

CMA MOBILE BROWSERS AND CLOUD GAMING MARKET INVESTIGATION

MOZILLA RESPONSE TO WORKING PAPER 7

August 2024

Introduction

Mozilla's response to the CMA's Working Paper 7 should be considered in conjunction with our responses to the other Working Papers. As noted in those responses, Mozilla commends the CMA for undertaking an in-depth analysis of competition in mobile browsers using its market investigation reference powers. Mozilla broadly supports the CMA's emerging findings and has highlighted in the Working Paper responses areas where we believe the CMA should focus particular attention.

Cross-cutting considerations

Barriers to competition in mobile browsers are both long-standing and deep-rooted. Moreover, previous interventions to improve browser competition in various jurisdictions have, in Mozilla's experience, largely fallen short.¹ As such, it is essential that any remedies are designed to address the range of adverse effects of competition and the consequent impact on people's habits and expectations.

In respect of the CMA's cross-cutting considerations, we would note the following:

Remedies should initially be implemented using the CMA's market investigation powers

The CMA has requested views on whether it should make a recommendation to the CMA Board to use the powers available under the Digital Markets Competition and Consumer Act 2024 (DMCC Act) to implement any remedies arising from the Market Investigation. Mozilla strongly believes that the CMA should continue with its market investigation powers under the Enterprise Act 2002 to require remedies. A crucial cross-cutting factor is the timeliness of any measures designed to remedy adverse effects on competition (AECs) in mobile browsers. As demonstrated by the detailed emerging findings of Working Papers 1 to 5, there are a range of features of iOS and Android which limit browser competition and choice for UK consumers. Many of these elements have been present since the introduction of these operating systems resulting in long term harm. The need to act swiftly is therefore clear.

¹ See, for example, Mozilla's report: [Can browser choice screens be effective?](#), page 18

Mozilla has long supported the introduction of ex ante digital competition regulation in the UK.² We have also supported the steps the CMA has taken to prepare for the regime, including providing detailed comments on the CMA's draft guidance.³ In the medium and long term, the new digital markets regime has the potential to be revolutionary in spurring competition and innovation in digital markets for UK consumers.

The CMA's powers under the DMCC Act regime should play an important future role in the monitoring of enforcement of remedies arising from the Market Investigation. But it should not delay the implementation of remedies under the Market Investigation. As noted in Working Paper 3: "*Any delay in extending functionalities can be significant because even a small-time advantage for Safari can have an impact on competitiveness of third-party browsers*". This consideration applies across the issues identified in the CMA's emerging thinking.

Accordingly, Mozilla considers that the CMA should implement remedies under its Enterprise Act 2002 powers and then transition remedies (including considering any improvements and enhancements) to the DMCC Act regime once the relevant designations have been made.

In particular, Mozilla notes the potential delay if the CMA 'waits' to use powers under the DMCC Act:

- Under the current markets regime, the final design and implementation of remedies would likely be early 2025. In contrast, there is not yet a set date for the DMCC Act to come into force and, even once it does:
 - There would likely be a minimum nine month delay until the relevant digital activity can be designated and conduct requirements set.
 - Mozilla's understanding is that a PCI investigation (the remedies for which are effectively the same as the remedies available under the markets regime) would only commence after an SMS designation, adding further delay.
- Although appeals under the new regime are non-suspensory, the Digital Market Unit's powers are untested and there is a risk that they are challenged which, again, may lead to further delay before an already established AEC can be remedied effectively and with certainty.

Measures taken in other jurisdictions

The CMA has rightly taken into account measures taken in other jurisdictions, namely the EU's Digital Markets Act (DMA). Mozilla considers this an important element of designing any remedy under the Market Investigation. However, it is important that the CMA is not tied to, or limited by, measures put forward by Google and Apple in other jurisdictions.

² See, for example:

<https://blog.mozilla.org/netpolicy/2022/02/07/uk-cmas-mobile-ecosystems-report-is-a-step-toward-improving-choice-for-consumers-swift-independent-enforcement-is-still-necessary/>; and <https://blog.mozilla.org/netpolicy/2024/04/26/dmcc-uk-support/>

³

The Digital Markets Act, like the UK's own DMCC Act, has its specificities which reflect many factors in the EU, including the legislative process and the structure of the regulation. The same will be true for digital competition laws and regulations which are currently being proposed in other jurisdictions. Compliance proposals put forward by regulated platforms will represent the precise requirements and enforcement of those regulations and not necessarily what is possible or what would be an optimal intervention given the objectives.

Accordingly, we consider the CMA's approach in Working Paper 7 to the policies announced by Google and Apple to comply with the DMA to be appropriate: they should be taken into account but should not limit the scope of remedies.

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Importance of specifying the remedies at the appropriate level of detail

As the CMA rightly notes, requirements relating to access to technical functionality must be set at the right level. If they are too prescriptive they may be easily circumvented or quickly become out of date; alternatively, if requirements are too high level they may be difficult to monitor and enforce, particularly given information asymmetries between the CMA/the access seeker and the platform.

In Mozilla's experience, the risk of the high level remedies is greater. While prescriptive remedies can be updated and modified, requirements which are too high level risk never meeting their objectives. Some flexibility will always be necessary to take into account the specificities of different products (see section 2 below, for example). Nevertheless, with high level remedies, the burden tends to fall on the challenger firm seeking to provide choice and competition to demonstrate why particular proposals from dominant platforms are unworkable.

The complex nature of browsers and browser engines means that it may not always be clear whether measures put forward by Apple and Google to address AECs are reasonable and effective. As a guiding principle for any remedies arising from the Market Investigation, Apple and Google should be required to demonstrate:

- i. how the measures put in place comply with the CMA's requirements;
- ii. how the measures put in place meet the relevant objectives and/or remedy the AECs; and
- iii. precisely how third parties and/or consumers can take advantage of the measures put in place.

If, for example, no third parties have opted to interoperate with features/functionality newly offered, or if user selection of alternatives is relatively low, the burden should be on the gatekeeper to improve the measures put in place and to do so swiftly. Delay in making remedies workable leads to persistent AECs and continued resulting harm to competition and consumers.

Testing and trialling user choice remedies

As noted in previous submissions, Mozilla strongly supports the use of in-depth user research to inform policy interventions. We have sought to provide research that assists legislators, policy-makers and regulators to optimise interventions by enhancing understanding of user behaviour and impact.⁴ Mozilla therefore welcomes the CMA's focus on "testing and trialling" in the context of remedies. Technology companies of all sizes use various forms of user research for their products and services; it is critical that policy and regulatory interventions in digital markets are also based on sound research and understanding of consumer behaviour. The user research commissioned by the CMA in the context of the Market Investigation is therefore encouraging and a solid base on which to build.

While specifically mentioned for "certain user-choice based remedies" we suggest that this theme of "testing and trialling" is even more broadly relevant than suggested in Working Paper 7. As noted in paragraph 3.29, "[m]any or all of the potential remedy options would be highly technical and may require ongoing monitoring and possible iteration."

A package of remedies will be necessary

The CMA is rightly considering whether a package of measures may be needed to address certain features giving rise to AECs. Mozilla's experience aligns with that of the CMA: multiple approaches may be necessary to comprehensively remedy a single issue. This is particularly the case given the consumer habituation and expectations which have been created over many years.

We would also underline the importance of taking into account the interactions between different proposed remedies. For example, Working Paper 3 considers limitations in relation to web apps, while Working Paper 2 and remedies A1 to A3 consider the WebKit restriction on iOS. One important interaction between these two issues is to ensure web app functionality on iOS should extend to allowing third party browsers to install and manage web apps using an alternative browser engine.

A. Issue 1: the WebKit restriction and Issue 2: access to WebKit and Blink functionality

Mozilla's response to Working Paper 2 sets out our response to the CMA's findings in relation to Issue 1. We do not repeat those points here but we welcome the CMA's investigation of potential remedies to correct the harm sustained by browser vendors, including that browser vendors:

- cannot use their own browser engines on iOS and iPadOS and the consequent impact on improvements and differentiation;
- must develop and maintain an additional version of their browser (based on WebKit) and the consequent additional costs; and

⁴ <https://research.mozilla.org/browser-competition/>

- must engage with Apple to fix browser engine issues or request new features and Apple's responses can be slow/non-existent.

In terms of the remedy options A1 to A3 proposed by the CMA, Mozilla considers that although each has advantages and drawbacks, A2 is most likely to effectively address the issues highlighted by the CMA.

Remedy A1 proposes a high level requirement that Apple grants access to iOS to alternative browser engines. It would not specify the level of access. This also means that it would not address Issue 2 in respect of WebKit. While remedy A1 could work in principle, it would need far greater specification to be effective in practice. Mozilla considers that it comes with significant risk that it is too vague and may leave too much uncertainty, undermining effectiveness. Simply granting access does not mean that access would be available on terms which create a level playing field or sufficiently incentivise third party developers to overcome barriers imposed which may make development commercially and technically unviable.

Remedy A3 would require Apple to grant equivalent access to APIs used by WebKit and Safari. This remedy would apply to existing and future iOS APIs and require them to be made public such that other browser vendors could access them. The simplicity of such a remedy belies its ineffectiveness. While it may be sufficient for other browsers which are based on Webkit (and should be implemented in the context of Issue 2), it is unlikely to be technically sufficient for alternative browser engines. given the complexity and breadth of engines and the browsers built on top of them.

Remedy A2 is therefore preferable since it recognises that there are multiple routes to allowing access to alternative browser engines. It also makes it possible to account for differences in products.

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In relation to Issue 2, Mozilla supports the principles and the goals of these remedies, namely ensuring access to current and new functionality and timely access. These are critical drags on competition and innovation in mobile browsers that the CMA rightly seeks to address.

As noted above, we consider that equivalent access to Android APIs used by Chrome to be a workable remedy. The CMA should also consider whether other functionality beyond that available to Chrome may also facilitate choice and user switching. For example, there is currently no process for importing browser data on either iOS or Android; this is not surprising since Safari is pre-installed and set to default on iPhones and iPads and Chrome is often in the same position on Android.

Similarly, for WebKit-based browsers on iOS, such as the current version of Firefox, Apple should grant equivalent access to APIs. Mozilla recognises that in some limited cases this may have security or privacy implications. There should be transparency relating to: (i) the APIs and

functionality to which Safari has access; (ii) the APIs and functionality to which Apple grants access to other WebKit browsers; and (iii) the specific reasons for withholding access to any APIs or functionality available to Safari.

B. Issues 3, 4 and 6: in-app browsers

As noted in Working Paper 4, in-app browsers (IABs) on iOS are locked to SFSafariViewController, meaning that - where a user has selected a browser which is not Safari - they are not able to open a remote tab IAB in their default browser. Not only do users have limited control and no choice over the IAB, but browser vendors miss out on the benefits of providing remote tab IABs. From Mozilla's perspective, this means that Firefox users do not benefit from the experience for which they have selected Firefox as their default. It also means that less time is spent using Firefox - which itself has several consequences (as set out in our response to Working Paper 4).

In order to address this issue, remedy B1 would require Apple to enable remote tab IABs for WebKit-based browsers. Remedy B2 would require Apple to enable remote tab IABs for browsers providing alternative browser engines.

Mozilla considers that B1 and B2 are complementary remedies. Enabling remote tab IABs for both WebKit-based browsers and those based on alternative engines would enable iOS users to benefit more fully from browser choice. Remedy B2 could be considered as part of remedy A2 and, as such, privacy and security considerations could be addressed as part of the wider process of facilitating access for alternative browser engines on iOS.

Mozilla welcomes the CMA's focus on user choice and control over IABs and its exploration of a range of measures to address this issue from the perspective of iOS and Android users.

Remedy B4 would require Apple and Google to implement remote tab IABs from the default browser. This remedy would be complementary to B1 and B2 which consider the supply of IABs and ensure that browser vendors are able to provide remote tab IABs. It would also leave app developers with discretion to change which browser is used for in-app browsing if needed.

Requiring Apple and Google to implement IABs from the default browser would ensure that users' default browser selection is respected. In our research experience, people typically have low awareness and comprehension of which browser might be called upon for in-app browsing. This is supported by the Verian research commissioned by the CMA which found low user awareness or understanding of in-app browsers. Accordingly, it is reasonable for users to assume that links will open with the pre-installed default if it has not been changed, or with the chosen default if a user has made this choice. Using the pre-installed default browser when a user has made an explicit choice to set an alternative default does not respect user choice and does not align with user expectations.

In general, Mozilla considers that information remedies are a necessary element to address not only the harm to browser competition which has occurred in mobile ecosystems, but also the

impact on user expectations and habituation created by a lack of choice over many years. As such, we support remedies such as B5 which aim to increase user awareness and understanding. B5 in particular would require an information screen for third party content in an IAB and/or require a different in-app browsing interface. In either scenario, the precise remedy would need to be carefully crafted and thoroughly tested to ensure it did not create unnecessary friction or confusion.

Remedy B6 would require Apple and Google to provide users with an option to opt-out of in-app browsers via a setting at the device level. This remedy appears to be more interventionist than B4 and B5 and, in Mozilla's view, may present greater risk of unintended consequences. While confers greater choice to users, it could also create breakages or a poorer user experience in some scenarios, such as removing the ability for app developers to have some necessary in-app browsing content like help pages.

C. Issues 7 and 8: choice architecture

Overarching considerations for choice architecture remedies

The CMA rightly recognises the importance of testing and trialling remedies: *“Therefore, some choice architecture remedies (eg choice screens and/ or prompts) would benefit from some form of testing and trialling to ensure that these remedies are effective and minimise unintended consequences.”* As noted in Section A above, Mozilla considers this an important principle for any remedies implemented by the CMA in mobile browsers. It is particularly suited to choice remedies, such as choice screens and prompts, as noted by the CMA. However, we would highlight that trialling and testing can also be relevant for optimising remedies related to settings and other user experience/user interface changes.

The CMA has previously undertaken excellent work in the field of choice architecture.⁵ All three principles for all choice architecture remedies represent an important starting point. However, in Mozilla's view, they may benefit from including some additional considerations and, in some cases, more specificity to ensure that they achieve their objectives:

- **“Targeted** - presenting choices to users at the right place, at the right time, with the right frequency.”
 - Mozilla supports the call for firms to identify *“suitable points for the choice to be presented.”* However, this principle could benefit from more detail around what is meant by *“suitable”* and the methods appropriate to ensure people are *“most likely to engage.”* For example, previous and current browser choice screens in the EU have been presented as a pop-up when people open the pre-installed default browser. Requiring a forced choice at this moment would show high engagement, but we know from our experience with and research on choice screens that interrupting people in the middle of a browser task and asking them

⁵ <https://www.gov.uk/government/publications/online-choice-architecture-how-digital-design-can-harm-competition-and-consumers>

to consider choosing a new browser is not an optimal time to expect people to make a thoughtful choice. We believe choice interventions should be presented in contexts that align with consumer expectations and do not interrupt an in-process workflow. Such interventions are also more likely to increase the quality of engagement.

- While one-time interventions are important, the CMA rightly does not overly focus on a single choice moment: *“Users can learn from previous experience (including mistakes) and their preferences can also change over time. It is important that firms give users the opportunity to make choices more than once, which can help them learn but also let them change without encountering difficulty whenever they choose. However, asking users too often can overwhelm them and lead to poor decisions.”* Mozilla would also encourage the exploration of remedies that could complement browser choice screens. We believe browser choice interventions should make it easy for people to explore alternatives and manage defaults beyond a single browser choice intervention moment. For example, choice remedies could be coupled with a dedicated section in both general settings and the Play or App Stores for reviewing and updating defaults. (See some of Mozilla’s concept research on these ideas⁶.)
- **Understandable:** *“giving choices that users understand.”* This is a necessary element of an effective choice architecture remedy. Mozilla would also recommend that user comprehension is verified through testing.
- **Balanced:** *“giving users autonomy and minimising unjustified friction where possible.”* The CMA has done an impressive job articulating aspects of online choice architecture and how these practices can impact user choice. It is clear that operating system providers can and have used unjustified friction to undermine user choice, including in the design of previous remedies. Mozilla therefore believes that these principles should call for eliminating “unjustified friction”, rather than simply minimising it.

The CMA has also requested input on the importance of alignment with existing regulation, such as the DMA when considering choice architecture practices. In Mozilla’s opinion, aligning for the sake of ensuring consistency would not only undermine the effectiveness of some remedies but would also risk missing an opportunity to address mobile browsing AECs for UK consumers. As noted above, compliance measures under the DMA should be taken into account, but should not limit the scope of remedies. The CMA should therefore take the opportunity to learn from the experiences of business users and consumers under the DMA and ensure that any remedies implemented under the Market Investigation and the DMCC Act build on and, where possible, improve on those already implemented.

Response to remedies C1 to C9

[redacted]

⁶ <https://research.mozilla.org/browser-competition/remedyconcepts/>

Mozilla agrees that remedy C1 of increasing the number of browsers that users have pre-installed on their devices may increase both user awareness of alternative browsers and influence users' choice of which browser to use. It would also remove obstacles (both behavioural and user friction related) to downloading alternative browsers. However, as noted by the CMA, important details about the implementation of this remedy would need to be carefully considered including which browsers are pre-installed, how they are selected, where they are placed in the user interface etc.

Many of the remedies put forward by the CMA in section C are complementary. This is also the case for option C2 (implementing browser choice screens at the point of device set-up). If properly implemented it would result in users making an active choice and increase the visibility of third-party browser alternatives. Although Mozilla's experience with browser choice screen remedies has historically been that they have not been effective, Mozilla's recent experiment on browser choice screens demonstrated that presenting choice screens at device set-up (vs. at first use of the browser) could increase browser contestability and aligns with people's preferences.⁷ However, the precise design, timing, and information provided are (among others) important factors in determining their effectiveness.

Remedy C5 (a requirement for Apple and Google to ensure the use of browser choice screen(s) *after device set-up*) may also help all users make an active choice about their browser. Given the experiences and research noted above, Mozilla believes that prompting people with a browser choice screen at/after major software updates would be a natural moment for consideration. This may allow for higher quality user engagement with a choice screen by avoiding interrupting a browser task.

An important factor in the (in)effectiveness of browser choice screen remedies is the impact of the user selection and how that is subsequently reflected in the user interface. Mozilla agrees that remedy C3, mandating that Apple on iOS and Google on Android always place the browser selected by the user in the 'dock' or 'hot seat' at device set-up, supports users' active choice of a default browser.

When a browser is downloaded and set to default, the app is typically placed on the final page. A browser's placement is highly likely to influence its usage. The Verian research found that: "*Whether users moved the position of apps depended on how organised and digitally confident they were.*" Where a user expresses a preference for a browser via a choice screen, the selected browser should be placed in the "hot seat." Placing the default browser on the final page while the pre-installed option remains in the "hot seat" is likely to lead to the user unintentionally using the pre-installed option and is likely to reduce usage of the browser they have actively selected.

We agree that any package of choice architecture remedies must include C6: A requirement for Apple and Google to make adaptations to the user journey for changing the default browser. It is

⁷ <https://research.mozilla.org/browser-competition/choicescreen/>

vital that not only do people have opportunities to overcome pre-installation through remedies such as C1, C2 and C5, but also that they have easily accessible ways to manage and change their settings.

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Based on our research, we believe it is essential that this remedy supports a single centralised location in the settings for changing default browser and that the same operating system user journey should apply across browsers. In addition, while we agree that a long user journey to change default settings is likely to be a barrier, regardless of “how intuitive and well-signposted” that journey is, we do not think the number steps is the only important factor in default settings friction. The complexity of those steps and harmful design patterns throughout the journey are also significant factors. A well-considered remedy C6 must take into account all of these considerations.

The ability for browser vendors to understand whether their browser is set to default is critical, to understand and optimise usage of the browser and to ensure that users are given relevant information. Remedy C7 (requirement for Apple and Google to share user data on default browsers settings with browser vendors) is therefore important and an issue Mozilla has previously detailed in our Platform Tilt repository.⁸ The lack of visibility into whether Firefox is set as default has significantly hindered our understanding of how many people are using Firefox and our ability to target the right users, at the right time, with the right information.

Mozilla supports remedy C8 in principle. A requirement for Apple and Google to ensure that the frequency of default browser prompts and notifications is limited (rather than denied altogether) would ensure that they were not able to use their position as operating system providers to undermine user choice for alternative browsers. It would also generally help to reduce the risk of overburdening or annoying consumers with too many prompts and would remove risks previously cited by Apple to justify blocking the ability of alternative browsers to prompt for default selection.⁹

Remedy C9 would require Apple and Google to allow users to uninstall Safari on iOS and Chrome on Android. Operating system providers should respect users' choices and allow them to delete browsers they are not using. The Verian survey found that 47% of respondents said that storage capacity/memory were important factors when they selected a smartphone. It is further noted in Working Paper 5 that “*Not being able to uninstall an existing browser app may deter users from installing additional browsers onto their device. For example, users may not want to have multiple browser apps serving the same purpose or they may have concerns about memory restrictions due to the space taken up by a browser app they cannot uninstall.*” This is therefore an important customisation tool which can help to facilitate user choice.

⁸ <https://mozilla.github.io/platform-tilt/>

⁹ See, for example, Apple’s response to Working Papers 1 to 5, paragraph 206