

**Mobile Ecosystems Market Study -- Statement of Scope**  
**Google's perspective**

Android is an open mobile platform. This means that anyone can build devices using the Android operating system for free under an open source licence. It also means that Android devices offer multiple channels for developers to reach consumers. Developers can use app stores of their choice, including Play and third party app stores; they can negotiate preload deals with OEMs; they can offer downloads directly from their websites; and they can distribute their services on the web via Chrome or third party browsers.

Licensing Android as open source makes smartphones more accessible and expands the audience for the mobile apps and services that we and others build. The continued success of our mobile business depends on users choosing to access content on Android devices; OEMs continuing to produce Android devices; and developers updating and releasing their apps and services on Android.

Giving OEMs the ability to choose their preloaded apps lets them decide how to make a return on their investment in Android devices. And enabling distribution via different app stores and websites helps meet developers' expectations, providing them with a choice of how they connect with consumers. Investing in supporting high-quality mobile web experiences via Chrome and the open-source Blink browser engine attracts those developers who want to offer browser-based services.

Consumers want a trustworthy and secure environment to find apps and services. That's why we use tools like Google Play Protect to scan apps on users' devices for security issues. It's why we have strict policies in Play against apps that contain malware or other unwanted software. It's why we have "safe browsing" and "incognito" modes in Chrome to protect users' security and privacy while browsing the web. And it's why we are introducing the privacy sandbox on Chrome in close cooperation with the CMA. Our long-term commercial success and competitive positioning depends on users being confident in the security and privacy of the services we offer.

We think the Market Study will show that Android has been a success for us and for competition. It has enabled a substantial increase in the number and range of apps, contributing to an app economy that barely existed a decade ago and been a key contributor to the development of high-quality, differentiated smartphones and tablets at a wide range of price points.

Policy changes can enhance competition and consumer welfare and we're committed to providing the data and evidence needed for that debate. Having the right choice architecture ensures users can make decisions between important services. Giving developers choice over how they design their apps and which distribution channels they use promotes technological diversity. Improving interoperability between platforms promotes user switching. Finding new ways to work with regulators to find reasonable solutions when product development involves difficult trade-offs can ensure that all voices are heard as the mobile ecosystem evolves and generates new benefits for consumers and businesses.

## 1. We developed Android to create more competition in distribution

Before Android, developers had a narrow range of options to distribute digital content to consumers. Microsoft accounted for (and continues to account for) c. 70% of PCs in the UK,<sup>1</sup> exercising control over how software could be made available to end users. Phones running now-defunct mobile operating systems, such as Symbian, included proprietary app stores that offered a narrow, tightly vetted and generally unsophisticated range of content (e.g., limited options to purchase ringtones or install basic games). In the premium smartphone space, Apple was the main player and accounts for c.50% of UK smartphones today, typically higher income consumers and those with higher spending patterns than Android users.<sup>2</sup>

Android was an effort to introduce more competition. With a free open source licence, Android lowered barriers to entry and enabled dozens of OEMs to produce differentiated, high quality smartphones and tablets at lower prices than ever before. In doing so, Android expanded the number of smartphone owners and provided an alternative to expensive iPhones or basic feature phones. As a result, developers could distribute their content to a large and new audience of smartphone and tablet owners.

Android also offered developers a greater choice of channels to distribute their content. They could strike deals with OEMs to have their apps preloaded. They could distribute their apps through Play and third party app stores. They could distribute apps directly from their websites. And they could offer web-based services, accessible through both Chrome and third party browsers. The same developers could take advantage of the features that Android has to offer: Android APIs and hardware components are open and accessible to all developers -- both Google and third parties alike.<sup>3</sup> And this continues to be the case today.

The data supports the proposition that Android has had a positive impact on competition. Making Android available for free has enabled millions of European consumers to own smartphones.<sup>4</sup> Android provides access to billions of consumers for developers: the average consumer in advanced economies regularly uses over 30 apps, with just under 100 apps installed on their smartphone.<sup>5</sup> As a result, the Android app ecosystem is estimated to support around €11.7 billion in revenue for European developers and over 1.4 million jobs.<sup>6</sup> The UK is the hub of European app development. British app developers are estimated to generate around £2.8 billion in revenue from the Android app

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<sup>1</sup> Statcounter, [Desktop Operating System Market Share United Kingdom](#).

<sup>2</sup> Statcounter, [Mobile Vendor Market Share United Kingdom](#). An October 2018 survey of 2,000 US smartphone owners suggested iPhone users earn approximately 44% more and spend approximately 50% more than Android users. See PR Newswire, [iPhone Users Spend \\$101 Every Month on Tech Purchases, Nearly Double of Android Users, According to a Survey Conducted by Slickdeals](#), 30 October 2018.

<sup>3</sup> For example, Google, OEM and third party wallets have equal access to the NFC antenna on Android devices, enabling them to offer in-store mobile payments.

<sup>4</sup> See Oxera, [Android in Europe: Benefits to consumers and business](#), October 2018 (estimating that an extra 21 million Android smartphones were sold in 2017 alone as a direct result of the Android platform being royalty-free).

<sup>5</sup> Public First, [Google's Impact in the UK 2020](#), p. 45.

<sup>6</sup> Public First, [Google's Economic Impact in Europe](#), p. 28.

ecosystem,<sup>7</sup> which supports 240,000 jobs in the UK (second only to Germany in Europe).<sup>8</sup> Android is widely acknowledged as having a positive effect on competition and consumers: the European Commission's Android case (which is under appeal) focused on the effects of certain distribution agreements. It did not call into question Android's beneficial effect on competition. As Commissioner Vestager has [commented](#), "Android and its openness is a good thing."

Our efforts to create more competition had no guarantee of success in a sector where many other efforts failed, including Symbian, Unix, and Windows Phone. For Android to succeed -- and to continue succeeding -- it requires participation from a range of players. Google contributes the operating system and regular new releases, an app store, a browser, and a small proportion of devices. But Android also depends on the presence of sophisticated OEMs who sell high-quality devices running Android; developers who build apps and services for Android that provide attractive content; providers of distribution channels to deliver content to smartphone users; and, of course, consumers themselves. Meeting these stakeholders' expectations is critical and a unique challenge. The following diagram gives an overview of who's involved and where we participate.

Figure 1: Components of the Android Ecosystem<sup>9</sup>

Google-developed or owned components in Green



<sup>7</sup> Public First, [Google's Impact in the UK 2020](#), p. 9.

<sup>8</sup> Public First, [Google's Economic Impact in Europe](#), p. 28.

<sup>9</sup> "Native" apps are downloaded or preloaded and stored on a mobile device. "Consumption only" apps do not sell content to users but allow users to access content that they have purchased elsewhere (e.g., on the developer's website). "Web" apps are programmes delivered over the Internet and accessed via a browser.

## 2. We have a strong incentive to support competition in the Android ecosystem

We generate revenue primarily by showing ads. Ads-funded services can facilitate high quality content with low or zero up-front fees. They are available to any consumer, regardless of their budget, delivering substantial consumer surplus.<sup>10</sup>

Our business model -- which enables greater access to more services for more people, regardless of their budget -- is central to Android's design, in particular, the decision to license Android on an open source basis and offer multiple channels for developers to distribute content to consumers, including channels that we do not control. Android's open source licence has helped increase the number of smartphone owners by enabling OEMs to develop quality smartphones and tablets at low cost. Having more smartphone users in turn encourages developers to create engaging apps and web-based services. And all of that additional content creates opportunities for us to generate revenue by showing relevant ads.

The more distribution channels developers have at their disposal, the greater the volume of content delivered and the greater the possibilities for us to sell ads services to publishers. For example, high quality app stores enable users to install apps securely in a matter of seconds. Users can access preinstalled apps straight "out of the box". And browsers (including Chrome, OEM-owned browsers and third party browsers) create opportunities to show ads on web-based services.

In addition to the opportunity to earn revenue, we support multiple distribution channels to provide a commercial incentive for OEMs and developers participating in the Android platform. For example, OEMs can earn revenue from preinstallation deals with third parties and by preloading their own app stores. Likewise, third party app stores and sideloading can help meet developer expectations of a choice of distribution channels.

## 3. We support multiple Android distribution channels

Developers have a choice between distributing their services as native apps, basic websites, web apps, progressive web apps, or some combination. Browsers (and the web-based services they support) compete with native apps (and app stores) as a means of delivering content to users. Music services, video-streaming, email, maps, cloud storage, translation services and many other products are typically available either via a native app or via the browser. If the quality of web apps was degraded, users would likely switch to using native apps, and vice versa.

Our incentive to expand the variety and amount of content that is available to consumers motivates us to support distribution for both native and web-based services on Android, which, in turn, provides benefits for all players in the ecosystem.

### 3.1. Distribution of "native" apps

**Preload deals.** OEMs decide which apps to preload on their Android devices. They may decide that certain apps are attractive and convenient for users to have available "out of the box" when the device is first activated. For other apps, OEMs may charge a fee in return for selling a portion of their screen space; for example, we understand that Facebook, Spotify, Microsoft and other developers

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<sup>10</sup> See e.g., Brynjolfsson, Collis, and Eggers, [Using massive online choice experiments to measure changes in well-being](#) (2019) (estimating that users in 2017 would be willing to go without search engines for one year in return for approximately \$18,000).

do deals with manufacturers to get their apps preloaded, as we do. OEMs also preload their own apps, creating a further opportunity for them to monetise their devices. Whatever their motivations, OEMs ultimately decide which apps to preload.

**App stores.** Having access to a range of attractive apps is an important factor when it comes to a consumer's decision over which device to buy. App stores factor into that decision -- both our own app store, Play, and app stores offered by third parties. A large majority (c.60-90%) of UK Android devices are likely to have at least one mobile app store preloaded other than Play (e.g., Samsung devices, which come preloaded with the Galaxy Store and Google Play, and Huawei devices, which come preloaded with Google Play and Huawei Appgallery).<sup>11</sup> We have introduced a wide range of measures to keep distribution costs in Play low, deliver tools and services that add value for developers, and treat developers equitably. For example:

- For the vast majority of apps on Play -- 97% in fact -- we do not charge service fees.<sup>12</sup> For the remaining 3%, we charge a fee of 15% of developers' revenues from paid apps, in-app purchases, and subscriptions up to the first \$1 million of revenue each year (and 30% thereafter).<sup>13</sup> These fees reflect the value that Play offers, are comparable to fees set by other app stores and digital storefronts, and have decreased over time.<sup>14</sup> Charging a percentage of revenues -- and charging it only in respect of in-app purchases, paid app downloads and subscriptions -- lowers barriers to distribution and ensures that Play only earns fees if developers are also generating revenue.
- Play regularly releases features that help developers get discovered, improve their content, and monetise their apps. In the past few months alone, we have delivered the following releases:
  - In March 2021, we [announced](#) a suite of new metrics to help developers evaluate their apps' engagement and monetisation trends against up to 250 different peersets.
  - In [May 2021](#), we announced updates such as new tools for verifying compliance with Play policies, changes to promote user discovery of apps, and more educational content.
  - In June 2021, we [announced](#) a redesign for a beta version of Google Play Console, with features such as new navigation tools, clearer overviews, easier publishing, and more. In the same month, we [provided an overview of updates](#) from the past year, such as the Android Game Development Kit and new ways to understand game reviews and ratings.
  - Another recent innovation, "Play as you download", [was announced in July 2021](#). This feature will enable users to start playing a game even while it is still downloading,

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<sup>11</sup> According to [Statcounter](#), Samsung accounts for c.60% of Android devices, while Huawei accounts for c.30% of Android devices.

<sup>12</sup> Play service fee is charged only in respect of apps that monetise through (i) fees to acquire the app, (ii) in-app purchases, and (iii) sales of subscriptions.

<sup>13</sup> The 15% service fee tier came into effect on 1 July 2021: see Play Console Help, [Changes to Google Play's service fee in 2021](#).

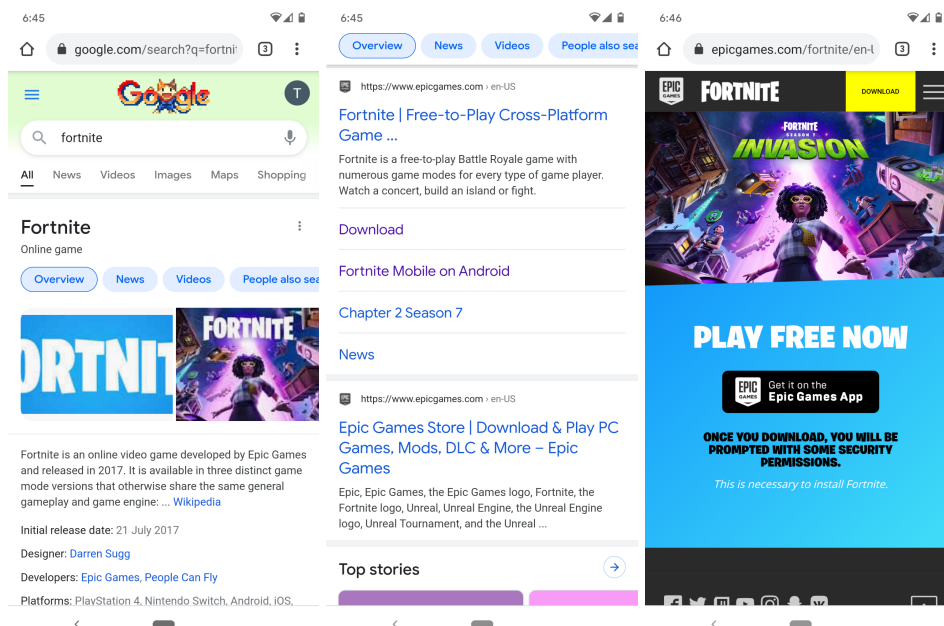
<sup>14</sup> Android Developers Blog, [Boosting developer success on Google Play](#), 16 March 2021.

which is particularly helpful for users without access to a fast Internet connection or when they are downloading large game packages that take time to install.

- Play ranks Google-owned and third party apps consistently. The fact that we develop an app does not change the position in which it appears in response to a query in Play.
- Play’s rules demonstrate the value that it offers users by making it easy for developers to use alternative distribution channels alongside or instead of Play. For example, Play does not impose parity requirements, thereby leaving developers free to offer lower prices or enhanced versions of their apps via other (Android or non-Android) channels instead of Play. Developers can also use consumption-only apps to avoid incurring the service fee.

**Sideloaded.** Downloading apps directly from developers’ websites (or via peer-to-peer app transfers) enables users to install apps without going through an app store. Developers are free to use sideloading as a distribution channel on Android, and several prominent developers do so (e.g., Epic’s Fortnite). Moreover, with Android 12, we have introduced new features that will enable even sideloaded apps to update automatically.<sup>15</sup>

Figure 2: Installing Fortnite via sideloading



Sideloaded can be used by malicious actors to bypass the security checks that app stores perform, instead distributing their apps directly to consumers who most likely do not have the technical ability to scan those apps for malware or viruses themselves. Even for well-known publishers, sideloading

<sup>15</sup> Android Developers, [Features and APIs Overview](#), Core Functionality.

presents a potential risk of security being compromised.<sup>16</sup> Accordingly, users are made aware of the risks that sideloading entails.

### 3.2. Distribution of web-based services

Some developers prefer to offer their services on the web instead of, or in addition to, native apps. Web-based services can be accessed on any device that has a browser without the need for users to download an app. Work on “progressive web apps” enables web-based services to adopt certain native app-like functionalities, such as the ability to work offline, and the ability to place an icon on the device’s home screen. In gaming, online streaming services such as Nvidia’s GeForceNow and Amazon’s forthcoming Luna gaming platform enable users to play games directly in the browser, without going through app stores or other channels. Uber, Trivago, and Twitter have developed web apps alongside their native apps. And there are many examples of the benefits to developers of making services available via the browser -- not only as native mobile apps.<sup>17</sup>

The quality of web-based services depends in part on the browser being used to access them and the underlying browser engine. We have a long history of investing in both.

Chrome, was developed in 2008 as “*not just a browser, but also a modern platform for web pages and applications*,”<sup>18</sup> with less latency than other browsers. We worked to “*turbocharge JavaScript*”<sup>19</sup> (the computer programming language on which Chrome is built) to “*power the next generation of web applications*.”<sup>20</sup> In 2012, we brought Chrome to mobile. We have continued to implement upgrades to improve users’ experience of browser-based services -- Chrome is now updating approximately every 4 weeks.<sup>21</sup> And since 2013, we have released the powerful browser engine, Blink,

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<sup>16</sup> See, e.g., ArsTechnica, [Fortnite’s Android vulnerability leads to Google/Epic Games spat](#), 27 August 2018 (“Epic Games’ popular shooter Fortnite has been out on Android for just a few weeks, and already there are concrete examples of some of the security fears brought about by the game’s unique distribution method”); Wired, [Fortnite has another security flaw and Epic’s response wasn’t great](#), 16 January 2019 (“A security flaw spotted in Fortnite means hackers could have allowed gamers’ login details to be compromised. But developer Epic Games didn’t even respond to the researchers who uncovered the vulnerability which affects the game’s 125 million players. Security researchers at Check Point Software have revealed they uncovered a vulnerability in the massively popular game’s login system, which could have let attackers takeover an account by tricking players into clicking a link offering V-Bucks, Fortnite’s in-game currency. With account access, hackers could buy more V-Bucks and spend it in-game, passing the loot on to other players, as well as viewing user data including contacts, and listen in on conversations held while playing”); and Cnet, [Just as critics feared, Fortnite for Android came with an epic security risk](#), 28 August 2018.

<sup>17</sup> See e.g., Google Developers, [Flipkart triples time-on-site with Progressive Web App](#); and Web.dev, [Progressive Web Apps](#) (see “Case studies”).

<sup>18</sup> Google blog, [A fresh take on the browser](#) (1 September 2008).

<sup>19</sup> TechInAsia, [How Google CEO Sundar Pichai used OKRs to build the world’s most popular web browser](#) (3 August 2018).

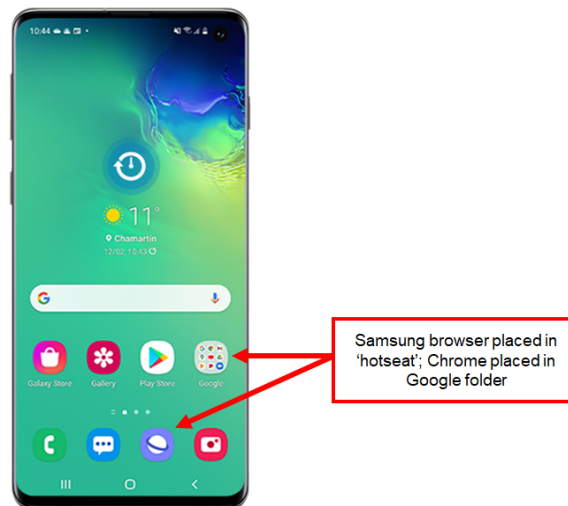
<sup>20</sup> Google blog, [A fresh take on the browser](#) (1 September 2008).

<sup>21</sup> Chromium Blog, [Speeding up Chrome’s release cycle](#), 4 March 2021. An example of a recent innovation concerns Chrome version 91, which incorporates changes that render Chrome 23% faster and will save more than 17 years’ worth of users’ CPU time every day ([announced in May 2021](#)).

under an [open source licence](#). This has contributed to the growth in browsers<sup>22</sup> and makes the new features in Blink available to others.

The distribution of web-based services is further helped by there being user choice in browsers and our approach to alternative browser engines. OEMs are free to preload rival browsers alongside or instead of Chrome on Android devices. For example, Samsung preloads its “S Browser” on Galaxy devices, sometimes with greater prominence than Chrome, as shown in Figure 4).

Figure 3: Chrome and S Browser Placement on Galaxy Devices



We recently implemented a [browser choice screen on Android devices](#) in the UK and EEA which prompts users to install alternative browsers alongside those that come preinstalled. This prompt is shown the first time users access Play, where users download rival browsers in large numbers.<sup>23</sup> After users download an additional browser on Android devices, they are asked which browser they want to use the next time they click on a link, with the option to make a selection on a one-off basis or to choose which browser they will “always” use in the future. Third party browsers can also display shortcuts prompting users to switch their default.

<sup>22</sup> See, ZDNet, [All the Chromium-based browsers](#), 29 January 2019.

<sup>23</sup> For example, [Opera browser](#), [Firefox browser](#), and [UC Mini](#) have been downloaded more than 100 million times from Play, while [Opera Mini browser](#) and [UC browser](#) have been downloaded more than 500 million times.



Figure 4: Browser choice screen and disambiguation box

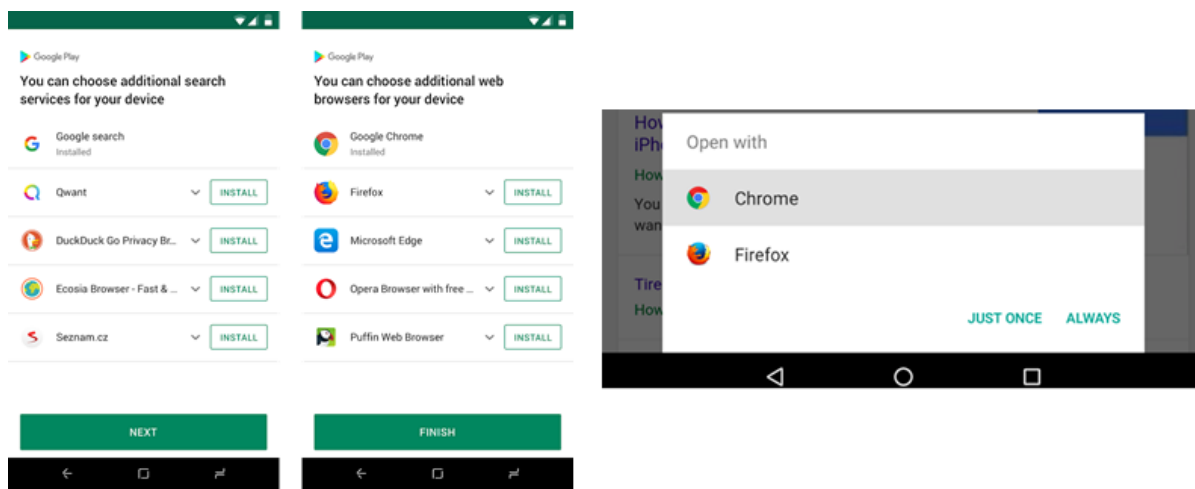
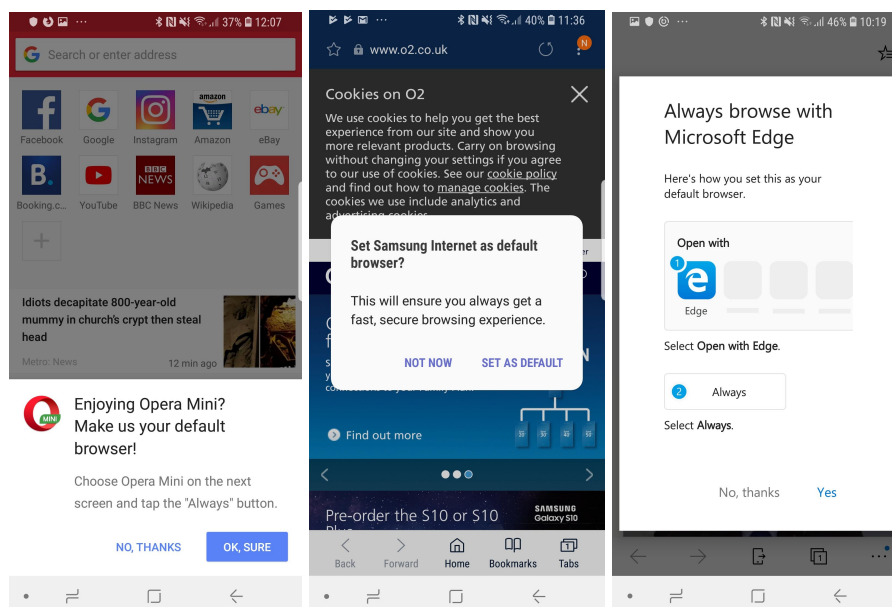


Figure 5: Browser prompts to switch default



Not every browser faces the same kind of competitive pressure as Chrome does. For example, on Windows devices, Microsoft preinstalls its Edge browser on the c.65% of desktop computers that run Windows. With Windows 10, Microsoft began including Edge as the default browser. And in Windows 10S, users are not able to change the default browser or search service under any circumstances, as Microsoft explains.<sup>24</sup> Chrome’s share of browser page views -- as set out in the Statement of Scope at Table 1 -- is 39.7% on mobile, behind Safari on 48.5%.

**4. Android faces competition for consumers, developers, and OEM investment**

For Android to succeed, it needs consumers to spend time on Android devices, developers to produce content that runs on Android devices, and OEMs to invest in building and improving those devices. However, consumers, developers, and OEMs all have other alternative platforms where they

<sup>24</sup> Microsoft Windows Support, [Windows 10 in S mode FAQ](#).

can spend their time. Consumers can access content across many different devices, including iOS phones, games consoles and PCs. Developers can focus on delivering content through these other platforms. And OEMs have multiple other business lines to which they could shift their resources.

#### 4.1. Competition for consumers

Competition for consumers typically takes place in two principal ways. First, consumers decide which brand of smartphone or tablet to buy. Second, Android device owners choose whether to consume content on their Android smartphone/tablet or an alternative device (e.g., PCs, games consoles).

**Purchasing an Android or iOS device.** Android smartphones and iPhones compete for sales and offer devices in overlapping segments. Android devices include premium smartphones that sit in the same price bracket as Apple's high-end devices, while Apple is competing increasingly in the mid-tier with its "SE" range of iPhones, including a new model that Apple released in 2020.<sup>25</sup>

Android devices face strong competition from Apple, which is competing successfully to bring users from Android to iOS devices. As Tim Cook [announced](#) on Apple's earnings call from July 2021, "*in Q3... we had strong double digit growth for switchers and for upgraders. And in fact, it was our largest upgrade quarter for a Q3 ever.*" The seemingly high growth in Android "switchers" may be explained by low barriers to moving from Android to iOS devices: the same popular apps on Android are almost all available on iOS; many services enable users to sign in with a single account, meaning users keep their content when switching to an iOS device; users can continue to use their "connected" devices, such as Fitbit, when they switch to iOS devices; and Apple has created a smooth process for transitioning users away from Android, even offering a "Move to iOS" app on Play.

**Consuming content on Android and other devices.** If a consumer purchases an Android smartphone or tablet, they may nonetheless use other devices to access content. For example, games that can be accessed on Android may also be accessible on traditional games consoles (e.g., Xbox, PlayStation) and handheld consoles (e.g., Nintendo Switch). Video-streaming services can be accessed via smart TVs or streaming devices. And PCs can be used to access all manner of content. These other devices have certain advantages relative to smartphones. For high-quality games, for example, users may prefer devices with larger screens and avoiding draining their smartphone's battery when "on the go". The fact that games are developing cross-platform functionality -- users can log into their account, access their in-game currency or products, and play on multiple devices -- means that users are not restricted to consuming content through their phone (or any other device). Likewise, for productivity services, such as spreadsheets, presentations, and document-creating tools, consumers may prefer a PC because of its larger screen size.

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<sup>25</sup> See Macrumours, [The 2020 iPhone SE](#), 23 June 2021 ("*Apple in April 2020 unveiled a low-cost iPhone, the iPhone SE, which is a follow-up to the 2016 iPhone SE of the same name. Like its predecessor, the 2020 iPhone SE is Apple's most affordable iPhone, priced starting at \$399*").

#### 4.2. Competition for developers

App developers can and do multi-home across different operating systems and devices. Many of the same apps that are available on Play and other Android app stores are available on Apple devices,<sup>26</sup> including popular apps such as Amazon, Facebook, WhatsApp, Instagram, Netflix, Spotify and others.<sup>27</sup> Google makes many of its own apps available on both Play and Apple's App Store (e.g., Google Search, Chrome, Gmail, YouTube, Google Meet and others).

Technical barriers to developing across Android and other platforms are often low. First, many services can now be accessed via the browser -- not only by using native mobile apps (e.g., Google Search, Facebook, Amazon) -- and are therefore available on Android, iOS, PCs and other platforms. The development of sophisticated web apps has made this an increasingly attractive option for developers. Second, cross-platform tools (such as Google's Flutter) are enabling developers to produce versions of their apps that work on Android, iOS and other platforms from a single codebase.<sup>28</sup> Third, developers have the option to make their apps available on Android even if they want to sell content only on other platforms or through other channels (such as a developer's website) -- "consumption only" apps on Play enable users to consume content purchased elsewhere with the developer not being charged a fee to distribute that content through Play.

While technical barriers to developing across platforms are therefore low, developers nonetheless choose where to focus their attention, including where to prioritise new software, where to roll out new versions of their apps and services first, and where to target special offers to users. Apple has for several years accounted for c.50% of smartphone users in the UK, including higher income consumers and those with higher spending patterns than Android users,<sup>29</sup> and Apple's App Store generates higher revenues than Play.<sup>30</sup> Consequently, app developers sometimes take an "Apple-first" approach, prioritizing Apple's App Store for new releases.<sup>31</sup> Likewise, developers of games (particularly high-end games that require sophisticated graphics and substantial power usage) may choose to focus their attention on consoles. We therefore have to compete to bring those developers to Android and to keep their attention. For example, Google runs developer academies, accelerator programs, and events such as the Indie Games Festival and Indie Corner to help bring the best apps and newest versions of apps to Android.<sup>32</sup>

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<sup>26</sup> See Statista, [Mobile operating system distribution for software development worldwide as of 2020](#), June 2020 ("Most mobile software developers work on the Android and iOS as of 2020, according to a global software developer survey").

<sup>27</sup> Multi-homing is common among developers of successful apps (see Observatory on the Online Platform Economy, [Multi-homing: obstacles, opportunities, facilitating factors](#), 13 January 2021, p. 29).

<sup>28</sup> [Flutter](#) is Google's open-source software development kit that allows developers to create cross-platform applications for iOS, Android, Linux, Windows, and other operating systems.

<sup>29</sup> See footnote 2.

<sup>30</sup> See Sensor Tower, [Global App Revenue Grew 31% Year-Over-Year in Q1 2021 to Nearly \\$32 Billion](#), 5 April 2021.

<sup>31</sup> For example, Clubhouse was launched on iOS approximately one year before coming to Android. See TechCrunch, [Clubhouse finally launches its Android app](#), 9 May 2021.

<sup>32</sup> See [Google Play Academy](#); Google Developers, [Accelerators](#); Android Developers Blog, [The winners of the Google Play Indie Games Festival are...](#), 27 July 2020; Google Play, [Indie Corner](#).

**4.3. Ensuring OEM participation**

We need to ensure that OEMs continue to invest in building Android smartphones and tablets. Google’s Pixel is a marginal player with a small share of devices. Android’s success thus depends on independent OEMs.

Many OEMs operate a range of business lines and could scale back -- or cease -- their activities in mobile if the commercial opportunity was no longer attractive relative to their other product areas. For example, LG announced in April 2021 that it would be shutting down its smartphone business to focus on its smart home and robotics products.<sup>33</sup> Therefore, Android needs to maintain OEM participation.

OEMs also have the possibility of developing their own operating systems which they can use alongside or instead of Android. Since each new version of Android is licensed on an open source basis, we have an incentive to maintain the quality of Android so that it continues to be attractive to OEMs. OEMs can continue to use previous versions of Android (or build on them). OEMs can and do “fork” Android to create their own operating systems.<sup>34</sup> For example, Huawei is releasing new devices that run on Harmony OS, which is said to be built using code from the Android Open Source Project.<sup>35</sup> Likewise, Amazon runs Fire OS -- a forked version of Android -- on its Fire devices.

Figure 6: Threats to OEM participation in Android



<sup>33</sup> CNet, [LG will shut down smartphone business in July to focus on smart home, robotics](#), 5 April 2021.

<sup>34</sup> The Statement of Scope states “we will consider any actions taken by Google which may have reduced the likelihood of OEMs switching to other mobile operating systems or developing their own mobile operating systems such as the impact of the anti-forking or other similar agreements” (p.41). While Google does not agree with this characterisation of Google’s agreements, anti-fragmentation provisions have nonetheless been amended in compliance with the European Commission’s Android decision (Case AT.40099 *Google Android*, Decision of 18 July 2018, paras. 1398-1400).

<sup>35</sup> Computer Base, [Update schedule: HarmonyOS is replacing Android, but not entirely the AOSP](#), 2 June 2021 (Huawei explained that “To make sure our existing users can still enjoy the experiences that they are familiar with in our phones and tablets, Huawei uses the open source code from AOSP in HarmonyOS on the condition of complying with open source license rules and fulfilling related responsibilities and obligations”).

## 5. Opportunities to improve distribution

We think Android follows the principle of providing consumer and developer choice and so we support the CMA in assessing whether policy changes can further enhance competition. In particular, we see value in the CMA gathering evidence in the following five areas.

**Promoting active consumer choice.** The Statement of Scope identifies potential concerns about default settings and inertia displacing active consumer choice (Statement of Scope, p.36). Well designed choice architecture benefits consumers and developers. Understanding the behavioural evidence in this area - including our own experience following the *Android* case - and the opportunities for improved designs for UK consumers seems to us worthwhile.

**Promoting developers' freedom to design.** Guaranteeing developers the freedom to choose how they design could enhance the quality of their launched products, lead to greater differentiation, and ultimately more consumer choice. In assessing this issue, relevant evidence could include a review of how products operate on different mobile platforms depending on whether they have access to APIs and hardware components, as well as rules prescribing which software should or should not be used by apps.

**Promoting developer choice of distribution channel.** Giving developers a choice of distribution channels facilitates competition on price, quality, and innovation. In assessing this issue, relevant evidence could include quantitative or qualitative data on app developers taking advantage of additional distribution channels when made available to them, while also taking account of evidence of any security issues that have arisen.

**Promoting users' ability to switch.** The threat of consumers leaving a platform constrains platforms' behaviour and provides an impetus to reduce prices, increase quality, and innovate. Switching might be facilitated through greater interoperability and portability, enabling apps and connected devices to perform well on multiple platforms, thereby improving and simplifying the consumer experience. In assessing this issue, relevant evidence could include an analysis of how important interoperability is for users and whether specific examples of non-interoperability have deterred switching.

**Promoting consultation for major product changes.** Developers can benefit from consultation on, and advance notice of, major product changes -- particularly those that affect their business models. In assessing whether and how to promote consultation, relevant evidence could include a comparison of how developers have been able to adapt and mitigate any financial impact in circumstances where they have been given forewarning compared to situations where they have not. Our privacy sandbox is a relevant case study in this regard.