Appendix J: Barriers to switching between mobile operating systems

Introduction

1. As set out in Chapter 3, only a small proportion of mobile device purchasers switch between mobile devices with different operating systems each year. This proportion is smaller among Apple iOS purchasers than Android. In 2020/21, between [0-10]% of users who purchased an Android device had switched from an iOS device each quarter. Between [10-20]% of users who purchased an Apple device switched from an Android device.

2. In this appendix, we first consider what factors may affect levels of switching between mobile operating systems, including inertia, brand loyalty, and satisfaction. We then examine evidence that some factors act as barriers to switching, for example if they could:

    *   cause users to perceive switching to be difficult or costly (eg because they would pose a 'hassle'), discouraging potential switchers; and

    *   impose actual costs on users that do switch (eg financial costs, time costs or learning costs).

3. Perceived barriers to switching, which discourage switching, may have a greater direct impact on switching rates than some actual costs for users that do switch. However, it is relevant to consider actual costs because they are likely to reinforce perceived barriers to switching if or when users learn of them, from personal or second-hand experience.

4. Taken together, these barriers may reduce the threat to Apple and Google that users may switch mobile ecosystem, for example to make savings or access new features. This may lessen the competitive constraints that apply to them.

5. Respondents suggested that users face three categories of potential barriers to switching between mobile devices with different operating systems:

    *   learning costs associated with switching mobile ecosystem;

    *   transferring data, apps and managing subscriptions across devices; and

- the availability and characteristics of Apple's and Google's first-party (ie developed and operated by Apple and Google) apps, services, and connected devices.

6. In each case we assess whether these factors could act as a perceived barrier to switching and if they could constitute a barrier by imposing actual costs on users who do switch. We also consider whether potential barriers may have asymmetrical effects: for example, by discouraging switching from Android to iOS but not vice versa.

7. It is difficult to assess the individual impact of each of these factors on users' propensity to switch between mobile devices with different operating systems. However we consider that, in the round, they pose material barriers to switching. To some extent these barriers apply to switching both to iOS and Android, although several appear more significant with respect to switching from iOS to Android:

- We consider that the learning costs associated with switching mobile ecosystems create perceived barriers to switching and impose actual costs on switchers. Survey evidence suggests that this perception affects both Android and iOS users, but is more widespread among iOS users.

- Transferring data, apps and managing subscriptions across devices may impose significant time and financial costs on switchers:

  – Respondents raised questions about the reliability of the guidance, switching apps and tools intended to enable users to transfer data to new Android or iOS devices. Survey evidence suggests that concerns around losing access to data affect users of both ecosystems but are more widespread among iOS users. It appears that Android APIs makes information available to switching apps about, for example, the apps the user has downloaded, whereas equivalent information is not available to switching apps on iOS.

  – Apple's policies in relation to in-app purchases prevent developers from requiring users to link their developer accounts to their Apple account. This makes it more likely that users will be unable to recover paid-for apps and in-app content after switching from iOS to Android or vice versa, posing time and financial costs on switchers. As set out in Chapter 4 and Appendix H, users may have little or no alternative to using Apple's in-app payments system. Google Play's billing system policies do not appear to pose this restriction on developers.

  – Switchers cannot manage (eg upgrade or cancel) subscriptions to paid-for apps or in-app content made on their prior operating system using a

different operating system (whether Android or iOS). Users must cancel subscriptions before switching and repurchase them to be able to manage them from their new device, posing time and financial costs for switchers.

- The availability and characteristics of Apple's first-party apps, services and connected devices pose significant barriers to switching to Android. By way of example, the features of iMessage can create problems for switchers to new Android devices, while Apple's approach of not adopting further potential interoperability with number-based messaging on Android devices could also diminish the experience of switchers to Android.

8. Given the ubiquity of mobile devices and heterogeneity of mobile users (including with respect to confidence to resolve problems arising and broader digital literacy), each of the barriers to switching are likely to have material effects on significant numbers of users.

9. We recognise that barriers to switching may, in some cases, be natural to any process of switching mobile device and ecosystem. Some barriers may also be the result of competitive differentiation between mobile ecosystems or of enhancements to devices. However, in other cases barriers to switching may have no such justification.

10. The findings in this appendix are relevant to our conclusion, set out in Chapter 2, that Apple and Google have different incentives with respect to retaining users within their ecosystems. At a high level, Apple's strong incentives to encourage users to purchase Apple devices generate further incentives to raise barriers to switching away from iOS. Google's incentives to establish barriers to switching mobile ecosystem may be less strong overall, given its strategic focus on online services available across mobile ecosystems and devices.

11. This appendix draws on submissions, survey evidence and internal documents from market participants, as well as other evidence.

Factors that may affect levels of switching between mobile operating systems

12. As set out above, only a small proportion of users switch mobile ecosystem each year. A larger proportion of mobile users appear to switch provider of

mobile connectivity than mobile ecosystem: in 2021, 16% of UK mobile users had switched mobile network operator in the past twelve months.[1]

13.   There is no recognised 'optimal' level of switching that, if met, would demonstrate that competition between Apple's and Google's mobile ecosystems is effective. However, we are concerned that barriers to switching may help drive prevailing low switching rates, alongside consumer inertia and motivations to remain within a mobile ecosystem.

14.   We consider that mobile users have reason to consider switching when purchasing a new device. Apple and Google's responses help inform this view:

- Apple stated that levels of switching between mobile operating systems are significant, considered that there is competition among device manufacturers for switching customers: for example, the iPhone SE was intended to attract Android users. It noted that some manufacturers offer discounts for those trading in devices made by another manufacturer.[2]

- Google noted that UK users replace their smartphones approximately every two years, creating regular moments at which they may consider switching.[3] Users may consider the different characteristics of devices when deciding which to purchase, such as new hardware, features and functions, improvements to operating systems that enhance the user's experience, and offers of discounted content services. Google argued that competing Android and iOS devices are available in all 'mid-to-high' price segments.

15.   However, across markets, many consumers choose not to engage or consider switching provider where doing so is straightforward, offers clear benefits, and where there is relatively little product differentiation by comparison with mobile devices and ecosystems, so that price comparison might be highly relevant to most people. Consumers may not perceive sufficient benefits to justify the time costs of engaging with the market and switching provider. When making

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[1] Ofcom (2021), *Core switcher tracker study*, Table 119.
[2] Apple also cited analysis by the Progressive Policy Institute, which suggested that switching costs from iPhone to Samsung in the US and EU amount to one-time costs of $16 and €18 respectively, including the opportunity cost of time spent switching. However, we note that this study did not assess factors such as learning costs, loss of some types of data (focusing on photos, videos and contacts, but not other data) or paid-for apps (all apps included were free apps), transferring the management of subscriptions made through Apple's in-app purchase or Google Play billing, or the costs of losing access to Apple's first-party apps and services (only noting that there are apps providing similar services on Android devices).
[3] A respondent presented evidence suggesting that the average duration of ownership of a smartphone increased by three months between 2015 and 2018.

mobile device purchasing decisions, users may perceive product differentiation to be significant and the benefits of switching difficult to assess.

16.　Different factors may motivate users to remain within their prior mobile ecosystem when they purchase a new device. Respondents suggested that factors that encourage users to remain within a mobile ecosystem include:

- Satisfaction with the characteristics of Android and iOS devices: in an online quantitative survey in the UK in January 2021 of 1,925 purchasers and 1,896 intenders,[4] 63% of UK iOS users who were extremely unlikely to buy an Android device stated that they would not switch because they prefer the design and features of iPhones. 53% of UK Android users who were extremely unlikely to buy an iOS device stated that this was because they preferred Android's design and features.

- Brand loyalty: survey evidence submitted to us showed the importance of previous experience with a particular brand on subsequent UK smartphone purchasing decisions (relevant to 35% of purchasers). Getting a good deal on the price of the smartphone was relevant to 46% of purchasers. [Parties] cited users' brand loyalty (in particular to Apple) as an important factor in device purchasing decisions.

17.　However, inertia, brand loyalty and user satisfaction may co-exist with barriers to switching. As set out above, barriers to switching may diminish the competitive constraints that apply to Apple and Google.

18.　In response to the CMA's questions, [a party] also told us that barriers to switching are asymmetrical, deterring switching from iOS to Android (and thus lessening the competitive constraints that apply to Apple) rather than vice versa.

19.　Below we consider whether learning costs associated with switching mobile ecosystem, transferring data, apps and managing subscriptions, or the availability and characteristics of first-party apps, services and devices, pose barriers to switching and to what extent. We also consider whether such barriers apply more strongly to switching from Android to iOS or vice versa.

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[4] 'Purchasers' defined as respondents shopping for a smartphone for personal use and 'intenders' defined as respondents planning to purchase smartphone in the next six months.

Potential barriers to switching: learning costs associated with switching mobile ecosystem.

Potential to act as a barrier to switching

20. Users may need to adapt to different controls, functionality, and features if they switch to a different operating system. Users considering switching may perceive this as a 'hassle' that would discourage them, while users who switch may incur time costs learning to adapt to a different device.[5]

Respondents' views and evidence

21. Several respondents considered that learning costs are a perceived barrier to switching and affect those who do switch. They agreed with Microsoft's view that operating systems differ in terms of their physical features, design, controls, and functions and that this can be time-consuming and burdensome.

22. Apple stated that, while users may need to learn about different settings and button uses on different operating systems, such learning costs 'would appear to be moderate' due to the 'high availability of video tutorials' and because apps have versions on both Android and iOS.

23. As set out in Chapter 3, in 2017 [20-30]% of UK iOS users would have been concerned about finding it difficult to learn to use a new brand of device or operating system. [10-20]% of Android users felt this way.

24. In Q3 2020, [60-70]% of UK iOS users considered 'Know[ing] how to use their phone' as an important influence on their purchasing decision (the most important factor for iOS users). In contrast, [40-50]% of Samsung users rated this factor as important and just [10-20]% of Huawei users.

Conclusions

25. The available evidence suggests that the learning costs associated with adapting to the different controls, functionality and features of an operating system could create perceived barriers to switching and impose time costs on switchers. Survey evidence suggests that these barriers are perceived more widely among iOS than Android users.

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[5] Learning costs were also identified as a barrier to switching in the following enforcement decisions and market studies: European Commission, Commission Decision of 18 July 2018: Google Android, recitals 523, 524, 527; the Netherlands Authority for Consumers & Markets, Market study into mobile app stores, p. 55; Australian Competition & Consumer Commission, Digital platform services inquiry, Interim report No. 2 – App marketplaces, p. 38.

26.   The extent to which learning costs may deter switching may depend on, for example, users' confidence in drawing on available tutorial information and their broader digital literacy. Some users may not consider learning costs a deterrent to switching, while they may be a significant deterrent to those least confident in their ability to adapt to a new device.

Potential barriers to switching: transferring data, apps and managing subscriptions across devices

Potential to act as a barrier to switching

27.   As detailed below, multiple respondents set out views on whether challenges to transferring data, apps and managing subscriptions could constitute barriers to switching between iOS and Android or vice versa. They commented on whether:

- Data held by apps and services (such as contacts, text messages and in-game progress), and data about which apps a user had installed on their prior device, may be unavailable to users after switching devices. While guidance, switching apps and tools are available to help switchers transfer their data between devices from different mobile ecosystems, respondents set out different views about how far users can rely on them.

- Preferred third-party apps may not be available to users on another mobile operating system.

- Users may have to repurchase or resubscribe to paid-for apps and in-app content if they cannot recover their pre-existing accounts after switching to a new ecosystem.

- Users may not be able to manage pre-existing subscriptions to paid-for apps and in-app content after switching to a device that uses a different operating system.

28.   A further related barrier to switching may be that most of Apple's first-party apps and services are not available on Android – we consider this in the section below on the availability and characteristics of first-party apps, services and connected devices.

Respondents' views and evidence

29.   Respondents commented on each of these factors:

- Respondents, including several app developers, suggested that users may find they are unable to transfer data from their prior devices to a

different operating system or may find the process difficult. They noted that, while guidance, switching apps and tools are available to enable users to transfer their data, these options may not be effective in all cases. For example, [a party] stated that in-built systems for switching data to a new device may work best when switching between devices from the same manufacturer or that use the same operating system. Microsoft considered that some users remain within the same ecosystem to ensure they do not lose data or have to make complicated data transfers. It stated that switchers may need to invest time in re-entering information on a new device, such as sign-in details, passwords, and contacts.

- With respect to whether users can access preferred third-party apps after switching: several app developers stated that they make their apps available to users of Android, iOS mobile ecosystems and on other platforms (in Chapter 4 we note that most popular third-party apps are available on both Android and iOS).

- With respect to whether users may have to repurchase or resubscribe to paid-for apps and in-app content after switching: app developers indicated that Apple's policies in relation to In-App Purchases (IAP) prevent developers from requiring users to link developer accounts to their Apple ID. While app developers can prompt users to link their accounts, the European Publishers Council stated that, if users choose not to do so, developers have no means to know whether switchers to Android have paid for a subscription on iOS. As set out in Appendix H, users have no alternative to Apple IAP for purchasing apps and in-app content.

- Google stated that Google Play's billing system policies do not constrain developers from requiring app users to link their Android app to a developer account, which they could access from an iOS device if they choose to switch. However, it considered that, for users of most apps, there is no risk of losing access for paid-for content after switching, as 97% of apps on Android do not offer paid downloads, in-app content, or subscription sales.

- Multiple app developers noted that users who have active subscriptions bought on the Apple App Store cannot manage these subscriptions on a device that uses a different mobile operating system. As such, to be able to manage their subscriptions on a new operating system, a user would need to cancel subscriptions on their prior device before switching and re-purchasing them. [One developer] stated that some users may be charged for subscriptions they cannot use if they switch from an iOS to an Android device before cancelling or managing through Apple a

subscription they have bought through Apple IAP. Epic Games noted that switchers may have, for example, multiple annual subscriptions bought on iOS that expire at different times, necessitating their cancellation and re-purchase because they would not be manageable on Android.

- As set out below, Apple stated that switchers from Android to iOS would also find that they are unable to manage subscriptions bought via Google Play on an iOS device.

30. Apple considered that any barriers to switching arising from the transfer of data, apps or managing subscriptions are limited:

- Apple stated that multiple apps are available on the App Store to transfer users' data to a new device (including data about which apps they had installed on their prior device), such as Huawei's Phone Clone and Copy My Data. It stated that these make transferring data from iOS to other platforms 'seamless and easy'. It also noted that the Google Drive app, available on the App Store, can be used to back up photos, contacts and calendar appointments and facilitate the transfer of data from Apple's Photos, Calendar and Contacts apps to Android devices.[6] Apple also referred to reports that Google plans to release an app for iOS called Switch to Android. It stated that, although Google has not yet submitted the app for its review, [✂].

- Apple noted that most popular apps are available on both Android and iOS. As such, it considered that the availability of apps to users after switching should not be an issue for switchers.

- With respect to managing subscriptions across devices, Apple stated that neither subscriptions bought through Apple IAP, nor Google Play, can be transferred to the other company's billing management system after switching. It considered that users would understand the need to cancel their current subscriptions and re-subscribe through another provider. However, it noted that some users may wish to continue paying for a subscription through their prior payment method (linked to their Apple ID) and to access the paid-for app or in-app content via the web or an Android app.

31. In response to our requests for information on this issue, [a party] informed us that Apple offers the Move to iOS app on Android, which can transfer users' data to an iOS device, including data about which apps were installed on the

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[6] Apple also stated that, where data that Apple collects is linked to a user's Apple ID, it is available to the user in a machine-readable and portable format from Apple's website.

user's Android device (accessible via an Android API). However, there does not appear to be a mechanism through which a third-party switching app can reliably obtain data on which apps a user has installed on their iOS device. We have also heard that, under Apple's App store policies that preclude references to other mobile platforms, names such as Move to Android may not be permitted.

32.   [A party] provided us with survey evidence that loss of access to data and to apps may deter switching, in particular to Android:

- in 2017, [20-30]% of iOS users would be concerned about losing the data on their phone. [10-20]% of Android users agreed; and

- in the same 2017 survey, [20-30]% of UK iOS users stated that they would be concerned about losing access to apps and features if they switched mobile operating system. The proportion of Android users who agreed was lower ([10-20]%).

Conclusions

33.   We consider that several of the factors above pose barriers to switching that may affect a significant number of users, by causing them to perceive switching to be difficult or by imposing costs on switchers. In the round the barriers apply to both switching to Android and iOS, but fall more heavily on switching to Android:

- On balance it appears likely that a significant number of users could find it – or be concerned that it may be – difficult or impossible to transfer data such as contacts, messages, and passwords to a new device. While some users may feel confident using guidance, switching apps and tools to manage this process, others will not and may find that these approaches do not transfer all the data that they require to their new device reliably. This may discourage switching or impose eg time costs on switchers as they resolve any resulting issues. Survey data indicates that both Android and iOS users perceive that switching could impose such costs. However, as set out above, this perception is more widespread among iOS users.

- Android and iOS offer cloud-based tools to transfer the user's apps and data to a new device of the same ecosystem reliably and quickly, so that users may perceive this to be an easier alternative than switching to a device with a different operating system.

- It appears that third-party switching apps on iOS devices are unable to access data on which apps a user has installed, while this information is

available to Apple's Switch to iOS app on Android via APIs. Restrictions on the functionality of data transfer apps on iOS suggest that switchers to Android cannot make use of switching apps and tools in the same way as switchers to iOS. We will continue to explore the implications of this for switching.

- With respect to whether users may lose access to preferred third-party apps after switching, we consider that the availability of most popular apps on both Android and iOS ecosystems makes this unlikely to act as a significant barrier to switching.

- With respect to whether having to repurchase or resubscribe to paid-for apps or in-app content after switching may be a barrier to switching: responses suggested that Apple's policies in relation to IAP (which prevent developers from requiring users to link developer accounts with their Apple ID) contribute to the likelihood that switchers will be unable recover their paid-for apps and content. As set out in Chapter 4 and Appendix H, iOS users may have little or no alternative to using Apple IAP to purchase paid-for apps or in-app content.

- It appears that Google Play billing's policies do not constrain developers from requiring users to link their Android apps to developer accounts, so that users can more easily recover paid-for apps and in-app content after switching.

- The characteristics of both Apple IAP and Google Play's billing system cause switchers to lose a significant degree of control over the ability to manage subscriptions bought on another mobile ecosystem. This could impose significant time costs for some users as they migrate subscriptions to their new device, plus financial costs where this process requires them to re-purchase eg annual subscriptions.

34. As discussed in detail in Chapter 6, Apple's restrictions on cloud gaming services may help to maintain some of these barriers to switching. Cloud gaming services work across platforms and involve streaming games from the cloud to users' devices, rather than relying on the processing power or storage of the device to run games. This means that a user of such services who switched from a high-end iPhone to a low-end Android phone would be able to access the same games at the same quality before and after switching. By restricting the availability of these services on its App Store, Apple may be obstructing a development in how users can access games, which could make switching from iOS to Android devices easier.

Potential barriers to switching: the availability and characteristics of first-party apps, services and connected devices

Potential to act as a barrier to switching

35.   Apple and Google make first-party apps and services available to users of their mobile operating systems. Many are pre-installed on devices. First-party apps and services may offer, for example, functionality that users expect from the device or additional in-app content: examples include Apple's iMessage and Apple Music and Google's Chrome browser and Google Maps app. Apple makes a small number of first-party apps and services available on Android devices, while Google makes most of its core apps and services available on iOS devices (we discuss the firms' different approaches below).

36.   Google and Apple also sell other first-party connected devices, which purchasers may use in conjunction with mobile devices (for example, by operating it via their mobile phone or tablet) or which may share integrated functionality with mobile devices. Examples include the Apple Watch, AirPod headphones and Google's Nest smart speakers, cameras and thermostats. iOS users may be able to use their mobile device in conjunction with a Google-manufactured connected device and vice versa.

37.   As detailed below, respondents set out different views on whether the availability and characteristics of first-party apps, services and devices may pose barriers to switching:

- if preferred first-party apps and services would be unavailable to users after switching;

- if users may lose access to shared functionality between first-party apps, services and connected devices; and

- if users would have a worse experience of interacting with friends' and family's devices after switching.

Respondents' views and evidence

38.   Various respondents considered that the availability and characteristics of Apple's first-party apps, services and devices constituted a barrier to switching from iOS to Android. No equivalent concerns were raised about barriers to switching from Android to iOS.

39.   Respondents noted that:

- Almost all of Apple's first-party apps and services are unavailable on Android devices.[7] Thus iOS users would lose access to them on their mobile device if they switch to Android.

- Users of multiple Apple devices may lose access to shared functionality between first-party apps, services and connected devices if they switch mobile operating system. This could worsen their quality of experience when using other Apple devices. For example:

  - Some first-party connected devices cannot be used in conjunction with Android devices (eg Apple Watch).

  - Some apps and connected devices offer limited functionality when used on or with Android devices (eg AirPods).

  - Users may no longer be able to use the same first-party apps on their choice of devices (eg they may no longer be able to use their preferred messaging app on their mobile, tablet and laptop[8]). There is evidence of high levels of ownership of Apple products and connected devices among UK iPhone owners: [60-70]% own an iPad, [20-30]% own an Apple Mac and [10-20]% own an Apple Watch.

- Users may take account of how Apple devices may offer a better quality of experience than Android devices when interacting with Apple devices owned by friends or family. The features of iMessage may also make using a new Android device harder. Examples include:

  - Android users sending number-based interpersonal messages to iOS users will reach the iOS device via Short Message Service (SMS) / Multimedia Messaging Service (MMS) technology, because Apple has not adopted the Rich Communications Standards (RCS) protocol for iMessage. By contrast, iOS users may send number-based messages to other iOS users via a faster, encrypted iMessage service that permits functionality (eg message effects and group chat functions) unavailable when communicating with an Android user. In response to the CMA's questions, we heard that Apple's practices impair

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[7] Apple stated that only Apple Music, Apple TV+, DarkSky Weather and Shazam are available as apps across a range of non-iOS devices (however we note that DarkSky Weather is not available on Android). Apple stated that it makes Apple TV+ and Apple Music available across a range of non-iOS devices because users expect them to be available in this way. iOS apps and services not available on Android (alongside DarkSky Weather) include the App Store, Apple Arcade, Apple Books, Apple Pay, Apple News+, iTunes Store and iMessage.
[8] For example, iMessage can be accessed on iPhones and MacBooks.

communications sent between non-iOS device users and iMessage users via SMS / MMS.[9]

— iOS users may need to manually disable iMessage, via their iOS device or online, to be able to receive messages sent to their number on an Android device.[10]

40. Apple stated that:

• With respect to the availability of its first-party apps and services: investing in developing these only for Apple's own products enables it to offer a better user experience.[11] It stated that its devices achieve unmatched levels of performance, privacy and security because of this tight integration. The availability of Apple's apps and services solely on Apple's products serves to differentiate them in the competitive device market. Apple also stated that they may generate no revenue in themselves, so that it would be irrational to offer them on competing mobile devices.

• Further, Apple stated that its survey data does not indicate that the use of certain products or services prior to switching is significant to mobile switching decisions.

• With respect to potential loss of access to shared functionality between first-party apps, services and connected devices: Apple stated that its connected devices offer interoperability with third-party devices and services to the extent possible and are operable on a standalone basis. In the case of the Apple Watch, Apple stated that it would be constrained technically from enabling users to access the Apple Watch's full functionality from a third-party device. For example, it stated that the watch's battery life relies on the use of proprietary technologies to pair with an iPhone for network connectivity and tasks such as receiving calls on the same number.

• With respect to the quality of experience of Android devices when interacting with others' Apple devices: Apple suggested that it has not

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[9] We heard that Apple's practices affect iOS and Android users' ability to communicate vis SMS / MMS in several ways: messages are delivered slowly and less reliably; users cannot include high-quality images and videos; certain features are hidden or not available (such as location and read receipts); group chat functionality is limited; and users often pay cellular network charges.

[10] Dr Greig Paul and Dr James Irvine, Response to the Statement of Scope, 25 July 2021, p.5-6.

[11] We note that evidence was cited in a case brought by Epic Games against Apple (Epic Games, Inc. v Apple Inc., United States District Court, Northern District of California, Case No. 4:20-cv-05640-YGR-TSH), relating to practices on Apple's App Store, which suggested that some Apple employees considered that the non-availability of iMessage on Android would discourage switching away from Apple's ecosystem. See Epic Games, Inc vs Apple Inc, Findings of Fact and Conclusions of Law Proposed by Epic Games, 2021, paragraph 58, p. 15.

adopted the RCS protocol for number-based messaging because RCS is a new technology and that it is unclear how effective it will be. Apple also noted that alternative third-party messaging services are available on Android and iOS.

41. Respondents provided survey evidence suggesting that a significant minority of users consider access to Apple's first-party apps and the compatibility of iOS devices with other Apple devices when making purchasing decisions:

- In a 2020 survey submitted to us by [a party], [30-40]% of UK iPhone buyers surveyed considered that access to Apple's built-in apps was very important to their mobile device purchasing decision.

- In the same survey, [40-50]% of UK iPhone buyers surveyed reported that it was extremely important to their smartphone purchasing decision that Apple products work well with other Apple products.

- In 2021, [30-40]% of UK iPhone users stated that the device working with their other devices was a reason to choose iOS.

- In a 2019 survey submitted by [a party], [60-70]% of UK iPad owners stated that access to Apple's built-in apps was very important to their purchasing decision.

- In the same survey [70-80]% of UK iPad owners considered that the iPad working well with other Apple products and services was very important to their tablet purchasing decision.

42. Survey evidence submitted to us shows US iPhone users attributed substantial value to iMessage and FaceTime.

43. A significant minority of iOS mobile users consider that switching would mean losing access to services (which could include first-party services) and that switching would affect their quality of experience when using other devices:

- As set out above, in 2017, [20-30]% of UK iOS users stated that they would be concerned about losing access to apps and features if they switched mobile operating system. The proportion of Android users who agreed was lower ([10-20%]).

- 40% of UK iOS users who considered that they were unlikely to buy a smartphone with a different OS stated that they would not switch because their friends and family use iOS. 34% stated that they would not switch because it would mean losing compatibility with other devices they already own.

44.   As set out above, respondents did not raise equivalent concerns about Google's first-party apps, services and devices acting as a barrier to switching from Android to iOS. Many of Google's core first-party apps and services are available on iOS and its connected devices can be used in conjunction with iOS devices via apps. However, Huawei stated that, because of limits on the availability of certain Google first-party apps and services on its Android operating system, Huawei's mobile devices may be less attractive to users.

45.   Google stated that it does not license its apps for mobile devices that are based on Android but which do not meet the requirements of Android's Compatibility Definition Document,[12] given the risk that they would not function properly, which could harm Google's reputation. It noted that its apps are available via browser. We understand US sanctions may prevent the licensing of Google's apps to Huawei's Harmony OS.

Conclusions

46.   In the round, we consider that these factors pose barriers to switching from iOS to Android, which may cause many iOS users to perceive switching to be difficult or impose costs on switchers:

- The limited availability of Apple's first-party apps and services on Android is likely to make switching less attractive to many iOS users. Broadly we do not consider that this is, for example, also likely to make switching appear difficult or imposes costs on switchers. However, the unavailability of apps such as iMessage on other operating systems is likely to contribute to other barriers to switching, set out below.

- Losing access to shared functionality between first-party apps, services and connected devices poses a barrier to switching for users who own multiple Apple devices and would, for example, no longer be able to use an iWatch or lose access to AirPods functionality (in some cases this may be the result of technical constraints on rolling out functionality interoperable with Android devices). Given the high proportion of iOS users that own multiple Apple devices and the potential replacement cost of devices such as smart watches, this barrier is likely to affect significant numbers of users.

- The diminished experience of interacting with friends and family's Apple devices after switching – and features of iMessage in particular – also pose barriers to switching. The potential for users who do not disable their iMessage account to have difficulties using a new device for number-

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[12] https://source.android.com/compatibility/cdd

based messaging is a significant barrier. Apple's approach of not adopting further potential interoperability with number-based messaging on Android devices (which iOS users may wish to receive) could also diminish the experience of switchers to Android.

47. Limits on the availability of Google's first-party apps, services and connected devices on Amazon and Huawei's Android operating systems could act as a disincentive to Android and iOS users from switching to Amazon and Huawei's devices. This may stymie the expansion of alternative mobile ecosystems, insulating Apple and Google from greater competition. However, these factors would not act as a barrier to Android users switching to iOS.