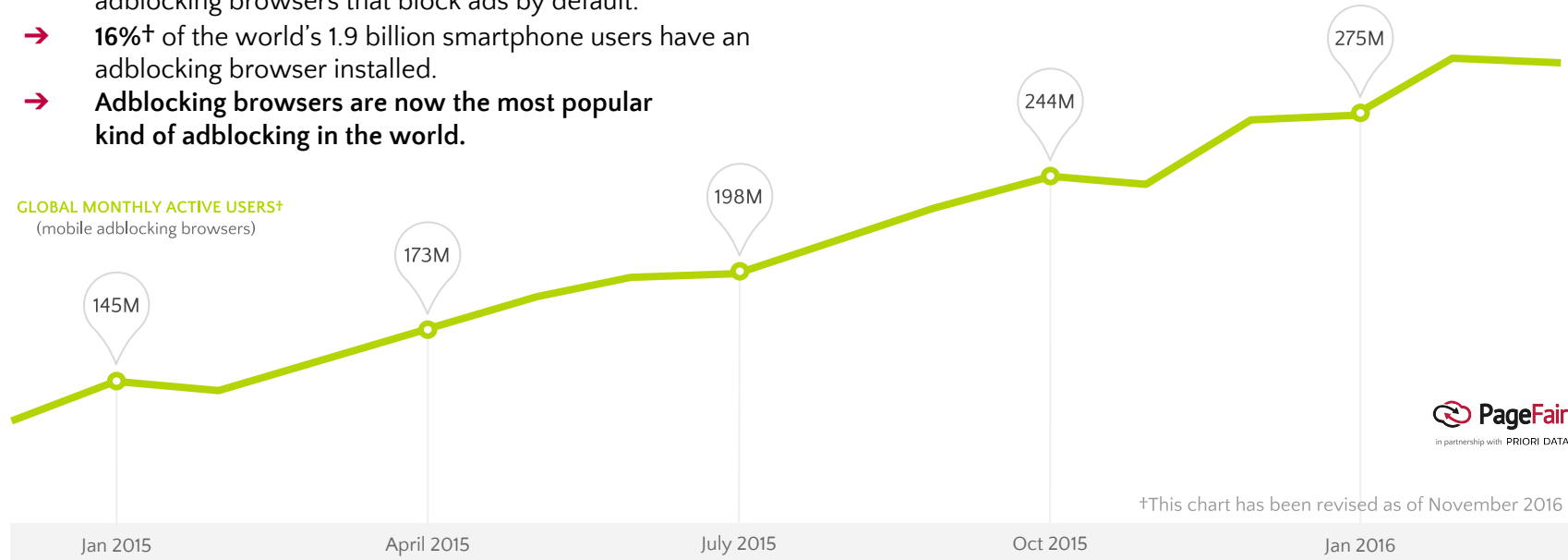
*by Eyeo GmbH*

# Adblocking browser adoption globally

## Mobile adblocking browsers are now a mainstream technology

- Usage grew by **102%<sup>†</sup>** during 2015.
- By March 2016, there were **298 million<sup>†</sup>** users of mobile adblocking browsers that block ads by default.
- **16%<sup>†</sup>** of the world's 1.9 billion smartphone users have an adblocking browser installed.
- **Adblocking browsers are now the most popular kind of adblocking in the world.**

GLOBAL MONTHLY ACTIVE USERS<sup>†</sup>  
(mobile adblocking browsers)





# Adblocking browsers by country

Adblocking browsers are attracting mass adoption in emerging markets

## Key findings

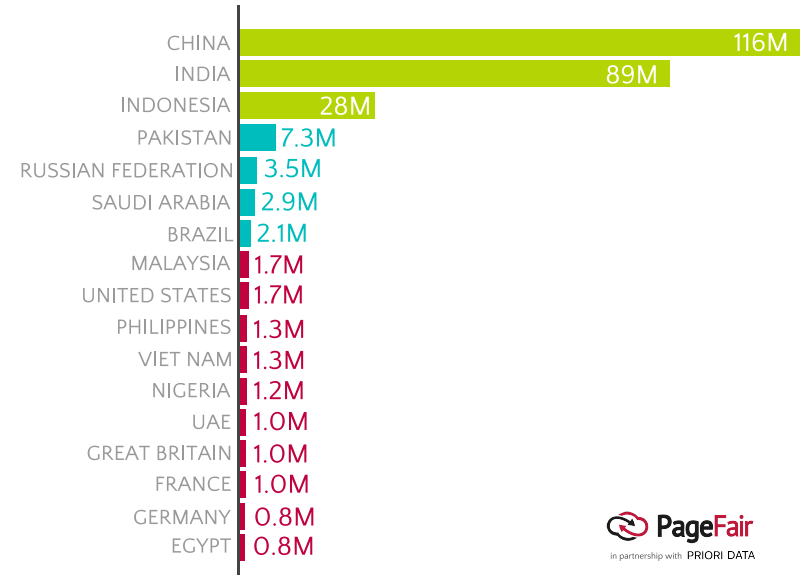
- Adblocking browsers are particularly popular in China, India, Indonesia, and Pakistan.
- The rapid success of adblocking browsers appears to be the result of a well-executed global strategy combining country localization with regional expansion offices.

## Prediction

Mobile adblocking is a serious threat to the future of media and journalism in emerging markets, where people are coming online for the first time via relatively expensive or slow mobile connections. Usage in western economies is likely to grow as more manufacturers and browsers start to include adblocking as a feature.

## MONTHLY ACTIVE USERS BY COUNTRY

(adblocking browsers, March 2016)†



# Adblocking browsers in Asia-Pacific

The vast majority of adblocking browser users are in the Asia-Pacific region

## Key findings

- Within the Asia-Pacific region, **27%+** of smartphone users are blocking ads with an adblocking browser.
- In March 2016, the Asia-Pacific region contained 54% of global smartphone users, but **93%** of adblocking browser usage.

## Insight

Adblocking browsers improve page speed and reduce bandwidth consumption on mobile. Accordingly, they are most rapidly adopted in markets where mobile data infrastructure is less developed and therefore slow and/or expensive relative to income.

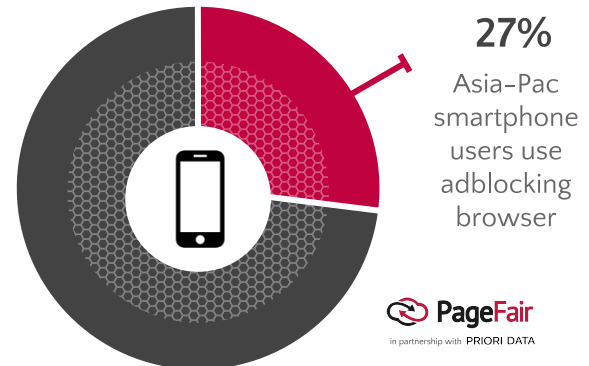
## SHARE OF ADBLOCKING BROWSER USERS

(Asia-Pac vs rest of world, March 2016)



## ADBLOCK BROWSER PENETRATION

(Asia-Pac, March 2016)



# Content blocking app growth slow but steady

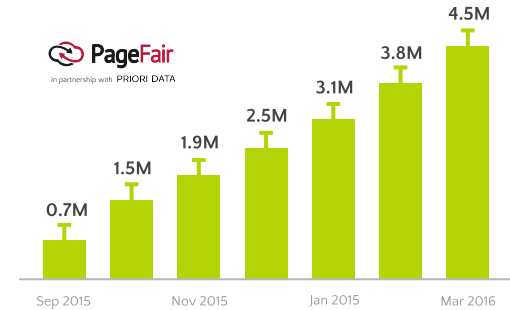
Since September 2015, users can install “content blocking” apps on their iOS 9 Apple devices to block ads in web pages viewed in Safari or in-app via the “webview” API. In January 2016, Samsung announced that the default browser on all its Android devices will support its version of content blocking.

## Key findings

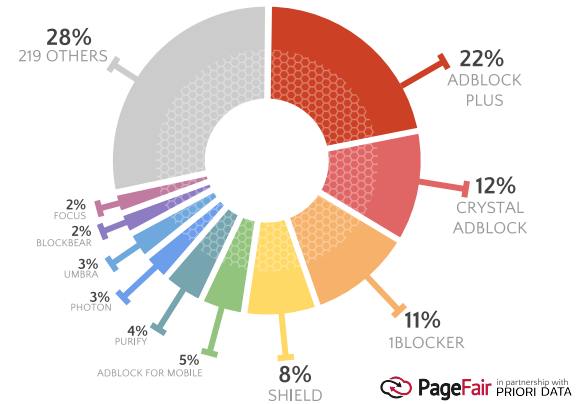
- We identified **229 different content blocking apps** on iOS.
- During the 7 months after launch, there were **only 4.5 million downloads** of these apps globally.
- The United States accounts for only **1.9 million** of these downloads. At most, **2% of users in the United States** who own a compatible iPhone are using a content blocking app.

## Prediction

The slow growth of content blocking may accelerate as more browsers add support and configuration becomes easier.



CUMULATIVE DOWNLOADS OF iOS CONTENT BLOCKING APPS  
(Sep 2015 - Mar 2016)



TOP 10 iOS CONTENT BLOCKING APPS  
(Sep 2015 - Mar 2016)

# Opt-in browser blocking

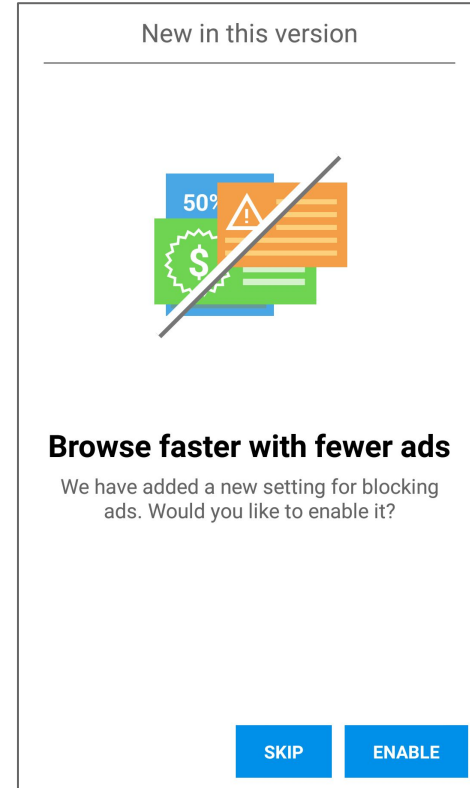
Many mobile browsers now provide opt-in adblocking functionality

## Key findings

- *Firefox for Android* (est. 173M users) supports add-ons, with 17.6% of traffic measured on the PageFair analytics network from users who have installed an adblock add-on.
- *Opera Mini* for Android (claiming 120M users) rolled out native opt-in adblocking functionality in May 2016.
- *Maxthon* browser (reportedly 15M–20M users) rolled out opt-in adblocking functionality in February 2015.

## Prediction

An estimated **30 million** *Firefox for Android* users are blocking ads. At the same adblocking opt-in rate as Firefox for Android, approximately **24 million** *Opera Mini* and *Maxthon* users will enable adblocking. Other browser vendors will come under increasing pressure to provide opt-in adblocking functionality to hundreds of millions of their users around the world.

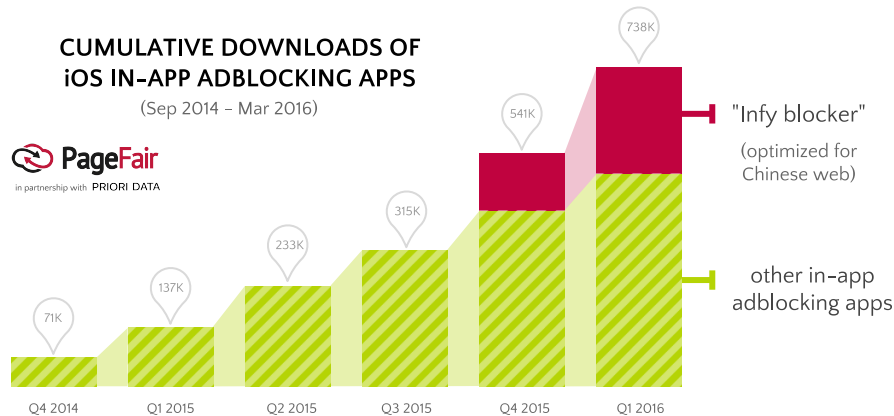


OPERA MINI FOR ANDROID ONBOARDING SCREEN

# In-app adblocking

Apps are now available to block third-party ads in other apps, such as Spotify, Apple News or CNN. These apps also block ads in any installed browsers.

- Most in-app adblocking apps operate with an HTTP Proxy which works only on wifi connections.
- Some in-app adblocking apps operate a VPN, which works on both wifi and cellular connections.
- In-app adblocking is available on both iOS and Android.
- Although in-app adblocking apps have previously been banned for violating Play Store policies, VPN-based adblocking apps are currently skirting these rules.



	AdBlock VPN	AdShaker HTTP Proxy	Block Infy HTTP Proxy	Weblock HTTP Proxy
Spotify	✓	✓	✓	✓
Apple News	✓	✓	✓	✓
CNN	✓	✓	✓	✓
Buzzfeed	✓	✓	✓	✓
Huffington Post	✓	✓	✓	✓
Color Switch	✓	✗	✓	✓
Google Chrome	✓	✓	✓	✓
Safari	✓	✓	✓	✓
Firefox	✓	✓	✓	✓
Facebook (in-app browser)	✓	✓	✓	✓

**iOS IN-APP ADBLOCKING APP EFFICACY**  
(tested by PageFair, February 2016)



# Adblocking in the West

Western economies are adopting mobile adblocking in different ways

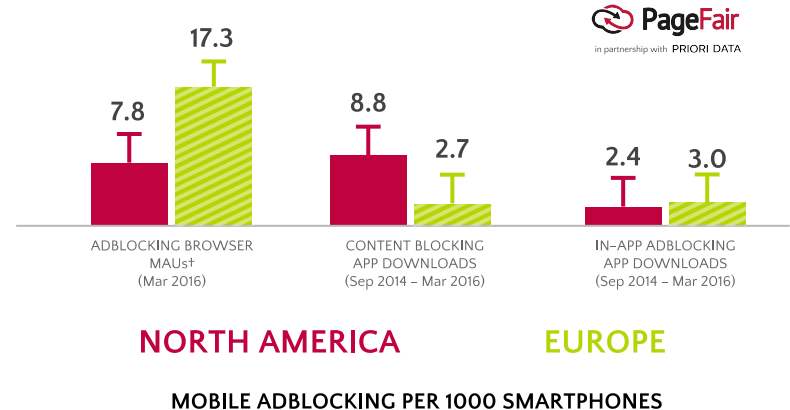
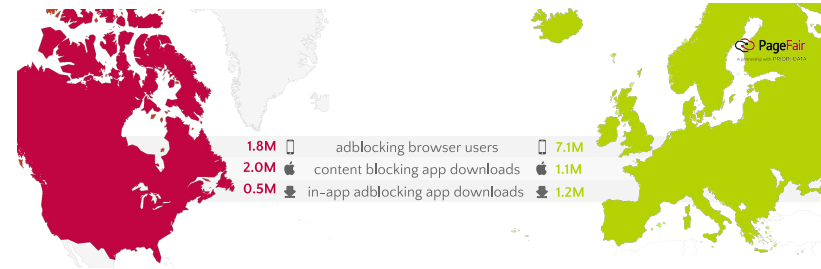
## Key findings

- Adblocking browsers are more than twice as popular in Europe than in North America, with over **17+** users per thousand smartphones.
- Content blocking apps are three times more popular in North America than in Europe, with nearly **9** users per thousand smartphones.
- Both North America and Europe have similarly low in-app adblocking app levels.

\*This data has been revised as of November 2016

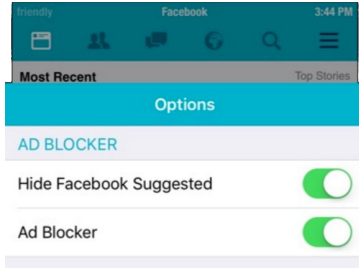
## Insight

The same adblocking technologies that are mainstream in emerging markets have relatively low adoption in western countries, likely due to more affordable mobile data costs in North America and Europe. Nonetheless, high rates of desktop adblocking in western countries indicate an appetite for adblocking, which may easily shift to mobile unless advertising practices change.

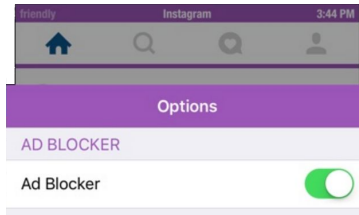


†This chart has been revised as of November 2016

# Case Study: Adblocking on Facebook



## ADBLOCKING FOR FACEBOOK



## ADBLOCKING FOR INSTAGRAM

Many publishers and investors hoped that advertising on Facebook and Instagram would be beyond the reach of adblocking. But these platforms are no longer immune.

In a development reminiscent of the “Instant Messenger Wars” of the early 2000s, alternative client apps are emerging that connect to multiple social networks, so you can enjoy all the content in one place, minus the ads.

The most popular example is *Friendly Social* on iOS by Friendly App Studio, which launched in 2010. The value proposition of *Friendly Social* is that users can connect multiple Facebook and Instagram accounts in one place and use less mobile data. However, for users who upgrade to the paid version, *Friendly* will display all the content with none of the ads, whether in-feed or on the mobile web.

When an app downloads in-feed advertising, the network traffic is usually indistinguishable from regular content and therefore impossible to reliably block. However, these ads are easily identified by the app that is doing the in-feed downloading, in this case *Friendly Social*.

There is room in the market for more apps to help people make sense of the plethora of social networks they use every day. If history repeats itself then these apps will compete for marketshare on their ability to simplify the user experience by aggregating social feeds and culling in-feed advertising. *Friendly* will soon be available for Android.

# The next billion adblockers

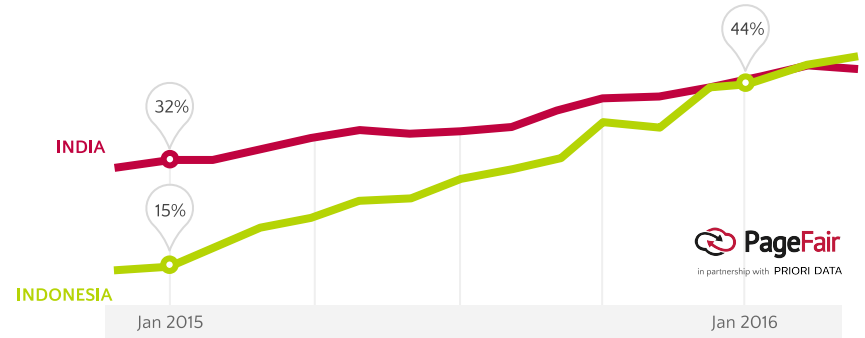
The next billion internet users will come online via low bandwidth, relatively expensive mobile connections. With readily-available mobile adblocking technologies, the next billion internet users may be invisible to digital marketers.

## Key findings

- Adblocking browsers almost command majority market share in India & Indonesia.
- ISP adblocking may emerge wherever net neutrality regulation does not prevent it. Digicel began adblocking for 10.8M mobile subscribers in the Caribbean in Sep 2015.

## Prediction

Adblocking browsers will continue to grow wherever data costs are high. Wireless carriers will follow Digicel's example to remain competitive and reduce costs for their subscribers. Unless the bandwidth cost of current advertising is addressed, the ad-funded digital media industry will never get a chance to flourish in many developing economies.



†This chart has been revised as of November 2016

## % SMARTPHONE POPULATION USING ADBLOCKING BROWSERS†



†This chart has been revised as of November 2016

## TOP COUNTRIES BY ADBLOCKING BROWSER USAGE†

(% smartphones on which adblocking browsers are installed)



# Responses from industry leaders



**Nancy Hill, CEO, 4A's**

*"This new report highlights something we've been discussing in the industry for a while now: consumers are pushing back on mobile and online ads. Now is the time for advertising professionals and marketers to take a hard look at ourselves to understand why consumers are not responding to these types of ads, and figure out how we can correct the issue to better engage with the consumers we're trying to reach."*



**Jason Kint, CEO, Digital Content Next**

*"This research only amplifies our concern in the rise of ad blocking across digital media. The perception that all ads can be blocked is quickly becoming reality as awareness grows. Any channel of consumption is at risk at this point. We believe an industry-wide focus on creating a better consumer experience for the blocked web should be the first and only priority."*



**Stephan Loerke, CEO, World Federation of Advertisers**

*"We have heard the message loud and clear: an increasing number of people aren't satisfied with the online ad experience, and they're voting with their feet. The ad industry needs to better understand what is driving them to opt for ad-blocking, and address the underlying issues head-on. Brand-owners are determined to take the lead."*



**Vincent Peyrègne, CEO, World Association of Newspapers and News Publishers.**

*"Mobile is now a major channel for news consumption, and is growing rapidly. Adblocking on mobile threatens this growth. We as an industry knowingly allowed bloated ads to run amok on news sites, packed with enough tracking software to annoy readers to ad nauseam, and causing a host of UX problems for users. We have to fix this."*

*continued...*

# Responses from industry leaders



**Frederic Filloux, Editor, The Monday Note**

*"PageFair's Mobile Adblocking Report is by far the most comprehensive and thorough research on the matter. For the first time, publishers get an invaluable dataset an analysis on the impact of adblockers on mobile – a burning issue for the industry."*



**Chris Llewellyn, CEO, International Federation of Periodical Publishers (FIPP)**

*"Adblocking is an exceptionally important issue facing all digital content creators. Blocking the ad blockers at the point of engagement with websites is an option in the short run, but in the long run the solution probably lies in advertising that moves away from clutter, from CPM-based selling, to premium solutions. To this end the media owners FIPP represents, and the advertisers and other stakeholders have a job to do to clean up the UX mess that led to this situation. FIPP hopes to play a user role in the journey to better."*



**David Chavern, CEO, Newspaper Association of America**

*"The public is not inherently hostile to advertising. There are magazines (like Vogue) and TV programs (like the Super Bowl), where people's primary interest is the ads. What people hate are bad ads. Digital advertising is still too derivative of print and TV advertising. We have no ad vocabulary that is optimized to the digital environment experience. People love Vine videos – so why are there no 7 second ads? We also measure digital ads by a metric – "impressions" – that has no real meaning or value. If we don't fix these problems, and we allow ad blockers to take over, then we will be left with small, subscription models that will exclude large portions of the public. Not being able to afford HBO is one thing. Not being able to afford quality news would be a much more serious problem."*

## ABOUT PAGEFAIR

PageFair helps the world's largest publishers to build revenue on the *blocked web*. The company's ad serving technology displays safe and respectful ads in a way that adblockers are unable to block.

PageFair's free analytics service is used by thousands of publishers and measures over 11 billion pageviews per month. It is the leading global authority on adblocking, issuing the most widely-cited reports on the topic over the last four years.

PageFair is also working with global stakeholders including publishers, consumer groups, advertisers, agencies, and browsers, to develop sustainable, pro-consumer approaches to the web.

Find out more at [pagefair.com](https://pagefair.com) and follow [@pagefair](https://twitter.com/pagefair).

## ABOUT PRIORI DATA

Priori Data is a Berlin-based app store intelligence company. It tracks apps in the Apple App Store and the Google Play store across more than 55 countries.

The company combines public app store data with transactional data shared by its app publisher partners to produce download and revenue estimates for every app. Priori Data currently counts over 12,000 partner apps.

Leading mobile app and gaming developers, investors, and advertisers rely on Priori Data for key metrics such as app revenue, downloads, and ranks on more than three million apps.

Find out more at [prioridata.com](https://prioridata.com) and follow [@prioridata](https://twitter.com/prioridata).

# Methodology & references

1. The number of global mobile adblockers combines the global active users of adblocking browsers in March 2016 (see point 5) and the number of Digicel's subscribers in the Caribbean (source: [Digicel](#)).
2. Determining the number of "Adblocking Apps" on the App and Google Play Stores represented a challenge because there is no umbrella app store category under which apps that adblock are grouped. The discovery and testing process for determining what these apps are and how they should be grouped was multi-stepped and time-intensive.
  - a. A list of keywords that are associated with adblocking or the functionality to block ads was made.
  - b. This list was used by Priori's Analysts to search both app names and descriptions in the iOS and Android app stores around the world for which Priori has data. This search produced a list of 5,151 apps.
  - c. A panel of testers manually searched these lists several times and extracted the apps that might be relevant to "adblocking" in a broad sense.
  - d. This list was then compared against app store searches, lists, blogs, articles, and websites, and services that document adblocking apps to make sure every relevant app was found and included in this list. Apps that did not make mention to adblocking in their name, description, or list of features but blocked ads as a byproduct of their functionality were not included in the list of applicable adblocking apps.
  - e. The relevant apps were then tested on mobile devices to confirm that they performed as they claimed, which further condensed the list.
3. Determining the classification of "Adblocking Apps" on the App Store and Google Play Store:
  - a. There was no umbrella category in either the App or Play Store under which "Adblocking Apps" were listed. Rather, our review and analysis found that "Adblocking Apps" spanned virtually every app store category.
  - b. After a list of apps that blocked ads was finalized, the apps were analyzed according to their function and placed into the following groups. These apps and groups were used throughout the analysis of this data.
    - i. Adblocking browsers (adblocking by default)
    - ii. Opt-in browser blocking (not adblocking by default, but possible by opting into adblocking) [note: these browsers either had adblocking built-in but not selected by default, or they had an extension store that has adblocking extensions available]
    - iii. Content blocking apps
    - iv. In-app adblocking apps
    - v. Single-app adblocking apps
4. The estimated number of smartphone users worldwide, by region, and by country was taken from eMarketer's smartphone estimates for 2014, 2015, and 2016 (source: eMarketer). Linear monthly growth was assumed and the number of smartphone users per month was adjusted at a constant rate between 2014 and 2016.
5. A monthly percent penetration of worldwide and country-specific mobile web browser usage for UC Browser from December 2014 - March 2016 was used throughout this report (source: [StatCounter](#)). These rates were recorded for the 43 countries for which eMarketer provided smartphone user estimates (source: eMarketer), and also for Pakistan (source: [The Express Tribune](#)).
6. The number of global monthly active users of adblocking browsers from December 2014-March 2016 was estimated by combining a number of sources:
  - a. Adjusted worldwide number of smartphone users for that month (source: eMarketer)
  - b. The percentage of Worldwide mobile browser traffic from UC Browser for that month (source: [StatCounter](#)), which was adjusted in version 2 to account for a reporting error.
  - c. The observed relationship between the monthly cumulative average downloads of UC Browser in all of its forms and the monthly cumulative average downloads of all adblocking browsers across Priori Data's markets, beginning in December 2014 and up to and including the month in question (source: Priori Data)
7. Country estimates of monthly active users of adblocking browsers were estimated by combining a number of sources:
  - a. The adjusted number of smartphone users for that month for the country in question (source: eMarketer), except Pakistan. The number of Pakistani smartphone users was estimated from July 2015-December 2016 using data from The Express Tribune (source: [The Express Tribune](#)), not eMarketer (due to Pakistani data not being available from eMarketer).
  - b. The percentage of mobile browser traffic from UC Browser for that month for the country in question (source: [StatCounter](#)), which was adjusted in version 2 to account for a reporting error.
  - c. The observed relationship between the monthly cumulative average downloads of UC Browser in all of its forms and the monthly cumulative average downloads of all adblocking browsers across Priori Data's markets, beginning in December 2014 and up to and including the month in question (source: Priori Data)
8. Regional monthly adblocking browser calculations:
  - a. The name for and regional grouping of countries follows eMarketer's regional grouping of countries (source: eMarketer).
  - b. Regional monthly adblocking browser share for March 2016 was calculated by determining the relationship between the number of adblocking browser users in that region in that month and the cumulative number of adblocking browser users in the 43 countries for which eMarketer provided smartphone user estimates in that month. This ratio was then applied to the worldwide estimate of adblocking browser users.
  - c. The percentage of smartphone users in Asia-Pacific who are actively using an adblocking browser for March 2016 was calculated by comparing the number of adblocking browser users in that month in Asia-Pacific to the number of smartphone users in Asia-Pacific in that month (source: eMarketer).

# Methodology & references (cont.)

9. Yearly growth for both worldwide and country-specific adblocking browser users was calculated by using the January 2016 and January 2015 figures for the region or country in question.
10. Download estimates for specific adblocking apps and/or groups of adblocking apps:
  - a. An estimate for the number of monthly downloads of various adblocking apps from September 2014- March 2016 was provided by Priori Data. Priori Data's estimation models rely on data from three different sources: publicly available app and publisher metadata and top charts from the app stores, as well as proprietary transactional data shared by its publisher partners. Using these inputs, the company performs multi-step statistical analyses to quantify the relationship between an app's daily installs and its top chart position in a given category/country for each day. The models are frequently updated in order to add features and effects as well as to account for changes in the app market for both platforms. These estimates are based on samples of apps in the App Store's 55 biggest and Google Play Store's 54 biggest markets, which covers roughly 90% of the global market.
  - b. The number of app downloads should not be confused with gross installs or active users of those apps or groups of apps. Apps can be downloaded and later removed or downloaded and never used. The information in this report that cites download data refers to download estimates only.
  - c. Daily app download counts were normalized into monthly app downloads.
  - d. Determining the "top 5 apps" in any given category used the cumulative number of downloads of those apps from September 2014-March 2016 (source: Priori Data)
11. In determining the maximum percentage of iPhone users in the United States who have downloaded a content blocking app, the following assumptions were made: (a) every download of a content blocking app is equal to one user, (b) only 64-bit iPhone models are capable of running content blocking apps, and (c) iOS 9 update rates are consistent across iPhone models.
  - a. For the purposes of this report, it is assumed that every download of a content blocking app is equal to one user. It is possible that one person may download more than one content blocking app. Additionally, downloads of content blocking apps do not equal current active users of those apps; an app can be downloaded and later removed or downloaded and never used. However, this specific calculation strives to estimate the maximum potential impact of content blocking app usage.
  - b. It is unclear how many content blocking-compatible iPhones are currently being used in the United States. Only certain iPhone models can run content blocking apps; these models must not only be iOS 9 compatible, but they also must be 64-bit devices (source: [Adblock Plus](#)). Based on this criteria, the following models are able to run content blocking apps: iPhone 5s, iPhone 6, iPhone 6 Plus, iPhone 6s, iPhone 6s Plus, and iPhone SE. A 2015 CIRP Report finds that by the end of December 2015, 110 million iPhones were in use in the United States (source: [CIRP](#)). Of these, approximately 101 million devices were from content blocking-compatible devices.
  - c. In order to run a content blocking app, a content blocking-compatible device must also have updated to iOS 9. As of April 18, 2016, the Apple Support Page for Developers claims that 84% of devices are using iOS 9 (source: [Apple](#)). In assuming that iOS 9 update rates are consistent across device types, this percentage is used to estimate the maximum number of content blocking-compatible devices that are running iOS 9 in the United States as of March 31, 2016.
12. Information about ASUS' 2016 projected smartphone sales were taken directly from pgs 14 and 26 of the company's Q4 2015 Investor Conference PDF found at ASUS' Investor Relations Website (source: [ASUS](#)). The number used in this report is for mobile, which includes phones and tablets, and according to the source, excludes the Chinese market.
13. Estimates about the number of users who will opt-in to blocking on mobile browsers where adblocking is possible (but not enabled by default) were calculated using several sources:
  - c. Proprietary information on the web traffic measured by PageFair on its network of publishers about the percentage of users from mobile browsers where adblocking is possible (but not enabled by default) who have enabled adblocking. This data reflects adblocking usage on sites using PageFair Analytics to monitor their adblocking levels. These sites are skewed towards publishers in Europe and North America (Source: PageFair).
  - d. The number of active users of Opera Mini for Android as of May 2016 (source: [Opera](#)).
  - e. The number of active users of Maxthon Browser as of Feb 2015 (source: [Maxthon](#)).
  - f. The number of Mobile Firefox Users on Android was estimated from StatCounter's worldwide traffic of mobile Firefox vs worldwide traffic of Opera Mini for March 2016 (source: [StatCounter](#)) and Opera Mini's stated active users of Opera Mini for Android as of May 2016 (source: [Opera](#)).
14. The effectiveness of iOS in-app adblocking apps was determined through a series of manual and non-exhaustive tests conducted in the United States and Ireland, across selected apps and on several iOS devices. These tests and their results should be taken as an indicator of the effectiveness of this category of adblocking in blocking in-app advertisements on mobile web browsers and in other apps.
15. Information about Digicel's network was taken from the F-1 form it published in advance of an IPO bid in September 2016 (source: [SEC](#)). Digicel claims that its "Ad control" service is available on its network without any activation required (source: [Digicel](#)).
16. Information about the "Instant Messenger Wars" of the early 2000's (source: [n+1](#))
17. Three's test of ISP adblocking will occur on June 13, 2016 in the UK for a 24 hour period (source: [Business Insider](#)). In February 2016, Three announced its collaboration with Shine Technologies to implement ISP adblocking in the UK and Italy, as well as its plan to roll the technology out to all other Three Group operators (source: [Three](#)).

# Acknowledgements

## **PageFair Team**

Special thanks to Matthew Cortland and Dr Johnny Ryan, and to Yulia Plaksina, Niall O'Sullivan, Daniel Levi, Donnchadh Ó Foghlú and James Cash for their research, analysis, and testing of apps. Thanks to all our colleagues for their support and thoughtful feedback.

## **Priori Data Team**

Thanks to Patrick Kane, Michelle Tran, Natasha Yarotskaya, Anders Lykke, Fabian Bruckschen, and Sunanda Garg for their partnership and assistance in the analysis and production of this report.

## **Industry Advisors and Partners**

Thanks to the many industry leaders who have freely given their time and expertise to help find a lasting solution to this industry-wide problem. We have been impressed by the intelligence, humility and honesty of so many people who have attended PageFair roundtables on adblocking.

## **eMarketer**

Thank you to eMarketer, who provided us with invaluable estimates on the number of smartphone users in countries across the world.

## **StatCounter**

Thank you to the StatCounter team, who generously make a wealth of internet analytics available for free, and who also gave their time to help us correctly understand their methodologies and interpret their data.