

# Mobile ecosystems market study

Statement of scope

15 June 2021

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## *Annexes*

A: Use of information provided to the CMA

## Summary

1. Mobile devices with internet connectivity such as smartphones and tablets now play a fundamental role in the lives of UK citizens, providing fast and convenient access to a wide range of products, content and services. In addition to communication, mobile devices also give us instant access to the latest news, music, TV and video streaming, shopping, games, fitness tracking and much more. They can also be connected to a wide range of other devices such as smart speakers, smart watches and home security and lighting. These products and services are now able to work in combination with each other, in a way that strengthens the value and functionality of each, within what we refer to as mobile ecosystems.
2. Mobile ecosystems can be broadly characterised as comprising the following core set of products:
  - **mobile devices**: portable electronic devices that can be held in the hand, including smartphones and tablets, and can connect to the internet;
  - **mobile operating systems**: the pre-installed system software powering mobile devices;
  - **mobile applications (or ‘apps’)**: pieces of computer software providing functionalities to mobile devices. Some apps come pre-installed on devices (including, notably, **mobile app stores** and **browsers**), while others can be selected and installed by the user.
3. Consumers today are in practice faced with a binary choice between two mobile ecosystems – that operated by Apple, powered by the iOS operating system, or that operated by Google, powered by the Android operating system. These companies now hold an effective duopoly over mobile operating systems: in 2020, the Apple iOS share of mobile operating systems in the UK was 52% and the Google Android share was 48%.
4. Apple and Google have the ability, within their respective ecosystems, to control the key ‘gateways’ through which users can access content and services on their mobile devices, the two most important of which are mobile app stores, through which users can download apps, and browsers, through which users can access content on the web. From the perspective of app developers and other providers of digital content and services, being able to access users through these gateways is increasingly seen as indispensable,

since the significant majority of UK internet use is now channelled through mobile devices rather than desktop computers.<sup>1</sup>

5. While both Apple and Google produce a range of products and services within their ecosystems that provide great value to consumers, there are increasing concerns that their control over these gateways gives them the power to dictate the terms under which competition within their ecosystems can take place, which they can use to impose high fees or favour their own products and services over those of rivals.
6. These concerns have recently been expressed by a range of rivals to Apple and Google, including game developers and music streaming service providers. But these issues matter to consumers too: barriers to competition within mobile ecosystems may constrain innovation and limit the development of new, valuable products and services, lead to more expensive or lower quality mobile apps, undermine consumers' ability to access higher quality, more relevant content and lead to consumers facing higher prices for mobile and connected devices.
7. We have launched a market study to investigate these concerns, and to consider potential remedies should these concerns be substantiated.

#### *Context for the market study*

8. Following recommendations made by the CMA in its market study into online platforms and digital advertising,<sup>2</sup> and through the Digital Markets Taskforce,<sup>3</sup> government has confirmed that it intends to establish a new, pro-competition regulatory regime to address concerns relating to digital platforms with 'strategic market status' (SMS). A Digital Markets Unit (DMU) has been established within the CMA on a non-statutory basis to begin work to operationalise the new regime, and government intends to introduce legislation to put the regime on a statutory basis as soon as time permits.
9. We intend that this market study into mobile ecosystems will contribute towards the establishment of the new pro-competition regulatory regime, in particular by enabling consideration of whether Apple or Google should be designated with SMS in relation to any of the activities captured by the scope of the study. Subject to the outcomes of our assessment, we also intend that the study will help develop key elements of the regulatory regime that would apply to any such designated activities, including codes to govern the conduct

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<sup>1</sup> 81% of time spent online in the UK in September 2019 was on smartphones and tablets combined and 35% of UK internet users accessed the internet solely via a smartphone or a tablet in 2019.

<sup>2</sup> The CMA's [Online platforms and digital advertising market study](#).

<sup>3</sup> [Digital Markets Taskforce](#).

of SMS firms and underpinning code guidance. Carrying out this work now will help ensure that, once the necessary legislation is passed, the DMU is able to hit the ground running.

10. In parallel to our work to develop the new regulatory regime, we are also making use of our existing powers to the fullest extent possible to address concerns in digital markets. We have launched two competition enforcement cases that are directly related to important aspects of this market study. The first is an investigation into Apple's App Store, in which the CMA is investigating Apple's conduct in relation to the distribution of apps on iOS and iPadOS devices in the UK, in particular, the terms and conditions governing app developers' access to Apple's App Store.<sup>4</sup> The second is an investigation into Google's 'Privacy Sandbox' browser changes, in which the CMA is investigating Google's proposals to remove third party cookies and other functionalities from its Chrome browser.<sup>5</sup> The CMA has recently opened a consultation on its intention to accept the commitments offered by Google in that case.<sup>6</sup>
11. Our competition enforcement cases focus on specific suspected breaches of competition law, while our market study will provide a broader, overarching view of these interconnected markets. To maximise the efficiency of our work and to minimise duplication and burdens for parties, we will be joined up internally, making flexible use of resources, knowledge, and information across the respective teams where appropriate.
12. We are also aware that other competition authorities and government bodies around the world are looking at similar issues to those we are considering in this study, or have previously carried out work in this area. For example, the European Commission is investigating whether Apple has breached competition law in relation to its distribution of apps, having previously fined Google for imposing anticompetitive restrictions on Android device manufacturers and mobile network operators. In addition, competition authorities in the Netherlands and Australia have recently published the findings of broader studies into mobile app distribution, while both Apple and Google are the subject of several private litigation claims from app developers in the US, Australia and elsewhere.
13. We intend that our own market study will contribute to international work in this area by taking a holistic perspective of how the different components of Apple and Google's mobile ecosystems interrelate, and seeking to understand

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<sup>4</sup> [CMA Investigation into Apple AppStore.](#)

<sup>5</sup> [CMA Investigation into Google's 'Privacy Sandbox' browser changes.](#)

<sup>6</sup> [Consultation on proposed commitments in respect of Google's 'Privacy Sandbox' browser changes.](#)

how the differing business models of Apple and Google drive their incentives and behaviour. We intend to draw fully on the work carried out in other jurisdictions in undertaking the study and, in turn, to contribute to the global debate on how to tackle the problems associated with platforms with substantial market power. This reflects our belief that the most effective way to promote competition in these markets will be through action that is internationally coherent, by achieving a common understanding of the problems and broad agreement over the way to tackle them. Increasing regulatory alignment between the largest digital economies will deliver efficiencies for the businesses affected, and will boost incentives for cooperation and compliance by the largest firms.

### *Scope of the Study*

14. In this study, we intend to adopt a broad focus on competition throughout the mobile ecosystem, assessing the nature of competition in relation to consumer-facing and business-facing services. The approach we will take to our analysis will be to seek to understand the differing business models adopted by Apple (which generates around 80% of its revenue from hardware sales) and Google (which generates around 80% of its revenue from digital advertising), and how the motivations and incentives of each company vary at different points of the value chain.
15. To approach this work in a structured way, we have broken down the scope of our study into four inter-related themes:
  - **Theme 1: competition in the supply of mobile devices and operating systems.** This will consider, among other issues, whether there may be natural barriers to entry and expansion in the supply of mobile operating systems such as network effects and economies of scale, whether there are barriers to switching that ‘lock’ consumers into a certain mobile ecosystem and how Apple and Google may contribute to the existence of such barriers by influencing the behaviour of consumers.
  - **Theme 2: competition in the distribution of mobile apps.** Under this theme, we propose to examine the extent to which Google and Apple, as owners of the main app stores, have market power in the distribution of mobile apps, including the extent to which there are suitable alternatives to the main app stores through which consumers can download and app developers can distribute mobile apps. We will also consider whether Apple or Google can use their position as owners of the main app stores to exploit consumers and app developers or entrench their market power in the distribution of mobile apps or elsewhere within their mobile ecosystem.

- **Theme 3: competition in the supply of mobile browsers and browser engines.** Under this theme, we propose to examine the extent to which Apple and Google, as owners of the two largest browsers and browser engines on mobile devices, have market power in the supply of mobile browsers. This will include an assessment of potential barriers to entry and expansion such as high development costs, the role of web standards and webpage compatibility, consumer behaviour and the role of pre-installation and default settings. We will also wish to assess whether Google's and Apple's positions in the supply of browsers enable them to undermine competition and reinforce or protect their market power in other parts of their mobile ecosystems (or across their wider businesses).
- **Theme 4: the role of Apple and Google in competition between app developers.** Under this theme, we propose to explore the ways in which Apple and Google's conduct as app store providers affects competition between app developers. We will explore concerns that Apple or Google could be using their position as operators of app stores to facilitate their expansion into different app categories and favour their own services over competing ones, as well as concerns that the app review process fails to prevent the distribution of apps that may cause consumer harm.

#### *Potential outcomes and remedies*

16. Based on the findings we make within the four themes described above, we will consider areas where interventions might be appropriate to address any harms that we find.
17. Since the market study is being carried out in the context of the work that the CMA and the Government is conducting to establish the new pro-competition regime for digital markets, we anticipate that its findings will inform how the regime is designed and implemented by the DMU in relation to mobile ecosystems. In practical terms, this will most likely mean informing SMS designation decisions by the DMU, supporting its development of codes of conduct and supporting guidance for activities where SMS designations are made, and highlighting specific areas where pro-competitive interventions could be taken forward to the benefit of competition and consumers.
18. At this stage, we have identified four broad categories of intervention that may be relevant, should we conclude that the markets within scope are not working well. These are:
  - **Interventions that limit platforms' ability to exercise market power:** for example, by preventing, addressing, or penalising exploitative or exclusionary conduct.



- **Interventions to promote interoperability and common standards:** with the primary objective of overcoming consumer lock in, enabling greater freedoms to switch and multi-home between competing providers.
  - **Consumer choice remedies:** to ensure that consumers have the ability to choose between providers of content and services, are empowered to make informed decisions through access to information and the design of choice architecture, and that where default settings are necessary, they are set in the interests of consumers.
  - **Separation remedies:** such as operational separation between entities owned by the same group, to overcome conflicts of interest or market power, or functional separation of datasets, which can help to create a more level playing field.
19. Where we consider it appropriate, we may take alternative or additional courses of action to address any concerns which we do not consider would be appropriately addressed by the new pro-competition regime. These include making recommendations to government for further legislative reform, making a market investigation reference to make use of our order making powers, and taking enforcement action where we suspect a breach of consumer or competition law.

#### *Evidence-gathering*

20. In addition to considering the responses from interested parties to this statement of scope, we intend to rely on various sources of evidence to assess the themes and issues we have identified, including:
- evaluating existing publicly available information and research;
  - issuing information requests to industry participants, including device manufacturers, providers of operating systems, software engineers and app developers, browser operators, academics, and commentators;
  - meeting key interested parties (through bilateral meetings, roundtable meetings and workshops); and
  - conducting original quantitative and qualitative analysis.

#### *Next steps*

21. The CMA welcomes views from interested parties on this statement of scope by no later than 26 July 2021. We will conduct our market study over the next year, gathering evidence from a wide range of stakeholders. Following evidence gathering and analysis, we will publish an interim report within six months and a final report within twelve months which sets out our findings, any concerns we identify and our proposed recommendations or remedies to

those concerns. Our final report must be published no later than 14 June 2022.

## Introduction

22. This document describes the intended scope of our market study into mobile ecosystems. It provides an overview of how the two leading mobile device ecosystems – those of Apple and Google – currently function and interact, and explains how this market study will inform our broader programme of work on digital markets as set out in our Digital Markets Strategy.<sup>7</sup> It then sets out: how we propose to define the scope of the study, breaking this down into separate but interrelated themes; the range of potential outcomes and remedies we will consider; and our approach to evidence gathering and analysis. Finally, we invite submissions on all of the matters raised. The remainder of this section provides a summary of the CMA's market studies regime.
23. The CMA's mission is to make markets work well in the interests of consumers, businesses, and the economy. It achieves this by promoting and protecting consumer interests while ensuring that businesses are fair and competitive.
24. Market studies are one of a number of tools at the CMA's disposal to examine possible competition or consumer protection issues and address them as appropriate, alongside its mergers, enforcement, and advocacy activities. They are examinations into the causes of why particular markets may not be working well, taking an overview of regulatory and other economic drivers in a market and patterns of consumer and business behaviour.
25. We have decided to launch a market study into mobile ecosystems in order to gain a better understanding of a major component of the digital economy, and to gather evidence to investigate the concerns that have been raised, with us directly and also publicly, regarding these markets. This exercise will inform our broader programme of work to establish a new pro-competition regime for digital markets. It will complement our active competition and consumer enforcement work in this area, and it will enable us to identify whether any additional action is necessary, either by us or by the government, to address any concerns that we identify.
26. A market study begins with the publication of a market study notice by the CMA – we have published a market study notice alongside this document on our case page.<sup>8</sup> A market study notice must be published where the CMA is

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<sup>7</sup> [The CMA's Digital Markets Strategy: February 2021 refresh.](#)

<sup>8</sup> [Mobile ecosystems market study case page.](#)

proposing to carry out its functions under section 5 of the Enterprise Act 2002 (EA02) for the following purposes:

- to consider the extent to which a matter in relation to the acquisition or supply of goods or services of one or more than one description in the UK has or may have effects adverse to the interests of consumers; and
  - to assess the extent to which steps can and should be taken to remedy, mitigate or prevent any such adverse effects.<sup>9</sup>
27. Market studies can lead to a range of outcomes. They may conclude that a market can be given a clean bill of health and that the initial concerns about consumer detriment are not substantiated by the information collected over the course of the study.
28. Where the market is not found to be working well, the CMA may consider several options. These may include:
- making recommendations to government or another authority to change regulations or take further action;
  - taking competition or consumer enforcement action of its own;
  - encouraging businesses in the market to self-regulate;
  - taking steps to improve the quality and accessibility of information to consumers or promoting consumer awareness;
  - making a market investigation reference;<sup>10</sup> and
  - accepting Undertakings in Lieu of making a market investigation reference.
29. Given the context in which this market study is being conducted, which is set out below, we intend for our findings to inform future work and decisions to be made by the government, the CMA, and the new Digital Markets Unit (DMU) regarding the establishment and operation of the new pro-competition regulatory regime.
30. Further information on market studies can be found in the following guidance documents: Market Studies: Guidance on the OFT Approach (OFT519)<sup>11</sup> and

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<sup>9</sup> Section 130A(2) of the Act.

<sup>10</sup> Where the findings of a market study give rise to reasonable grounds for suspecting that a feature or combination of features of a market or markets in the UK prevents, restricts, or distorts competition, and a market investigation appears to be an appropriate and proportionate response the CMA may make such a reference.

<sup>11</sup> [Market Studies guidance on the OFT approach \(OFT519\)](#).

## **Context for the market study**

31. The conclusions we reach in this market study will contribute towards a broader programme of work, which includes the establishment of a new pro-competition regulatory regime for digital markets, and our active competition and consumer enforcement work. This is consistent with our Digital Markets Strategy, refreshed in February 2021, which emphasises that a key objective across our work in digital markets is to support the establishment of the DMU within the CMA. In establishing the DMU we hope to deliver a step-change in the regulation and oversight of competition in digital markets and in turn drive dynamic innovation.<sup>13</sup>
32. We summarise the relevant policy and regulatory context within which this study is being conducted below.

### ***Developing the new pro-competition regime for digital markets***

33. In 2018, the government commissioned an expert panel led by Professor Jason Furman ('the Furman Review') to examine competition in the digital economy, and to ensure that the UK's market regulating institutions are fit for purpose in the digital age. Since then, there have been a number of important developments towards the establishment of a new regulatory regime for digital markets in the UK:
  - March 2019: the Furman Review published 'Unlocking digital competition', which made 6 strategic recommendations, including establishing a new Digital Markets Unit (DMU) which would oversee the activities of digital firms with 'strategic market status'.<sup>14</sup>
  - December 2019: the CMA published the interim report of its market study into online platforms and digital advertising,<sup>15</sup> setting out its initial findings in relation to platforms funded by digital advertising. It supported the framework proposed by the Furman Review for the new regime.

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<sup>12</sup> [Market Studies and Market Investigations: Supplemental Guidance \(CMA3\)](#).

<sup>13</sup> [The CMA's Digital Markets Strategy: February 2021 refresh](#).

<sup>14</sup> [Unlocking digital competition, Report of the Digital Competition Expert Panel](#).

<sup>15</sup> [The CMA's Online platforms and digital advertising market study](#).

- March 2020: the government responded to the Furman Review in its Budget,<sup>16</sup> accepting all six strategic recommendations, and commissioned the Digital Markets Taskforce.
  - July 2020: the CMA published the final report of its market study into online platforms and digital advertising.<sup>17</sup> It made more detailed recommendations to government for how the new regulatory regime should apply to platforms funded by digital advertising – in particular Google and Facebook.
  - November 2020: government responded to the CMA's recommendations,<sup>18</sup> confirming that it supports the establishment of a new, pro-competition regime for the digital markets, announcing that it would establish the DMU within the CMA from April 2021.
  - December 2020: the Digital Markets Taskforce delivered its advice<sup>19</sup> to government on the potential design and implementation of the new regime. The advice suggested that, once established, the DMU should prioritise SMS assessments in the following sectors: online marketplaces, app stores, social networks, web browsers, online search engines, operating systems, and cloud computing services
  - April 2021: the DMU was established on a non-statutory basis within the CMA to begin work to operationalise the future pro-competition regime for digital markets.<sup>20</sup>
34. The government has committed to consulting on proposals for the new pro-competition regime in 2021. Following this, new legislation will be necessary to bring the regime into law.
35. One of the early priorities for the DMU will be to conduct designation assessments where it suspects digital firms have market power in a digital activity, providing them with a strategic position. Where designations are made, the DMU will need to produce and consult on codes of conduct, along with supporting guidance. While the CMA already has extensive information and evidence in relation to search, social media, and digital advertising, we have comparatively less detailed knowledge and evidence in relation to other digital markets.

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<sup>16</sup> [Budget 2020 - GOV.UK](#).

<sup>17</sup> [The CMA's Online platforms and digital advertising market study](#).

<sup>18</sup> [Government response to the CMA's digital advertising market study](#).

<sup>19</sup> [Digital Markets Taskforce](#).

<sup>20</sup> [Digital Markets Unit](#).

36. We intend that the findings and outputs of this market study will enable us to assess whether Apple and Google should be designated with SMS in relation to any of the activities captured by the scope of this study. We therefore expect that this study will be an important input into any formal designation decision taken by the DMU. Subject to the outcomes of our assessment, we also intend that the study will help develop key elements of the regulatory regime that would apply to any such designated activities, including codes and code guidance. Carrying out this work now should help ensure that, once the necessary legislation is passed to legally empower the DMU to perform its functions, it is able to hit the ground running.

### ***Enforcing consumer and competition law***

37. In parallel to our work to develop the new regulatory regime, we are making use of our existing powers to the fullest extent possible in digital markets. In addition to our markets work, we are using our consumer protection law enforcement powers to tackle fake online reviews and unfair roll-over contracts in subscriptions for online gaming and anti-virus software, we are assessing the impact of mergers in digital markets with support of updated Merger Assessment Guidelines,<sup>21</sup> and using competition law to tackle potentially anti-competitive activity in digital markets.
38. We have launched two competition enforcement cases that are directly related to important aspects of this market study. These are:
- **An investigation into Apple's App Store:** the CMA is investigating Apple's conduct in relation to the distribution of apps on iOS and iPadOS devices in the UK, in particular, the terms and conditions governing app developers' access to Apple's App Store.<sup>22</sup>
  - **An investigation into Google's 'Privacy Sandbox' browser changes:** the CMA is investigating Google's proposals to remove third party cookies and other functionalities from its Chrome browser.<sup>23</sup> The CMA has recently opened a consultation on its intention to accept the commitments offered by Google in that case.<sup>24</sup>
39. While considering similar markets and issues, those competition enforcement cases are distinct from our market study, involving, for example, different processes, legal tests, decision makers and potential outcomes. They will

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<sup>21</sup> [Merger Assessment Guidelines \(CMA129\) - 2021 revised guidance](#)

<sup>22</sup> [CMA Investigation into Apple AppStore.](#)

<sup>23</sup> [CMA Investigation into Google's 'Privacy Sandbox' browser changes.](#)

<sup>24</sup> [Consultation on proposed commitments in respect of Google's 'Privacy Sandbox' browser changes.](#)

focus on specific suspected breaches of competition law, whereas our market study will provide a broader, overarching view of the functioning of these interconnected markets. The outcome of each of the enforcement cases and the market study will be determined on the basis of the evidence gathered in that particular investigation, applying the legal tests applicable in each case. However, to maximise our impact and to avoid duplication, we will be joined up internally, making flexible use of resources, knowledge, and information across teams where appropriate and consistent with parties' procedural rights. We will work to ensure that this coordinated use of our tools will also bring benefits for the parties involved, by seeking to streamline our approach to evidence gathering, for example in relation to meetings and information requests, so far as it is practicable and appropriate to do so. Whenever we request information, we will always be clear about the basis on which it is being requested, and how it will be handled by the CMA.

40. We expect to be an increasingly active enforcer in relation to digital markets, in part due to the fact that we are now taking on digital enforcement cases and mergers which would previously have fallen under the jurisdiction of the European Commission. This study could inform decisions on any future enforcement activity.
41. Looking forwards, as was envisaged by the Furman Review when initially proposing the new pro-competition regime, we intend for our *ex post* enforcement of competition law to serve as an important complement to the new *ex ante* regulatory regime overseen by the DMU.

### ***International work in this area***

42. We are aware that other competition authorities and government bodies around the world are looking at similar issues, or have previously carried out work in this area.
43. This work in other international jurisdictions includes various studies and inquiries, including the following:
  - The Netherlands Authority for Consumers & Markets (ACM) completed a market study into mobile app stores in April 2019.<sup>25</sup> The ACM concluded that app developers depend on app stores in order to reach users on their mobile phones and for many there are no realistic alternatives to Apple's App Store and Google's Play Store. The ACM also identified a number of concerns relating to the fact that Apple and Google were both owners of

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<sup>25</sup> [ACM market study into mobile app stores](#).



these app stores and have their own mobile apps which compete with those of third party app developers and subsequently launched an investigation into Apple's behaviour.<sup>26</sup> In December 2020 the ACM also launched an investigation into users' freedom of choice regarding payment apps on smartphones.<sup>27</sup>

- The Swedish Competition Authority completed a sector inquiry into digital platforms markets, including app stores, in February 2021.<sup>28</sup> It highlighted the importance of recognising variances between different platforms and platform markets, both in terms of the risks to competition and in terms of the impact of platforms' conduct. It also concluded that existing competition law in Sweden does not always provide effective remedies for competition concerns.
- As part of its five year Digital Platform Services inquiry, the Australian Competition and Consumer Commission (ACCC) published a report on the distribution of mobile apps in March 2021 and is set to publish a report in September 2021 on market dynamics and consumer choice screens in search services and web browsers into the provision of browsers and general search services.<sup>29</sup> The ACCC's report on the distribution of mobile apps found 'that Apple's App Store and Google's Play Store have significant market power in the distribution of mobile apps in Australia' and put forward a series of potential measures in response to its findings.

44. There have also been several antitrust investigations in other jurisdictions, including:

- In its antitrust case against Google, the European Commission (EC) fined Google €4.34 billion for illegal practices regarding Android mobile devices to strengthen dominance of Google's search engine.<sup>30</sup>
- In March 2020, the French competition authority fined Apple €1.1 billion for engaging in anticompetitive practices within the distribution network for its products (excluding the iPhone), and abuse of a situation of economic dependency with regard to its 'premium' independent distributors.<sup>31</sup>
- The EC has several ongoing antitrust cases against Apple that are relevant to this study and to the CMA's enforcement work in this area. In

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<sup>26</sup> [ACM investigation into abuse of dominance by Apple in its App Store.](#)

<sup>27</sup> [ACM investigation into users' freedom of choice regarding payment apps on smartphones.](#)

<sup>28</sup> [SCA sector inquiry into digital platform markets.](#)

<sup>29</sup> [ACCC: Digital Platform services inquiry - App marketplaces, Digital platform services inquiry 2020-2025 and Report on market dynamics and consumer choice screens in search services and web browsers.](#)

<sup>30</sup> [European Commission's Google Android case.](#)

<sup>31</sup> [Fines handed down to Apple, Tech Data and Ingram Micro by Autorité de la concurrence.](#)

June 2020, the EC opened formal antitrust investigations to assess whether Apple's rules for app developers on the distribution of apps via the App Store violate EU competition rules,<sup>32</sup> and separately whether Apple's conduct in connection with Apple Pay violates EU competition rules.<sup>33</sup>

- The US Department of Justice — along with eleven state Attorneys General — filed a civil antitrust lawsuit in the in October 2020 to stop Google from unlawfully maintaining monopolies through anticompetitive and exclusionary practices in the search and search advertising markets and to remedy the competitive harms. The case relates to Google's multiple positions as the default search engine on mobile and desktop devices.<sup>34</sup>
- In May 2021, the Italian competition authority announced it was fining Google over €100 million for the abuse of its dominant position in relation to its Android operating system, and ordered it to include in Android Auto the Enel X app allowing the use of services related to the recharging of electric vehicles.<sup>35</sup>

45. Action is also being taken privately as well as by competition authorities. For example, Epic Games filed private cases separately against Apple and Google in the US in August 2020, relating to practices on their respective app stores. It has also subsequently filed similar cases in other jurisdictions, including the EU and Australia.<sup>36</sup>
46. We are aware that many other nations are exploring related issues and concerns, and the above lists are not intended to be exhaustive. We intend to draw fully on the work carried out in other jurisdictions in undertaking the study. This includes drawing from the published evidence and findings, evaluating the impact of any past interventions, and engaging on lessons that have been learned through the investigative process.

## Overview of mobile ecosystems in the UK

### *What is a mobile ecosystem?*

47. Mobile devices with internet connectivity such as smart phones and tablets now play a fundamental role in the lives of UK citizens, providing fast and

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<sup>32</sup> [European Commission's investigation into Apple's App Store rules.](#)

<sup>33</sup> [European Commission's investigation into Apple's practices regarding Apple Pay.](#)

<sup>34</sup> [Justice Department Sues Monopolist Google For Violating Antitrust Laws | OPA | Department of Justice.](#)

<sup>35</sup> [AGCM fines Google over €100 million for abuse of dominance.](#)

<sup>36</sup> It also has a case against Google in the UK, while its case against Apple was rejected by the UK's Competition Appeal Tribunal.

convenient access to a wide range of products, content and services.<sup>37</sup> In addition to communication, mobile devices also give us instant access to the latest news, state of the art cameras, music, TV and video streaming, fitness tracking, shopping, banking, food delivery services, maps and navigation, web browsing, games, and many more. They can also be connected to, with the potential to control, a wide range of other technology and devices such as smart speakers, smart watches, home security and lighting, and even vehicles. These products and services are now able to work in combination with each other, in a way that strengthens the value and functionality of each, within what we refer to as mobile ecosystems.

48. This represents a dramatic evolution in the role and uses of mobile phones over the last two decades. Mobile devices, and particularly smartphones, are now the most commonly owned devices by UK consumers, and are viewed as the most important way to access the internet.<sup>38,39</sup> Reflecting this, the majority of UK internet use is now channelled through mobile devices rather than desktop computers: 81% of time spent online in the UK in September 2019 was on smartphones and tablets combined<sup>40</sup> and 35% of UK internet users accessed the internet solely via a smartphone or a tablet in 2019.<sup>41</sup> Furthermore, mobile devices are also used to channel an increasing proportion of consumer spending online.<sup>42,43</sup>
49. While mobile ecosystems can contain a wide range of products and services, they can be broadly characterised as comprising the following core set of products:
- **mobile devices:** portable electronic devices that can be held easily in the hand, including smartphones and tablets, which can connect to the internet;

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<sup>37</sup> We use the term 'mobile device' to describe electronic devices that can be held easily in the hand and have been designed with portability in mind. Our definition of 'mobile device' includes smartphones and tablets but excludes devices with larger display formats such as personal computers (PCs), both laptop and desktop. The term in this context also excludes devices such as gaming consoles and e-readers.

<sup>38</sup> In 2020, eight in ten adults aged 16+ used smartphones. In comparison, almost six in ten (57%) adults had a laptop, half (52%) had a tablet and only a quarter (24%) had a desktop PC in their households. Smartphones were cited as the most important device for accessing the internet at home or elsewhere among all adults 16+ (60%). See [Ofcom Online Nation 2020](#), page 9.

<sup>39</sup> When asked about the most important device they used to connect to the internet in 2020, at home or elsewhere, 60% of the UK respondents replied it was the smartphone, 12% replied it was the tablet. [Devices used to access the internet in the United Kingdom \(UK\) in 2020](#).

<sup>40</sup> 71% of time spent online in the UK in September 2019 was on smartphones only. See [Ofcom Online Nation 2020](#), page 10.

<sup>41</sup> By contrast, just 4% of UK internet users accessed the internet via a computer only (including laptop and desktop) in 2019, while 60% accessed the internet on both computers (laptop or desktop) and mobile devices (smartphones or tablets). See Comscore MMX Multi-Platform, Total Internet, Adults 18+, Sep 2019.

<sup>42</sup> [European Mobile App Consumer Spending Grew 31% in 2020 to Nearly \\$15 Billion](#).

<sup>43</sup> [Smartphone Now Dominant Device For Buying Online - IMRG](#).

- **mobile operating systems:** the pre-installed system software powering mobile devices;<sup>44</sup>
- **mobile applications (or ‘apps’):** pieces of computer software providing additional functionalities to the devices and mobile operating system they are installed on. Some apps come pre-installed on devices at the point of purchase, whereas others can be selected and installed by the user.
  - **pre-installed apps** come together with a given mobile device. The most important of these are **mobile app stores and browsers**. Mobile app stores are marketplaces for mobile users to discover and download apps on their mobile devices, while mobile browsers are apps they use to access the web. Together, they constitute the two major access points for content and service providers to consumers, and every mobile device comes with at least one of each pre-installed.<sup>45</sup>
  - **user-installed apps** can be installed by consumers at any point after they have purchased and setup their mobile device. They are primarily distributed through mobile app stores but can in some cases be distributed through alternative app distribution channels such as the browser, which can be used to find and download app packages directly (so called ‘sideloading’).<sup>46</sup>

50. As a result of the strong positions that Apple and Google hold in many of the above core product categories, consumers are in practice faced with a binary choice between two mobile ecosystems – Apple’s or Google’s. Figure 1 illustrates the nature of this choice and the implications that it has on consumer behaviour in other markets.

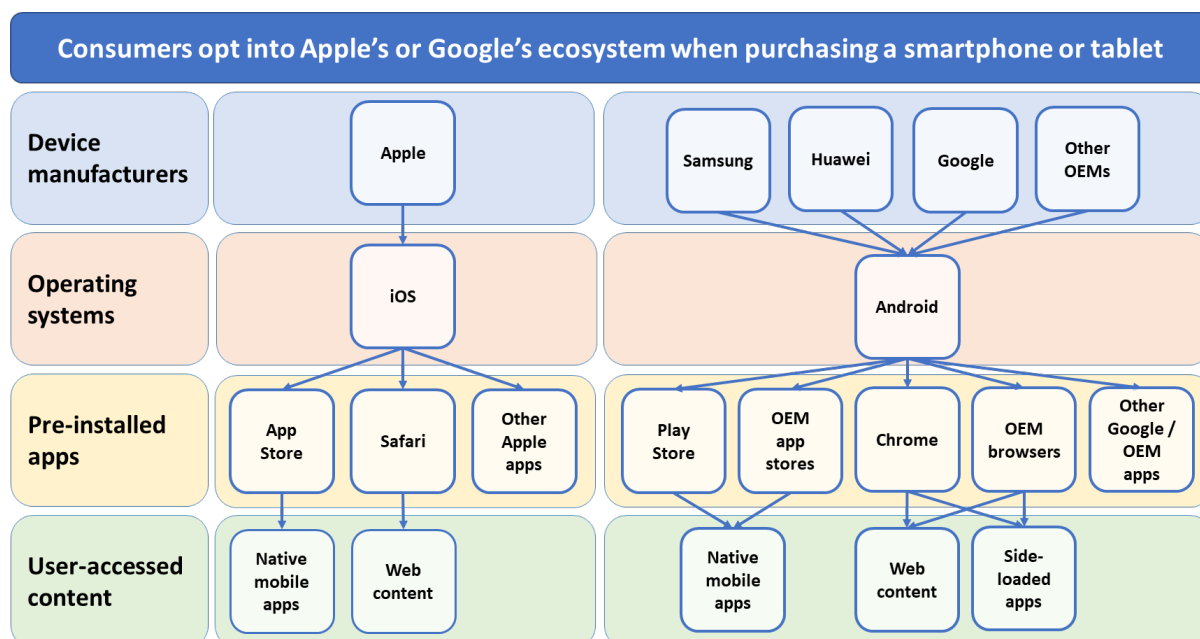
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<sup>44</sup> The OS on a mobile device may also be periodically updated.

<sup>45</sup> Pre-installation of a given app store and a browser depends on the specific mobile OS the device is running on as well as the choices of the device manufacturer. For instance, Samsung usually ships its Galaxy devices with the app store Samsung Galaxy Store, the browser Samsung Internet as well as the Google Play Store and various other Google-owned apps. See [Pre-installed apps: Samsung Galaxy S20 Ultra 5G](#).

<sup>46</sup> Availability of alternative app distribution channels depends on the specific mobile OS. For instance, Apple only allows app distribution through its proprietary app store.

Figure 1: the choice between mobile ecosystems



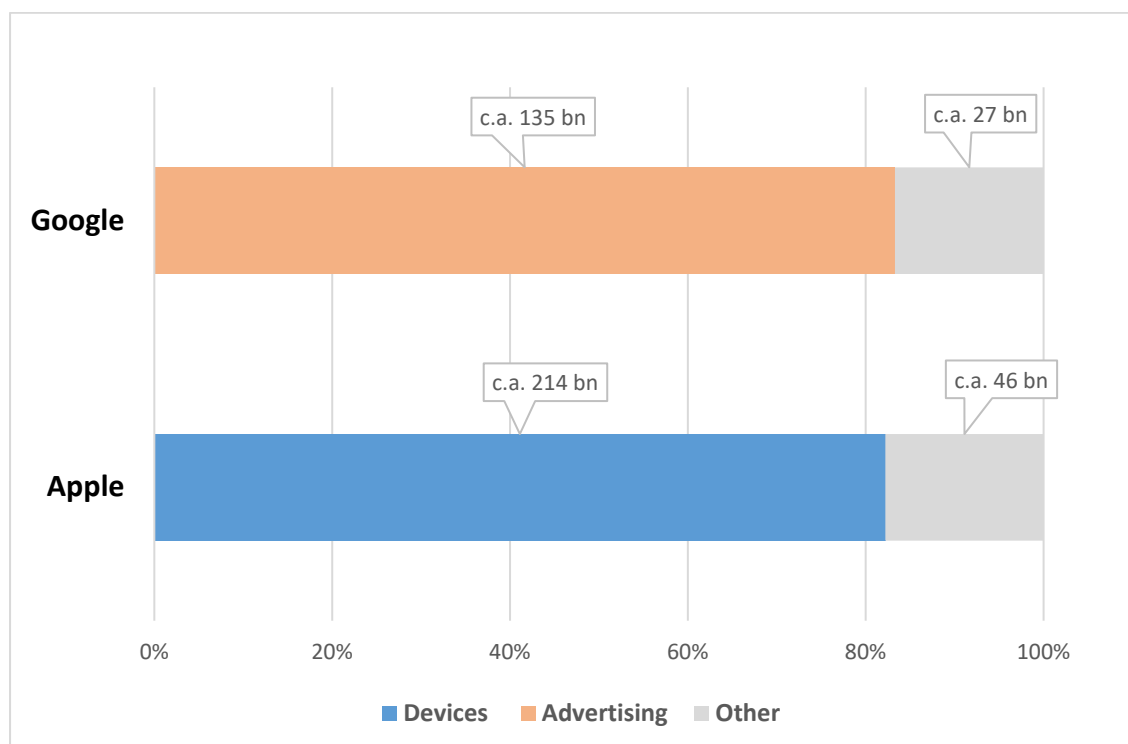
51. Despite many similarities in terms of the products and services offered by Apple and Google, there are a number of important differences in their overarching business models. The following sections first provide an overview of the two companies' business models in respect of mobile ecosystems, before then explaining at a high level how the core products of the value chain function and interrelate.

### ***Apple's and Google's business models***

52. Apple and Google operate the two major mobile ecosystems, both worldwide and at the UK level.<sup>47</sup> As illustrated in Figure 2, there are significant differences in their business models, with Apple generating revenue primarily through device sales, while Google's main source of revenue is through digital advertising.

<sup>47</sup> We note that the European Commission excluded China in its analysis of the global mobile OS market, due to Google's limited presence there. See EC's [Google Android](#) decision, paragraph 416 onwards. We understand that, although Android is very popular in China, smartphones sold there cannot have any proprietary Google services pre-installed on Android. See [Is Android blocked in China?](#)

**Figure 2: Apple and Google global revenue by category (2019, \$)**



Source: Apple's and Google's 2019 annual reports.

53. The 'other' sources of revenue captured by the chart include revenue from app stores and subscription-based services for both companies.<sup>48</sup> For Google, the figure also includes revenue from hardware.<sup>49</sup> For Apple, the figure also includes revenue from digital advertising<sup>50</sup> and the payments made to it by Google to set Google search as the default search engine on Apple devices, including in the Safari browser. These payments take the form of a revenue share between Google and Apple relating to search advertising revenues and were reported to amount to up to \$12 billion by the US Department of Justice.<sup>51</sup>
54. There are a large number of valued products and services provided by each company, for instance operating systems, browsers, and mapping apps, that we understand provide negligible direct revenue.
55. In the course of this market study, we plan to investigate how elements of Apple and Google's ecosystem relate to each other, how the actions they take

<sup>48</sup> For Google, 'Other' includes revenue from Google Play Store, YouTube non-advertising revenue, revenue from Google Cloud, revenue from hardware, including Google Nest home products, Pixelbooks, Pixel phones and other devices and Other Bets revenues (which consists primarily of sales of Access internet and TV services, licensing and R&D services). For Apple, 'Other' includes revenue from the App Store, from its own apps (eg subscription fees), revenue from digital advertising and default payments from Google.

<sup>49</sup> This was estimated to be around \$2 billion in 2019. See [Google now has a 'multibillion-dollar' hardware business, has paid \\$80B to Android app devs.](#)

<sup>50</sup> Analysts estimated Apple's revenue from search advertising to be worth \$500 million in fiscal year 2018. See [Apple looking at \\$2 billion from Search Ad business alone by 2020.](#)

<sup>51</sup> See [Complaint](#) filed by the Department of Justice against Google.

with respect to some elements affect other areas of their business, and the extent to which these actions depend on their specific business model. This will require a more detailed understanding of the different sources of revenue in each of the companies' ecosystems.

## *Apple*

56. Apple designs both hardware and software running on its devices and its mobile operating system (iOS) is non-licensable to non-Apple makers.<sup>52</sup> Apple's primary source of revenue comes from selling hardware, accounting for 80% of its total net sales in 2020, which totalled \$274 bn.<sup>53</sup> The iPhone is Apple's main revenue source and accounted alone for half of the company's net sales.<sup>54</sup> In early 2020 the number of active Apple devices worldwide surpassed 1.5 billion. Of these, at least 900 million are iPhones.<sup>55</sup> Apple presents its focus on products as a differentiator compared to companies such as Google and Facebook which derive most of their revenue from services and advertising.<sup>56</sup>
57. In addition to products, Apple also provides services, which contributed to approximately 20% of its global revenue in 2020, for a total of almost \$54 bn. The importance of services to Apple's revenues has increased in recent years, having grown from 9% of global revenues in 2015. Apple's services segment includes several categories, such as subscription-based streaming apps (Apple Music, Apple TV+), a browser (Safari), a browser engine (WebKit), a digital payments service (Apple Pay), a gaming services (Apple Arcade), the news aggregator Apple News+, cloud storage services (iCloud), advertising services (ie ads within the App Store and Apple News+) and various others.
58. Apple does not disclose the specific revenue it gets for each of its services. We understand that the services revenue stream includes Apple's revenue from its advertising business,<sup>57</sup> commissions from app developers distributing their apps through the App Store,<sup>58</sup> revenue from its own apps (eg subscription fees), and the default payments made by Google for setting

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<sup>52</sup> Although iOS initially powered both Apple iPhones and iPads, in September 2019, Apple introduced a rebranded variant of iOS for iPads only (iPadOS) to reflect the growing set of differentiating features of the two products. In this document, we use the term 'iOS' to describe both the mobile OS powering iPhones and the mobile OS powering iPads.

<sup>53</sup> Hardware includes smartphones, tablets, PCs, wearables, and accessories. See Apple annual report 2020.

<sup>54</sup> See Apple annual report 2020.

<sup>55</sup> [Apple's iPhone installed base hits 900 million](#), Jon Fingas, 29 January 2019.

<sup>56</sup> [Apple's submission to ACCC re App Marketplace Issues Paper](#).

<sup>57</sup> [Apple signals greater role in ad revenues as iPhone sales drop 15%](#), Omar Oakes, 30 January 2019.

<sup>58</sup> Apple does not disclose revenue associated with the App Store. Analysts estimated that the App Store's worldwide gross app revenue reached around \$50bn in 2019. See [Apple's App Store had gross sales around \\$50 billion last year, but growth is slowing](#).

Google Search as default search engine, including on Apple's browser Safari, which was reported to amount to up to \$12bn.<sup>59</sup>

## Google

59. Google produces a wide range of digital products and services, including over fifty user-facing services such as its search engine Google Search and the Chrome browser, online advertising technologies, mobile devices and operating systems, cloud computing and software.
60. Unlike Apple, Google does not generate a substantial proportion of its income from sales of hardware, where it has a very small share of mobile device sales (~1% in 2020 in the UK).<sup>60</sup> Instead, it operates an ad-funded business model and its primary revenue source comes from selling digital advertising, which accounted for over 80% of its total revenue in 2019.<sup>61</sup> Google has had a share ranging between 89% and 93% of the general search market throughout the last ten years in the UK and had a share of over 90% of UK search advertising revenues in 2019.<sup>62</sup> Google also earns substantial revenue from display advertising on its video streaming platform YouTube.
61. Google leads the development of the mobile operating system Android, based on open source software and originally developed by a consortium of developers (the Open Handset Alliance). It also operates a range of other services which complement its advertising businesses. These include a browser (Google Chrome), a navigation and web mapping service (Google Maps) and an email client (Gmail).
62. Google's business model relies on attracting consumers by offering its core services for free and then monetising them through selling advertising inventory to businesses that wish to reach those consumers. As a result, business segments such as Android, Chrome and Gmail are monetised largely through their role in developing Google's ecosystem, where Google is the default search provider, allowing it to monetise these activities through digital advertising.<sup>63</sup> Consistent with this strategy, Google licenses Android to original equipment manufacturers (OEMs) without charging a licence fee.

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<sup>59</sup> Department of Justice investigation. The CMA's online platforms and digital advertising market study found that Google paid around £1.2 billion in return for default positions in the UK alone, the substantial majority of which was paid to Apple.

<sup>60</sup> See [Mobile & Tablet Vendor Market Share United Kingdom | StatCounter Global Stats](#). Google's share of mobile devices is reported to have shrunk by 50% in 2020. See [Google's Smartphone Market Share Shrunk by 50% In 2020 \(androidheadlines.com\)](#).

<sup>61</sup> The CMA's [Online platforms and digital advertising market study](#).

<sup>62</sup> *Ibid.*

<sup>63</sup> The CMA's online platforms and digital advertising market study, [Appendix D](#).



## ***Mobile devices and operating systems***

63. Mobile devices, and the mobile operating systems associated with them, serve as the entry point for consumers into mobile ecosystems. The choices of which device and operating system to purchase are made together, as these products are generally sold in combination. Though it may not be a conscious decision for all, when purchasing a mobile device, a consumer also decides which mobile ecosystem they will operate in going forwards. Today, the choice in practice is binary: Apple's iOS, or Google's Android.
64. Both globally and at the UK level, Google and Apple hold a de facto duopoly over mobile operating systems with the combined share of Android and iOS exceeding 99%.<sup>64</sup> In 2020, the Apple iOS share of operating systems on mobile devices, including smartphones and tablets, in the UK was reported to be 52% and the Google Android share was 48%.<sup>65</sup>
65. Apple's iOS is not licensed to non-Apple mobile device manufacturers as Apple operates a vertically integrated model and designs both the software and hardware of its devices. As a result, Apple's position in mobile devices mirrors its position in mobile operating systems, with a share of 50% as smartphone manufacturer and 65% as tablet manufacturer in the UK in 2020.<sup>66</sup>
66. Unlike iOS, Android is open source and commercially sponsored by Google, which retains the 'Android' trademarks. Google licenses the Android name and logo to OEMs that enter the Android Compatibility Program.<sup>67</sup> Versions of the Android source code which are outside of the compatibility program are called Android 'forks'.<sup>68</sup> The most well-known example is Amazon's Fire operating system, which we understand only operates on Amazon's tablets, accounting for around 1% of mobile devices in 2020.<sup>69</sup> After building an Android compatible device, OEMs can choose to license Google Mobile

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<sup>64</sup> See <https://gs.statcounter.com/os-market-share/mobile-tablet/worldwide/#monthly-202003-202103> and <https://gs.statcounter.com/os-market-share/mobile-tablet/united-kingdom/#monthly-202003-202103>

<sup>65</sup> See [Mobile & Tablet Operating System Market Share United Kingdom | StatCounter Global Stats](#).

<sup>66</sup> See [Mobile & Tablet Vendor Market Share United Kingdom | StatCounter Global Stats](#). Shares are by volume and calculated by StatCounter via analysing page views. See [FAQ | Statcounter Global Stats](#).

<sup>67</sup> The Android compatibility program consists of three key components: (i) The Android Open Source Project source code; (ii) The Compatibility Definition Document (CDD), representing the 'policy' aspect of compatibility and (iii) The Compatibility Test Suite (CTS), representing the 'mechanism' of compatibility. See [Android Compatibility Program Overview | Android Open Source Project](#). To build an Android compatible device, hardware manufacturers must comply with the Android CDD and pass the CTS. See EC Google Android Decision. In this document, we use the term 'Android' to describe all versions of the Android mobile OS which enter into the Android Compatibility Program.

<sup>68</sup> Our approach is consistent with the one taken by the EC in its Android decision, where any reference to an 'Android fork' is to a version which is outside Google's compatibility program. The EC has not attributed to Google the share of Android devices running on Android forks or where the fork developer did not apply for the Android compatibility tests. This is because the development of such forks is not generally subject to the monitoring and control of Google. See EC Google Android Decision.

<sup>69</sup> See [Mobile & Tablet Vendor Market Share United Kingdom | StatCounter Global Stats](#).

Services (GMS), a collection of proprietary applications and application programming interfaces (APIs) from Google.<sup>70</sup> We understand that only Android-compatible devices can license GMS.<sup>71</sup>

67. Google's share of mobile devices, through the Pixel line of smartphones and tablets, is very small (around 1% in 2020 in the UK), with most mobile devices running on the Android mobile operating system manufactured by third parties.<sup>72</sup> In the UK, even the largest of these third party mobile device manufacturers (Samsung with a share of 27% in 2020, followed by Huawei with a share of 9%) is considerably smaller than Apple, which had a share of 52% in 2020.<sup>73</sup>
68. While other mobile operating systems were available in the early 2000s, such as Nokia's Symbian, Microsoft's Windows Mobile and RIM's BlackBerry operating system, Apple and Google have been by far the biggest mobile operating system providers for the last decade.<sup>74</sup> As shown in Figure 3, Apple's estimated share of supply in mobile operating systems has been relatively stable and over 50% since 2012 while the Android share has risen steadily, from 21% in 2012 to 48% in 2020.<sup>75</sup>

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<sup>70</sup> Google Mobile Services include Google Play, YouTube, Google Maps, Gmail, and many other proprietary apps that run on top of Android. GMS is not part of the Android Open Source Project and is available only through a license with Google. See [Android Compatibility Program Overview | Android Open Source Project](#)

<sup>71</sup> See [Frequently Asked Questions | Android Open Source Project](#)

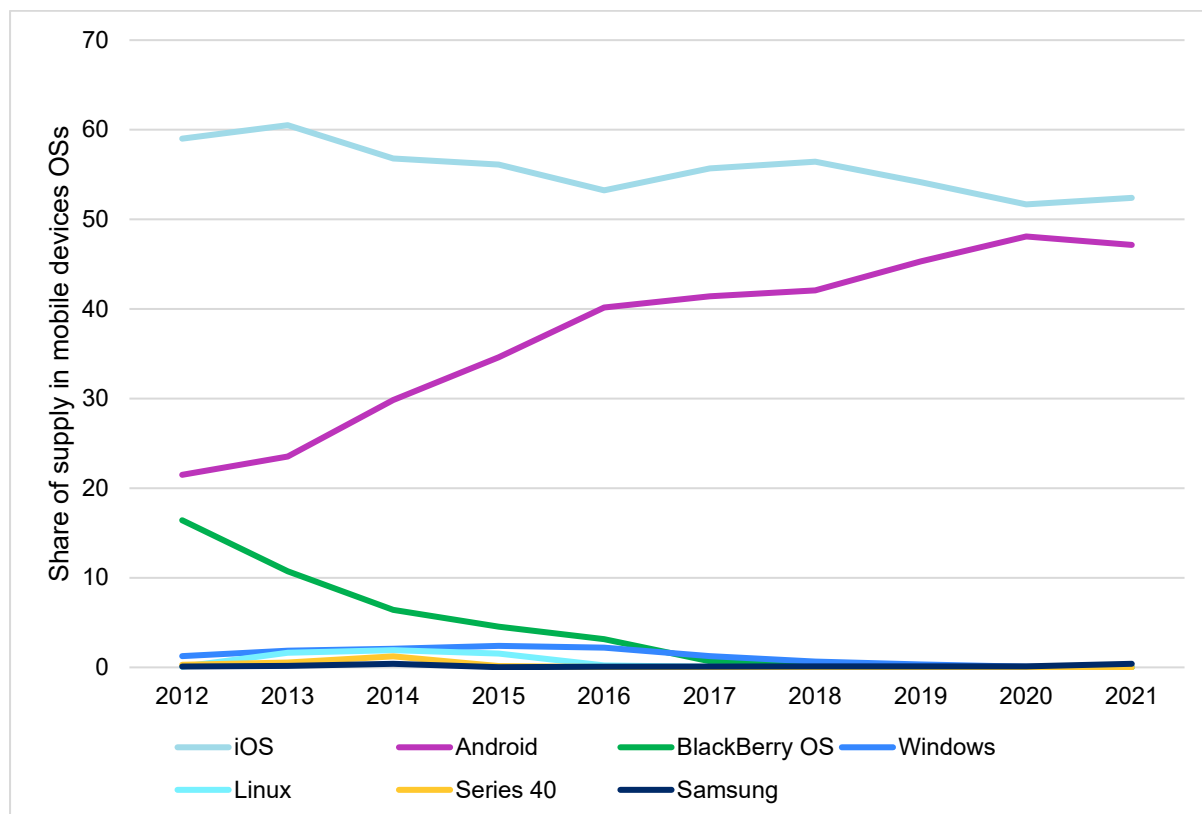
<sup>72</sup> See [Mobile & Tablet Vendor Market Share United Kingdom | StatCounter Global Stats](#).

<sup>73</sup> See [Mobile & Tablet Vendor Market Share United Kingdom | StatCounter Global Stats](#).

<sup>74</sup> In the early 2000s, Symbian had clearly established itself as the market-leading mobile phone OS, with a 67% share of smartphones sold globally. At the same time, Microsoft and RIM held 14% and 7% market shares respectively. See [Success Factors of Mobile Business Ecosystems](#), 23 September 2014, page 3.

<sup>75</sup> [Market share of leading mobile device vendors in the UK](#), Statista website

**Figure 3: Shares of supply in mobile devices operating systems in the UK (2012-2021)**



Source: [Statcounter website](#).

Notes: It is unclear whether Android forks such as Fire OS are included in Android or 'Other'. However, we understand that Fire OS is by far the largest and only operates on Amazon's tablets, accounting for around 1% of mobile devices in 2020.<sup>76</sup>

Other and Unknown have been removed for ease of comparison.

69. One of the major shifts in the mobile operating system market, which greatly popularised mobile apps, occurred in 2008, when Apple and then Google launched their proprietary app stores: the App Store and Google Play. This came one year after the launch of Apple's iPhone, the first large touchscreen smartphone, and at the same time as Google's launch of the mobile operating system Android, licensable to third party manufacturers and compatible with any smartphone.<sup>77</sup>
70. Alongside a distribution platform for their apps, Apple and Google offered software tools to third party app providers (ie Software Development Kits or 'SDKs') which allowed them to easily develop apps for Android and iOS mobile ecosystem. Collectively this lowered development costs for third-party developers and provided them with access to a large pool of potential users.

<sup>76</sup> See [Mobile & Tablet Vendor Market Share United Kingdom | StatCounter Global Stats](#).

<sup>77</sup> ACM Market Study, page 20.

This created significant benefits for both businesses and consumers, who were able to access an increased range of services and functionalities.<sup>78</sup>

## **Mobile apps**

71. Mobile apps are typically designed to work on a specific mobile operating system, in which case they are called 'native apps'.<sup>79,80</sup> This means that, for a developer's mobile app to be present on both Android devices and iOS devices, there will need to be two versions of that app. Android-native apps are generally written in the Java programming language, while iOS ones are written using Swift, Apple's official programming language.<sup>81</sup> Unlike most websites, mobile apps tend to be designed specifically for mobile devices and typically deliver faster performance and a better user experience than by accessing sites via web browsers.<sup>82</sup>
72. Mobile apps play an increasingly fundamental role in the operation of many UK businesses and in the lives of many UK consumers and are used to provide an increasingly wide variety of services, including games, entertainment, health and fitness, and facilitation of physical services (eg food delivery, ride-hailing). In March 2020, there were over 5 million apps available for downloading in the UK.<sup>83</sup>
73. In 2019, the UK mobile app market was the most lucrative in Europe, with nationwide revenue from app sales over £1.5 billion.<sup>84</sup> This trend has increased during the COVID-19 pandemic,<sup>85</sup> with consumers downloading, using and spending more in apps than ever before. In 2020, consumer expenditure on mobile apps reached \$111 billion globally, a rise of 20% over

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<sup>78</sup> See [Success Factors of Mobile Business Ecosystems](#), 23 September 2014, page 3. Windows' mobile OS was discontinued in 2017. See [Windows 10 Mobile gets its final death sentence](#), 8 October 2017.

<sup>79</sup> Native apps are developed for use on a particular mobile OS or device and tend to work with it in ways that enable them to perform faster and more flexibly than alternative application types. See <https://searchsoftwarequality.techtarget.com/definition/native-application-native-app>. Apps can be written for a mobile or a desktop environment and generally provide a more focussed set of functionalities compared to traditional software programs for desktop. See [ACM Market study into mobile app stores](#), page 20.

<sup>80</sup> In this document, we use the term 'mobile apps' or 'apps' to describe native apps as opposed to web apps.

<sup>81</sup> [Android vs iOS: Which Platform to Build Your App for First?](#)

<sup>82</sup> [Ofcom Online Nation 2020](#), page 23.

<sup>83</sup> [Ofcom Online Nation 2020](#), page 23.

Examples of mobile apps include email clients (eg Gmail), web browsers (eg Safari, Chrome), content streaming apps (eg Spotify, Netflix), messaging apps (eg WhatsApp, Signal), food delivery apps (eg Uber Eats, Deliveroo) and ride-hailing apps (eg Uber, Bolt).

<sup>84</sup> [Statista: Mobile App Revenue Europe](#).

<sup>85</sup> Mobile apps have spiked in use since lockdown as consumers turned towards retail and fitness apps to fill the void of physical stores and gyms closures and looked at gaming and entertainment apps as real-world socialising was restricted. See [Mobile Device Apps: including impact of Covid-19](#), Mintel Report (UK), October 2020. See also <https://www.statista.com/statistics/1121168/device-usage-coronavirus-in-the-uk/> on increased mobile device usage during the Covid-19 pandemic.

2019. The UK featured among the top markets driving this spend,<sup>86</sup> with UK consumers spending over £2 billion on mobile apps in 2020.<sup>87</sup>

74. App developers<sup>88</sup> can distribute their mobile apps to users either via pre-installation on a given mobile operating system or by encouraging the user to install their app on their device. Users can install apps through an app store, or (on Android devices) through alternative distributions channels such as the browser, which users can use to download apps on their devices, bypassing the official app store.

#### *Pre-installed mobile apps*

75. As noted above, pre-installed mobile apps come together with a given mobile device, on which they are pre-installed prior to purchase. Pre-installed mobile apps tend to be mobile apps that are generally produced by the mobile operating system provider or, in the case of Android, the OEM. In some cases, the apps which come pre-installed by the mobile operating system provider or the device manufacturer can be difficult to delete by users, are prominently displayed on the mobile device's home screen or are set as default app for certain of its functionalities.
76. Arguably, the most important mobile apps to the mobile ecosystem are the app store, which allows users to browse and download other apps, and the browser, which gives users the ability to browse the web, accessing the vast array of websites and services available online. App stores and browsers have a broadly similar role, in that they both serve as a major access point to consumers for all businesses with an online presence, providing them with an important route to market. Equivalently, they provide the main means by which users can access content and services through their mobile device. Every mobile device comes with at least one app store and one browser pre-installed, reflecting the essential nature of their function.

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<sup>86</sup> The UK mobile app market was estimated to be worth £1.98 billion in 2019, with a growth of 33% compared to the previous year and to have grown to £2.75 billion in 2020, a 43.3% increase from 2019. Mintel expects 2020's growth to be consolidated and built on in the next five years, due to stickiness in new consumer behaviours such as retail activities online and technology advancements like 5G network and AR. See *Mobile Device Apps: including the effects of Covid-19*, Mintel report, October 2020. See also [The State of Mobile 2021](#), App Annie.

<sup>87</sup> <https://sensortower.com/blog/european-app-revenue-and-downloads-2020>.

<sup>88</sup> We use app developer as common shorthand to refer to app providers/owners/publishers, even if strictly speaking some app providers/owners outsource the coding of their mobile apps to third party developers.

## *App stores*

77. App stores are two-sided platforms: they allow consumers to browse and download mobile apps and developers to distribute them through a centralised marketplace.
78. Apple and Google each have their own proprietary app store, with Apple's App Store pre-installed on iOS devices and Google's Google Play Store typically pre-installed on Android devices.<sup>89</sup> We understand these two app stores are the main distribution channels for mobile apps in each ecosystem such that Apple's and Google's position in the mobile operating system space is largely mirrored in their position as app store providers within iOS and Android respectively.<sup>90</sup> On their proprietary app stores, Apple and Google offer both in-house developed mobile apps and mobile apps developed by third-party app providers. To be admitted into the App Store or Google Play, third-party mobile apps are subject to a review process by the app store operator (Apple or Google) to check whether they comply with their store guidelines (eg in terms of functionality, performance, safety and security).<sup>91,92</sup> Any mobile apps that are not deemed to comply by the app store operator are then rejected (although the app developer can submit a revised version), this effectively means that for a given app store, the operator sets the rules for app developers using that app store to follow.
79. On Apple devices, the App Store is the only distribution channel for native mobile apps<sup>93</sup> as Apple does not allow alternative app stores or sideloading.<sup>94,95</sup> By contrast, alternative app stores to Google Play are available on Android devices and may come pre-installed on them by the device manufacturer or be available to download (eg Samsung's Galaxy Store, Aptoide). Google also allows direct app distribution through sideloading. We discuss these alternative app distribution channels in further detail in the user-installed app section below.

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<sup>89</sup> Following the EC's decision *Google Android*, Google no longer gives away Google Play Store when licensing Android for free and now charges a fee for Google Play Store. Nevertheless, we understand that the vast majority of Android devices are shipped with Google Play Store pre-installed.

<sup>90</sup> While there are alternative app stores for Android, such as the Amazon Appstore for Android or the Samsung Galaxy Store, these have significantly fewer apps than the Play Store and are only available on specific devices. There are no alternative app marketplaces for iOS. See ACCC's [Digital platform services inquiry, Interim report No. 2 – App marketplaces](#).

<sup>91</sup> See <https://developer.apple.com/app-store/review/guidelines/> and [Developer Policy Center \(google.com\)](#).

<sup>92</sup> In addition, developers that want to distribute their apps through the App Store need to pay a \$99 annual fee to Apple.

<sup>93</sup> In addition to via native apps, Apple consumers can also be reached via web apps.

<sup>94</sup> Apple does not allow alternative app stores on its proprietary one, so users cannot download alternative app stores on Apple devices. 'Jailbreaking' iOS to allow unapproved software to be installed, is in principle possible on Apple devices but reported to be technically difficult and contrary to Apple's terms of use.

<sup>95</sup> In addition to native apps, content and service providers can also reach Apple users via a web apps, which are accessible directly through a web browser.

## Browsers

80. Mobile devices allow users to access the internet through browser apps, which are typically pre-installed on the device.<sup>96</sup> For example, Apple's Safari comes pre-installed on iPhones and iPads, whereas Google Chrome generally comes pre-installed on mobile devices using Android operating system. Other web browsers are also available and may either come pre-installed on mobile devices by manufacturers (eg Samsung browser) or be downloaded by the user (eg Firefox).
81. At the most basic level, browser apps are software to enable users of mobile devices<sup>97</sup> to access and search the internet and interact with content on different sites. Other than through native apps, web browsers are the most important way for users of mobile devices to access content and services over the internet. A 2019 report from a mobile advertising company indicated that users spend a higher proportion of their time on browsers than any other single app.<sup>98</sup>
82. Through browsers, businesses can also reach consumers via web apps, which are similar to common websites, but designed specifically to be viewed on a smartphone.<sup>99</sup> Unlike native apps, web apps are not mobile operating system-specific, they do not need to be downloaded or installed, and are accessed through an internet browser.<sup>100</sup> There are therefore some benefits of web apps, including not needing to download them and a cheaper cost of development, but we understand that web apps are not always substitutable to native apps for both app developers and consumers in terms of offered functionalities and user experience.<sup>101</sup>
83. In addition to providing access to users, browsers are an important access point for businesses that want to reach users with their content and services. Businesses build and optimise web pages that load on browsers to make content available to users. Where businesses monetise their content using ads (publishers), they and the ad tech providers operating on their behalf may also collect and use data about users' browsing behaviour, in order to display

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<sup>96</sup> We understand that mobile devices come with at least one mobile browser pre-installed. However, users can also download and install additional mobile browsers on their mobile devices at any time after purchase.

<sup>97</sup> Web browsers provide the same function on desktop and other devices.

<sup>98</sup> [Kargo & Verto Analytics - Web vs App report 2019](#). The report says that approximately 17% of users time is spent on mobile web (Safari + Chrome), with the next closest apps being Facebook with 14% and YouTube with 8%.

<sup>99</sup> We understand that a direct link to a web-app could also be 'pinned' to a mobile device home screen to make the access to the web app easier.

<sup>100</sup> [Mobile Apps vs. Web Apps — What's The Difference? \(careerfoundry.com\)](#).

<sup>101</sup> For example, the Dutch ACM found that 'the browser or web-apps cannot be considered a realistic alternative to most native apps since their functionality and usability is limited compared with native apps, especially on iOS.'. [Marktstudie appstores \(acm.nl\)](#), page 4.

targeted ads to them. Businesses interested in selling their products and services to users (advertisers) pay for ads to be served on publishers' web pages in order to direct users to their own web pages selling goods and services.

84. Apple and Google operate the largest two browsers both in the UK and globally, although there are significant variations in their relative shares across mobile and desktop devices. On mobile devices in the UK, Safari has a share of 49% and Google Chrome a share of 40%; while on desktop Google Chrome is the largest web browser, with a share of 60%, and Safari has a share of 17%.<sup>102</sup>
85. Each browser sits on top of a browser engine,<sup>103</sup> which transforms web page source code into web pages that people can see and engage with. There are three main browser engines, which are all open-source projects:
- Blink, which is created and controlled by Google, is used by Google Chrome and many other browsers including Microsoft Edge.<sup>104</sup>
  - WebKit, which is used by Apple and is the basis for its own web browser Safari and must also be used by any other browser available on Apple mobile devices. This means that the version of Google Chrome on Apple mobile devices is based on WebKit rather than Blink.
  - Gecko, which was developed by Mozilla is the basis for the Firefox browser and some others such as Cliqz.
86. Most browsers which compete with Apple and Google use Google Blink as their browser engine. All browsers on iOS devices are required to use Apple WebKit. Although browsers can in principle choose to 'fork' from their underlying browser engine to differentiate their browsers, this may be costly for browser developers which, as a result, may choose to replicate the functionalities introduced by Apple or Google. Google Blink-supported browsers and Apple Webkit account for almost the entirety of all page views on mobile devices (Blink-supported browsers 50% and Apple Webkit 48%).

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<sup>102</sup> See Table 1 below, and also Statcounter ([Desktop Browser Market Share United Kingdom | StatCounter Global Stats](#)) for information on desktop shares.

<sup>103</sup> The CMA understands that browser engines are also called rendering engines.

<sup>104</sup> Blink is the browser engine, also called rendering engine. Chromium, including Blink, is the open-source project behind the Google Chrome browser.



### *Other pre-installed apps*

87. In addition to mobile app stores and browsers, mobile devices typically come with a set of other pre-installed apps which are produced by the provider of the mobile operating system or the OEM. These include several general utility-style apps, such as calendar, calculators, and notepads, as well as a range of other categories of apps such as those for content streaming (Apple Music, Apple TV+, Google TV, YouTube), navigation (Apple Maps, Google Maps), email (Gmail, Apple Mail), and contactless payment services (Apple Pay, Google Pay).
88. While in the case of Apple, pre-installation is limited to Apple's own apps,<sup>105</sup> a number of apps produced by the OEM come pre-installed on Android phones. In addition, some third-party apps are also pre-installed on Android phones. These may be popular apps which the OEMs want to offer on their devices that have been pre-installed as a result of specific agreements between third-party developers and OEMs.

### *User-installed apps*

89. The vast majority of apps available for download on mobile devices are user-installed, in the sense that they are not installed on the mobile device when a user purchases a mobile device but can be installed at a later stage by the mobile devices' users. User-installed and pre-installed apps are not mutually exclusive, as some apps may come pre-installed on an Android phone but also be available for user installation on an Apple one (eg Google Chrome app).
90. As noted above, there are various routes for app developers to distribute their mobile apps and for users to install them on their mobile devices. These include pre-installation (as discussed above), installation through an app store and sideloading, which refers to direct installation of a software package on a mobile device bypassing the official app store.
91. Apple's proprietary app store is the only distribution channel for mobile apps on iOS, as Apple does not allow alternative app stores or unapproved software to be installed on its mobile devices. Google does allow users to use alternative app stores on Android phones and to bypass the app store through sideloading. However, we understand that both alternative app stores and sideloading are used significantly less than Google's Play Store, which

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<sup>105</sup> [ACM market study into mobile app stores](#), page 50.

reportedly facilitates the majority of app downloads on Android devices.<sup>106</sup> Furthermore, sideloading is reported to require some time and effort by consumers and to represent a realistic alternative to the official app store only for apps that already have a large brand awareness and established user bases.<sup>107,108</sup>

## Objectives of the market study

92. The overarching objective of the market study is to assess whether the markets within its scope are working well and in the interests of consumers and, if we find problems, to identify interventions to address them.
93. As outlined above, this market study is being conducted in the context of a broader programme of work, both within the CMA and also across government, to design and establish a new pro-competition regulatory regime for digital markets in the UK. We therefore intend for the outputs of this study to inform, and be informed by, the developments of that wider programme. More specifically:
  - i. **Establishing the new pro-competition regime:** we anticipate the findings of this study will inform the scope of the new pro-competition regulatory regime. For example, we intend that the study will provide a basis for future DMU designation decisions and for the development of codes of conduct and associated guidance, and will inform the potential future use of pro-competitive interventions (PCIs) by the DMU.
  - ii. **Supporting current and further action by the CMA:** we will seek to operate flexibly and in a joined-up manner so that the study can complement our related enforcement cases. We may also reach the conclusion that further direct intervention by the CMA is necessary, for instance, if we identify evidence that consumer or competition law has been breached and enforcement action is necessary, or if we identify problems that could most effectively be resolved through use of our order making powers following a market investigation reference.

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<sup>106</sup> According to the DoJ, more than 90 percent of apps on Android devices are downloaded through Google Play. See US Department of Justice complaint against Google. See also ACM final report, on use of alternative app stores on Android.

<sup>107</sup> [ACM market study into mobile app stores](#), page 45-49.

<sup>108</sup> Epic Games previously tried to sidestep Google Play and distribute its popular game Fortnite exclusively via its own website, but eventually made the game available on Google Play too. This outcome suggests that distributing apps via sideloading might not be a realistic alternative even for apps with a strong brand and large user base. According to Epic Games, Google used 'scary, repetitive security pop-ups' to put software downloadable outside of Google Play at a disadvantage. See [Fortnite owner gives up battle against Google Play store](#), Alex Hern, 22 April 2020.

- iii. **Promoting global regulatory alignment:** the most effective way to promote more effective competition in these markets will be through action that is internationally coherent. This is not to suggest that regulatory interventions in the UK must be identical to those applied in other countries, but achieving a common understanding of the problems and broad agreement over the necessary toolkit will be a significant driver of change. Increasing regulatory alignment between the largest digital economies will deliver efficiencies for the businesses affected, and will boost incentives for cooperation and compliance by the largest firms.
94. These factors will inform our approach to evidence gathering, aid decisions regarding which strands of analysis to prioritise, and help us to assess trade-offs between the breadth and depth of our focus.

## Scope and structure of the market study

95. As outlined earlier in the document, Apple and Google hold an effective duopoly in key elements of the mobile device value chain, including in the provision of operating systems, app stores, and browser engines. As platforms, these services bring together and facilitate interactions between different users, including consumers and businesses. By controlling the primary access points to consumers in their mobile ecosystems, Apple and Google have established themselves as gatekeepers between consumers and a large and increasing proportion of economic activity.
96. In this study, we intend to adopt a broad focus on competition throughout the mobile ecosystem, assessing the nature of competition in relation to consumer-facing and business-facing services as well as the strategic importance of each element of the mobile device value chain.<sup>109</sup> The approach we take to our analysis will be mindful of the differing business models adopted by Apple and Google, and how the motivations and incentives of each company may vary at different points of the value chain. This is reflected in the proposed scope and structure of our study, and in our proposed approach to evidence gathering discussed later in this document.
97. To approach this work in a structured way, we have broken down the scope of our study into four inter-related themes:
- Theme 1: competition in supply of mobile devices and operating systems.

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<sup>109</sup> As noted in the discussion of theme 3, we welcome submissions on whether the consideration of browsers should cover desktop as well as mobile devices.

- Theme 2: competition in the distribution of mobile apps.
- Theme 3: competition in the supply of mobile browser and browser engines.
- Theme 4: the role of Apple and Google in competition between app developers.

98. Underpinning these themes is a set of cross cutting issues which we intend to explore in the study. We summarise these issues first before discussing each of these themes in turn below.

### ***Cross cutting issues***

99. There are a number of related cross-cutting issues that we will wish to explore in the study.

100. First, we propose to explore certain types of barriers to entry and expansion which may lead to market power across different elements of the mobile ecosystem. These include:

- Network effects: Both operating systems and app stores are two-sided platforms that facilitate interactions between consumers and app developers. The value to an app developer of developing its mobile app for a specific operating system (and making it available on a specific app store) increases the more consumers use that specific operating system and specific app store. Similarly, the value to a consumer of a specific operating system and specific app store increases the more app developers that make their mobile app available on that operating system and app store. This means that operating systems and app stores both exhibit indirect network effects. As a result, new entrants may find it difficult to enter as they need to attract consumers to attract app developers, but they also need to attract app developers to attract consumers.<sup>110</sup>
- Consumer behaviour and default settings: Consumer behaviour (eg inertia, default bias) and switching costs may limit switching between mobile ecosystems as a whole and between different elements of the mobile ecosystem including app stores and browsers. We propose to investigate the extent to which this behaviour is influenced by the way that platforms shape the choices available to users, including the pre-

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<sup>110</sup> For example, the [ACM study](#) and the [ACCC study both](#) identified the existence of network effects in relation to mobile OSs and app stores.

installation of mobile apps, default settings and other aspects of choice architecture.<sup>111</sup>

- Interoperability: the extent of interoperability between services and connected devices is also likely to affect the extent of competition within different elements of the mobile ecosystem. Where interoperability is restricted, we will wish to understand the technological or other justifications for such restrictions.<sup>112</sup>

101. Second, as outlined above, mobile operating systems, app stores and browsers have a similar role, in that they serve as major access points (or ‘gateways’) to consumers for many businesses with an online presence, providing them with an important route to market. We propose to explore concerns that ownership of these gateways provides the gatekeepers with a source of market power which allows them to exploit consumers and businesses and / or entrench or extend their market power in related activities. For example:

- As outlined above, Apple prevents consumers from downloading mobile apps directly from websites and does not allow consumers to download rival app stores from its app store. This has been identified as a factor that reinforces the position of Apple’s App Store.<sup>113</sup>
- Parties have also raised concerns that Apple and / or Google exploit their position as owners of the main app stores by making their own in-app payment systems mandatory and not allowing app developers selling digital content to offer alternative payment methods to consumers.<sup>114</sup>

102. Third, the firms controlling these gateways are able to set the rules within which they and other market participants must operate, determining the parameters of competition within their ecosystems. For example, we have heard concerns that Google is using its position as the owner of Chrome/Blink to disable third party cookies and replace them with an alternative that would

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<sup>111</sup> For example, the [ACM study](#) and [ACCC study](#) both considered factors such as pre-installation and default settings.

<sup>112</sup> For example, the [ACM study](#) considered the implications of services and connected devices not being compatible across different mobile ecosystems.

<sup>113</sup> For example, the [Majority Staff Report and Recommendations of the Subcommittee on Antitrust, Commercial and Administrative Law of the Committee of Judiciary](#) highlighted these factors when finding that Apple’s App Store had market power. For example, it stated ‘[t]here is no method for a third-party app store to challenge the App Store on iOS devices’ and ‘the ability for consumers to sideload apps—installing apps without using an app store—does not discipline the dominance of Apple and Google in the mobile app store market. Apple does not permit users to sideload apps on iOS devices, and few consumers have the technical savvy to “jailbreak” an iOS device to sideload apps.’ The implications of these restrictions were also considered in the [ACM study](#) and the [ACCC study](#).

<sup>114</sup> For example, the [ACM study](#) and the [ACCC’s study](#) both considered Apple and Google’s in-app payment systems.

benefit its own digital advertising service over its rivals.<sup>115</sup> We have also heard concerns that Apple's recent changes to how app developers can track users in its ecosystem for the purpose of mobile advertising ('App Tracking Transparency') would advantage its own advertising service over rivals and reinforce the importance of its App Store as a means for users to discover new apps.<sup>116</sup>

103. We propose to explore whether Apple and Google are taking on quasi-regulatory functions within their ecosystems and may be setting the rules in relation to matters such as privacy and user security in ways that advantage themselves over their rivals.<sup>117</sup> More broadly we will look to consider whether the behaviour of Apple or Google can be seen as an attempt to establish the primacy of closed, walled garden ecosystems, with rules and standards set by the gatekeepers, as an alternative to the open web, based on open standards, and, if so, to assess the likely impacts on consumers.<sup>118</sup> We will wish to consider both the potential benefits of more closed ecosystems as compared to more open ecosystems (which may relate, for example, to increased security), and the potential costs (for example, in terms of reduced innovation, choice and competition).

### ***Theme 1: competition in the supply of mobile devices and operating systems***

104. Consumers enter Apple's or Google's mobile ecosystems the first time they purchase a mobile device that uses iOS or Android. Under this theme, we will consider whether there is effective competition at this point of entry, with a particular focus on the extent to which different operating systems compete. We propose to examine the extent to which Apple and Google enjoy market power as owners of the main two operating systems.
105. In doing this we will seek to develop a better understanding of the history of mobile operating systems and the factors that led to the rise of iOS and Android as the main operating systems. For example, as can be seen in Figure 4, 12 years ago both Symbian (Nokia's operating system) and

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<sup>115</sup> For example, see [Online platforms and digital advertising market study final report](#), paragraphs 5.321 to 5.328. The CMA is currently [investigating](#) Google's Privacy Sandbox proposals to replace third party cookies and other forms of user tracking on Chrome. The CMA has recently opened a [consultation](#) on its intention to accept the commitments offered by Google in that case.

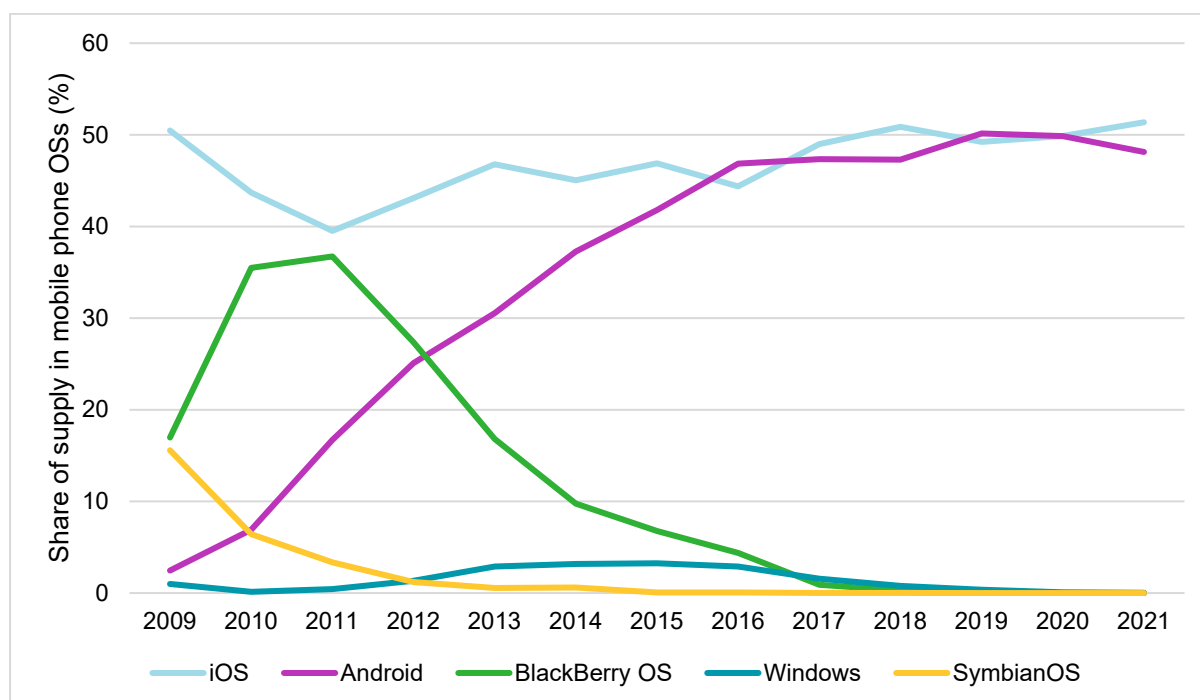
<sup>116</sup> For example, see [Apple privileges its own ad network with ATT. What's its privacy endgame? | Mobile Dev Memo](#) and [Why is Apple rebuilding the App Economy? | Mobile Dev Memo](#).

<sup>117</sup> We considered similar issues in relation to Google and Facebook in the Online Platforms and Digital Advertising Market Study. For example, see [Online platforms and digital advertising market study final report](#), paragraphs 47 and 5.313 to 5.330.

<sup>118</sup> For example, the [ACM study](#) set out that Apple and Google maintain a high degree of control over their respective mobile ecosystems, a [complaint](#) filed by the US Department of Justice against Google set out the various actions it considers Google takes to maintain control over its mobile ecosystem and some have suggested that Apple's recent App Tracking Transparency policy promotes closed walled gardens (for example, see [The profound, unintended consequence of ATT: content fortresses | Mobile Dev Memo](#)).

Blackberry operating system (owned by RIM) held material shares of supply in mobile phone operating systems in the UK and Blackberry operating system was the second largest mobile phone operating system as recently as 2012. Other large companies such as Microsoft have tried to enter with their own mobile phone operating systems (Windows), but never gained a material share (Windows peaked at 3% in 2015).<sup>119</sup>

**Figure 4: Shares of supply in mobile phone operating systems in the UK from 2009 to 2021**



Source: [Mobile Operating System Market Share United Kingdom | StatCounter Global Stats](#).

Notes: Other and Unknown have been removed for ease of comparison.

106. We propose to explore why Apple and Google succeeded in building and maintaining their share of supply, while rivals either lost their share of supply or never managed to build a material share. This will include exploring several factors.
107. First, we will explore whether there may be natural barriers to entry and expansion in the supply of mobile operating systems such as network effects and economies of scale and scope. For example, mobile operating systems are likely to benefit from indirect network effects as the value of a mobile operating system to a consumer increases the more app developers make their mobile apps available on that mobile operating system and vice versa. If this is the case then new entrants may find it difficult to enter as they need to

<sup>119</sup> Windows' Phone mobile OS was reportedly discontinued by Microsoft in 2017 due to a lack of interest from app developers and too low volume of users. See [Windows 10 Mobile gets its final death sentence](#), 8 October 2017.

attract consumers to attract app developers, but they also need to attract app developers to attract consumers.

108. In doing this we will seek to understand why Apple and Google may have benefited from some of these natural barriers to entry more than others and the implications of this for competition.<sup>120</sup> In particular, this will inform our understanding of the likelihood of dynamic competition.
109. Second, we will explore how consumer behaviour may contribute to Apple and Google's positions in mobile operating systems – and how Apple and Google may influence the behaviour of consumers. A key question to answer in this regard will be the extent to which, after entering a specific mobile ecosystem, consumers subsequently switch between mobile ecosystems (and thus mobile operating systems) and if not the reasons for this. In doing this we will explore the actual level of switching and whether there are barriers to switching that 'lock' consumers into a certain mobile ecosystem.
110. In addition to traditional barriers to switching such as actual or perceived learning costs or consumer inertia, we will explore the role the wider mobile ecosystem plays in consumer lock-in by raising barriers to switching. For example, the ACM in its market study identified the wider mobile ecosystem as a factor that increased barriers to switching as consumers used mobile apps that could not be ported over another mobile ecosystem and found that over time this barrier to switching (and thus consumer lock-in) increased.<sup>121</sup>
111. As part of this we will consider the extent to which Apple or Google may enhance consumer lock-in through their actions within the mobile ecosystems or through the connected devices they offer. This will include considering:
  - Whether Apple or Google make their own mobile apps interoperable with other mobile operating systems and the reasons for and impact of their interoperability choices.
  - Whether Apple or Google make their connected devices (eg smart watches) interoperable with other mobile operating systems and the reasons for and impact of their interoperability choices.

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<sup>120</sup> For example, the ACM identified several reasons in its market study including: (i) that Apple and Google's mobile OSs were easier to develop apps for; (ii) that Apple and Google have prevented or limited fragmentation within their mobile ecosystems; (iii) that Apple and Google were the first to introduce app stores which allowed consumers and app developers to find each other more easily; and (iv) that Google also offered Android to third party manufacturers for free whereas competing mobile OSs charged. See [ACM study](#), pages 34 to 37 and <https://techcrunch.com/2010/07/05/mobile-developer-economics-2010/>.

<sup>121</sup> See [ACM market study into mobile app stores](#).



- Whether Apple or Google take actions within their mobile ecosystems to favour their own mobile apps (or actions that otherwise have that effect) and the reasons for and impact of these actions. For example, this includes pre-installation of their own mobile apps and the extent to which their own mobile apps can access functionality (in relation to hardware and software) that competing third-party mobile apps cannot. These actions will also be considered in relation to Theme 4 where we will consider the role of Apple and Google in competition between app developers.
112. While our primary focus in this theme will be on operating systems, we will also consider the extent to which manufacturers of mobile devices might constrain any market power Apple or Google may have at the operating system level. This is for two reasons:
- First, in practice consumers cannot change the mobile operating system on an existing mobile device so the only way for a consumer to switch between competing mobile operating systems is for them to switch between mobile devices. This means that competition between device manufacturers using different operating systems could constrain any market power at the operating system level and our analysis of this will closely relate to our analysis of the extent of consumer lock-in (eg we will consider the impact of any actual or perceived differences in mobile device hardware affect consumer behaviour including lock-in).
  - Second, as outlined above, most mobile devices running on the Android mobile operating system are manufactured by third parties. If these third parties can switch to a credible alternative mobile operating system, then this could constrain any market power Google has at the mobile operating system level. In doing this 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.<sup>122</sup> In addition, our analysis of this will closely relate to both the analysis of barriers to entry and expansion in operating systems and the analysis of consumer lock-in.

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<sup>122</sup> For example, see a [complaint](#) filed by the US Department of Justice against Google which sets out the anti-forking agreements used by Google.

## ***Theme 2: competition in the distribution of mobile apps***

113. As set out above, the app store and the browser are key apps within mobile ecosystems. Every mobile device comes with at least one app store and one browser pre-installed and one or both serve as a major access points or gateways to consumers for all businesses with an online presence, providing them with an important route to market.
114. Across the next two themes we consider app stores and browsers in turn. However, in doing this we will keep in mind the extent to which consumers and businesses may consider apps distributed through app stores and content available on browsers as substitutes, and the incentives of both Apple and Google as owners of both the main app stores and the main browsers within their mobile ecosystems.
115. As outlined above, mobile apps are predominantly distributed through app stores, which are two-sided platforms: they allow consumers to browse and download mobile apps and developers to distribute them through a centralised marketplace. Under this theme, we propose to examine the extent to which Google and Apple, as owners of the main app stores, have market power in the distribution of mobile apps. This will include considering a number of inter-related issues.
116. First, we will assess the extent to which there are suitable alternatives to the main app stores through which consumers can download and app developers can distribute mobile apps. If both consumers and app developers are able to switch to suitable alternatives this may constrain any market power in app distribution.
117. In doing this we will examine the following:
- Whether there may be natural barriers to entry and expansion for rival app stores, such as network effects and economies of scale and scope, which lead to market power in the distribution of mobile apps. As outlined above, mobile operating systems are likely to exhibit indirect network effects and app stores are also likely to exhibit such indirect network effects. For example, consumers are likely to derive more value, and therefore use, an app store the higher the number of app developers present on that app store and vice versa. If this is the case, then new entrants may find it difficult to enter as they need to attract consumers to attract app developers, but they also need to attract app developers to attract consumers.
  - Whether specific actions taken by Apple and / or Google restrict the ability of consumers or app developers to use alternatives to their app stores.

For example, Apple only allows mobile apps to be distributed through its App Store as it specifically prevents other app stores from being installed on iOS devices and also prevents mobile apps being downloaded from webpages (ie sideloading). Further, while Android users can engage in sideloading we understand that they receive a prompt when doing so and have to change their security settings each time in order to do so.<sup>123</sup>

- Whether consumers and app developers use alternative app stores or installation methods when they are available and, if not, the reasons for this behaviour. For example, past studies have found that on mobile devices using Android most mobile apps are distributed through Google Play Store despite the fact that consumers can both use alternative app stores (often device manufacturers pre-install alternative app stores) and engage in sideloading.<sup>124</sup> In doing this we will consider how pre-installation of Apple and Google's app stores and the default settings of and prompts from their mobile operating systems affect the behaviour of consumers when downloading mobile apps. In relation to the Play Store we will also consider the impact of any agreements Google has with third party device manufacturers relating to the positioning of the Play Store and whether it can be uninstalled by users.

118. Second, we will assess the extent to which there are suitable alternatives to mobile apps through which consumers can access content and app developers can distribute their content. If both consumers and app developers are able to switch to suitable alternatives this may constrain any market power in app distribution.
119. Within mobile ecosystems we understand the main alternative channel to mobile apps through which consumer and app developers can connect is through web browsers. This can be done through either regular webpages or through web apps as outlined above. We will explore whether these are suitable alternatives to mobile apps, for example in terms of functionality or user experience.<sup>125</sup> In doing this we will seek to understand the incentives Apple and Google might have as both owners of the two main app stores and the two main browsers within mobile ecosystems.
120. At least in some instances, consumers and app developers may also be able to connect outside mobile ecosystems. For example, many app developers

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<sup>123</sup> For example, see the [ACM market study into mobile app stores](#) which discusses the warning message received by users of Android devices when engaging in sideloading.

<sup>124</sup> For example, see a [complaint](#) filed by the US Department of Justice against Google which sets out that '[m]ore than 90 percent of apps on Android devices are downloaded through Google Play'.

<sup>125</sup> For example, the [ACM study](#) found that 'the browser or web-apps cannot be considered a realistic alternative to most native apps since their functionality and usability is limited compared with native apps, especially on iOS.'

may be able to develop apps for desktop devices, and for certain app categories such as gaming and video streaming services there may be alternatives such as games consoles and smart TVs. Therefore, we will also consider whether these are considered suitable alternatives by consumers and app developers. Importantly in doing this we will consider the extent to which these alternatives are seen by app developers as substitutes or complements.

121. Third, we propose to examine some more specific concerns that have been raised around the extent to which Apple and Google can use their positions as owners of the main app stores, and thus controllers of these major access points, to exploit consumers/app developers and / or entrench their market power in the distribution of mobile apps .
122. For example, we will explore the impact of Apple and Google mandating that many app developers using their app stores only use their in-app payment systems when selling digital content.<sup>126</sup> In particular, concerns have been raised that the mandatory usage of these in-app payment systems forecloses rival payment systems and also means that app developers selling digital content are precluded from using potentially lower cost or better alternatives which may ultimately lead to higher prices for consumers.<sup>127</sup> In doing this we will also consider the restrictions that both Apple and Google place on the ability of app developers to communicate to users when there are alternative payment methods outside of the mobile app (eg where the user can subscribe to a service through a website).
123. We also propose to explore the recent introduction by Apple of its App Tracking Transparency policy. This policy mandates that app developers collecting any information that could be used to track consumers across mobile apps will be required to use a specific prompt to request permission to do so – that is, consumers have to actively opt-in.<sup>128</sup>
124. In particular, we will explore concerns that have been raised about the impact that this new policy will have on mobile advertising, which many app developers use to attract consumers and monetize their apps, including that this new policy will favour Apple’s own advertising services and that this will reinforce the importance of Apple’s App Store in content discovery for consumer and thus its importance to app developers in attracting

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<sup>126</sup> See [Google's Payments Policy](#) (provision 2) and Apple’s [App Store Review Guidelines](#) (section 3.1.1).

<sup>127</sup> The CMA is considering related issues in the context of its investigation into Apple, following complaints that its terms and conditions for app developers are unfair and anti-competitive. [CMA investigates Apple over suspected anti-competitive behaviour](#).

<sup>128</sup> [Apple, User Privacy and Data Use](#).

consumers.<sup>129</sup> In doing this we will also explore how such mobile advertising operates within Google's mobile ecosystem.

125. Finally, we will explore whether Apple and / or Google take actions as owners of app stores to hold up entire business models (or actions that otherwise have that effect). For example, we have heard concerns that Apple has used its App Store policies to prevent developers from introducing cloud gaming services such as Microsoft's xCloud or Google's Stadia on iOS devices. These services would allow users to stream games remotely rather than needing to install individual games on their devices and would enable technically sophisticated games to be played on less powerful devices.<sup>130</sup> However, restrictions Apple places on apps that can be distributed through the App Store have delayed or prevented the introduction of these services for iOS devices.
126. We will explore whether this and other restrictions Apple or Google have placed on the business models that developers can use have harmed the quality and variety of apps available to consumers. We will also explore whether these restrictions may be motivated by a desire to protect revenues in related areas or to curtail innovation that might undermine Apple or Google's market position.
127. While certain practices or actions Apple and / or Google take may reinforce or entrench any market power, they may also have beneficial impacts. For example, while some have expressed concerns about actions taken by Apple to reduce consumer tracking across mobile apps, these changes may also have beneficial impacts in terms of user privacy. Similarly, while some have expressed concerns about actions taken to restrict the installation of mobile apps outside of app stores, these restrictions may also have some beneficial impacts in terms of security. Therefore, as well as assessing the extent to which such practices reinforce or entrench any market power, we will also consider other harms and benefits to customers that may arise.

### ***Theme 3: competition in the supply of mobile browsers***

128. As set out above, browsers are an important access point to consumers for businesses and to content for consumers. Chrome and Safari are the largest browsers on mobile (and desktop) devices and their browser engines

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<sup>129</sup> For example, see [Facebook, Speaking Up for Small Businesses; iOS14, Fortnite, and the importance of controlling distribution | Mobile Dev Memo](#); [Why is Apple rebuilding the App Economy? | Mobile Dev Memo](#), [Apple privileges its own ad network with ATT. What's its privacy endgame? | Mobile Dev Memo](#); [How does IDFA deprecation impact ad prices? | Mobile Dev Memo](#); [An Interview with Eric Seufert about Apple, Facebook, and Mobile Advertising – Stratechery by Ben Thompson](#).

<sup>130</sup> [The Verge, What is Cloud Gaming?](#)

underpin most of their competitors. As shown in Table 1, Google Blink-supported browsers and Apple WebKit accounted for almost the entirety of all page views on mobile devices in the UK in 2020 (Blink-supported browsers 50% and Apple WebKit 48%).

**Table 1: Browser shares based on page views in the UK, 2020**

<i>Browser</i>	<i>Browser engine</i>	<i>Mobile device (%)</i>	<i>All devices (%)</i>
Chrome	Blink	39.7	49.0
Safari	WebKit	48.5	33.6
Samsung	Blink	8.1	4.3
Firefox	Gecko	0.5	3.5
Edge	Blink	0.2	5.4
Internet Explorer	Trident	n/a	1.5
Android	Blink	2.2	1.1
Opera	Blink	0.3	0.8
Others		0.5	0.8

Source: Statcounter

129. Under this theme, we propose to examine the extent to which Apple and Google, as owners of the two largest browsers and browser engines on mobile devices, have market power in the supply of mobile browser engines and mobile browsers.
130. In doing this we will seek to develop a better understanding of the history of browsers and browser engines and the factors that led to the rise of Chrome/Blink and Safari/WebKit as the main browsers/browser engines.
131. First, we will explore whether there may be natural barriers to entry and expansion in the supply of browsers and browser engines such as high development costs, the role of web standards and webpage compatibility. For example, we propose to consider to what extent the need for web developers to ensure that their websites are compatible with the leading browsers or browser engines, rather than broader industry standards, limits the extent to which new entrants can challenge the position of incumbents. As part of this assessment, we will wish to understand the relationship between the browser and the browser engine, and to consider any constraints on the ability of browsers to ‘fork’ from their underlying browser engine to differentiate their browsers. We will also consider whether specific actions taken by Apple and Google may increase barriers to entry. For example, Apple requires any competing browsers to use its browser engine, WebKit, on iOS devices.<sup>131</sup>

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<sup>131</sup> [App Store Review Guidelines - Apple Developer](#), paragraph 2.5.6.

132. Second, we will explore how consumer behaviour may contribute to Apple's and Google's position in relation to browsers and browser engines – and how Apple and Google may influence the behaviour of consumers. In particular, we will focus on the pre-installation of browsers and default settings<sup>132</sup> on mobile devices. Both of these practices may affect usage patterns by consumers and encourage them to use a pre-installed or default browser as opposed to other browsers which are available to download.
133. Third, we propose to assess whether Google's and Apple's positions in the supply of browsers and browser engines enable them to undermine competition and reinforce or protect their market power in other parts of the mobile ecosystem (or across their wider businesses). In doing so, we will seek to understand their business models and the incentives to operate browsers, which neither users nor businesses are directly charged for, and the extent to which browsers, as important access points, can act in a quasi-regulatory capacity by setting rules for market participants, including competitors, in various parts of the ecosystem.
134. For example, we will wish to consider Google's 'Privacy Sandbox' browser proposals to remove third party cookies and other functionalities from Blink and its Chrome browser, which could entrench Google's market power in digital advertising, and which the CMA is currently investigating.<sup>133</sup> On 11 June 2021, the CMA opened a consultation on its intention to accept the commitments offered by Google to address the CMA's competition concerns.<sup>134</sup> We will explore these changes in the context of competition between browsers as in the past few years both Apple and Firefox have also removed third party cookies.<sup>135</sup>
135. Further, as outlined above there are web-based alternatives which may allow consumers and app developers to bypass app stores and the suitability of these alternatives depends on the functionality of the browsers. Therefore, we will seek to understand the incentives Apple and Google might have as both owners of the two main app stores and the two main browsers within mobile ecosystems. While our primary focus will be on browsers on mobile devices and how they relate to the mobile ecosystem, we will also consider the extent to which competition in the supply of browsers on desktop devices differs and whether it leads to different outcomes.

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<sup>132</sup> For example, this may include the default positioning of the pre-installed browser and the pre-installed browser opening by default when a webpage link is clicked, for example, in an email.

<sup>133</sup> [CMA to investigate Google's 'Privacy Sandbox' browser changes.](#)

<sup>134</sup> [Consultation on proposed commitments in respect of Google's 'Privacy Sandbox' browser changes.](#)

<sup>135</sup> [Firefox, Apple \(AAPL\) Block 3rd-Party Cookies, GOOGL Does Not - Bloomberg.](#)

#### ***Theme 4: the role of Apple and Google in competition between app developers***

136. As mentioned above, Apple and Google operate the main mobile app stores, which are the only or major app distribution channels in their respective mobile ecosystems. In doing so, they determine which apps the users of their mobile operating system are able to download. In particular, all third-party mobile apps available on these app stores are subject to a review process by Apple/Google, which means that Apple and Google set the rules that third-party apps need to comply with (eg in terms of functionality or services offered) to be allowed on their app stores.
137. At the same time, Apple and Google also produce certain categories of app in competition with third-party app developers, essentially playing a dual role as both app store provider and downstream competitor. This dual role may create conflicts of interest for Apple and Google.
138. Under this theme, we propose to explore the ways in which Apple and Google's conduct as app store providers affects competition between app developers. This will include both situations where Apple and Google operate competing services to the ones provided by third-party developers and situations where they do not operate competing services, but their conduct as app store providers may nevertheless affect the ability of app developers to operate.
139. We will explore concerns that Apple or Google could be using their position as operators of app stores (and their position in mobile OSs) to facilitate their expansion into different app categories and favour their own services over competing ones (potentially leading to the foreclosure of actual or potential competitors). We will consider the extent to which Apple or Google are able to give their own apps competitive advantages over their competitors, and whether this is likely to result in a loss of innovation or consumer choice. If we do find Apple or Google engaging in behaviour that favours their own mobile apps, we will wish to understand the justifications for such behaviour.
140. Mechanisms through which Apple or Google might be favouring their own services over those of third parties, some of which have been the object of public concerns raised from various app developers,<sup>136</sup> include:
  - pre-installation of their proprietary apps on their own mobile operating systems or default setting of their own services, which can be difficult to

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<sup>136</sup> For example, Spotify has complained about the obligation to use Apple's in-app payment system and pay a 30% commission, Tile has complained about Apple putting restrictions on its product's capabilities before launching a competing product, and DuckDuckGo has complained about the difficulty in changing the default search engine on Android devices.



uninstall or change and which may affect usage patterns by consumers and encourage them to use Apple's and Google's apps for certain purposes as opposed to browsing and downloading third-party ones with a similar function;

- raising downstream rivals' costs through the obligation on certain third-party app developers to use Apple's and Google's proprietary in-app payment systems for in-app purchases, in relation to which they charge a commission of up to 30%;
- prominent placement of their proprietary apps in the rankings of their app stores or prominent positioning in dedicated sections of their app store (eg 'Featured' or 'Suggested for you');
- collection and use of commercial information on rivals that would facilitate Apple or Google's expansion into different app categories – eg through their app review process or through their control over the in-app payments and the visibility it gives them over app-related transactions;
- intermediation of the relationship between consumers and developers and potential restrictions in the services developers are allowed to offer (eg discounts, cancellations, refunds, etc) or in the ways they can engage with consumers (eg via direct marketing communication); and
- restrictions on the ability of third-party developers to access software and hardware functionalities that are used by Apple and Google's proprietary apps.

141. The above mechanisms could also contribute to reinforcing or entrenching any market power that Apple or Google have in the supply of mobile operating systems. For instance, pre-installation or prominent placement of proprietary apps by Apple might increase the use of Apple's own apps, which are only available on iOS, thereby making it more costly for consumers to switch mobile ecosystem.

142. Given that app stores are the main way in which consumers download mobile apps, the running of these app stores has a material impact on app developers' ability to operate even when Apple or Google do not have competing proprietary apps. Therefore, as part of this Theme, we intend to develop a better understanding of how Apple and Google operate their app stores and any potential impact that this might have on competition between third party app developers.

143. As mentioned above, the App Store and Google Play offer millions of apps for consumers to choose from. We anticipate that how these apps are displayed

in these app stores, and thus Apple's and Google's control over choice architecture within their own store, may have a significant impact on an app's overall success.<sup>137</sup> We intend to test this hypothesis through the course of the study.

144. App stores typically enable a 'search' function to help consumers find an app that meets their needs. This function lets consumers enter a search term and the search algorithm sorts through the multitude of apps available and returns a list of apps that are most relevant to the search term. How the list appears and thus the apps are ranked is determined by the app store owner who sets the default ranking.
145. App stores also sort apps based on their 'category' or 'genre' (eg entertainment, productivity, shopping, or social networking) and may also 'feature' or 'push' particular apps by displaying certain apps in a highly prominent manner. Various factors can determine where and how an app is displayed. These include the use of keywords which are relevant to the user's search (on which app providers can bid), number of downloads, ratings, and reviews. Furthermore, Apple and Google also offer developers 'paid placements' for certain apps to be displayed among the first results in their app store.
146. Due to the importance of ranking and prominent placement in determining consumer engagement, particularly on mobile devices,<sup>138</sup> we intend to gather evidence to better understand how Apple and Google operate these mechanisms and the extent to which their workings influence competition.
147. We will also explore the impact that Apple and Google's app review processes, through which they determine which apps can be downloaded through their app stores, may have on competition between third party developers. We have heard concerns that a lack of transparency and consistency in the app review process can impede the ability of app developers to reach consumers,<sup>139</sup> as well as concerns that the app review process fails to prevent the distribution of apps that may cause consumer

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<sup>137</sup> Literature on online search habits and consumer behaviour as well as published reports on related topic suggest that consumers focus mostly on results at the top of the search results, even more so on mobile. See [Online search: Consumer and firm behaviour](#), EC's decision on [Google Search \(Shopping\)](#) and [Online platforms and digital advertising market study](#).

<sup>138</sup> Ibid.

<sup>139</sup> See for example [Digital platform services inquiry, interim report No. 2 - App marketplaces](#), ACCC, pages 51-54.

harm, for example through misleading consumers into signing up to unwanted subscriptions with high fees.<sup>140</sup>

148. We will seek to understand the nature of the relationships between Apple, Google, third party app developers, and consumers. This will enable us to examine whether the terms and conditions that Apple and Google impose on third party developers have any harmful consequences for consumers, such as signing up to unwanted subscriptions. We will also explore whether similar concerns could arise in relation to Apple's and Google's own services. We will also explore Apple's and Google's roles in relation to cancellations and refunds that consumers attempt regarding services accessed via the App Store or Google Play.

### ***Potential consumer harms from a lack of competition***

149. Concerns relating to the four themes above could in principle lead to a variety of harmful effects on consumers. The extent of the effects of any market power is likely to be a crucial element of any SMS designation – the Digital Markets Taskforce suggested that a firm should be found to have a strategic position when 'the effects of its market power are likely to be particularly widespread and/or significant'.<sup>141</sup> Understanding the consumer harm caused by market power or firm behaviours is also important for assessing the appropriateness of any remedies.
150. We will explore which harms are likely to arise and how widespread and significant they are likely to be. Examples we will consider include the following:
- Weak competition throughout the mobile device value chain could constrain innovation and limit the development of transformative new products and services.
  - Weak competition in mobile devices and operating systems could lead to consumers facing higher prices for mobile and connected devices, and less innovation and quality in the services provided by Google and Apple in terms of operating systems, app stores and browsers.
  - Weak competition in operating systems, browsers and app stores could lead to consumers sharing either more or less data than they would

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<sup>140</sup> See for example [Apple's \\$64 billion-a-year App Store isn't catching the most egregious scams - The Verge](#) and [Digital platform services inquiry, interim report No. 2 - App marketplaces, ACCC](#), chapter 6.

<sup>141</sup> [Digital Markets Taskforce](#).

otherwise do, potentially leading to broader privacy concerns or impacts on their choice of apps.

- Weak competition in app stores and browsers may undermine consumers' ability to access higher quality, more relevant content and services.
- If competition between app developers is undermined, consumers may face higher prices when both purchasing mobile apps and for in-app purchases as well as lower quality apps.
- If market power in operating systems, browsers or app stores is leveraged to undermine competition in digital advertising, this can lead to: an increase in the prices consumers pay for goods and services across the economy that use digital advertising; and weaker incentives for app developers and web publishers to produce valuable content.

### ***Potential remedies***

151. Based on the findings we make within the four themes described above, we will consider areas where interventions might be appropriate to address any harms that we find.
152. As outlined above, this market study is being carried out in the context of the work that the CMA and the government is conducting to establish the new pro-competition regime for digital markets. We anticipate that the findings of this study will inform how the regime is designed and implemented by the DMU in relation to mobile ecosystems, and which firms will be designated as having SMS.
153. Similarly, through those findings and our exploration of potential remedies to any concerns identified, we also expect to inform decisions by the DMU regarding how the regime is applied, which issues should be addressed by the DMU's new powers, and what types of interventions and issues the DMU should prioritise going forwards.
154. In practical terms, this will most likely mean informing SMS designation decisions by the DMU, supporting its development of codes of conduct and supporting guidance for activities where SMS designations are made, and highlighting specific areas where pro-competitive interventions could be taken forward to the benefit of competition and consumers. Where we consider it appropriate, we may take alternative or additional courses of action to address any concerns that that we find which we do not consider would be appropriately addressed by the new pro-competition regime. These include making recommendations to government for further legislative reform, making

a market investigation reference to make use of our order making powers, and taking enforcement action where we suspect a breach of consumer or competition law.

155. Based on our experience from the market study into online platforms and digital advertising, and on our initial consideration of the issues we intend to explore, we have identified four main categories of intervention that may be most relevant, should we conclude that the markets within scope are not working well. These are:

- **Interventions that limit platforms' ability to exercise market power:** for example, by preventing, addressing, or penalising exploitative or exclusionary conduct.
- **Interventions to promote interoperability and common standards:** with the primary objective of overcoming consumer lock in, enabling greater freedoms to switch and multi-home between competing providers.
- **Consumer choice remedies:** to ensure that consumers have the ability to choose between providers of content and services, are empowered to make informed decisions through access to information and the design of choice architecture, and that where default settings are necessary, they are set in the interests of consumers.
- **Separation remedies:** such as operational separation between entities owned by the same group, to overcome conflicts of interest or market power, or functional separation of datasets, which can help to create a more level playing field.

156. We expand below on each of these remedy areas in more detail, providing examples of some of the issues they might apply to within the ecosystem of mobile devices and web browsers. These examples are not intended to be exhaustive, and we may identify further potential interventions through the course of the study, depending on the nature of any issues identified.

#### *Remedy area 1: limiting platforms' ability to exercise market power*

157. If we conclude that the exercise of market power is harming competition and consumers, we will explore in more detail which issues and harmful practices could be addressed through a set of ex ante rules, and incorporated into a code of conduct.

158. We will explore which issues and specific types of conduct relating to mobile ecosystems might be adequately addressed through a code, in the interests of influencing behaviour before harm to competition and consumers can arise.

We will wish to consider, for example, whether competition concerns suggest that the code should be used to:

- enable users of mobile devices to switch or multi-home with regards to operating systems or app stores;
- give users of mobile devices greater freedom regarding the channels through which they are able to procure and download apps;
- remove particular constraints placed on app developers through terms and conditions for gaining access to an app store;
- provide greater clarity and transparency to app developers regarding decisions that could or have been made by app store operators;
- ensure consumers face fair and transparent choice architecture where consent is sought; or
- prevent app store and browser operators from unduly favouring their own downstream services such as within digital advertising markets;

159. Our work will be informed by any specific concerns that are brought to our attention by market participants through the course of the study.

160. Within this remedy area, we would also expect to consider the appropriate balance between *ex ante* rules in the code and *ex post* enforcement, including the use of existing competition and consumer powers.

#### *Remedy area 2: interventions to promote interoperability and common standards*

161. In the context of mobile devices, measures to promote greater interoperability could be focused on overcoming factors that encourage ecosystem 'lock-in'. As discussed above, this is the concern that, once a consumer has purchased a smart phone that is tied to a particular operating system, they will then continue to use other products and services that exist within and complement that operating ecosystem with a low probability of switching in the future.

162. As set out within our summary of the issues we will explore under themes 1 and 2 above, there are several factors that we consider may limit the ability or incentives of consumers to switch to an alternative ecosystem. Under this remedy area we will consider ways to overcome such barriers and constraints.

163. One such remedy area to explore would be the application of common standards of some form among mobile ecosystems so that developers can

distribute their app on different ecosystems without facing unnecessary barriers or costs to do so.

164. Another example to consider would be requiring owners of the main mobile operating systems to make certain connected devices (eg smart watches) interoperable with similar devices from another ecosystem, and also with rival mobile operating systems. This could help to overcome network effects on such connected devices, while also making it easier for consumers to switch between mobile ecosystems as it would allow them to retain their connected services and devices along with any user-generated activity/content/data.
165. We would wish to consider the potential costs of any such interventions, including the risk of reduction in diversity and innovation through standardisation and any concerns relating to security or user privacy.

### *Remedy area 3: consumer choice interventions*

166. Consumer decision making within the mobile ecosystem can be heavily influenced by the use of default settings. Such default settings are prevalent and influence many aspects of how users engage with online content and services, including, for example, the web browser that will open when a website link is clicked on within an app, the search engine that will be used to return results when a query is entered into a web browser address bar, or the decision to allow an app to collect location data.
167. We will explore whether there are any circumstances within mobile ecosystems where such default settings, or the monetisation of them, can be harmful. In these instances, we will explore a range of options, including prohibitions on particular agreements, and the inclusion of choice screens, such as the remedy applied by the European Commission in its *Android* case.<sup>142</sup> We will explore in this study how successful that remedy has been, and seek to understand any lessons learned regarding design and implementation.
168. A range of other aspects of mobile ecosystems can have a similar effect to default settings, including the pre-installation of particular apps onto devices, the use of prompts and pop ups to encourage users to take (or not to take) certain actions, and the design of choice architecture. The use of such approaches may help streamline the user's experience, but can also have the effect of influencing how they engage with other markets. In circumstances

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<sup>142</sup> [European Commission's case against Google Android.](#)

where such practices and arrangements are harmful to competition, we will consider interventions to prevent or overcome them.

#### *Remedy area 4: separation remedies*

169. There are a number of circumstances where separation remedies may be appropriate to explore, in particular to address concerns relating to conflicts of interest arising from the combination of certain functions within a single company. Separation remedies could relate to the separation of specific entities, functions, or departments within an organisation, or alternatively to information and data coming from different sources within an organisation.
170. With regard to the former, this could range from functional or operational separation – a requirement that a firm continues to operate particular elements of its business as separate from others, acting as if they are independently owned – to full structural separation, where a company is required to divest ownership of a particular entity or function within its business.
171. In the context of mobile ecosystems, we may consider the case for separation interventions were we to identify concerns regarding conflicts of interest and the potential for self-preferencing for example, if we were to identify evidence that an app store provider was giving undue prominence to its own apps, or that a browser operator was providing an advantage to its own websites or downstream advertising services.

#### *Summary*

172. In the study we will look to assess both the case for any of the above remedies and, if we conclude there is a case for intervening, the appropriate form that intervention should take, including action by the CMA or the DMU, through the code of conduct and PCI tools, once it is established. We will assess this on a case by case basis.
173. We are open to additional or alternative ideas and remedies to the problems addressed in this market study, and we invite interested parties to bring forward proposals in their submissions to us.

#### ***Issues we do not intend to focus on***

174. The focus of this study is broad, and we intend to prioritise the use of our resources on areas of greatest importance. There are several areas on which we do not intend to focus in the study, even though they are related to some of the themes and issues we do propose to address. These include:



- **Supply of desktop devices such as laptops and desktop computers** – while it would not be appropriate to draw a bright line between desktop and mobile devices, we consider that consumers generally use them in different ways, and for different purposes, typically as complements rather than direct substitutes. This is therefore not an intended area of focus for the study, although we do not rule out identifying and exploring discrete issues that cut across different device types. As discussed above, one area where we might look at issues across both mobile and desktop devices is in relation to browsers, if the evidence we gather suggests that many of the issues and barriers to competition are common to desktop and mobile devices.
- **Distribution of mobile devices:** for example, by network service providers, or in the context of online or physical stores. We have not heard concerns that sales channels for devices contribute to any market power Apple and Google might have in relation to their mobile device ecosystems.
- **Supply of mobile telecoms network services:** we have not identified any link between the issues being explored through this study and the provision of network services, nor have we heard any concerns from market participants of that market that relate to the scope of this study.
- **Supply of individual components and technology that are included within mobile devices:** we have not identified concerns regarding the supply chain for mobile device components that would serve to support any market power Apple and Google might have in relation to their mobile device ecosystems. We therefore do not consider such markets to be materially relevant to our market power assessments or theories of harm regarding Apple and Google.

175. We propose to constrain the scope in this way in order to allow for sufficient focus and attention to be provided to the wide range of issues and concerns we have raised in this document. The above list are examples of markets that are closely related to our study yet are outside of its scope – it should not be viewed as an exhaustive list.

176. We invite feedback from interested parties on these assessments and the boundaries that we have proposed for the scope of this study.

## Approach to evidence gathering

177. In addition to considering the responses from interested parties to this statement of scope, we intend to rely on various sources of evidence to assess the themes and issues we have identified, including:
- drawing together and evaluating existing publicly available information and research;
  - issuing information requests to industry participants, including device manufacturers, providers of operating systems, software engineers and app developers, browser operators, academics, and other industry participants and commentators;
  - meeting key interested parties (through bilateral meetings, roundtable meetings and workshops); and
  - conducting original quantitative and qualitative analysis.
178. We are conscious that the study has a broad scope covering a wide range of complex issues. These issues are relevant to many interested and well-informed parties including consumers groups, mobile device manufacturers, providers of operating systems, software engineers, developers and owners of apps, publishers, browser operators, providers of advertising services, academics, and other industry participants and commentators. We are keen to take advantage of the knowledge of these parties as efficiently as we can. We will seek views and evidence from stakeholders, including existing internal research, through meetings and information requests from the outset of the study. We also encourage interested parties to be proactive in responding to this statement of scope and identifying to us evidence relevant to the study.
179. From Apple and Google in particular we intend to seek information on their business models, drawing out more clearly the similarities and differences between them, and confirming how they each interact with individual and business users throughout their respective ecosystems. We will look to improve our understanding of how the different products and services within their ecosystems interrelate, both from an end-user perspective and also with regards to generation of revenue, including, for instance, how Apple's and Google's provision of services such as operating systems, app stores, browsers, and other apps relate to their primary sources of revenue from device sales and advertising respectively. This evidence and analysis will inform our assessment of the two companies' incentives and actions in respect of each of these services.

180. We will also seek evidence to inform our assessment of the existence and sources of any market power held by these two companies in relation to the markets captured by this study.
181. We intend to seek evidence from other mobile device manufacturers on the relationships they have with Apple and Google, and the barriers they face to gaining a more substantial share in markets for mobile devices. This will include seeking information and perspectives from companies that have lost ground or failed to get a foothold in the mobile device market in recent years, and also companies that have phased out support for their own independent operating systems in favour of running the Android system. On this latter point, we will seek transparency over the terms that apply to device manufacturers' use of Android.
182. From app developers, we wish to understand the nature of their relationships with app store providers, and how they are able to reach and interact with their end users. We will seek evidence on the contractual terms that come with access to mobile app stores, and to understand the impacts that any terms of interest ultimately have on competitive outcomes for consumers. We will also seek to understand how their services, and the returns they make from them, differ depending on whether they are accessed through an app or via a browser.
183. From browser operators, we will be seeking information on the role of browser engine technology with regards to competitive dynamics in the market, and the factors that inform individual providers' assessment of whether to maintain their own engine. We will also seek further evidence on the role that the largest browsers play within the mobile ecosystem as a key access point to consumers, and also as a rule maker for a broader range of market participants. As discussed above, this is one area in the study where we might look at issues across both mobile and desktop devices if the evidence we gather suggests that many of the issues and barriers to competition are cross-cutting.
184. In addition, we intend to carry out our own analysis of market outcomes using our information gathering powers to collect quantitative information from stakeholders in each of the above markets. Some of the key outcomes we intend to look at include shares of supply at each product level, pricing and commission levels throughout each ecosystem, and financial information such as revenue and profitability for relevant parts of Apple's and Google's business. Our main objectives in undertaking this analysis are to understand how competition between providers of mobile devices and operating systems, app stores, and browsers has evolved over time, and how the relationship between the individual products and services has evolved with it.

185. We do not intend to carry out our own consumer survey research at the outset of the study. We anticipate that both Apple and Google, and potentially other market participants, will have conducted extensive research to understand consumer preferences and behaviour. We intend to obtain access to the findings of any such research where appropriate.
186. Further, we are aware that some of the issues relevant to our study are subject to a significant body of academic research. We are keen to engage with academics in the UK and internationally to identify evidence relevant to our study and to collaborate where there are productive opportunities to do so.
187. We are also aware that international competition authorities have carried out much relevant work in this area, including, for example, the European Commission's past case against Google relating to Android, and the ACCC's recent market study into the mobile app market. We will continue to engage proactively with our international counterparts in the context of this study, as well as more broadly, in order to share insights and promote cross-border regulatory coherence in response to global competition challenges.

## **Next steps**

188. We will conduct our market study over the next year, gathering evidence from a wide range of stakeholders. In light of the evidence we receive, we may reconsider the focus of our study. Following evidence gathering and analysis, we will publish a report which sets out our findings, any concerns we identify and our proposed recommendations or remedies to those concerns. Our final report must be published no later than 14 June 2022.
189. We will publish an interim report with our initial findings, including whether a market investigation reference is needed, six months after the launch of this market study, by 14 December 2021. Where we find issues of particular concern, we may also take action during or at the end of the study, such as opening consumer or competition enforcement cases.

## ***Invitation to comment on our market study notice and statement of scope***

190. The CMA welcomes submissions on the market study from interested parties by no later than 26 July 2021. In this statement of scope, we have set out four themes that we propose to investigate drawing on concerns that have been raised and our understanding of the sector. We would welcome comments and views, supported with evidence where available, on:
- Our description of the sector, and whether this is broadly accurate.

- The proposed scope of the market study, including whether there are areas we should particularly focus on, and whether there are important areas we have missed. In particular we would welcome views on whether we should include browsers on desktop, alongside mobile browsers, within the scope.
- The four themes identified, including views on the potential concerns we propose to explore.
- The range of potential remedies, including whether they would be appropriate, proportionate, and effective and whether there are other potential interventions we should consider.
- Our proposed approach to evidence gathering.

191. To respond to this invitation to comment, please email or post your submission to:

**Email:** mobileecosystems@cma.gov.uk

**Post:** Mobile ecosystems market study  
 Competition and Markets Authority  
 The Cabot  
 25 Cabot Square  
 London  
 E14 4QZ

192. In providing responses, please say whether you are an individual or a business, or if you represent consumer or business interests. Please provide your name, email address, postal address and telephone number and indicate whether you would be happy for us to follow-up with you.
193. Please note that we are unable to provide advice on individual complaints. Our website provides links to sources of advice, information, and support.
194. For transparency and to help debate, we intend to publish all of the responses we receive on our website, as well as potentially providing summaries of the evidence we receive in our interim and final reports.
195. We recognise that in some cases parties may wish to submit information or evidence to us that they consider to be confidential or sensitive. The factors that we must have regard to in these circumstances are set out in Annex A.

196. On this basis, when providing responses, please indicate the following alongside the submission:
- the interest or organisation that you represent, where appropriate;
  - whether you are providing any material that you consider to be confidential and explain why this is the case; and
  - where the submission contains confidential material, please provide separately a non-confidential version that is suitable for publication
197. Annex A sets out how the CMA may use information provided to it during the course of this market study.
198. A possible outcome of this market study is enforcement action using either our consumer or competition powers. Therefore, the information provided to us will help assess whether providers of mobile ecosystems are complying with the relevant consumer and competition law and determine whether enforcement action is appropriate. If we take enforcement action, please note that information provided may potentially be used in evidence.

## **Annex A: How the CMA will use the information you provide**

1. This annex sets out how we may use information you provide to us during the course of this market study, in line with our legal responsibilities. In particular, please note that we may choose to refer to comments or evidence that you provide in a published report or publish non-confidential information on our website. This may include identifying the contributor.

### ***Why is the CMA asking for information?***

2. The CMA is asking for information to help us to better understand how well mobile ecosystems are working for consumers and businesses that are competing fairly.

### ***What will the CMA do with the information I provide?***

3. Your information will inform our interim and final market study reports. We may publish information you provide and identify you as the contributor of it in those reports, or alongside them on our website. Our final market study report will set out our findings and any proposed remedies to any existing or potential issues we find.
4. We may disclose any information provided by you for the purposes set out in sections 7, 170 and 241 to 243 of the Enterprise Act 2002, where we consider such disclosure to be appropriate. In particular, we may choose to put information provided by you to third parties, such as other government departments and other parties providing information to the CMA, for the purpose of facilitating any further related work.
5. Where appropriate, we may use information you provide to take enforcement action, using our competition or consumer powers, against businesses operating in the markets within the scope of this study. We may also share your information with another enforcement authority or with another regulator for them to consider whether any action is necessary.
6. Unless an exemption applies, we may disclose the fact that you have provided information to us, and the information you have provided, in accordance with our obligations under the Freedom of Information Act 2000.

### ***Will the CMA take steps to protect my information?***

7. We may only publish or share with others information that you provide to us in specific circumstances set out in legislation (principally Part 9 of the Enterprise Act 2002). In particular, prior to publication or any such disclosure, we must have regard to (among other considerations) the need for excluding,

so far as is practicable: (a) any information relating to the private affairs of an individual which might significantly harm the individual's interests; or (b) any commercial information which, if published or shared, we think might significantly harm the legitimate business interests of the undertaking to which it relates.

8. We will redact, summarise, or aggregate information in published reports where this is appropriate to ensure transparency whilst protecting legitimate consumer or business interests.

***How will the CMA handle any personal data I provide?***

9. Any personal data you provide to us will be handled in accordance with our obligations under the UK General Data Protection Regulation and the Data Protection Act 2018. Our [personal information charter](#) set out the standards you can expect from us when we collect, use or share personal data and provides details of your rights in relation to that personal data and how to contact us.

***What should I do if you have concerns about how the CMA will use any information I provide?***

10. You should make clear to us any information that you consider to be confidential when you provide it to us and set out why you consider it to be confidential.
11. If we want to include any sensitive commercial or personal information in a document that will be published we will, save in exceptional circumstances, contact you prior to publication to give you an opportunity to tell us about any concerns you may have regarding that publication.

***Where can I find further information?***

12. Further details of the CMA's approach can be found in [Transparency and Disclosure: Statement of the CMA's Policy and Approach \(CMA6\)](#).