

An analysis of cross browser and cross device behaviours

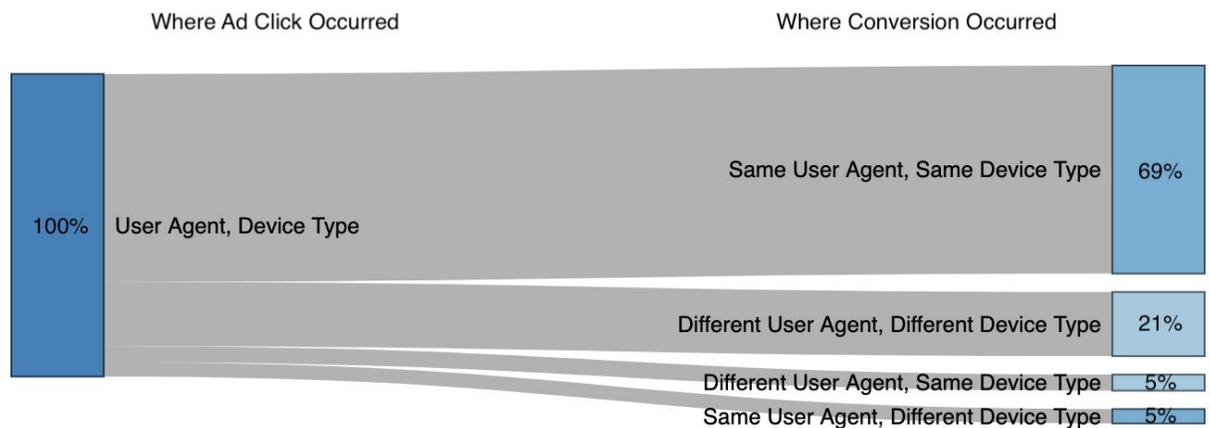
Context

This document was produced by Facebook to highlight the typical cross user agent (browser and app) and device behaviours that we see today. Our aim is to illustrate the importance and regularity with which users cross between browser, apps, and devices as part of their journey. This non-linear path delivers value to businesses based on the ideal outcomes for that business, such as purchases, new leads, mailing list sign ups, new subscriptions, etc.

7 day last click conversion paths

Our first visualisation shows the journey from “Last click user agent” to an event we consider to be a conversion, across various user agent and device combinations.

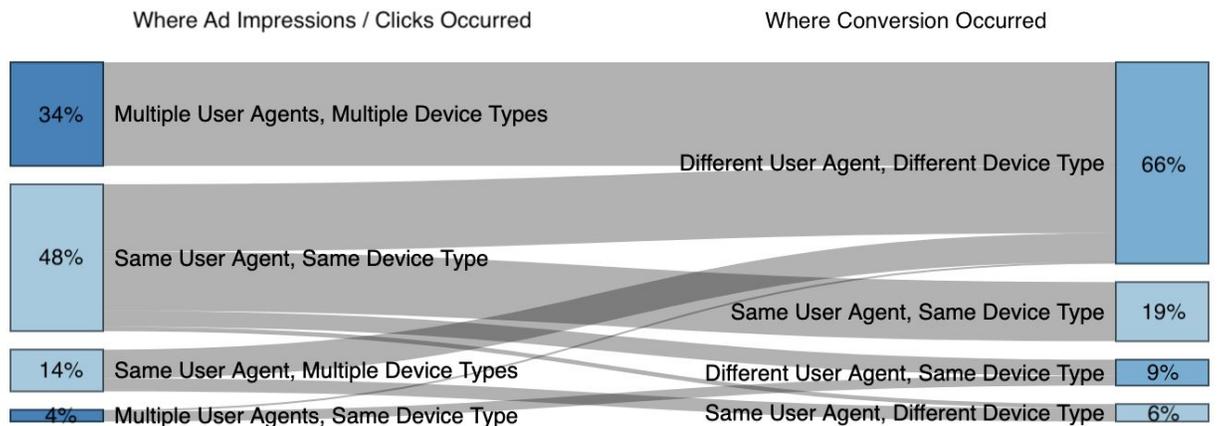
Takeaway: 70% of the time, we see the same user agent and same device type for the last click event and the point of conversion. **However**, the other 30% of the time, we see either a change in user agent, a change in device type, or both. The Safari and Chrome teams have proposed new, privacy-preserving ads measurement APIs. Both of these proposed APIs would only count same-device, same-user-agent click-through conversions. This means that they could result in a loss of approximately 30% of all attributed conversions.



30 day multi-touch impression and click conversion paths

Next, we broaden our scope to look at **all conversions** where the user had at least one impression from a related ad for a given business in the 30 days prior to the conversion. Since we consider **all ad events** for the past 30 day period, it is possible that a user has seen or interacted with ads on multiple devices and user agents, which is what the left hand side of this visualization shows

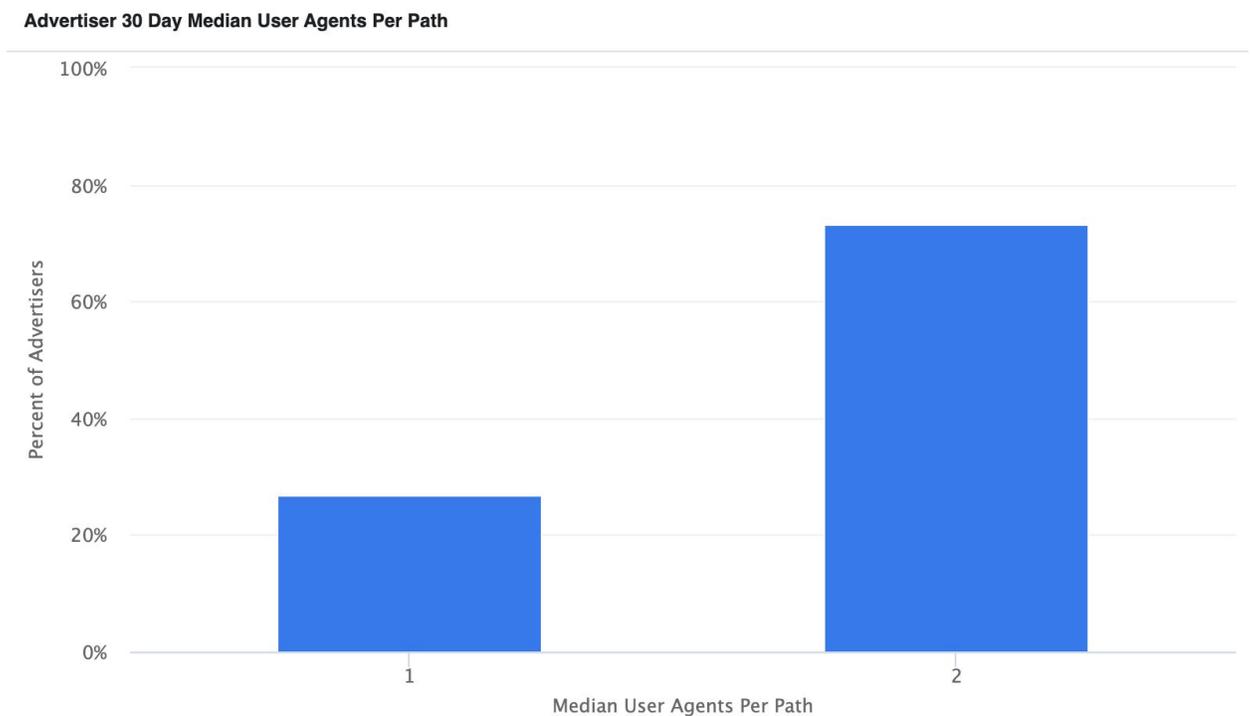
Takeaway: Cross user agent, cross device journey behaviour is the norm, with many of the “same user agent” or “same device type” starting points eventually leading to a journey across multiple user agents or devices. We see roughly 20% of journeys starting and ending on the same user agent and device that they started on.



Average number of user agents per 30 day path, by advertiser

This visualisation shows, from a sample of about 300 advertisers, the median number of user agents that are involved in a 30 day conversion path. Our measure of conversions is the same as above; **all conversions** where the user had at least one impression from a related ad for a given business in the 30 days prior to the conversion.

Takeaway: 75% of advertisers have a median of 2 user agents involved in user journeys resulting in a conversion. The other 25% of advertisers have a median of 1 user agent involved in journeys that result in a conversion.



Conclusion

Over a prolonged period of time (the likely amount of time that a user will take to consider a purchase), the number of user agents or devices involved in that conversion path are likely to be **more than one**. If we do not account for this as part of our measurement APIs, we are very likely to undercount conversions, which should be attributed to ads shown on other user agents or devices.

Appendix: How we calculated this data

We placed some rules in this data around what we'd treat as a "same user agent" or a "same device type". We outline here the various permutations that we considered, which are then referenced in the data outline in the rest of this document.

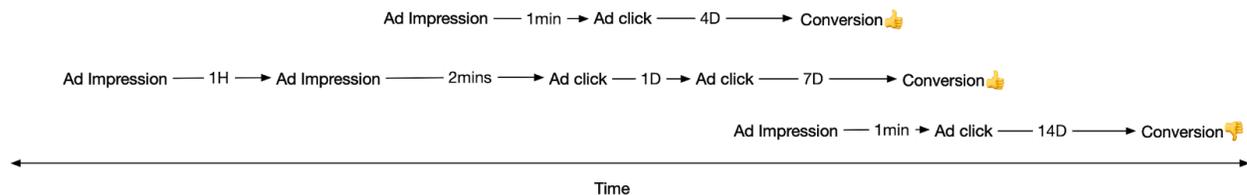
Ad impressions and clicks to conversions

In the data compiled in this report, we've included cross user agent / device data for a "7 day last click" attribution model. We do not believe this to be an ideal model to accurately reflect how users interact with digital advertising across web and app. However, it is considered by some to be an industry standard today and more closely aligns with the existing browser proposal APIs. Therefore we wanted to look at the data with that perspective in mind to demonstrate what we believe is a need for cross-user agent and cross-device support.

We calculated journeys for the following data sets based on a "start device" and "start user agent" and "end device" and "end user agent".

For 7 day last click, we will include data where conversions occurred within 7 days of the last ad click.

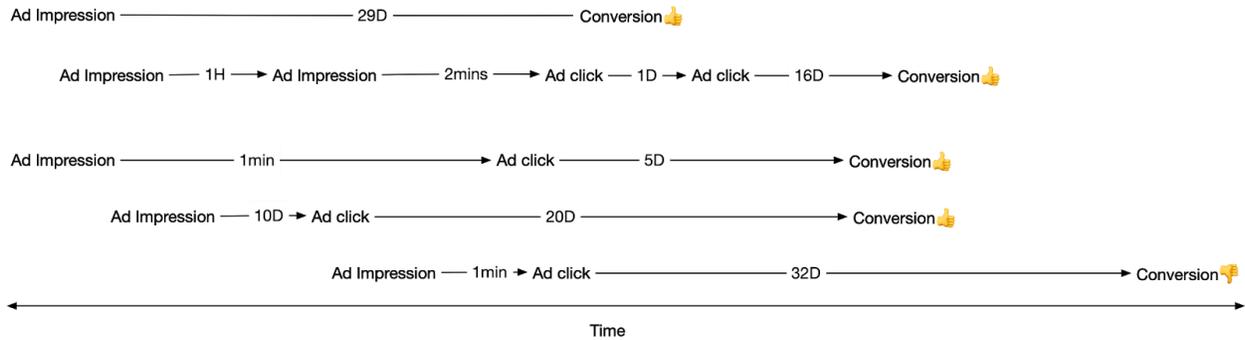
Illustrative examples of user journeys included in our 7 day last-click conversion paths data set



Many advertisers depend on multi-touch attribution in order to fairly credit upper funnel ad contributors for building intent to convert. Therefore, we also included cross browser / device data for full paths to demonstrate the other side of the spectrum for advertisers that depend on multi-touch attribution.

For 30 day multi-touch, we will include data where conversions occurred within 30 days of any ad click or impression.

Illustrative examples of user journeys included in our 30 day multi-touch impression and conversion paths data set



Same user agent

We consider a user agent to be the “same” **based on its user agent string**. We clustered together browsers based on vendors, so we consider “Chrome” and “Mobile Chrome” the same for this data set. We also cluster together our Facebook apps in this data, as ad impressions or clicks could happen within our app properties as well as on our website. The app properties (Facebook, Messenger, Instagram) are represented in the data as a single “user agent”. Below is a table that lists some examples of what could occur:

User agent where ad event occurred	User agent where conversion occurred	Result
“Safari”	“Safari”	“Same user agent”
“Safari”	“Mozilla”	“Cross user agent”
“Facebook app”	“Chrome”	“Cross user agent”

Same device type

We consider a device to be the “same” **based on a device type (iPhone, iPad, Android phone, Android Tablet, Computer) and user combination**. Below is a table that lists some examples of what could occur:

Device type where ad event occurred	Device type where conversion occurred	Result
“iPad”	“iPhone”	“Cross device type”
“Android phone”	“Android phone”	“Same device type”
“Computer (Windows)”	“Same Computer (Windows)”	“Same device type”
“Computer (Mac)”	“Computer (Windows)”	“Cross device type”

Combined

Looking at all of this together, we see various possible combinations:

User agent and device type where ad event occurred	User agent and device type where conversion occurred	Result
“Facebook app, iPad”	“Safari, iPhone”	“Cross user agent, Cross device”
“Chrome, Android phone”	“Chrome, Android phone”	“Same user agent, Same device type”
“Edge, Computer (Windows)”	“Chrome, Computer (Windows)”	“Cross user agent, Same device type”
“Safari, Computer (Mac)”	“Safari, iPhone”	“Same user agent, cross device type”
“Chrome, Computer (Mac)”	“Chrome, Computer (Mac)”	“Same user agent, same device type”

Webview based in-app web-page viewer

There are several different technological options available to mobile app developers who want to render a webpage. As an example, on the iOS platform, options include WKWebView and SFSafariViewController. In this section we will discuss how each of these options are treated in this data analysis. Let’s work through an example to explain this.

Imagine a user sees a natively rendered ad within the Facebook for iPhone app:

- They click on the ad and this opens up the website referenced in the ad within a WKWebView based in-app web-page viewer.
- In this case the developer has chosen to alter the WKWebView user agent to "MyCustomUserAgent"
- The user decides to not purchase there and then but instead will purchase later on using the same device, with the Safari mobile browser
- We would treat this journey as "same device type, cross user agent", since the "MyCustomUserAgent" string will not match the Safari user agent string

Imagine the same flow, but using the **SFSafariViewController** instead:

- They click on the ad and this opens up the website referenced in the ad within a SFSafariViewController based in-app web-page viewer.
- In this case, the developer cannot alter the user agent string and our data would see a "Safari" user agent string
- The user decides to not purchase there and then but instead will purchase later on using the same device, with the Safari mobile browser
- We would treat this journey as "same device type, same user agent"

We similarly treat the Android Webview and Custom Chrome Tabs as either "Same user agent" or "Cross user agent", based on matching user agent strings.

Putting this in tabular form:

User agent and device type where ad event occurred	User agent and device type where conversion occurred	Result
"Facebook app (WKWebView), iPad"	"Safari, iPad"	"Cross user agent, Same device type"
"Facebook app (SFSafariViewController), iPad"	"Safari, iPad"	"Same user agent, Same device type"
"Facebook app (WebView), Android phone"	"Chrome, Android phone"	"Cross user agent, Same device type"
"Facebook app (CCT), Android phone"	"Chrome, Android phone"	"Same user agent, Same device type"