CMA Mobile Browsers and Cloud Gaming Market Investigation
Working Paper 4 - Meta Response
Submitted 2 August 2024

1. Introduction

1.1. This submission provides Meta's views and feedback on the Competition and Markets Authority's (**CMA**) Working Paper 4 (**WP4**) in the context of its Mobile Browsers and Cloud Gaming Market Investigation (**MBCG Market Investigation**). WP4 focuses on in-app browsing within the iOS and Android mobile ecosystems.

1.2. In this submission, Meta seeks to (i) provide specific feedback on the findings of WP4 in order to assist the CMA's ongoing Investigation, and (ii) provide further evidence on the vital role of in-app browsers (**IABs**) in stimulating browser competition. Meta's overarching concerns with WP4 can be summarized as follows.

1.3. First, within a mobile browser landscape dominated by incumbents like Apple and Google, IABs (and particularly IABs employing custom browser engines) represent a vital source of dynamic competition. This is clear from evidence [REDACTED] on innovations [REDACTED] [Meta] has brought to the market with its IAB on Android, which have spurred responses from dedicated browsers that have benefited consumers. WP4 gives little weight to such dynamic competition (when it should be central to its assessment of the importance of IABs to browser competition on iOS).

1.4. Second, WP4 includes various submissions from third parties which inform the CMA's emerging thinking in this area. Much of that material is not credible and, in Meta's view, is outweighed by strong evidence. For example:

(a) WP4 features statements that IABs may present higher security and privacy risks relative to dedicated browsers. Meta has shown that this is wrong in the case of its IAB (and likely many others), and much of the supporting material provided in WP4 is not credible;

(b) WP4 references claims that IABs offer an inferior user experience relative to dedicated browsers. These claims are incorrect. First, claims that IABs, relative to dedicated browsers, cause websites to load improperly are largely unsubstantiated, and app developers have every incentive to create apps that load websites properly. Second, to the extent there are functionality differences between IABs and dedicated browsers, they are often the consequences of platform policies, not the consequences of any decisions that app/IAB developers have made. To the extent these unsubstantiated claims would lead the CMA to discount the importance of IABs for dynamic competition in mobile browsers generally, that would not be in the interest of consumers;

(c) WP4 cites claims that there is low developer interest in building custom engine IABs on iOS. Some developers, notably Meta, have demonstrated substantial interest, and Meta does not believe it would be consistent with the CMA's guidance in other areas to dismiss the importance of individual competitors in dynamic markets. For example, in a mergers context, the CMA would stringently assess whether the

acquisition of a single firm could lead to a substantial lessening of competition (SLC) from a loss of dynamic competition.[1]

(d) The submissions reflected in WP4 suggest that remote tab IABs carry fewer risks than other IABs (including custom engine IABs). To the extent the CMA is contemplating requiring app developers to implement or support implementation of remote tabs, this would: (i) cause significant technical difficulties for third party developers to implement remote tabs within their apps; and (ii) tend to reinforce the incumbent strength of dedicated browsers like Safari and Chrome.

(e) [REDACTED].

1.5. We hope this submission is helpful and, as ever, we would welcome the opportunity to provide further clarifications on any point or to support the CMA further in its Market Investigation.

Note on terminology and categories of browsers

1.6. In this submission, Meta uses the terminology of IABs and dedicated browsers, in keeping with the terms adopted by WP4. However, Meta notes that in reality there are no well-defined boundaries that separate various categories of browsers. iOS and Android host a wide variety of native apps that enable users to interact with web content, including third-party web content. These apps compete with and complement each other in complex and evolving ways. WP4 attempts to define some criteria that distinguish IABs from dedicated browsers - for example, stating that IABs "*generally do not have a URL bar or a search function, cannot access browsing history or sync it with the user's history on a standalone browser, and do not have password saving features or tabs.*"[2] However, these are artificial distinctions which occlude the porous boundary between different types of browsers. It is telling that Meta's IAB already offers some of these features and is exploring others.

1.7. Browsers, regardless of their classifications, employ many of the same technologies, offer many of the same user benefits, and present a similar risk profile. As such, rules should not distinguish between different sub-types of browsers, as this would result in inefficient regulatory arbitrage (as developers modify features to meet a certain category 'definition' and attain favored status) and potentially hamper competition (by discouraging product differentiation and innovation that might lead a product to lose favored status).

2. IABs provide real consumer benefits and are an important dynamic force in browser competition

2.1. Throughout this Market Investigation, Meta has sought to help the CMA by explaining the significant user benefits that IABs offer (particularly those employing custom browser engines). This is important because: (a) it should be central to any assessment of remedial action in these areas (for example, in the context of Apple's restrictions on IABs on iOS); and (b) to the extent that the CMA receives submissions on alleged risks or weaknesses of IABs from certain parties, it is critical that the CMA appropriately weigh those risks against the demonstrable benefits of IABs, so that it can reach conclusions that are in the interests of consumers.

[1] See CMA 129, *Merger Assessment Guidelines*, Section 5.
[2] WP4, para. 3.14.

Key user advantages of IABs

2.2. As Meta has outlined in previous submissions, IABs can provide users with a significantly improved browsing experience, both by enabling them to seamlessly execute tasks arising from content they were engaging with on an app, and by improving the security and stability of their browsing experience. This enhanced browser experience is achieved, in many instances, through features which dedicated browser providers may be unable to develop or uninterested in developing.[3]

2.3. Benefits of IABs across the board include:

2.3.1. Improved user security. For example, through protection from [REDACTED].

2.3.2. Improved convenience. IABs enable app developers to support a number of functionalities which improve user experience. For example, Meta is able to offer users who choose to enable Facebook Pay the option to 'autofill' form fields on websites with credit card information and payment addresses they have previously provided to Facebook. This leads to a smoother, faster and therefore ultimately more convenient experience for the user.

2.3.3. Innovative combinations of web and native content. Through IABs Meta is able to introduce innovative app features that combine third-party web content with native app content. For example, Meta has introduced Watch and Browse (which combines web content with natively rendered video) and Instant Articles (a feature that allows publishers to create fast and interactive articles on Facebook).

2.3.4. Improved cookie storage capabilities (including when multiple users are logged into the app at the same time) and cookie persistence. These improved capabilities have a positive impact on user experience (see paragraph 3.11.3).

2.4. Enabling IABs to have custom browser engines has had real benefits, demonstrated by Meta's own IAB [REDACTED].

2.4.1. Meta's custom browser engine IAB is a more stable browser. It is smoother to use, and there are fewer instances of it crashing.[4]

2.4.2. Meta's custom browser engine IAB is able to load web pages more quickly. As a result of sitting within the Facebook app, the browser engine can now begin to initialize earlier on after the user taps a relevant link, and therefore can begin fetching resources more quickly.[5] As explained at paragraph 2.9, [REDACTED].

2.4.3. Improvements in browser stability and page-load times have allowed users of Meta's apps to more easily complete actions of interest and importance to them. [REDACTED].[6]

2.4.4. Increased ability to identify and resolve bugs that have historically reduced the stability of in-app browsing. For example, when Meta's IAB was based on the

[3] For example, [REDACTED].
[4] For example, [REDACTED].
[5] Meta's experimental data indicate that this feature has effectively reduced page-load time by [REDACTED]%.
[6] For example, [REDACTED]. Likewise, [REDACTED]. These data provide evidence of an enhanced user experience and of improved outcomes for businesses and advertisers.

Android System WebView, Meta was aware that a small percentage of its users experienced render crashes when using the IAB, but was unable to take action to remediate the issue. Meta's custom browser engine has allowed Meta to investigate and fix issues such as this one; when Meta ships the browser engine, it is able to understand how bugs map to the underlying source code.[7]

2.4.5. Meta has narrowed the gap between system browsers and IABs through its custom browser engine IAB on Android. Meta has been able to build support for the Web Share API into its IAB and integrate that API with the native Facebook sharing experience. [REDACTED].

2.4.6. [REDACTED].

2.5. These are real, sustained and tangible consumer benefits, and should profoundly color the CMA's assessment of IABs in the context of browser competition. Unfortunately, WP4 appears to assign little weight to evidence of the positive impact of IABs, and does not explain why the evidence it has received is not probative to its emerging thinking (or otherwise not accurate or reliable). This is concerning because, at the same time, WP4 also cites claims from certain parties concerning the (alleged) risks and weaknesses of IABs, which should have been carefully tested for accuracy and reliability, and weighed against the evidence showing the consumer benefits of IABs.

IABs are an important dynamic force in browser competition, and stronger IABs would lead to stronger browser competition generally

2.6. WP4 gives limited weight to evidence that IABs promote competition, and spur innovation by other browsers, including dedicated browser apps. This is significant given the substantial evidence, including directly from Meta,[8] that this is the case.

2.7. For example, in the spring of 2015, Meta launched its 'Instant Articles' format on Facebook, a HTML document which decreased the load time for documents on Facebook, thereby enhancing the user experience. Shortly after the introduction of Instant Articles, Google launched a competing service, 'Accelerated Mobile Pages' (or AMP), on its Chrome browser and throughout its mobile ecosystem. [REDACTED], this shows that dedicated browsers such as Chrome compete with (and copy) functionalities originally offered by IABs.

2.8. Competition between providers of IABs (e.g. Meta) and dedicated browser apps (e.g. Google) promises to intensify as Meta continues to develop and enhance the capabilities of its custom engine IAB. For example, [REDACTED]. In the past, [REDACTED].[9]

2.9. [REDACTED].

2.10. [REDACTED].

[7] As explained in Meta's blog post about its custom browser engine, custom browser engine code runs within the app's memory space in much the same way that System WebView does. Meta's custom browser engine, however, enables it to understand the mapping of code end-to-end, and this enhances Meta's ability to fix stability and other issues with browser source code that Meta would otherwise be unable to address.

[8] Please see [REDACTED].

[9] For additional background on the past initiative, [REDACTED].

2.11. Discounting the competitive impetus that IABs create, and declining to address iOS restrictions that limit their potential would serve only to entrench current dedicated-browser incumbents and diminish incentives to innovate.

3. The supposed risks or weaknesses of IABs referred to in WP4 are hypothetical and/or do not support that IABs are inferior to dedicated browsers

The third party submissions in WP4 regarding security and privacy risks are not credible

3.1. WP4 references in numerous places submissions from parties alleging that IABs present higher security and privacy risks compared with dedicated browsers (or, for that matter, remote tab IABs). Many such claims are simply not credible; they are unsupported by sound evidence and are directly contradicted by Meta's own evidence. Any conclusion the CMA reaches which is based on such submissions, for example that remedial action should not prioritize IABs, would therefore be ill-founded.

3.2. The CMA cites several parties as stating that webview IABs may possess weaker security and privacy protections relative to remote tab IABs and dedicated browsers.[10] The reported concerns are largely speculative; for example, alleging "*webview IABs **may** be more prone to security and privacy risks*" (emphasis added), without providing actual evidence. This is a significant weakness of the criticisms levied by such parties.

3.3. Specific concerns reported in WP4 are unfounded or erroneous.

3.3.1. In relation to possible usage of custom engines for IABs, Apple states that the "*vast difference in volume*" of IABs versus dedicated browsers "*makes the attack surface from the in-app browsing use case many orders of magnitude greater than that of the dedicated browser use case*".[11] Concern over a "*difference in volume*" between IABs that may adopt custom browser engines and dedicated browser apps that may do the same is misplaced: WP4 itself finds that few developers would develop custom engine IABs on iOS, implying no material change to the "*attack surface*" at all.[12] Furthermore, any developers seriously considering adoption of a custom engine IAB are (like Meta) likely to possess the engineering expertise required to ensure high security standards.

3.3.2. Apple[13] and other parties such as Open Web Advocacy[14] (**OWA**) also raise concerns over IABs' use of JavaScript injection.[15] These concerns are largely speculative (resting on technical possibilities, rather than evidence of actual misuse) and apply equally to dedicated browsers.

3.3.3. All third-party browsers on iOS (and many on Android), whether IABs or dedicated browsers, use JavaScript injection for much the same reasons: to provide functionalities which benefit users and which users increasingly expect.[16] On iOS all third-party party browsers are required to rely on JavaScript injection due to

[10] WP4, para 2.13.
[11] WP4, para 4.21.
[12] WP4, para 2.17.
[13] WP4, fn 24.
[14] WP4, para 5.32.
[15] For example, WP4 states that "*webview IABs allow the modification of webpage content through JavaScript injection, which can be misused to modify webpages in ways designed to track or mislead users*" at paragraph 2.13.
[16] Examples of functionalities enabled by JavaScript are: (i) protection from fraudulent advertisers and cloaking attacks (see paragraph 3.4.1); (ii) autofill; (iii) in relation to Chrome on iOS, translations, (both full-page and app-specific); (iii) and in relation to Chrome on iOS options such as 'share', 'search' or 'partial translate' when users highlight text; and (iv) facilitating user interaction with web content on iOS, such as detecting and offering package notifications.

Apple's policy limitations preventing the use of third-party party browser engines. While webview IABs *could* misuse JavaScript injection, dedicated browsers could as well.[17] Indeed, Meta is unaware of *any* evidence that IABs often misuse JavaScript injection or that the risk of JavaScript-injection misuse is more pronounced among IABs than among dedicated browsers.

3.3.4. Many of the allegations concerning potential misuse of JavaScript injection by IABs cited in WP4 appear to derive from arguments advanced by OWA, which are in turn largely based on commentary from Felix Krause. However, Krause's allegations concerning Meta's use of Javascript injection are entirely speculative; Krause himself acknowledged that his statements addressed only "*what is possible on a technical level*," not that Meta's IABs "*actually steal . . . passwords, address and credit card numbers*" or otherwise misuse data.[18] Tellingly, private plaintiffs that filed lawsuits against Meta in the aftermath of Krause's allegations later agreed voluntarily to dismiss their claims.[19]

3.4. While security and privacy concerns about IABs are largely speculative, IABs enable demonstrable security and privacy benefits. In previous submissions, Meta has shown that IABs can significantly enhance user security and privacy compared with dedicated browser apps. For example:

3.4.1. As explained in [REDACTED].

3.4.2. In addition, on Android, Meta's custom engine IAB means that, when the native app (e.g., Instagram) is updated, the browser engine is updated too, ensuring that users will not be using out-of-date browser software with known security vulnerabilities. This overcomes a key problem for both dedicated browsers and IABs which are prevented from employing a custom browser engine: that on iOS they can only update security when a user updates their operating system and on Android many users simply do not end up getting System WebView or browser updates. Often users update the Instagram app but not the Android System WebView and Chrome. [REDACTED].[20]

3.5. In sum, the benefits to users of IABs are tangible, significant, and clearly evidenced. By contrast, the possible downsides of IABs cited in WP4 are theoretical, abstract and unsubstantiated by concrete real world evidence. To the extent the misleading claims referenced in WP4 lead the CMA to discount the benefits of IABs to competition and innovation, that would not be well-founded nor in the interests of consumers.

Potential user confusion does not warrant limiting developers' use IABs or failing to address restrictions on such use

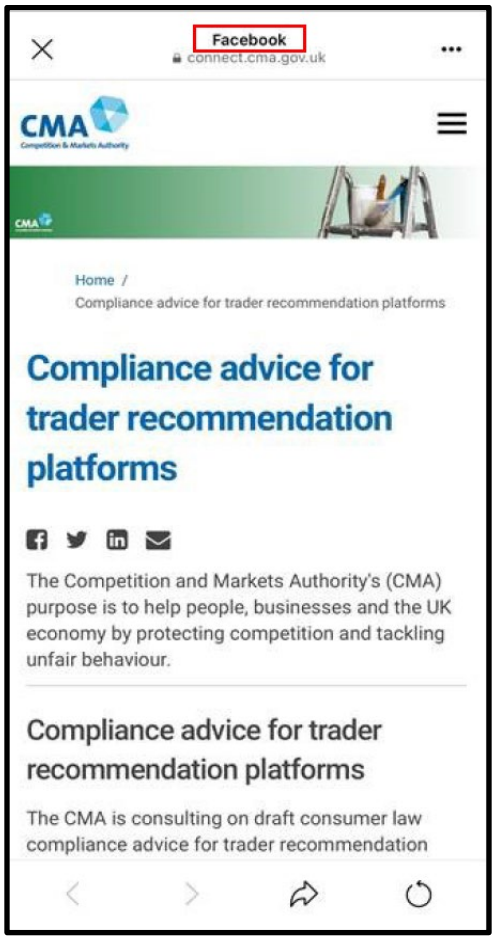
3.6. WP4 notes concerns that users who interact with web content from within an app may be unaware that they are using the app's IAB, rather than their default dedicated browser app, to interact with that content.[21]

[17] For example, security researchers recently found that Google's Chrome browser shares device and performance data with Google. Though Google informed reporters that Chrome shares this information in order to improve the user experience, this finding nevertheless reinforces the fact that the same theoretical concerns raised in WP4 about data use by IABs apply equally to dedicated browsers. See: Google Chrome Secretly Shares Your Device Data—With Google (forbes.com)
[18] iOS Privacy: Instagram and Facebook can track anything you do on any website in their in-app browser · Felix Krause
[19] See for example Meta Browser Tracking Litigation, 3:22-cv-05267-AMO, ECF No. 96 (N.D. Cal. Oct. 30, 2023).
[20] [REDACTED].
[21] For example, WP4, para 2.53 and 4.54(c).

3.7. App developers can address these concerns directly, by taking steps to promote their users' "sense of place," i.e., their awareness of the app that they are using.

3.8. For example, to promote its users' sense of place, Meta recently implemented changes to its apps' user interfaces, displaying "Facebook" or "Instagram" in the IAB header, as shown in Figure 1 below.

Figure 1: Example of a web page displayed in Meta's IAB (UK)



3.9. While Meta supports measures that enhance users' awareness of the apps they are using, Meta believes it would be a profound error to respond to certain users' lack of awareness either by curbing developers' freedom to utilize IABs or by failing to address OS restrictions on that freedom. These actions would diminish both the substantial benefits that IABs deliver to consumers, and competition and innovation among browsers and browser engines.

Remote tab IABs are often a poor substitute for other IABs

3.10. WP4 makes reference to ostensible benefits of remote tab IABs, though it does acknowledge a number of their shortcomings.[22] In Meta's experience, remote tab IABs sharply restrict developers' ability to offer users convenient, safe and innovative experiences.

3.11. Meta has found that adoption of remote tab IABs would restrict the following functionalities in its apps:

3.11.1. Meta's own IAB is able to offer users a number of different 'viewing modes' such as a 'preview' page. However, Meta is unable to provide these different options to the user via a remote tab IAB given the severely restricted scope to customize remote tab IABs compared with other forms.[23]

3.11.2. Meta's own IAB offers users substantially improved security than would be available through dedicated browsers (see paragraphs 3.4.1 and 3.4.2 above). Remote tab IABs do not permit app developers to customize the fundamental browser engine, meaning security improvements delivered through webview or custom browser engine IABs [REDACTED] are unavailable to users when using remote tab IABs.

3.11.3. Meta's custom browser engine IAB has improved both cookie storage capabilities (including when multiple users are logged into the app at the same time) and cookie persistence. This has enhanced cookie storage reliability, increasing the likelihood that when a user re-visits a website to which they previously logged in, they will still be logged in.[24] Remote tab IABs employ the cookie storage policies of the browser provider, depriving users of significant improvements offered by Meta's custom browser engine IAB.[25]

3.11.4. [REDACTED].

3.12. An app developer's adoption of a remote-tab IAB will often sharply limit the features and protections that the developer can offer consumers. Promotion of remote tab IABs by the CMA at the expense of webview or custom browser engine IABs could well degrade the IAB experience for users and entrench power of dominant dedicated browsers.

[REDACTED]

3.13. [REDACTED].

3.14. [REDACTED][26] [REDACTED].

3.15. [REDACTED].

3.16. [REDACTED].

3.17. [REDACTED].

[22] For example, WP4, para 2.10, 4.8.
[23] WP4, para 2.9.
[24] [REDACTED].
[25] [REDACTED].
[26] [REDACTED].

4. Conclusion

4.1. As Meta has sought to explain to the CMA throughout this Market Investigation, IABs represent a significant and positive development for competition and consumers. IABs have a proven track record of delivering benefits in terms of enhanced user experience, security and safety. These benefits are tangible, significant, sustained and substantiated.

4.2. By contrast, the submissions referenced in WP4 of the alleged harms, risks or weaknesses of IABs are either hypothetical, inaccurate, or otherwise reveal no meaningful distinction between IABs and dedicated browsers when properly interrogated.

4.3. Therefore, to the extent WP4 leads the CMA to discount the importance of IABs to dynamic competition on mobile browsers in iOS, and to take no action to strengthen the ability of IABs to compete (particularly by unlocking custom engine IABs on iOS), that would be adverse to the interests of consumers. It would be an arbitrary decision to favor one set of competitors (providers of dedicated browsers) over another, without any real supporting evidence. It would also play directly into the hands of the dominant browser incumbents (principally Safari and Chrome), rather than supporting the broader set of providers of IABs.

4.4. The same would be true if the CMA were to pursue measures that limit developers' freedom to utilize IABs. The only beneficiaries of such measures would be the dominant browsers, and the only effect would be to entrench their position. That would be an unfortunate and counterproductive outcome of this Market Investigation.