

1 Yavar Bathaee (CA 282388)
yavar@bathaeedunne.com
2 Andrew C. Wolinsky (CA 345965)
awolinsky@bathaeedunne.com
3 **BATHAEE DUNNE LLP**
445 Park Avenue, 9th Floor
4 New York, NY 10022
5 Tel.: (332) 322-8835

Brian J. Dunne (CA 275689)
bdunne@bathaeedunne.com
Edward M. Grauman (*p.h.v.* to be sought)
egrauman@bathaeedunne.com
6 **BATHAEE DUNNE LLP**
901 South MoPac Expressway
7 Barton Oaks Plaza I, Suite 300
Austin, TX 78746
8 Tel.: (213) 462-2772

6 *Attorneys for Plaintiffs and the Proposed*
7 *Classes*

8 **UNITED STATES DISTRICT COURT**
9 **NORTHERN DISTRICT OF CALIFORNIA**

10 LUISA BAKAY, ELISA JONES, and LETICIA
11 SHAW, individually and on behalf of all others
similarly situated,

12 Plaintiffs,

13 v.

14 APPLE INC., a Delaware corporation.

15 Defendant.
16

Case No. 24-cv-00476

CLASS ACTION COMPLAINT

DEMAND FOR JURY TRIAL

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INTRODUCTION

1
2 1. Defendant Apple Inc. (“Apple”) makes and sells the iPhone—the most common
3 smartphone in the United States—along with the iOS operating system that powers it. The iPhone and its
4 iOS operating system are proprietary, and part of a closed ecosystem of apps and services for which
5 Apple, through its App Store, is the sole gatekeeper.

6 2. In 2023, Apple had a 55% market share of all smartphones sold in the United States.
7 Nearly every other smartphone in the United States is tied to another closed ecosystem—Google’s.
8 Google, the maker of Android, uses its Play Store to exercise significant control over the apps and services
9 that can be, and are, provided on Android-based smartphones, which comprise nearly all non-Apple
10 smartphones sold in the United States.

11 3. For years, Apple and its smartphone counterpart Google have been protected from
12 meaningful competition by their large ecosystem of apps, developers, and users. To meaningfully
13 compete with Apple or Google, a newcomer would have to develop not just a smartphone but a
14 smartphone operating system, then convince developers to build apps for it, and then convince users to
15 switch to the new smartphone platform.

16 4. This has historically kept out even the most well-resourced competitors, and the U.S.
17 smartphone market settled into a steady iOS-Android duopoly in 2014. There are powerful network
18 effects favoring the two incumbents—users only want to use smartphones with a critical mass of third-
19 party apps, and app developers will only invest in a new smartphone platform if there are sufficient users
20 on the platform to justify the cost—and Apple and Google have supercharged them by designing bespoke,
21 proprietary languages and development tools for iOS and Android, creating large populations of purpose-
22 trained mobile developers with specialized experience in iOS or Android development.

23 5. These network effects—and the carefully-planned business strategies of Apple and
24 Google—have helped create a powerful barrier to entry, the Mobile Ecosystem Barrier to Entry
25 (“MEBE”), protecting the longstanding Apple-Google duopoly. Companies as powerful and well-
26 resourced as Microsoft have impaled themselves upon it, failing to take even a small fraction of market
27
28

1 share from iPhone and the smartphones running Google’s Android operating system despite a multi-
2 year attempt at a Windows Phone.

3 6. At the heart of the MEBE and Apple’s supracompetitive profits is a simple (and
4 longstanding) fact: every app that runs on the iPhone must be approved by Apple and deployed through
5 Apple’s App Store. The only way onto the iPhone and iOS is through Apple.

6 7. There is, however, another *potential* way onto iPhones—through the engine that powers
7 the smartphone’s web browser. Apple’s Safari browser relies on such an engine to process and render
8 web pages and execute code that runs through the browser and even in native third-party apps. Every
9 browser comes equipped with a browser engine that performs the same function. At the close of the
10 2010s, this threat vector to the MEBE and to the United States smartphone duopoly came of age.

11 8. By 2019, apps that ran on browser engines and in web browsers had become incredibly
12 powerful—in many cases indistinguishable in look, feel, and function from native apps distributed
13 through Apple’s App Store. These apps, called Progressive Web Apps (“PWAs”), posed not only a threat
14 to Apple’s uncontestable hegemony over apps running on its iPhones, but also to its large share of the
15 smartphone and smartphone operating system (“OS”) markets in the United States.

16 9. A modern browser engine is, for all intents and purposes, a potential app store in itself—
17 and a cross-platform one at that. The PWAs that can run on the leading browser engines—engines like
18 Google’s Blink, which forms the heart of Chrome, and Mozilla’s Gecko, which underpins Firefox—raise
19 the promise of code-once, run-anywhere PWAs that would allow developers to write one full-featured
20 web app, and then deploy it across every major platform, both desktop and mobile.

21 10. This was the reality that Apple—and Google—faced at the end of the last decade. With
22 the rise of PWAs, a third-party browser engine could mean the end of the Apple App Store and the Google
23 Play Store as single points of entry to the entirety of the country’s smartphones.

24 11. To prevent the emergence of this cross-platform threat, Apple has entered into a series of
25 agreements with browser makers, particularly those who have developed major cross-platform browser
26 engines. By agreement with Apple, none will deploy their browser engines on iPhone. Instead, every web
27 browser on iOS and every iOS app relying on a browser engine must, by agreement, use Apple’s browser
28

1 engine, called WebKit. Companies that have developed advanced, full-featured browser engines that
2 could serve as cross-platform launching pads for PWAs across both major mobile ecosystems have agreed
3 with Apple not to do so on iPhone.

4 12. Notably, Apple made such an agreement with its direct, horizontal competitor in both the
5 smartphone and smartphone OS markets, Google.

6 13. Google, which has the dominant web browser in the United States, Chrome, uses its own
7 browser engine Blink on every platform except iOS. By agreement with Apple, on iOS Google has
8 continuously released its apps and its Chrome web browser with Apple's WebKit instead of Blink, the
9 browser engine behind Chrome. This has prevented Chrome, the world's number one web browser, from
10 serving as a cross-platform launching pad for PWAs on smartphones.

11 14. Apple, for its part, entered into agreements with every other browser maker, including
12 Microsoft and Firefox, to forgo their own browser engines and use only WebKit on iOS. The result is
13 that every browser on iOS, no matter how branded, is in fact just Apple's Safari browser, reskinned—
14 and every iOS app that uses browser engine functionality exclusively uses Apple's WebKit too.

15 15. Apple's agreements with browser developers, including browser market-leading Google,
16 do not just protect Apple and iPhone; they also protect Google and the Android smartphones that Google
17 monetizes. By ensuring that developers who seek to write once and deploy on a cross-platform browser
18 engine are excluded from 136 million U.S. smartphones, Apple's agreements restricting browser engine
19 functionality on iOS ensure that no true cross-platform browser engine can exist in the United States.
20 This insulates both Apple and Google from smartphone competition, and it ensures that the companies'
21 respective smartphone ecosystems remain distinct, walled, and fragmented.

22 16. By agreeing not to deploy a cross-platform browser engine on iOS, Apple and Google
23 have strengthened the MEBE, preventing new entry into the smartphone market, protecting the Apple-
24 Google duopoly in the smartphone OS market, and allowing Apple and Google to maintain a near 100%
25 monopoly over smartphone OSes.

26 17. Because of Apple's agreements, including with its direct, horizontal competitor Google,
27 Apple has been able to charge supracompetitive prices for its iPhones. No smartphone can enter the
28

1 market in the United States without either licensing Android from Apple’s co-conspirator Google or
2 creating its own smartphone OS from scratch. As such, there has been no successful entry by any
3 smartphone platform to challenge the Apple and Google ecosystems—and there has been no check on
4 the prices Apple charges iPhone customers.

5 18. Apple’s agreements violate Section 1 of the Sherman Antitrust Act, including because of
6 Apple’s *per se* unlawful agreement with Google to divide markets. Moreover, Apple and Google have
7 directly conspired to monopolize the market for smartphone operating systems under Section 2 of the
8 Sherman Act.

9 19. Plaintiffs are purchasers of Apple’s iPhones who paid supracompetitive prices as a result
10 of Apple’s anticompetitive agreements. They seek to recover for the overcharge caused by Apple’s
11 agreements, and also seek injunctive relief to prevent Apple from continuing to restrain, distort, and
12 overtly harm competition.

13 **PARTIES**

14 **I. PLAINTIFFS**

15 20. Plaintiff Luisa Bakay is a domiciled resident of La Jolla, California. Ms. Bakay purchased
16 an iPhone 12 Pro for \$1,299.00 on November 15, 2020. Ms. Bakay purchased an iPhone 13 Pro Max for
17 \$1,599.00 on November 2, 2021. Ms. Bakay purchased an iPhone 14 Pro for \$1,399.00 on September 28,
18 2022. Ms. Bakay made each of her purchases directly from Apple online via Apple.com.

19 21. Plaintiff Elisa Jones is a domiciled resident of Zion, Illinois. Ms. Jones purchased an
20 iPhone 12 for \$629.00 on May 24, 2023. Ms. Jones made her purchase directly from Apple online via
21 Apple.com.

22 22. Plaintiff Leticia Shaw is a domiciled resident of Los Angeles, California. Ms. Shaw
23 purchased an iPhone 12 for \$799.00 Apple on June 9, 2021. Ms. Shaw purchased an iPhone 14 for
24 \$829.00 on December 8, 2022. Ms. Shaw made both of her purchases directly from Apple at the Apple
25 Store in Santa Monica, California.

26 23. Plaintiffs paid prices for their iPhones that are higher than they would be absent Apple’s
27 anticompetitive conduct described in this Complaint. Plaintiffs suffer other ongoing injuries from Apple’s
28

1 anticompetitive conduct described in this Complaint, including diminished product quality and reduced
2 consumer choice in the United States Smartphone Market and the United States Smartphone OS
3 Market—markets in which Plaintiffs are active consumers.

4 24. Apple’s anticompetitive conduct remains in place and, absent an injunction, will continue
5 to harm competition in the Smartphone Market and Smartphone OS Market by directly increasing prices;
6 preventing price competition; strengthening the MEBE; and reducing consumer choice.

7 **II. DEFENDANT**

8 25. Defendant Apple Inc. (“Apple”) designs and manufactures a variety of consumer products,
9 including smartphones, personal computers, tablets, and wearables.

10 26. Apple is headquartered in Cupertino, California, at One Apple Park Way.

11 27. According to its 2023 Annual Report, Apple currently sells several models of its
12 smartphone product, the iPhone, all of which run Apple’s iOS operating system:

13 iPhone is the Company’s line of smartphones based on its iOS operating
14 system. The iPhone line includes iPhone 15 Pro, iPhone 15, iPhone 14,
15 iPhone 13, and iPhone SE.

16 28. Apple also runs several service-based lines of business, namely advertising, AppleCare
17 (Apple’s warranty and repair service for its retail products), cloud services, digital content, and payment
18 services.

19 29. Apple’s digital content line of business is operated through its Apple App Store. As Apple
20 explains in its 2023 Annual Report:

21 The Company operates various platforms, including the App Store, that
22 allow customers to discover and download applications and digital content,
23 such as books, music, video, games and podcasts.

24 The Company also offers digital content through subscription-based
25 services, including Apple Arcade, a game subscription service; Apple
26 Fitness+, a personalized fitness service; Apple Music, which offers users a
27 curated listening experience with on-demand radio stations; Apple News+,
28 a subscription news and magazine service; and Apple TV+, which offers
exclusive original content and live sports.

1 30. Apple’s smartphone and smartphone operating system business relies on attracting third-
2 party developers to develop apps for its iOS platform. In other words, Apple’s ability to sell its iPhones
3 and iOS operating system relies heavily on the availability of apps developed by third-party developers
4 and on attracting third-party developers to continue developing apps. Because third-party developers are
5 attracted to platforms with significant user bases and opportunities for revenue, a feedback loop emerges.
6 As Apple explains in its 2023 Annual Report:

7 ***The Company’s future performance depends in part on support from***
8 ***third-party software developers.***

9 The Company believes decisions by customers to purchase its hardware
10 products depend in part on the availability of third-party software
11 applications and services. There can be no assurance third-party developers
12 will continue to develop and maintain software applications and services
13 for the Company’s products. If third-party software applications and
14 services cease to be developed and maintained for the Company’s products,
15 customer may choose not to buy the Company’s products.

16 The Company believes the availability of third-party software applications
17 and services for its products depends in part on the developers’ perception
18 and analysis of the relative benefits of developing, maintaining and
19 upgrading such software and services for the Company’s products
20 compared to competitors’ platforms, such as Android for smartphones and
21 tablets, Windows for personal computers and tablets, and PlayStation,
22 Nintendo and Xbox for gaming platforms. This analysis may be based on
23 factors such as the market position of the Company and its products, the
24 anticipated revenue that may be generated, expected future growth of
25 product sales, and costs of developing such applications and services.

26 The Company’s minority market share in the global smartphone, personal
27 computer and tablet markets can make developers less inclined to develop
28 or upgrade software for the Company’s products and more inclined to
devote their resources to developing and upgrading software for
competitors’ products with larger market share. When developers focus
their efforts on these competing platforms, the availability and quality of
applications for the Company’s devices can suffer.

 The Company relies on the continued availability and development of
compelling and innovative software applications for its products. The
Company’s products and operating systems are subject to rapid
technological change, and when third-party developers are unable to or
choose not to keep up with this pace of change, their applications can fail
to take advantage of these changes to deliver improved customer

1 experiences, can operate incorrectly, and can result in dissatisfied
2 customers and lower customer demand for the Company's products.

3 31. Apple sells third-party software through its App Store and charges developers a percentage
4 of the sales of apps, in-app purchases, and subscriptions sold through the App Store.

5 32. Apple warns its investors that its App Store business model is subject to regulatory
6 scrutiny and litigation. As Apple explains in its 2023 Annual Report:

7 The Company distributes third-party applications for its products through
8 the App Store. For the vast majority of applications, developers keep all of
9 the revenue they generate on the App Store. The Company retains a
10 commission from sales of applications and sales of digital services or goods
11 initiated within an application. From time to time, the Company has made
12 changes to its App Store, including actions taken in response to
13 competition, market conditions and legal and regulatory requirements. The
14 Company expects to make further business changes in the future, including
15 as a result of legislative initiatives impacting the App Store, such as the
16 European Union ("EU") Digital Markets Act, which the Company is
17 required to comply with by March 2024. The Company is also subject to
18 litigation and investigations relating to the App Store, which have resulted
19 in changes to the Company's business practices, and may in the future
20 result in further changes. Changes have included how developers
21 communicate with consumers outside the App Store regarding alternative
22 purchasing mechanisms. Future changes could also affect what the
23 Company charges developers for access to its platforms, how it manages
24 distribution of apps outside of the App Store, and how and to what extent
25 it allows developers to communicate with consumers inside the App Store
26 regarding alternative purchasing mechanisms. This could reduce the
27 volume of sales, and the commission that the Company earns on those
28 sales, would decrease. If the rate of the commission that the Company
retains on such sales is reduced, or if it is otherwise narrowed in scope or
eliminated, the Company's business, results of operations and financial
condition could be materially adversely affected.

33. Apple's iPhone is its largest product segment. Apple's net iPhone sales were \$200.583
billion in 2023, \$205.489 billion in 2022, and \$191.973 billion in 2021.

34. Apple's consumer products provide it with high gross margins, approximately 36.5% in
2023, 36.3% in 2022 and 35.3% in 2021. The gross margin on its services business segments is
approximately double that—70.8% in 2023, 71.7% in 2022, and 41.8% in 2021.

1 35. The company’s net income was \$96.995 billion for its 2023 fiscal year, \$99.803 billion
2 for 2022, and \$94.680 billion in 2021.

3 **JURISDICTION AND VENUE**

4 36. This action arises under Sections 1 and 2 of the Sherman Act, and Section 4 and 16 of the
5 Clayton Act (15 U.S.C. §§ 12, 15, 26). Plaintiffs and the proposed class seek to recover treble damages,
6 interest, costs of suit, equitable and injunctive relief, and reasonable attorneys’ fees for their injuries
7 resulting from Apple’s anticompetitive conduct.

8 37. This Court has subject matter jurisdiction under 28 U.S.C. §§ 1331 (federal question),
9 1332 (class action diversity jurisdiction), and 1337(a)(antitrust); and under 15 U.S.C. § 15 (antitrust).

10 38. Venue is appropriate in this district under 15 U.S.C. § 15(a) (Clayton Act), 15 U.S.C. § 22
11 (nationwide venue for antitrust matters), and 28 U.S.C. § 1391(b) (general venue provision). Apple
12 transacts business within the district, and it transacts its affairs and carries out interstate trade and
13 commerce, in substantial part, in this district.

14 39. The Court has general personal jurisdiction over Apple because it is headquartered in
15 California.

16 **DIVISIONAL ASSIGNMENT**

17 40. This is an antitrust class action for which “venue is proper in any courthouse in this
18 District” under Gen. Order No. 44 § D.3 and Civil Local Rule 3-2(c).

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FACTS

I. THE SMARTPHONE DUOPOLY

A. The Advent of the Smartphone

41. On January 9, 2007, Apple's late founder and CEO, Steve Jobs, took the stage at the 2007 MacWorld Expo and introduced the first modern smartphone, the iPhone.



42. The iPhone, which was released on June 29, 2007, sold for \$499 and came with 4GB of storage. The device was like nothing else being sold at the time. Nokia dominated the global cellular telephone market in 2007, and devices made by Blackberry and Palm provided inelegant access to email over mobile networks. None of the devices at the time provided the ability to run third-party applications that materially augmented the function of the phone.

43. The original iPhone came with 15 apps: Calendar, Camera, Clock, Contacts, iPod, Maps (provided by Google), Messages, Notes, Phone, Photos, Safari, Stocks, Voice Memos, Weather, and Settings. The iPhone integrated the functionality of what used to be several devices (including a cellphone, a portable digital media player such as Apple's iPod, a PDA, and a digital camera), and unlike then-existing mobile devices, Apple's iPhone provided the functionality in a single, polished package.

44. The iPhone also changed the way in which a user interacted with a smartphone. Unlike other contemporary devices, Apple used a multitouch interface rather than a physical keyboard and provided a high-resolution screen. The iPhone's new multitouch interface was far more accurate and

1 usable than touchscreens of the past. As *The Wall Street Journal* noted when it reviewed the iPhone in
2 2007:

3 The iPhone’s most controversial feature, the omission of a physical
4 keyboard in favor of a virtual keyboard on the screen, turned out in our
5 tests to be a nonissue, despite our deep initial skepticism. After five days
6 of use, Walt—who did most of the testing for this review—was able to type
7 on it as quickly and accurately as he could on the Palm Treo he has used
8 for years. This was partly because of smart software that corrects typing
9 errors on the fly.

10 45. The iPhone’s killer app was a web browser called Safari. Even the most advanced cellular-
11 equipped mobile devices at the time provided text-only web browsing or limited image rendering. The
12 iPhone featured the first true web browser on a smartphone—one that could display webpages with the
13 layout and quality available on computer browsers.

14 46. As *The Wall Street Journal* reported in its iPhone review:

15 **Web browsing:** The iPhone is the first smart phone we’ve tested with a
16 real, computer-grade Web browser, a version of Apple’s Safari. It displays
17 entire Web pages, in their real layouts, and allows you to zoom in quickly
18 by either tapping or pinching with your finger. Multiple pages can be open
19 at the same time, and you can conduct Google or Yahoo searches from a
20 built-in search box.

21 47. The iPhone looked like none of the smartphones at the time, and more importantly, it
22 provided the first practical way to browse and search the web from a mobile device.



26 48. As a June 29, 2017 article in Big Medium, titled “How iPhone Changed Computing—and
27 Much More” recounted, the iPhone provided users access to the web, which meant web apps:

1 The iPhone was the first popular device to make it easy to browse desktop
2 websites on a mobile device. Before the iPhone, the mobile web experience
3 was hobbled by crummy WAP sites, weird trackball cursors, or lousy text-
4 only experiences navigated by keypad. The iPhone’s huge (for the era)
5 screen and pinch-to-zoom interaction made it possible to see the whole web
6 from your phone for the first time. **The iPhone released the web from its
7 desktop prison.**

(For the iPhone’s first year, the only way to create an ‘iPhone app’ was to
build a web app, remember?)

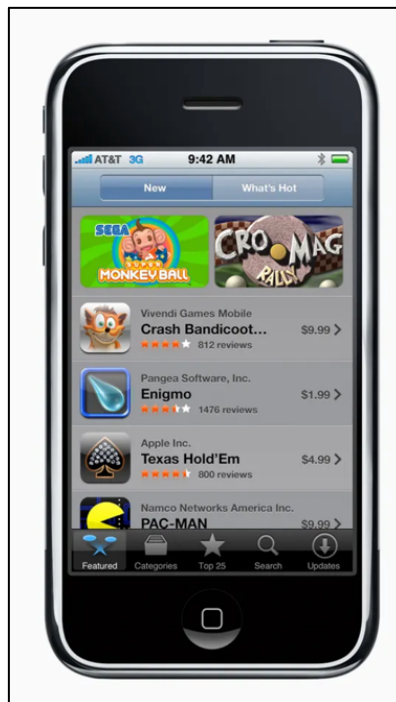
(emphasis in original)

8 49. The iPhone’s computer-like web browsing functionality instantly augmented the
9 functionality of the fifteen-app iPhone.

10 50. For approximately a year, any new app for the iPhone came in the form of web apps, as
11 Apple had not yet provided a means of downloading and installing third-party applications on iPhones.

12 **B. The App Store**

13 51. In July 2008, Apple provided a means of distribution for third-party smartphone apps that
14 ran on the iPhone. It launched the Apple App Store—an application on the iPhone that allowed a user to
15 download “apps” created by third-party developers, which Apple had approved prior to distribution.



1 52. Apple’s App Store featured games, productivity applications, and social networking apps.
2 Apps quickly proliferated, and by 2010, the App Store had become the leading source for smartphone
3 applications.

4 53. As CNET reported in a February 15, 2011 article titled, “Report: Apple remains king of
5 app-store market”:

6 Though more online stores have been crowding the mobile app market,
7 Apple remains by far the app-store leader, according to data out today from
8 IHS, which recently acquired technology researcher iSuppli.

9 For 2010, Apple took in \$1.78 billion in worldwide sales from its App
10 Store, a leap of 132 percent from \$769 million in 2009. And while it lost
11 market share to some of its mobile rivals, Apple still captured 82.7 percent
12 of the app store market last year, down from 92.8 percent the prior year.

13 54. Apple’s App Store quickly became a massive revenue generator for Apple and third-party
14 developers. By the end of 2010, Apple’s App Store featured 300,000 apps and had launched a billion-
15 dollar industry. As TechCrunch reported in a December 26, 2010 article titled, “The Top 40 iPhone Apps
16 of 2010”:

17 The iTunes App Store is huge. More than 300,000 apps huge. I’ve watched
18 this monster start from nothing and turn into a billion-dollar industry in
19 only a few short years. We’ve been approaching this point for some time
20 now, but it’s more apparent than ever that app exposure is of critical
21 importance.

22 55. Apple’s app store eventually expanded to allow in-app purchases and subscriptions. Apps
23 became a significant source of Apple’s revenue, as Apple took a percentage of all app and in-app sales
24 through its App Store, which was the only means of distributing third-party applications to Apple’s
25 locked-down iPhone.

26 56. By 2013, sales from all smartphone app stores had reached \$25 billion, but Apple, for the
27 first time, faced competition from a significant rival—Google.

28 **C. Google Launches Android and the Google Play Store**

 57. In 2005, Google acquired a Palo Alto, California company that was developing an
advanced operating system originally intended for digital cameras. Android, Inc., which founded in

1 October 2003, pivoted with the rise of the smartphone toward creating a new handset operating system,
2 one that could rival Nokia’s Symbian and Microsoft Windows Mobile.

3 58. As PC Magazine recounted in an April 16, 2013 article titled, “Android founder: We
4 aimed to make a camera OS”:

5 The creators of Android originally dreamed it would be used to create a
6 world of “smart cameras” that connected to PCs, a founder said, but it was
7 reworked for mobile handsets as the smartphone market began to explode.

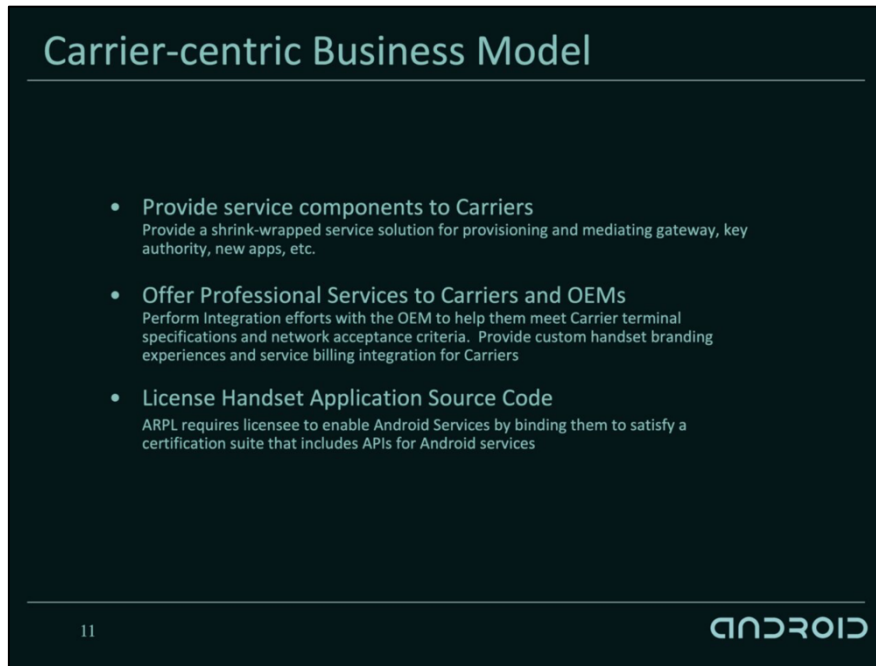
8 “The exact same platform, the exact same operating system we built for
9 cameras, that became Android for cellphones,” said Android co-founder
10 Andy Rubin, who spoke at an economic summit in Tokyo. . . .

11 But growth in digital cameras was gradually slowing as the technology
12 became mainstream. Rubin’s company revamped its business plan: A pitch
13 from five months later declares it to be an “open-source handset
14 solution.” . . .

15 “We decided digital cameras wasn’t actually a big enough market,” said
16 Rubin. “I was worried about Microsoft and I was worried about Symbian,
17 I wasn’t worried about iPhone yet.”

18 59. Android was a modified branch of Linux—a free and open source operating system.
19 Android also drew heavily from, and built upon, Java, a programming language developed to generate
20 code that ran on a virtual machine.

21 60. Android Inc.’s business model was to license its new mobile operating system to handset
22 makers. As Ars Technica recounted in an August 13, 2021 article titled, “Excerpt: How Google bought
23 Android—according to folks in the room,” Android Inc.’s pitch deck described the company’s technology
24 and business model as a handset operating system that could be tailored to cellular carriers’ needs:
25
26
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61. Google acquired Android, Inc. in 2005. In 2007, after Apple announced the iPhone, Google scrambled to adapt its mobile operating system to provide a competitive product. Google formed the Open Handset Alliance with non-Apple cellphone providers HTC and Motorola, and secured the support of chip manufacturers such as Qualcomm and Texas Instruments.

62. Google was assembling the pieces of what appeared to be its own smartphone product—one to rival Apple’s revolutionary iPhone. But what Google ultimately released was an operating system, and connected services ecosystem, that provided other smartphone manufacturers the functionality needed to take on Apple.

63. The Open Handset Alliance announced their partnership in a November 5, 2007 press release titled, “Industry Leaders Announce Open Platform for Mobile Devices”:

A broad alliance of leading technology and wireless companies today joined forces to announce the development of Android, the first truly open and comprehensive platform for mobile devices. Google Inc., T-Mobile, HTC, Qualcomm, Motorola and others have collaborated on the development of Android through the Open Handset Alliance, a multinational alliance of technology and mobile industry leaders.

1 64. Google had joined forces with other handset makers and carriers to provide a platform for
2 smartphones. As part of this new venture, Google agreed to provide Android under a uniform licensing
3 agreement.

4 65. In September 2008, the first smartphone with Google’s mobile operating system was
5 released. Called the HTC Dream, the device was distributed by T-Mobile and ran Android 1.0.

6 66. At about the same time, Google announced its own app store, which it called the Android
7 Market. As CNET reported in an August 28, 2008 article titled “Google announces Android Market for
8 phone apps”:

9 Google on Thursday announced Android Market, an online center that will
10 let people find, buy, download, and rate applications and other content for
mobile phones equipped with the open-source operating system.

11 67. As CNET noted, Android’s first task was to attract a critical mass of developers to stock
12 its new app store with third-party applications:

13 Attracting developer attention is a key part of the Google-led Android
14 software effort, and those who produce applications will have an easy time
15 getting them to the market, Eric Chu of Google’s Android project said in a
Thursday blog post.

16 68. Google had produced a rapid response to Apple’s innovative new iPhone. It quickly signed
17 up and assisted hardware manufacturers to become vessels for its Android operating system and Android
18 Market app store.

19 69. On March 6, 2012, Google changed the name of Android Market to the Google Play Store,
20 unifying the software distribution channel for consumer Android devices under one banner—Google’s.

21 70. As ABC News reported on March 6, 2012 in an article titled, “Google Play Store: New
22 Name for Android Market”:

23 Goodbye, Android Market. Google’s online store for mobile apps—as well
24 as music, movies and digital books—will now be known as the Google
Play store, beginning today.

25 The company says it is consolidating different sites and apps under the new
26 name so that you can “experience a simpler way to manage your
27 entertainment.” Up to now, Google offered music files at Google Music,
28

1 books at the Google eBookstore, apps at the Android Market and so forth—
2 and competitors like Apple and Amazon, with one-stop shopping did it
3 better.

4 71. By the next year, Google Play and Apple’s App Store were offering hundreds of thousands
5 of apps and generating billions of dollars in revenue. As *The Wall Street Journal* reported in a March 4,
6 2013 article titled “Apps Rocket Toward \$25 Billion in Sales”:

7 Nearly five years after Apple Inc. kicked off the mobile-apps craze, the
8 industry is booming.

9 App stores run by Apple and Google Inc. now offer more than 700,000
10 apps each. With so many apps to choose from, consumers are estimated to
11 spend on average about two hours a day with apps. Global revenue from
12 app stores is expected to rise 62% this year to \$25 billion, according to
13 Gartner Inc. . . .

14 Apple and Google Inc.’s Play store are today neck-in-neck in terms of
15 smartphone apps catalogs and usage, said analysts. Apple still dominates
16 in terms of money made by more than three to one, according to App
17 Annie.

18 72. Google had launched a direct rival to Apple’s iPhone—both through its own Nexus (and
19 later Google Pixel) devices running Android and the devices of companies such as Samsung, which
20 licensed Android from Google.

21 73. Google also distributed its own web browser with every Android device—pre-installed
22 and made the default system browser—called Google Chrome. Chrome was Google’s answer to the
23 powerful web browsing functionality released with the very first iPhone.

24 74. As Google described on its own website (as preserved by the Wayback Machine), Chrome
25 was every Android user’s default entrée into the Google ecosystem:

26 **A first-class browsing experience**

27 When the user signs into Chrome on one device, the tabs and browsing
28 history of that session are available to the user when she signs into Chrome
on another device. Note, it’s the entire page content that gets synchronized
between Chrome instances, not just the URL, so the user doesn’t have to
resubmit credentials to see a boarding pass or an article on a site that
requires a login.

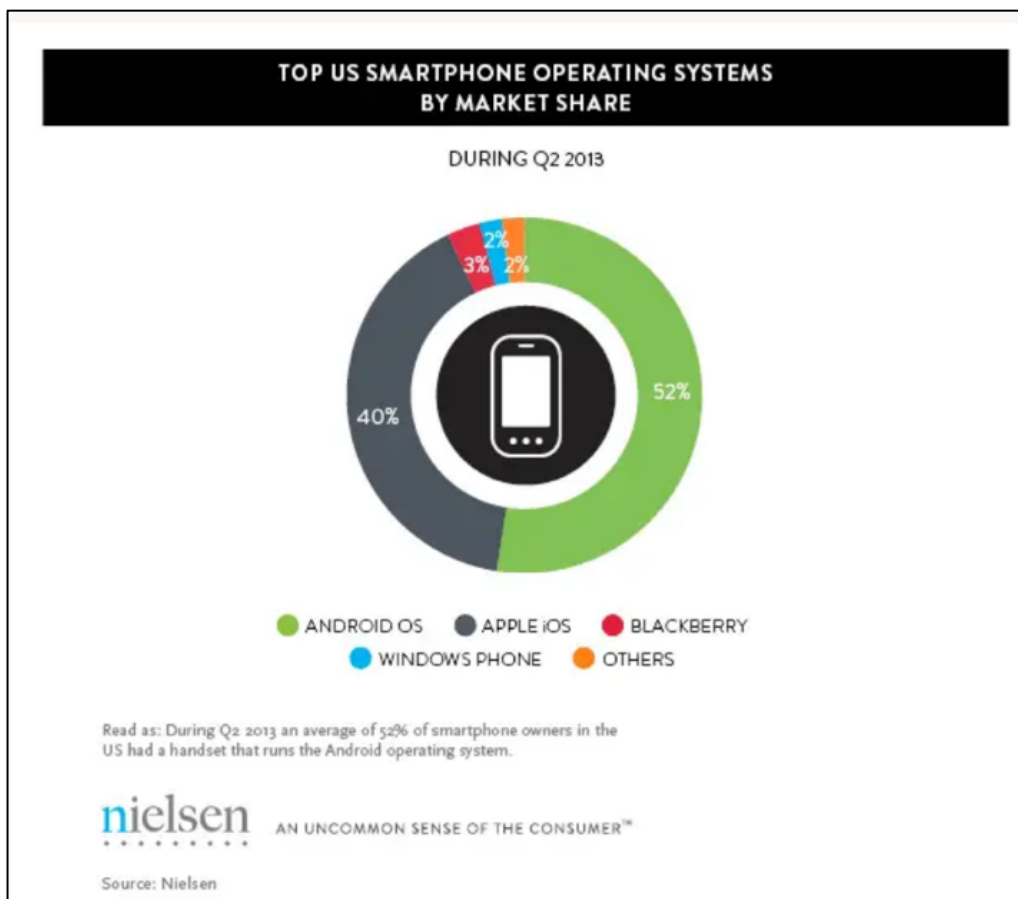
The address bar uses prefetching to fill in URLs and perform search queries with suggestions based on browsing history and local bookmarks. To save bandwidth, this feature only runs when the user is connected to a wifi network.

75. Through Chrome, Google brought its products, services, and user ecosystem onto Android phones sold throughout the United States (and worldwide).

D. Apple and Google Lock into a Duopoly

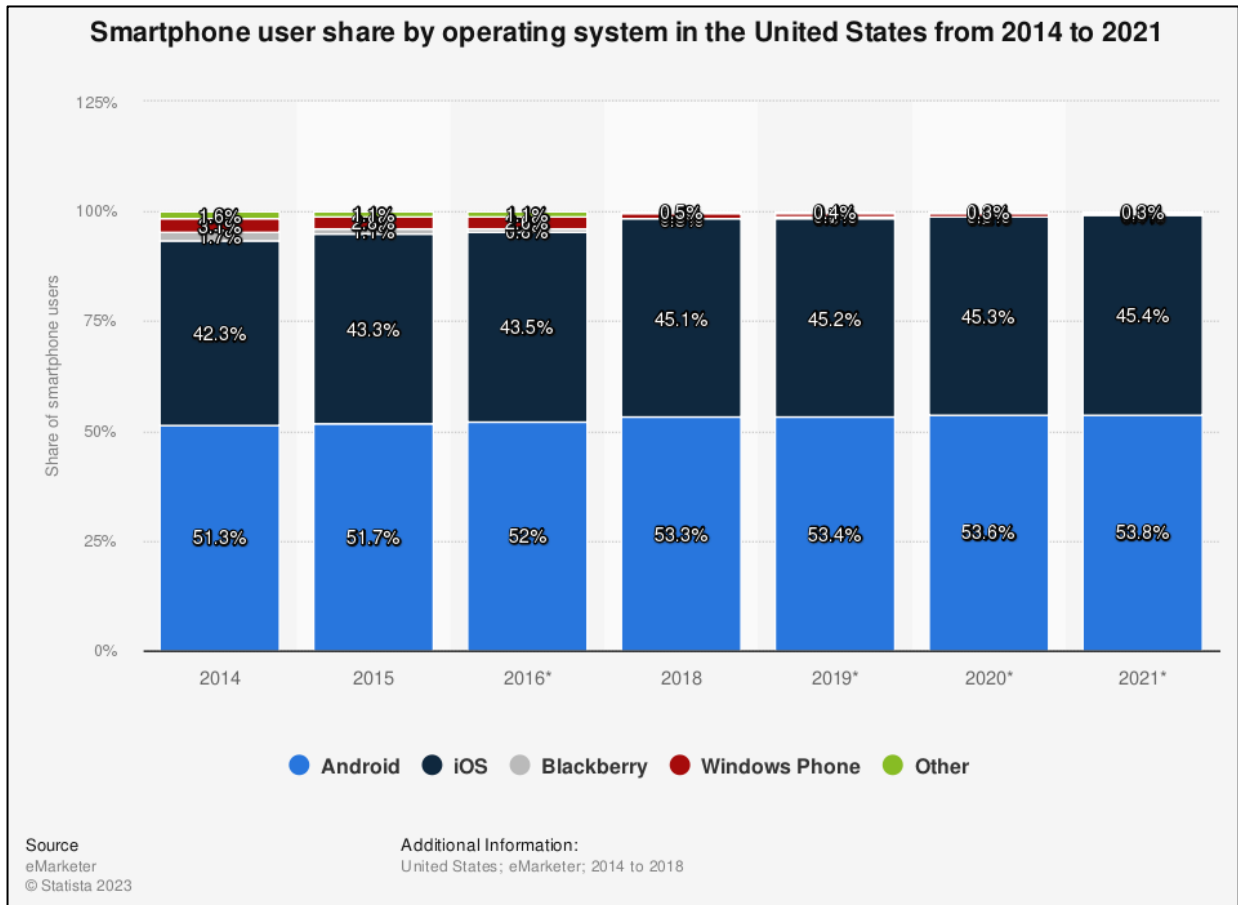
76. Android phones had quickly surpassed iPhone in market share in 2010, but by 2014 the United States smartphone market had stabilized into an operating system duopoly, with Android and iOS smartphones comprising more than 92% of all smartphones in the U.S.

77. As reported by an April 23, 2014 CIO article titled, “U.S. Smartphone Market Share Numbers for Q1 2014,” Nielsen estimated that 52% of devices in the U.S. ran Google’s Android, and approximately 40% ran Apple’s iOS.



78. Globally, Google’s Android operating system skyrocketed in market share, powering approximately 75% of all smartphones worldwide by the beginning of 2019.

79. In the United States, however, the two companies were locked into a duopoly that exists to this day, with Android smartphones maintaining approximately half of U.S. smartphone market share, and Apple the other.



80. Beginning in 2010, Google directly marketed its own Android-based smartphone, called Google Nexus. In 2016, Google discontinued the Nexus and announced as its successor the Google Pixel smartphone. Google continues to sell its Pixel smartphones today, directly competing with Apple’s iPhone.

81. Both companies maintain their own walled gardens through their control over devices and device operating systems. Google distributes apps and taxes app and in-app revenue through its Play Store, and Apple distributes apps and taxes app and in-app revenue through its App Store.

1 82. As explained below, this duopoly is maintained by a series of lock-in and network effects
2 arising from distinct “ecosystems.” That is, both Apple and Google maintain a constellation of apps and
3 services that keep users on one of the two respective platforms.

4 **II. THE MOBILE ECOSYSTEM BARRIER TO ENTRY PROTECTING THE APPLE-**
5 **GOOGLE DUOPOLY**

6 83. Apple and Google’s duopoly is protected by a powerful barrier to entry, the Mobile
7 Ecosystem Barrier to Entry (“MEBE”), that arises from the critical mass of apps available for each
8 platform.

9 **A. The App and Platform Critical Mass**

10 84. By the time they were locked into a duopoly, both Apple and Google had obtained a
11 critical mass of mobile apps for their platform. As users adopted or purchased apps for either iOS or
12 Android devices, they became less likely to change platforms.

13 85. By the mid-2010s, both iOS and Android had garnered significant developer support,
14 which in turn meant that other developers were attracted to the two platforms when developing and
15 distributing new smartphone apps.

16 86. This created a virtuous circle. Both platforms’ user bases were (and are) large enough to
17 attract a critical mass of developers to build apps for them, and developers as a result develop more apps
18 for both platforms, attracting more users.

19 87. As such, in modern day software development, most mobile apps are developed for both
20 iOS and Android devices—and not for any other smartphone platform. For example, social networks,
21 such as Facebook, Instagram, X (formerly Twitter), and Snapchat distribute native apps through both
22 Apple’s App Store and Google’s Play Store.

23 88. iOS and Android devices derive direct value from the network effects arising from the fact
24 that the most popular mobile apps run on both platforms. For example, an Android user can send a
25 WhatsApp message from her Pixel or Samsung smartphone, and an iOS user can receive it through the
26 WhatsApp app on their iPhone.

1 89. Because top apps are developed for both of the two dominant smartphone operating
2 systems (iOS and Android)—but not for any other smartphone operating system—smartphone users will
3 choose one or the other dominant smartphone platform over any potential entrant that has not yet garnered
4 a critical mass of apps and developers to trigger the virtuous circle.

5 **B. Disparate Development Environments**

6 90. A significant factor contributing to the MEBE’s strength is that both Apple and Google
7 provide their mobile operating systems’ application programming interfaces in disparate—and bespoke—
8 programming environments and languages.

9 91. Rather than adopt platforms that allow the use of multiple programming languages, such
10 as Microsoft’s .NET initiative, Apple and Google by 2019 each locked their mobile platforms into
11 bespoke programming languages and runtime environments—languages and runtime environments
12 developed and provided by Apple and Google, respectively.

13 92. Apple initially provided a compiler, documentation, and other tools to iOS developers in
14 a language called Objective C. The language was esoteric and required developers not only to learn new
15 syntax, but also to implement their iOS programs using a programming paradigm called Object Oriented
16 Programming.

17 93. Writing programs for Apple’s toolchain, programming language, and developer
18 environment required significant investment by developers. Once they had mastered all of this, as well
19 as the application programming interfaces exposed by Apple’s mobile operating system, developers were
20 unlikely to adopt a new platform and learn how to write programs with different tools.

21 94. Apple compounded the necessary bespoke investment by developers when it developed
22 its own programming language, Swift, in 2014. By 2018, Swift was the primary language used to write
23 iPhone apps.

24 95. Google forces Android developers to write their apps in Java. Although Java was initially
25 designed to run on a cross-platform virtual machine called the Java Virtual Machine, Google jettisoned
26 that aspect of the Java development paradigm. Instead, Google adopted only the language itself as part
27 of its Android developer platform.

1 96. Google, like Apple, then developed its own Java-like programming language, called
2 Kotlin, which it announced as the preferred language for Android development.

3 97. As *TechCrunch* reported in a May 7, 2019 article titled, “Kotlin is now Google’s preferred
4 language for Android app development”:

5 Google today announced that the Kotlin programming language is now its
6 preferred language for Android app developers.

7 “Android development will become increasingly Kotlin-first,” Google
8 writes in today’s announcement. “Many new Jetpack APIs and features
9 will be offered first in Kotlin. If you’re starting a new project, you should
write it in Kotlin; code written in Kotlin often mean much less code for
you—less code to type, test, and maintain.”

10 98. As explained below, this was done at the precise time that HTML 5 and Progressive Web
11 Apps (“PWAs”) threatened to render native mobile applications—and the proprietary app stores that
12 distributed (and restricted) them—obsolete, threatening the MEBE and the Apple-Google duopoly.

13 99. Both companies, Apple and Google, had increased the amount of investment required
14 from a developer seeking to build for their respective mobile platforms.

15 100. The further entrenched a developer became building for either dominant smartphone
16 platform—iOS or Android—the less likely that developer would be to build for a new platform.

17 101. Because of the differences in development environments, app developers often keep two
18 sets of engineers—one set for the iPhone and one set for Android development. Programmers are often
19 not interchangeable, as they will generally be materially more experienced in and knowledgeable about
20 a particular platform.

21 102. These disparate development environments work in favor of the Apple-Google duopoly
22 and help to maintain the moat around the United States smartphone market. Mobile app developers are
23 forced to invest in the Apple or Google mobile development environment—and in many cases both—in
24 order to reach a critical mass of smartphone users. This makes developers supremely unlikely to incur
25 the substantial expense of developing for an entirely new smartphone platform—one that by definition
26 will have very few users in comparison with iOS or Android.

1 **C. HTML 5 and the Rise of Progressive Web Apps**

2 103. In the mid-2010s, improvements in web browser technology promised a new type of cross-
3 platform application, one that would run through a browser engine and use newly developed common
4 web technologies like HTML 5, Cascading Style Sheets, JavaScript, and WebAssembly to replicate the
5 look, feel, and functionality of a native application in an operating system- and even hardware-
6 independent manner.

7 104. In 2015, a web designer and a Google Chrome engineer dubbed this new type of cross-
8 platform, natively web-based application the “Progressive Web App” (“PWA”). Progressive Web Apps
9 promised to make platform-native applications—and proprietary mobile app stores—a thing of the past.

10 105. Moreover, losing OS-based control on mobile app distribution threatened the smartphone
11 duopoly entirely—a new smartphone platform would not need a critical mass of purpose-built native apps
12 to commend it to consumers, if PWAs allowed mobile developers to build high-performance apps that
13 would run on iPhone, on Android handsets, and on smartphones with some other mobile operating
14 system.

15 106. The leading evangelists of PWAs—and the browser engines used to run them—were the
16 makers of the two largest browsers by market share at the time, Google (Chrome) and Mozilla (Firefox).

17 107. However, as explained below, Apple used contractual restraints on its iOS ecosystem—
18 including agreements with Google, Mozilla, and Edge/Explorer developer Microsoft—to exclude the
19 introduction of cross-platform PWAs on iPhones, thereby maintaining its duopoly position in the United
20 States smartphone and smartphone operating system markets and functionally dividing markets with co-
21 conspirator Google (maker of Chrome).

22 **D. Blocking the Browser Back Door**

23 108. The MEBE arises from the critical mass of apps and developers for each dominant
24 smartphone platform. As long as the iOS and Android platforms attract app developers and provide a
25 critical mass of apps, users remain locked into one of those two platforms.

26 109. Apple and Google, the companies behind iOS and Android, maintain an important choke
27 point over app distribution—their respective app stores. Apple applies strict rules that apps on its App
28

1 Store must follow, and Google does the same through a series of policies that it enforces—sometimes
2 with little explanation.

3 110. Smartphone apps are generally developed to be compliant on both platforms (iOS and
4 Android), and developers will generally invest in complying with any idiosyncrasies of the two platforms.

5 111. Opting out of the Apple or Google ecosystems is extremely difficult, particularly on
6 iPhone. Apple makes it virtually impossible to load apps onto an iPhone outside of the App Store. Doing
7 so potentially even voids the warranty attached to the iPhone. Moreover, even if their iPhones are
8 successfully “jailbroken” from Apple’s control (a technologically complex and dangerous process), users
9 will lose access to many of the iPhone’s core functions, such as iMessage and iCloud—apps that
10 frequently communicate and check in with Apple’s servers.

11 112. Google too locks down its operating system. It also punishes people who “root” or
12 “jailbreak” their phones with a voided warranty. Moreover, many apps simply will not run on devices
13 that are rooted or jailbroken.

14 113. Unsurprisingly, in practice, very few people “jailbreak” their devices or opt out of the
15 Apple (App Store) or Google (Play) distribution system for smartphones. It is too difficult for most users;
16 the tradeoff simply is not worth the risk; and many users rely on continued access to apps central to each
17 ecosystem.

18 114. This control by Apple and Google over all of the apps on virtually every smartphone in
19 the United States allows them to ensure that no developer can write once and run everywhere. Each
20 company forces its toolchain and platform on developers, each company traps its users into its ecosystem,
21 and together they maintain the MEBE protecting their collectively dominant share of the U.S. smartphone
22 market.

23 115. Apps are not, however, the only means through which developers can potentially deploy
24 their applications to smartphone users. Because iOS and Android smartphones each contain full-featured
25 web browsers, they can generally run web apps.

1 116. Moreover, as noted earlier in this complaint, over the past few years, a web-based
2 programming language and runtime environment based on JavaScript has matured such that sophisticated
3 web apps can run through browser engines, including on mobile browsers and other mobile apps.

4 117. Most web browsers, including Chrome and Safari browsers for smartphones, contain
5 engines that can run JavaScript programs. As explained below, these engines are carefully controlled by
6 Apple and Google on their respective smartphones to prevent them from becoming a cross-platform
7 means of deploying applications.

8 118. As noted earlier, rich, native-like programs that run through browser engines using
9 JavaScript and other common web technologies are commonly referred to as Progressive Web
10 Applications (“PWAs”). PWAs are applications, delivered through the web, that are built using common
11 web technologies including HTML 5, CSS, JavaScript, and WebAssembly.

12 119. PWAs pose a clear risk to both Apple and Google’s control over the apps that run on their
13 smartphones. If a developer could write a single PWA and deploy it on any smartphone—one running
14 iOS, one running Android, or one running a completely distinct mobile operating system—it would erode
15 the MEBE protecting the Apple-Google duopoly.

16 120. In other words, PWAs create a cross-platform threat. The way in which this competitive
17 threat would make its way onto a smartphone is through the device’s central piece of software—its web
18 browser engine. The web browser engine is the part of the browser that, among other things, renders web
19 pages and runs JavaScript code.

20 121. Both Apple and Google have created their own browser engines. Keeping the functionality
21 implemented by these engines under control is a vital part of maintaining the MEBE. As explained below,
22 Google maintains its control over the browser engine on Android devices by ensuring that it is the default
23 browser on every Android device. Apple outright bans the use of any other browser engine but its own.

24 122. Browser engines are also important because many third-party apps show information
25 through an in-app browser. Indeed, some apps are web apps disguised as native mobile apps.
26
27
28

1 123. Apps that rely on in-app browsers are prominently featured in the top 10 of both the Apple
2 App Store and the Google Play Store. Apps such as Facebook, TikTok, and X, for example, allow users
3 to view websites without leaving the app.

4 124. Apple and Google impose strict rules on these and other apps as they are deployed through
5 their respective app stores. The ability to run an internal web browser, however, threatens to undermine
6 the application choke point the companies have implemented over their many years of duopoly.

7 125. To maintain their control over the apps on their platform and to ensure that in-app browsers
8 and rival web browsers do not become cross-platform threats to the barrier to entry protecting their
9 duopoly, both companies develop and deploy their own browser engines—and Apple outright prohibits
10 the use of others.

11 **E. Microsoft Runs into the Powerful Mobile Ecosystem Barrier to Entry and Fails to**
12 **Enter the Smartphone and Smartphone Operating System Markets**

13 126. In 2015, Microsoft ran directly into the MEBE protecting Apple and Google. Microsoft
14 sought to release its own mobile operating system and smartphones to compete with Google’s Android
15 platform and Apple’s iPhone. Called Windows 10 Mobile, Microsoft distributed its operating system
16 through handset makers, including once-dominant Nokia.

17 127. Windows attempted to unify its mobile operating system with its dominant computer
18 operating system, creating a common UI language and developer environment across devices.
19 Microsoft’s only hope of overcoming the MEBE was to leverage its large Windows developer base to
20 enter the smartphone market with sufficient apps.

21 128. However, Microsoft, with all of its capital, power, and technical knowledge, failed
22 miserably. The reason was simple—there were not enough developers to make third-party apps for
23 Windows Phones, and because there were not enough apps, users would not consider switching from
24 iPhone or Android smartphones to a Windows Phone.

25 129. Microsoft killed its Windows Phone operating system and products in October 2017.
26 Microsoft, which had long enjoyed a similar virtuous circle in Intel-compatible computer software, had
27 failed to bridge the “app gap” in the United States smartphone market.
28

1 130. CNET reported Microsoft’s capitulation in an October 8, 2017 article titled, “Windows 10
2 Mobile gets its final death sentence”:

3 Bill Gates has given up his Windows phone. HP is pulling production of
4 its flagship Windows handset. Now Microsoft has finally seen the writing
5 on the wall—there aren’t enough people using Windows 10 Mobile or
6 enough apps to make it viable.

7 Corporate vice president of Windows 10 and head of Microsoft’s “PC-
8 Tablet-Phone” division, Joe Belfiore, said on Twitter Sunday that
9 Microsoft will continue to support Windows 10 Mobile with bug fixes and
10 security updates, but new features and hardware are no longer front and
11 centre.

12 131. Microsoft’s full-scale entry into the U.S. smartphone market had garnered a tiny amount
13 of market share. As CNET reported:

14 But the ecosystem had struggled since the launch of Apple’s iOS in 2007
15 and Google’s Android operating system in 2008. According to the most
16 recent sales figure from Kantar Worldpanel, Windows phones account for
17 just 1.3 percent of the market in the US, bested only by BlackBerry at 0.3
18 percent. Compare that with Android’s 64 percent share of new phone sales
19 and 34 percent for iOS (figures that are closely matched in the UK and
20 Australia).

21 Microsoft has attempted to leverage its legacy in the PC space to push
22 further into mobile—Windows 10 Mobile was billed as the “everywhere
23 OS” that would let users shift seamlessly between desktop, tablet and
24 mobile.

25 *But users have long complained the lack of apps on Windows Mobile
26 devices is a deal breaker.*

27 (emphasis added).

28 132. The reason was clear, even to Microsoft Vice President in charge of Windows 10, Joe
Belfiore—there were simply not enough apps to convince iPhone and Android users to give up their
ecosystems and switch. As Belfiore explained in an October 8, 2017 tweet:



13 133. Microsoft had run directly into the barrier to entry protecting the Apple-Google duopoly.
14 Without the ability to attract developers, there were not enough apps for the new platform to break in,
15 and without a critical mass of apps, there were not enough users to attract developers to invest in the new
16 platform.

17 134. The barrier to entry resulting from the critical mass of apps and developers for the existing
18 Apple-Google smartphone duopoly—the MEBE—was so powerful that Microsoft, which had a
19 significant user base and countless developers for its computer operating systems, could not overcome it.

20 135. Microsoft, which was ranked 15 on the Fortune 500 in 2022, could not make even a dent
21 in the Apple-Google duopoly's share of the market. When Microsoft killed the Windows Phone, it had
22 obtained only 1.3% of the market.

23 136. As explained below, when PWAs threatened to erode the MEBE—and the market power
24 enjoyed by Apple in the U.S. smartphone market—Apple and Google agreed to browser engine
25 restrictions that stifled this competitive threat to the companies' smartphone dominance, and Apple used
26 its control over iPhone to extract similar concessions from all other would-be threats, including Mozilla
27 (maker of Firefox) and Microsoft (maker of Edge/Internet Explorer).
28

1 **III. APPLE AND GOOGLE EXPRESSLY AGREE TO MAINTAIN AND STRENGTHEN**
2 **THE MOBILE ECOSYSTEM BARRIER TO ENTRY PROTECTING THEIR**
3 **DUOPOLY**

4 **A. Apple’s WebKit Engine, the WebKit Rule, and the Stranglehold over iPhone Apps**

5 137. A browser engine, also known as a rendering engine, is a core software component of
6 every web browser. The engine transforms HTML documents and other resources, such as JavaScript
7 code, into an interactive visual representation on a user’s device.

8 138. Browser engines are not standalone computer programs. They are core components of
9 other computer programs, including apps that use in-app browsers or rely on web-based functionality.

10 139. Apple controls what web-based applications, including PWAs, can do on its devices
11 through the browser engine at the core of its operating system, which it calls WebKit.

12 140. WebKit 2.0 was deployed as part of iOS 8 in September of 2014. Since then, WebKit has
13 been the cornerstone of Apple’s iPhone devices.

14 141. In addition to serving as the browser engine at the core of Apple’s Safari web browser,
15 WebKit is used to render web-based content in iPhone apps. Even a competing web browser must use
16 the WebKit engine rather than its own browser engine, in order to run on iPhone.

17 142. Apple sets forth this requirement in its App Store Review Guidelines, to which iPhone
18 developers must agree in order to distribute their apps on the Apple App Store—the exclusive means of
19 distributing iPhone apps to almost every iPhone user.

20 143. Section 2.5.6 of Apple’s App Store Review Guidelines states:

21 2.5.6 Apps that browse the web must use the appropriate WebKit
22 framework and WebKit Javascript.

23 144. This requirement means that any web browser, whether it be in a third-party app or even
24 a web browser app, is at its core, Apple’s Safari web browser.

25 145. Thus, even when an iPhone user loads a webpage using the Firefox browser for iOS, she
26 is in fact using a reskinned version of the same engine underlying Safari.

27 146. As Macworld explained in a March 3, 2022 article titled, “Developers condemn Apple’s
28 ‘deeply anti-competitive’ browser rules”:

1 Apple allows alternative web browsers on iOS—it even allows you to make
2 them the default on your iPhone—but they’re not given anything like the
3 same freedom afforded to browsers on other platforms. The iOS versions
4 of Chrome, Firefox, Opera and the rest have to be based on Apple’s
5 WebKit engine, whereas the versions on Android, Windows, Mac and
6 Linux use other options such as Blink and Gecko.

7 147. Apple’s WebKit is far more restrictive than the engines powering rival browsers on other
8 platforms. In fact, many of the restrictions placed on WebKit hamper PWAs. For example, Apple’s
9 WebKit constrains the use of service workers—code modules that allow a web app to, among other
10 things, operate asynchronously and cache online content when there is no Internet access—as part of
11 PWAs.

12 148. Apple’s WebKit is regarded by many as part of its stranglehold over apps, with many
13 restrictions aimed at preventing the development of PWAs on iPhone. As one observer stated in an April
14 23, 2023 post on YCombinator’s *Hacker News* forum:

15 Apple’s ban of all browsers but Safari turned out to be the main barrier
16 preventing progressive web apps from being viable, deepening the duopoly
17 power of themselves and Google, because Apple refuses to implement
18 basic browser standards that are necessary for PWAs.

19 And then when they do implement similar browser standards, they don’t
20 follow any web standards, they instead make their own proprietary bespoke
21 web standard for Safari.

22 And they also did other fun things like wait until nearly 2021 to support
23 WebP and let Safari be the #1 source of one-click exploits on iOS.

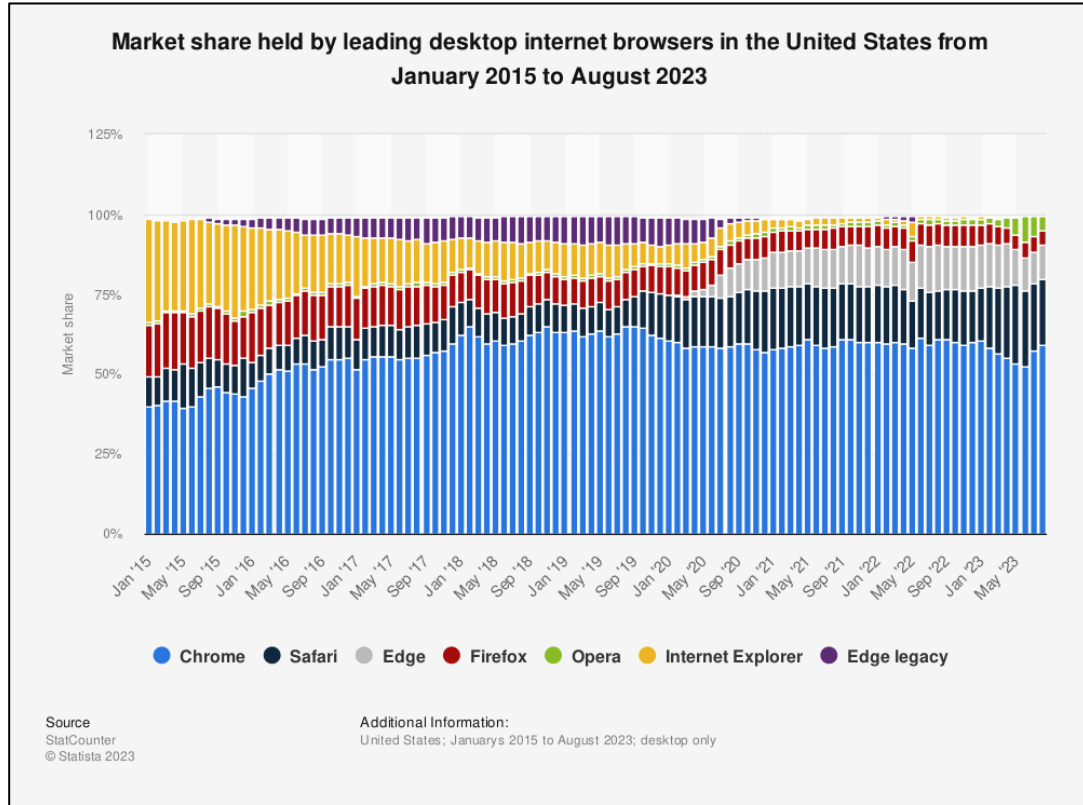
24 149. Apple’s WebKit creates severe incompatibilities with apps that run on other browsers.
25 That, however, is a feature, not a bug, from Apple’s perspective. Increased incompatibility reduces the
26 likelihood that a PWA could be written once and run on any smartphone platform with a web browser.

27 150. Without control over every web browser on an iPhone, Apple would face the prospect of
28 the emergence of a cross-platform browser engine for which a developer could write once and deploy on
any smartphone and smartphone operating system.

29 **B. Google’s Blink Engine and the Dominance of Google Chrome on Android**

30 151. Google also maintains a stranglehold over the web browsers on Android.

1 152. Google’s Chrome browser is the most widely used web browser in the United States. On
 2 the desktop, Chrome has consistently maintained half of the market share.



17 153. On Android smartphones, Chrome is the default browser, and it is the browser actually
 18 used by the overwhelming majority of Android smartphone users.

19 154. Google uses a fork of WebKit, called Blink, as the browser engine powering Chrome on
 20 Android smartphones. Blink, like Apple’s WebKit, is riddled with incompatibilities that prevent cross-
 21 platform apps and PWAs.

22 155. Indeed, Google’s control over Blink, as well as Apple’s control over WebKit, have
 23 allowed the companies to eliminate competitive browser engines.

24 156. In a September 2022 report by Mozilla titled *Five Walled Gardens*, Mozilla explains that
 25 Blink’s incompatibilities (and Apple’s WebKit requirement) have caused even Microsoft to abandon
 26 developing a rival browser engine in favor of adopting Google’s Blink engine:
 27
 28

1 Faced with both web incompatibility issues and the costs of maintaining a
2 separate browser engine for iOS, Opera abandoned its browser engine in
3 2013 and Microsoft followed suit in 2019. Both companies adopted
4 Google's Blink/Chromium browser engine for their primary browsers and
5 continue to offer WebKit versions on iOS. In particular, Microsoft's 2019
6 decision to abandon Trident reveals the scale of the challenge of
maintaining a browser engine. Microsoft is a company with currently more
than 150,000 employees and a market capitalization of around \$2 trillion.
Yet it decided to abandon a key piece of software and instead use a browser
engine created and maintained by one of its main rivals.

7 157. Google's Chrome is the most widely used web browser in the United States—and across
8 several device platforms. Google leverages its control over its Blink engine underlying all of these
9 Chrome browsers (except the one for iOS) to ensure that incompatibilities are pervasive.

10 158. So long as incompatibilities remain between Blink and rival engines, Google functionally
11 prevents the emergence of a potential cross-platform threat in the form of a rival browser engine.

12 159. Google's large market share gives it significant power over Android smartphones, but it
13 relies on Apple to prevent a cross-platform threat from emerging from its half of the duopoly.

14 **C. A Cross-Platform Threat: Mozilla's Open-Source Gecko Browser Engine**

15 160. In 1998, the first major web browser company, Netscape, created a free software
16 community called Mozilla.

17 161. In 2003, Mozilla began an ambitious task of developing its own free web browser. On
18 November 9, 2004, Mozilla announced the Firefox web browser.

19 162. Firefox's web browser became one of the fastest web browsers available, with versions of
20 Firefox besting web browsers bundled with Microsoft and Apple's operating systems in loading speed.
21 At the core of Firefox's high-performance web browser was a browser engine called Gecko.

22 163. Mozilla's ambition was well beyond providing a free web browser, and in 2011, Mozilla
23 began developing a means of booting a computer directly to its Gecko browser engine. As Mozilla
24 explained in a July 27, 2011 blog post titled, "Announcing Boot to Gecko (B2G)—Boot to the Web":

25 Mozilla recently announced the Boot to Gecko (B2G) Project which is a
26 project towards the goal of building a complete, standalone operating
27 system for the open web.
28

The aim of B2G

The idea is that open web technologies can supersede single vendor control over application environments, and instead use something that will be open for all and consistent across the board. The first main aim is mobile/tablet devices and to be able in such an environment to give access through web technologies to all the capabilities native applications have.

The project is in a very early stage right now, but we believe in communicating this early and getting as much valuable input, help and suggestions as possible to make this out to be all it can be.

164. Mozilla’s goal was to build an operating system built on its browser engine. Applications built to run on the web would be immediately portable to every mobile device running the B2G operating system. The move immediately positioned Mozilla against Apple and Android.

165. B2G ultimately developed into a fully-fledged mobile operating system called Firefox OS.



166. In 2013, Firefox deployed its new operating system to handset manufacturers, and by February 2014, Mozilla had announced seven commercial Firefox OS devices.

1 167. These devices were built entirely on Firefox’s browser engine. This meant that an
2 application built in the newest HTML iteration, called HTML5, could not only run on Firefox devices,
3 but on any device running a compatible browser engine.

4 Firefox OS devices are the first devices built entirely to open Web
5 standards, with every feature developed as an HTML5 application. Mozilla
6 previewed the future of Firefox OS at its press event, demonstrating how
7 its flexibility, scalability and powerful customization empower users,
8 developers and industry partners to create the exact mobile experience they
9 want. Carriers can easily and deeply customize the interface and develop
10 localized services that match the unique needs of the customer base.

11 168. Firefox OS provided a platform for cross-platform apps. Its goal was to write once for the
12 open web platform Firefox’s engine provides, and run the app on any platform. As Firefox explained in
13 an October 28, 2013 blog post, titled “Progress report on cross-platform Open Web Apps”:

14 We’re working to ensure that those same apps can also run on Android,
15 Windows, Mac OS X, and Linux devices. If your app can adapt to those
16 screen sizes, CPU’s [sic], and device capabilities, then we’ve got a plan to
17 ensure your apps install, launch, quit and uninstall as native apps on each
18 of those platforms.

19 169. Firefox OS directly challenged Android’s app store. Firefox made its Firefox Marketplace
20 available to Android users. As the same blog post explained:

21 Android users discover apps in Firefox Marketplace using the Firefox for
22 Android browser. Firefox Marketplace has approved Shotclock for
23 Android, so we just click the install button as we did on Firefox OS. We
24 will automatically repackage the Open Web App as a native Android app
25 to give our users a native app experience for Open Web Apps.

26 170. Firefox could not, however, deploy a similar store on Apple’s iOS. As the blog post
27 explained:

28 **iOS**

We’d love to support Open Web Apps on iOS devices, but iOS does not,
at this time, include the option to install a Gecko-based web browser, which
is currently needed to support Open Web Apps.

171. Firefox OS’s goal of deploying only web-based apps proved difficult because of
incompatibilities created by Apple and Google’s browser engines.

1 172. By the end of 2015, Mozilla’s Firefox OS had failed. Mozilla announced in December
2 2015 that it would be discontinuing its Firefox OS and its smartphones.

3 173. Although Mozilla had an operating system that could provide a platform for web
4 applications that could run on any device, it was not able to enter at scale. Mozilla had run into the same
5 powerful barrier to entry that Microsoft had run into.

6 174. In the past few years, however, PWA technology has improved to the point that Mozilla
7 does not need its own hardware to pose a threat to the dominance of Android and iPhone. Given modern
8 technology, Mozilla’s browser engine, Gecko, could create a middleware layer for apps on all platforms
9 and thereby threaten the smartphone duopoly.

10 175. That is, if Gecko could be deployed on Android and iPhone, then a new entrant in the
11 smartphone market could present a simple proposition to developers: write apps that run on any device
12 that runs a Gecko-based browser, and your app will immediately work on our new devices as well as on
13 iOS and Android. The MEBE could be eroded, and the duopoly broken—simply by virtue of a powerful
14 cross-platform browser engine.

15 176. For this proposition to work, however, Gecko would have to run everywhere.

16 177. By 2017, Mozilla had pivoted to deploying its browser engine across platforms.

17 178. In September 2018, Mozilla announced a new, open-source browser engine designed to
18 run on mobile products, called GeckoView.

19 179. Mozilla implemented its mobile Firefox browser on Android using the GeckoView
20 software designed to wrap around Mozilla’s Gecko browser engine.

21 180. Prior to its release, Google and Apple controlled the only two major browser engines used
22 by consumers. Gecko introduced a third option. As Mozilla explains in its September 2022 “Five Walled
23 Gardens” report:

24 One of the ways Mozilla seeks to do this is through developing and
25 investing in our Gecko browser engine. This matters because there are only
26 three main browser engine providers left: Google, Apple and Mozilla—but
27 Apple’s engine only runs on Apple devices. So, without Mozilla, the only
28 cross-platform browser engine would be provided by Google. Putting
development of cross-platform web browsers in the hands of a single

1 company creates not only a concentration of power, but also a single point
2 of failure.

3 181. Gecko threatened to provide a cross-platform option for developers. Web-based apps,
4 including PWAs, could be written for Gecko and immediately distributed on any platform that ran Gecko.
5 This would directly erode the MEBE protecting the Apple-Google duopoly.

6 182. Gecko could, however, only provide a cross-platform middleware layer for apps if it was
7 available on every mobile operating system. So long as either Apple or Google prevented Gecko from
8 obtaining a foothold, the proposition of writing once and deploying everywhere was an impossibility, and
9 the economics behind the MEBE would hold firm.

10 183. Google, which deployed its Android operating system on a variety of hardware, did not
11 maintain the tight hardware integration needed to keep Gecko off of every Android device. The most
12 Google could do was ensure incompatibilities between Gecko and its own Blink engine.

13 184. On the other side of the duopoly, however, was Apple, which tightly integrated its
14 hardware and operating system, allowing it to exercise unfettered control over what could run on every
15 one of the millions of iPhones it had sold throughout the United States.

16 **D. Google, which Makes the Web Browser with the Highest Market Share, Agrees
17 with Apple to use only WebKit on iPhones, Even in its Chrome Browser App**

18 185. By 2020, Google was the dominant browser on virtually every device. According to
19 W3Counter, Chrome accounted for 63% of all browsers worldwide, with Safari at 14.4%, Internet
20 Explorer/Edge at 8%, and Firefox with 5.1%. In October 2023, estimates placed Chrome at 70% of
21 worldwide browser market share, with Safari 15.1%, Internet Explorer/Edge 3.6% and Firefox 3%.

22 186. Google's browser dominance was its primary weapon against the cross-platform threat
23 posed by a rival browser engine such as Gecko.

24 187. On Android devices, where Chrome's market share was substantially higher than across
25 other devices, Google could itself maintain incompatibilities with other browsers to reduce any cross-
26 platform threat.

27 188. The key, however, was ensuring that no platform could unify applications for both
28 Android devices and Apple's iPhones. If there was no means of writing once and deploying on both

1 mobile platforms, the MEBE would remain strong enough to preserve the duopoly. Absent a unifying
2 application platform, the virtuous circle of apps and developers would never begin, and the one protecting
3 Google and Apple would remain intact.

4 189. Safari and Chrome together comprise more than 90% of the U.S. mobile browser market
5 share, with each company maintaining about half of the total share.

6 190. Google has developed a version of its Chrome browser for iOS. In doing so, Google
7 entered into Apple's Developer Agreement, agreeing that Google could provide its Chrome web browser
8 on iPhones using WebKit—not Google's Blink engine. As a result, PWAs written for Chrome do not run
9 in a cross-platform manner on iOS devices; there is no cross-platform threat from Google's own dominant
10 browser engine.

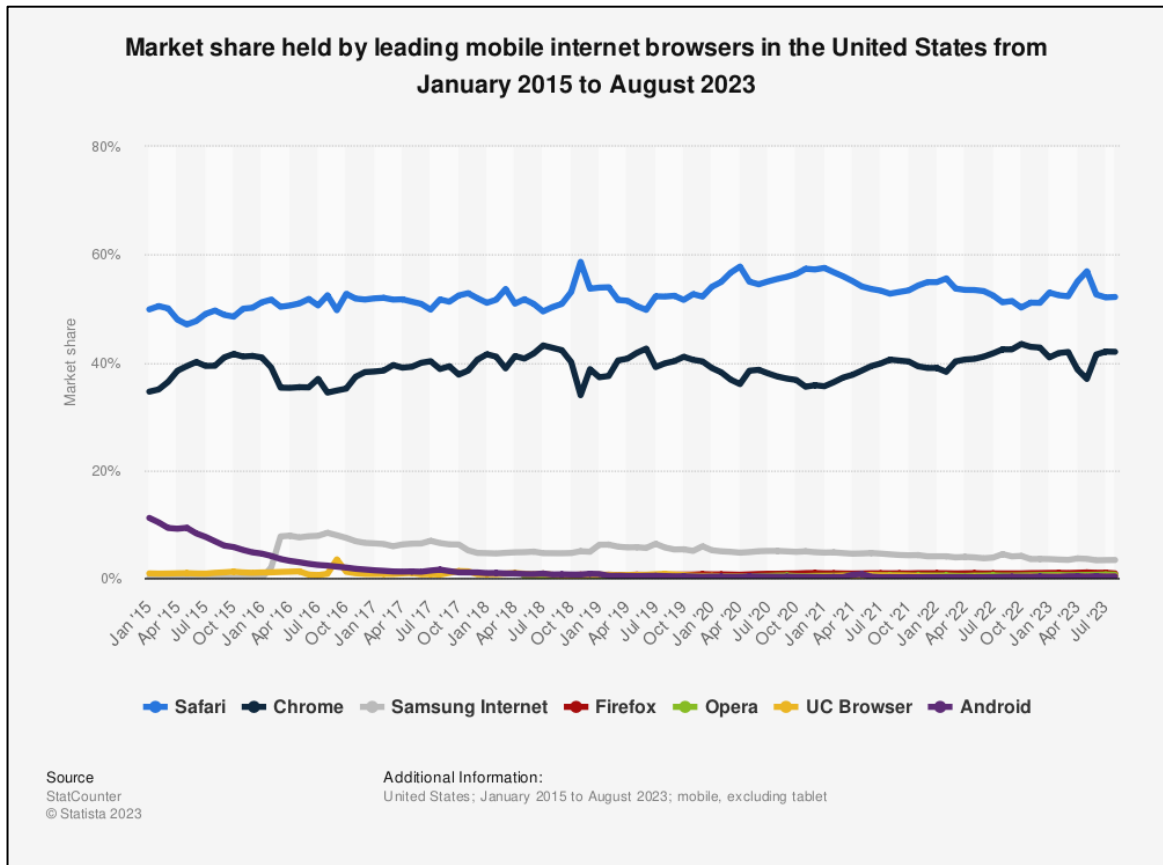
11 191. Google and Apple maintain an express agreement in which Google provides Chrome on
12 iPhones, but only using WebKit as the browser engine. This express agreement between the two
13 companies behind the United States smartphone duopoly restrains the development of a cross-platform
14 PWA solution for smartphones. In particular, Google—the largest threat to develop a cross-platform
15 PWA solution, as the proprietor of the nation's most popular browser (Chrome) and browser engine
16 (Blink) has affirmatively agreed to run a modified product on Apple devices that prevents Chrome from
17 being a write once, run-anywhere mobile platform.

18 192. Google is not a passive observer to this agreement: the company, which derives billions
19 of dollars from its own dominant position in the smartphone duopoly, as the purveyor of Android and its
20 inextricably linked Play Store ecosystem, squarely benefits from handcuffing its own mobile browser
21 product on iOS devices. That is, both Apple *and* Google benefit from the smartphone duopoly, and their
22 agreement to prevent the introduction of a cross-platform mobile threat by keeping Blink off of iPhones
23 benefits both companies in the form of supracompetitive profits from the smartphone duopoly.

24 193. Google released version 80.3 of its Chrome browser in February 2020 pursuant to the
25 companies' agreement, as well as subsequent major versions released to this day, including version 81 in
26 April of 2020, version 83 in May of 2020, and version 84 in July of 2020. Google currently distributes
27 version 120 of Chrome through Apple's App Store pursuant to an express agreement to use only WebKit.
28

1 194. There is no technical reason for Google to use WebKit in Chrome for iOS. Its own Blink
 2 browser engine is state of the art, and other aspects of Chrome are specially designed to interoperate most
 3 seamlessly with Blink. Google has even developed versions of its Chrome browser that could run on iOS
 4 if Google and Apple had not agreed to distribute only WebKit-based Chrome through the Apple App
 5 Store.

6 195. On mobile platforms, Chrome and Safari make up almost all of the browsers used. As
 7 *Statista* reports, Safari and Chrome together have approximately 94% of mobile browser share:



21 196. Google’s agreement with Apple also applies to any potential entrant, including Mozilla.
 22 That is, Mozilla’s Firefox browser for iPhone must also use the WebKit engine, precluding the
 23 development of a multiplatform PWA threat on smartphones by someone outside of the Apple-Google
 24 agreement.

25 197. Thus, by express agreement, Google and Apple have agreed not to allow any potential
 26 cross-platform threat onto the iPhone platform in the form of a non-Apple browser engine. This
 27
 28

1 agreement has the purpose and effect of preventing anyone—Google with Blink or Mozilla with Gecko—
2 from providing a unified write-once, run-anywhere application platform that runs on both Android and
3 iOS devices, and thereby prevents any erosion of the existing MEBE and the smartphone duopoly it
4 enables.

5 198. To this day, Apple’s WebKit ensures that no cross-platform browser engine can serve as
6 middleware unifying the iOS and Android smartphone platforms. And the companies directly responsible
7 for ensuring this status quo continues, by express agreement, are the companies that develop and profit
8 from those platforms—Apple and Google.

9 199. Apple and Google maintain this agreement today. No one—not Google, nor any non-
10 conspirator like Mozilla, has been able to deploy a non-Webkit browser engine on any of the millions of
11 iPhones in the United States. This has effectively, and by design, precluded an erosion of the Apple-
12 Google smartphone duopoly.

13 **E. Google’s Agreement with Apple to Use Only WebKit on iPhones Strengthens the**
14 **MEBE and Prevents an Entrant from Garnering a Critical Mass of Cross-Platform**
15 **Apps**

16 200. Apple’s agreement with Google directly affects the markets for smartphones and
17 smartphone operating systems. Preventing a cross-platform layer that would unify the two companies’
18 mobile platforms prevents any new smartphone or smartphone operating system competitor from
19 emerging.

20 201. This is because absent a unifying cross-platform layer that runs on both platforms, a new
21 entrant into those markets would have to overcome what ultimately defeated Microsoft—it would have
22 to incentivize developers to expend significant resources to develop for a nascent platform with far fewer
23 users than Android or iOS.

24 202. If cross-platform browser engines could power PWAs and other web-based mobile
25 applications, a new entrant would not have to incentivize developers to do anything additional to support
26 its smartphones. If the new entrant supported the cross-platform browser engine, software could run on
27 its platform as well as on iPhone or an Android smartphone.
28

1 203. Together, Google and Apple have agreed not to develop browsers for iOS that use any
2 browser engine besides Apple’s WebKit. Moreover, Apple has agreed with Mozilla, the creator of
3 Firefox, to use Apple’s browser engine on iOS as well. This web of agreements ensures that a developer
4 cannot write an app that can be deployed on both iPhone and an Android smartphone.

5 204. But for these agreements, a creator of a rival browser engine could serve as a cross-
6 platform layer unifying both of the dominant smartphone platforms—and new or nascent smartphone
7 platforms as well. A developer could simply write one app and deploy it on all mobile devices and mobile
8 operating systems. This would weaken the MEBE protecting the Google-Apple duopoly, subjecting the
9 companies to competition in the smartphone market and the smartphone operating system market.

10 205. In addition, because Gecko and other cross-platform browser engines are open-source,
11 Apple and Google cannot risk allowing other engines on iPhones. Doing so would allow “forked” or
12 modified versions of open-source engines such as Gecko onto the iPhone, creating the potential of a
13 unifying cross-platform layer. Even more concerning, an open-source version of Gecko could be
14 modified and deployed by a rival smartphone or smartphone operating system competitor, weakening the
15 MEBE protecting the duopoly and allowing entry.

16 206. The net effect of the anticompetitive agreements between Apple and other browser
17 developers, including Google, is to prevent smartphone and smartphone operating system competition.
18 So long as there is no cross-platform browser engine that could unify the duopoly’s disparate and
19 incompatible platforms, the MEBE surrounding Google and Apple’s combined, virtually 100% share of
20 the United States smartphone operating system market remains intact.

21 207. The Apple-Google agreement, and Apple’s web of agreements with other browser
22 developers, has had a clear effect. Prices for Apple’s smartphones have monotonically increased year
23 over year. According to Consumer Intelligence Research Partners, LLC, the average selling price of
24 iPhones increased from \$873 in December 2020 to \$988 in March 2023. Apple continued to raise prices
25 for its iPhone 15 in the fall of 2023. Despite consistently raising prices, Apple has given up very little
26 market share and has faced no competitive entry, leaving its duopoly with Google ironclad. Moreover,
27 because Apple distributes its iOS smartphone operating system with its iPhones, Apple’s agreements
28

1 have maintained its stranglehold over its share of the smartphone operating system market as well (and
2 Apple’s iOS is installed on approximately 100% of iPhones).

3 **F. The Apple-Google WebKit Agreement Makes No Sense But for Its Anticompetitive**
4 **Effect**

5 208. Apple and Google’s agreement not to use any other browser engine but WebKit on
6 iPhones makes no technical or business sense but for the anticompetitive effect of maintaining and
7 strengthening the MEBE.

8 209. To begin with, Apple’s decision to force all iPhone users to use WebKit for all web
9 browsers and apps has left iPhones devastatingly vulnerable to security breaches. Apple’s users have no
10 choice but to remain sitting ducks for cyberattacks—they cannot simply use a different browser, and no
11 developers can innovate and improve by developing their own, more secure, browsers.

12 210. For Google, the agreement eliminates all of its hard-won product differentiation on 136
13 million U.S. smartphones. Indeed, Google markets its Chrome browser as providing one of the fastest
14 and most customizable browsing experiences—yet Google gives up all of its advancements and
15 improvements across a fully half of U.S. smartphones, instead opting to reskin Apple’s Safari browser as
16 “Chrome.”

17 211. The Apple-Google agreement only makes sense because it has the anticompetitive effect
18 of preventing third-party browser engines from working on both platforms, thereby eliminating the
19 possibility of a unifying, cross-platform engine that could ultimately allow a new smartphone and
20 smartphone operating system entrant to overcome the MEBE.

21 **1. Apple’s WebKit Agreements Make iPhones Less Secure and Prevent Users**
22 **and Developers from Opting Out**

23 212. Apple’s requirement that Google Chrome use the WebKit browser engine makes no sense
24 but for its anticompetitive effect.

25 213. WebKit is serially the source of vulnerabilities in iPhones and on the iOS operating
26 system. What makes the vulnerabilities worse is that WebKit is often attacked through code on a remote
27
28

1 webpage. In other words, because WebKit is the iPhone’s primary interface to the open Internet, its
2 vulnerabilities are far more severe than general security vulnerabilities.

3 214. Moreover, zero-days—dangerous, non-public vulnerabilities—have repeatedly been
4 found in WebKit. For example, in February 2022, Apple frantically moved to patch zero-day
5 vulnerabilities in its WebKit browser engine.

6 215. As The Register reported on February 11, 2022 in an article titled “Apple emits emergency
7 fix for exploited-in-the-wild WebKit vulnerability”:

8 Apple on Thursday patched a zero-day security vulnerability in its WebKit
9 browser engine, issuing updates for iOS, iPadOS, and macOS.

10 216. The article explained that WebKit had become a dangerous, single point of failure in
11 Apple’s iPhones:

12 **Single point of failure**

13 The Apple patch is relevant not just to users of Safari, which relies on
14 WebKit, but to users of any iOS browser, because Apple requires that all
15 iOS browsers use WebKit—a situation currently being considered by
16 antitrust regulators in the US and UK.

17 Alex Russel, a program manager for Microsoft’s Edge browser who
18 formerly worked at Google and has long evangelized web technology,
19 echoed past frustration with Apple’s insistence that only WebKit is fit for
20 iOS.

21 “Imagine, if you can, a world where installing an alternative browser as
22 your default actually had a chance of protecting you from Apple’s shocking
23 underinvestment in security,” he lamented via Twitter.



1 217. In June 2023, it was again publicly disclosed that every iPhone was vulnerable to another
2 zero-day that allowed covert and severe attacks. These zero-days have occurred repeatedly for years on
3 Apple’s iPhones, and iPhone users have no way of truly changing browsers to protect themselves.

4 218. Indeed, iPhone zero-days have repeatedly been exploited by spyware companies and sold
5 to authoritarian regimes. As reported on in the SC Media article titled, “Apple patches 17th zero-day of
6 2023”:

7 Many of the new zero-days targeting Apple have been vulnerabilities
8 exploited by commercial spyware vendors, explained Ken Westin, Field
9 CISO at Panther Labs. Westin said the spyware vendors rely on these
10 exploits to deploy their spyware to unsuspecting targets. However, once
11 used against a target, Westin said they essentially play their hand and
12 researchers from Citizen Lab, Google, and others have identified the
13 vulnerabilities being exploited and notify Apple to patch them.

14 “Less than ethical researchers can make quite a bit of money selling the
15 exploits to these companies,” Westin said. “There’s an increase in demand
16 for spyware by authoritarian regimes, although the commercial spyware
17 vendors say they only sell to certain countries for certain uses, it has been
18 proven several times that it’s often not the case and the spyware gets used
19 to target dissidents, journalists and political rivals. Companies like NSO
20 Group have been blacklisted by the U.S. government and are under
21 increased pressure at home and abroad, but other spyware vendors have
22 come into the market.”

23 219. All of these vulnerabilities have something particularly dangerous in common—they are
24 remote exploits. Because WebKit will execute code provided to it by a website, malicious JavaScript or
25 WebAssembly code can be used to hack into an iPhone without any physical access to the device.

26 220. In addition, Apple’s agreements on WebKit provide remote means to exploit Apple’s
27 hardware, particularly its new Apple silicon.

28 221. Recently, a catastrophic example of such a vulnerability was discovered, called iLeakage.
iLeakage is a speculative execution attack, meaning it exploits the side effects that remain after a CPU
predictively executes instructions while waiting on information from relatively slow random access
memory.

1 222. Because of WebKit, this attack can be orchestrated remotely—simply by feeding code to
2 Apple’s browser engine. As The Register reported on October 26, 2023 in an article titled, “Side channel
3 attacks take bite out of Apple silicon with iLeakage exploit”:

4 University researchers have developed a novel exploit that can steal
5 information from virtually all modern Apple Macs, iPhones, and iPads.

6 Dubbed “iLeakage,” the exploit targets WebKit, the JavaScript engine that
7 powers Apple’s Safari browser, and is reminiscent of the Meltdown and Spectre attacks of 2018.

8 The research shows how a remote attacker could steal secrets such as Gmail
9 inbox data, text messages, password manager-supplied credentials via
10 autofill fields, and other miscellaneous information like watch histories
from YouTube.

11 223. Although the vulnerability is severe on all of Apple’s devices, it is catastrophic on its iOS
12 devices, such as the iPhone. As the Register explained:

13 The attack can be launched against Macs, iPhones, and iPads running
14 Apple’s A-series or M-series chips. For macOS, the attack only works on
Safari, but for iOS and iPadOS, there’s a much larger attack surface.

15 As Apple requires all browsers on its App Store to be based on WebKit,
16 third-party browsers on Apple devices, like Chrome and Firefox, are
17 essentially just Safari with proprietary wrappers on them that add
functionality, and are therefore vulnerable to the attack.

18 224. The vulnerability was reported to Apple on September 12, 2022, and it took Apple 408
19 days to publicly release information about it. What’s more, although Apple devised a mitigation for its
20 Macs, it had not yet devised any mitigation for iOS devices.

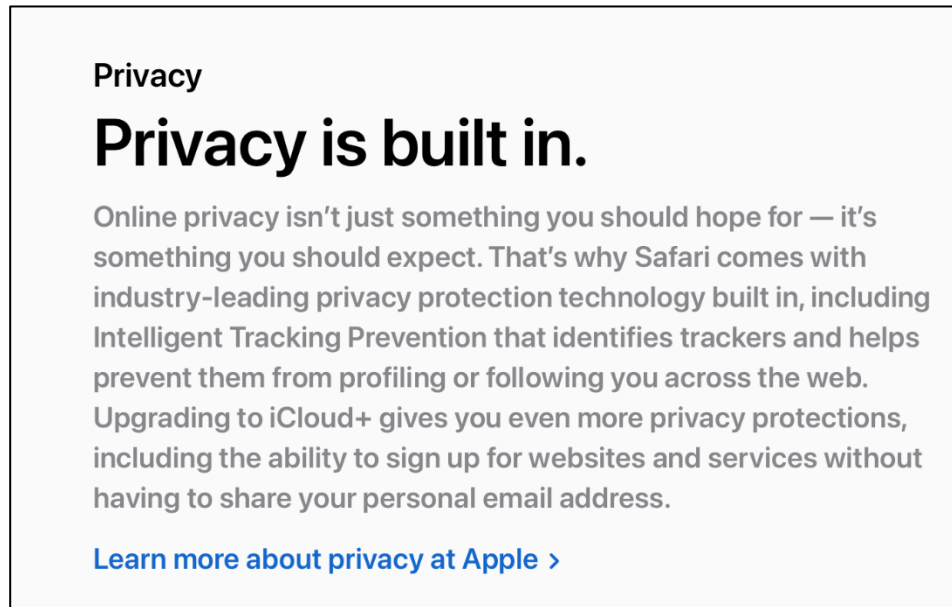
21 225. The pattern is troubling: Apple’s smartphones are repeatedly exploited with dangerous
22 and invasive attacks, and Apple gives its users no choice but to remain fish in a barrel. iPhone users are
23 stuck in a vulnerable state without any choice of switching browsers.

24 226. None of this is a technical necessity. Indeed, Apple permits any browser engine to run on
25 its Macintosh computers, but does not allow it on its iPhones and other iOS devices.

26 227. Apple’s willingness to routinely expose all of its iPhone users to remotely activated
27 cybersecurity threats is evidence that Apple’s real reason for its agreement with Google on WebKit is to
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1 keep out a cross-platform threat. Absent that purpose, Apple’s decision to expose its users to catastrophic
2 security risks makes no sense.

3 228. Apple’s conduct is particularly irrational given that it differentiates its iPhone product
4 from Android by advertising browser security. As Apple explains on its page marketing the Safari web
5 browser built into its iOS operating system:



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16 229. Apple is willing to risk its reputation for security—one of its most-marketed product
17 features on the iPhone—to maintain its WebKit agreements. This makes no economic sense but for the
18 anticompetitive effects Apple and Google obtain, particularly the strengthening of the MEBE protecting
19 their duopoly.

20 **2. Google’s Elimination on iOS of Its Hard-won Product Differentiation Is**
21 **Irrational But for Its Anticompetitive Effect**

22 230. But for the anticompetitive effect, the agreement with Apple on WebKit is economically
23 irrational for Google as well.

24 231. Google expends significant resources advertising the speed and security of its Chrome
25 browser. Google is able to obtain product differentiation by optimizing its Blink browser engine.

26 232. Indeed, Blink is the primary means Google is able to maintain its massive browser share
27 outside of Apple’s mobile devices.

1 233. Google essentially scuttles all of its comparative advantages to Safari and other browsers
2 on iOS, relying on Apple’s browser engine to ensure performance.

3 234. This makes no sense absent the anticompetitive effects of Google’s agreement with Apple.
4 By giving up any product differentiation for Chrome, Google also cedes its ability to lock iPhone users
5 into its Chrome ecosystem through its browser extensions.

6 235. Google’s decision to give up competing with Apple on iOS can only be explained by the
7 anticompetitive purpose and effect of its agreement with Apple. To Google, it is more important to
8 prevent a cross-platform browser engine on the iPhone than it is to differentiate its product on Apple’s
9 mobile devices.

10 236. Doing so maintains the MEBE, and impedes a new smartphone maker from entering the
11 market, even at scale (as Microsoft attempted to do). Google—which benefits from the smartphone
12 duopoly to the tune of billions of dollars annually—has agreed with Apple that the two companies’
13 supracompetitive smartphone profits must be protected at all costs.

14 **IV. THE RELEVANT MARKETS**

15 237. As explained below, Apple’s conduct harms competition in two relevant markets—the
16 United States market for smartphones (the “Smartphone Market”), and the United States market for
17 smartphone operating systems (the “Smartphone OS Market” or “SOS Market”).

18 **A. The United States Smartphone Market**

19 238. The Smartphone Market is a distinct submarket of the overall market for mobile phones.
20 The product sold in that market is the smartphone, which includes the hardware required to communicate
21 through cellular networks, a multitouch display, a battery with sufficient power to maintain functionality
22 for several hours, and an operating system optimized for mobile applications, hardware, and battery
23 constraints. Smartphones generally run one of two such operating systems—Android and iOS.

1 **1. Distinct Submarket**

2 239. The Smartphone Market is a distinct submarket of mobile phones. Several relevant factors
3 indicate that the Smartphone Market is distinct from others, including the general market for mobile
4 phones.

5 240. *Industry and public sources recognize the Smartphone submarket as a separate*
6 *economic entity.* Smartphones are widely and universally recognized as distinct from other mobile
7 devices. Although, like traditional cellular phones, smartphones are capable of making phone calls
8 through cellular networks, they are not reasonably interchangeable with traditional cellular phones.

9 241. To begin with, public sources routinely define smartphones as a distinct market from
10 cellular phones generally. For example, market analysis firm, International Data Corporation (“IDC”),
11 recognizes the market for smartphones as distinct and Apple as the dominant manufacturer of
12 smartphones.

13 242. As IDC stated in a January 15, 2024 article titled, “Apple Grabs the Top Spot in the
14 Smartphone Market in 2023 along with Record High Market Share Despite the Overall Market Dropping
15 3.2%, According to IDC Tracker”:

16 The last time a company not named Samsung was at the top of the
17 smartphone market was 2010, and for 2023 it is now Apple. A sort of
18 shifting of power at the top of the largest consumer electronics market was
19 driven by an all-time high market share for Apple and a first time at the
20 top. Overall, the global smartphone market remains challenged, but
21 momentum is moving quickly toward recovery. According to preliminary
22 data from the international Data Corporation (IDC) Worldwide Quarterly
23 Mobile Phone Tracker, global smartphone shipments declined 3.2% year
24 over year to 1.17 billion units in 2023. While this marks the lowest full-
25 year volume in a decade, driven largely by macroeconomic challenges and
26 elevated inventory early in the year, growth in the second half of the year
27 has cemented the expected recovery for 2024. The fourth quarter (4Q23)
28 saw 8.5% year-over-year growth and 326.1 million shipments higher than
the forecast of 7.3% growth.

29 243. Data firm Statista likewise recognizes the Smartphone Market, particularly the United
30 States Smartphone Market, as a distinct submarket. Statista defines the market as follows:

31 Smartphones are mobile devices that combine the functionality of a
32 computer with the ability to make phone calls. It typically features a touch

1 screen display, a camera, internet connectivity, and a range of other
 2 features, such as GPS navigation, music playback, and the ability to run
 3 apps (short for applications). Smartphones run on operating systems like
 4 Android, iOS, and Windows, and offer a range of apps for productivity,
 games, social media, and entertainment. Some smartphones also have the
 ability to connect to other devices, such as laptops, tablets, and wearable
 devices, to share data and perform other tasks.

5 244. Statista estimates that Apple has a 62% brand share of the market as of January 2024.
 6 Statista also projects that the market will reach \$60.8 billion in revenue in 2024, with an annual growth
 7 rate of 0.86%.

8 245. Statista includes within the scope of the market “[m]obile phones with advanced operating
 9 systems such as iOS or Android,” and excludes other devices, such as tablets and feature phones.

+ IN-SCOPE	- OUT-OF-SCOPE
<ul style="list-style-type: none"> • Mobile phones with advanced operating systems such as iOS or Android • 5G phones 	<ul style="list-style-type: none"> • Feature phones • Tablets and other larger devices with SIM card slots • Smartphone accessories sold separately (e.g., phone chargers, earphones)

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 17 246. Financial firms and investment banks also recognize the Smartphone Market as distinct.
 18 For example, as recognized by TechCrunch in a December 1, 2023 article, titled “Smartphone sales to
 19 rebound on AI gains, Morgan Stanley says,” firms such as Morgan Stanley and Goldman Sachs cover
 20 and analyze the Smartphone Market as a distinct economic entity and product market:

21 Smartphone sales will mount a comeback starting in 2024, defying growing
 22 warnings of a prolonged slump across the mobile sector, according to
 23 separate projections by Goldman Sachs and Morgan Stanley reviewed by
 TechCrunch.

24 Morgan Stanley’s report predicts global smartphone shipments will
 25 rebound by nearly 4% in 2024 and by 4.4% in 2025, shrugging off
 comparisons to the PC industry’s multi-year downdrafts. . . .

26 Goldman Sachs estimates that global smartphone volumes in 2023 will end
 27 at a 5% y-o-y dip to 1.148 billion units, down from an estimated 1.206
 28

1 billion phones shipped last year. The 2023 decline would mark a second
2 straight annual drop following much steeper falls in 2022.

3 But Goldman said momentum will rebuild in 2024 and 2025, fueled by new
4 product launches. It forecasts worldwide smartphone shipments rising 3%
5 to 1.186 billion in 2024, then climbing another 5% to 1.209 billion in 2025.

6 “With the holiday season and continuous restocking, along with better
7 guidance from the supply chain on a market recovery, we revised up 2023-
8 25E smartphone shipments; however, we continue to expect low single
9 digit growth in 2024-25E, and global smartphone shipment to gradually get
10 back to the 2022A level by 2025E,” Goldman Sachs analysts wrote.

11 247. ***Peculiar characteristics and uses.*** Smartphones are also widely recognized as distinct
12 from “dumbphones” or traditional cellular phones on a feature basis. Indeed, smartphones have peculiar
13 characteristics and uses as compared to other mobile devices.

14 248. For example, as TechTarget explains in its definition of “dumbphone”:

15 A dumbphone (also seen as *dumb phone*) is a mobile telephone that, unlike
16 a smartphone, has little-to-no computing or internet capacity.

17 Smartphones have become so sophisticated that they are for all intents and
18 purposes miniature computers with the ability to make and receive voice
19 calls—which may be one of their less commonly-used features. Like the
20 cell phones of decades ago, dumbphones are used mostly for calling. The
21 devices typically enable texting, albeit through methods that don’t require
22 a full keyboard such as multi-tapping or text on nine keys (T9). Some
23 dumbphones include features such as MP3 players and simple games, in
24 which case they are sometimes called feature phones.

25 Dumbphones don’t require data plans and are typically much cheaper to
26 own and operate than smartphones. Because they don’t have many features,
27 the devices have lower power requirements and can run for several weeks
28 on a charge. With their limited connectivity, dumbphones also provide a
security advantage over smartphones.

29 249. A central feature of a smartphone is the use of a multitouch display. These displays allow
30 both input and output through the screen of the smartphone, allowing the smartphone to maintain a form
31 factor focused on a large display.

32 250. As Lifewire explains in an August 22, 2021 article titled, “What Is a Multi-Touch Screen”:

33 Multi-touch technology makes it possible for a touchscreen or trackpad to
34 sense input from two or more points of contact at the same time. This

1 allows you to use multiple finger gestures to do things like pinch the screen
2 or trackpad to zoom in, spread your fingers to zoom out, and rotate your
3 fingers to rotate an image you are editing.

4 Apple introduced the concept of multi-touch on its iPhone smartphone in
5 2007 after buying Fingerworks, the company that developed the multi-
6 touch technology. However, the technology isn't proprietary. Many
7 manufacturers use it in their products.

8 251. Virtually every smartphone sold uses a multitouch display, including those manufactured
9 by Samsung, Google, and Apple.

10 252. Moreover, because smartphones interface with the Internet either through apps or a web
11 browser, they are equipped with high throughput transceivers that enable the devices to transmit and
12 receive high-bandwidth data through cellular networks, including 3G, 4G, and 5G networks.

13 253. Smartphones with LTE and 5G transceivers are capable of broadband Internet connection
14 speeds. Indeed, 5G networks can rival home broadband speeds.

15 254. As the Wall Street Journal explained in an August 17, 2020 article titled, "5G Smartphones
16 Could Crush Your Home Wi-Fi. So Where's the 5G?"

17 This 5G is the fifth generation of cellular networks, designed to replace 4G,
18 aka LTE. AT&T, Verizon and T-Mobile have all been building out their
19 networks here in the U.S. You may have heard how it will unlock the future
20 of self-driving cars, augmented reality and lots of other buzzword-bingo
21 tech terms.

22 Most of that isn't quite ready, but what is? A bunch of new 5G phones,
23 including an expected iPhone, that are required to tap the speeds of these
24 new networks. And though they are completely upgraded inside, you don't
25 need to sell an internal organ to buy one. I've been testing the \$600
26 Samsung Galaxy A71 5G on AT&T and T-Mobile and the \$800 OnePlus
27 8 5G on Verizon. (I've also been testing an unlocked \$1,300 Galaxy Note
28 20 Ultra on all three carriers).

255. Virtually every modern cell phone is now equipped with 5G functionality. Apple's iPhone
supports 5G (since the October 2020 release of the iPhone 12), and virtually every modern iPhone and
smartphone includes an LTE transceiver allowing high-speed data transmission.

1 256. Because smartphones have large multitouch screens and communicate at broadband data
2 rates, they require batteries large enough to power such components for several hours—often for a full
3 business day or more.

4 257. Smartphone batteries typically provide approximately 4,000 to 5,000 mAh of capacity.
5 These batteries can run typical smartphone loads for approximately 10-12 hours, and when idling, can
6 last several days without being recharged. The batteries themselves typically have two to three years of
7 life before replacement is needed.

8 258. Apple’s iPhone 15, for example, is advertised to last approximately 20-29 hours
9 (depending on the model) while playing back video, and 80-100 hours while playing back audio.

10 259. Unlike traditional cell phones, which can operate weeks without being recharged,
11 smartphones require large batteries to provide baseline functionality. Because of the power consumption
12 characteristics inherent in smartphone use, smartphone hardware is not interchangeable with other cell
13 phone hardware, particularly the power and battery systems on the smartphone.

14 260. Moreover, because smartphones power large screens, manage large batteries, and manage
15 complex input and output through multitouch interfaces, they require complex mobile operating systems.
16 Without such operating systems, a smartphone cannot function, whereas traditional cellular phones do
17 not require a complex operating system for their far more limited functionality.

18 261. The two dominant operating systems are Apple’s iOS and Google’s Android. These
19 operating systems are optimized to, among other things, manage power consumption, maximize battery
20 life, handle high throughput/bandwidth communication, run full-featured third-party applications, and
21 manage location and cloud services.

22 262. Smartphones are used for purposes beyond making phone calls through cellular networks.
23 They are used to browse the Internet through the worldwide web, interact with various servers and
24 systems through third-party applications and through the mobile operating system, and even for voice
25 applications, to access VOIP and videoconferencing services that traditional cellular phones cannot
26 access.

1 263. Smartphones can be used to, among other things, edit documents, take photos, listen to
2 music, watch movies and TV shows, obtain map information and real-time directions, and interact with
3 social media. Traditional cellular phones, such as flip phones and limited feature phones, are unable to
4 perform even a small subset of these tasks—if any of them at all.

5 264. Moreover, because smartphones are also capable of full-featured web browsing.
6 smartphone operating systems must provide browsers and browser engines. No such functionality is
7 provided as part of dumbphones or traditional cellular phones.

8 265. Smartphones also provide nearfield communications systems that enable mobile
9 payments. For example, Apple’s iPhones provide for contactless payments using Apple Pay. Android
10 smartphones also provide NFC-based contactless payment systems, such as Google Pay and Samsung
11 Pay. Cellular phones do not have such functionality.

12 266. Because smartphones are highly portable and are carried around by users from place to
13 place, smartphones generally provide means to encrypt and decrypt data at high speeds and with low
14 power consumption. Cellular phones do not generally handle encrypted data, as access to such a device
15 does not generally mean access to a user’s documents, contacts, messages, e-mails, and financial
16 information.

17 267. Smartphones are also distinct from tablets because of their form factor. They can be held
18 to the ear to make a phone call, and they can discreetly take photos. They can be placed in a pocket or
19 carried as part of a wallet. Most tablets have screen sizes that are too large for such applications.

20 268. Moreover, tablets do not necessarily come with LTE and 5G antennas (though such
21 functionality can be added), whereas all smartphones do. This is because tablets are often kept on the
22 person, such as in a pocket, bag, or purse.

23 269. ***Unique production facilities.*** Smartphones require highly sophisticated manufacturing.
24 To begin with, because smartphones are power constrained, meaning they must generally operate using
25 a battery, the CPUs and supporting chips for a smartphone must be made with the smallest sized
26 transistors available.

1 270. Only state-of-the-art chip fabrication facilities are capable of manufacturing nanometer-
2 scale chips. Apple is one of the few companies that manufactures and distributes devices with 3
3 nanometer chips at scale. Not every fabrication facility can produce such chips. Taiwan Semiconductor
4 Manufacturing Company (“TSMC”) is one of the few fabrication facilities that can manufacture
5 nanometer scale chips, and smartphone manufacturers, such as Apple, have a significant amount of
6 TSMC’s capacity.

7 271. As Ars Technica reported in an August 7, 2023 article titled “Report: Apple buys every
8 3nm chip that TSMC can make for the next-gen iPhones and Macs”:

9 It’s been rumored for several months now that Apple will be using new
10 3nm manufacturing process from Taiwan Semiconductor (TSMC) for its
11 next-generation chips, including M3 series processors for Macs and the
12 A17 Bionic for some next-gen iPhones. But new reporting from The
13 Information illuminates some of the favorable terms that Apple has secured
14 to keep its costs down: Apple places huge chip orders worth billions of
15 dollars, and in return, TSMC eats the cost of defective processor dies.

16 272. Access to fabrication facilities require large orders and the ability to absorb the costs of
17 defective chips that are inherently part of the manufacturing process. Smartphone manufacturers can
18 generally bring these costs down and ensure access through scale.

19 273. As Ars Technica further explains:

20 At a very high level, chip companies use large silicon wafers to create
21 multiple chips at once, and the wafer is then sliced into many individual
22 processor dies. It’s normal, especially early in the life of an all-new
23 manufacturing process, for many of those dies to end up with defects—
24 either they don’t work at all, or they don’t perform to the specifications of
25 the company that ordered them.

26 274. The design of smartphones requires the cooperative work of hundreds if not thousands of
27 highly-skilled engineers. Each aspect of the smartphone must be engineered by those with significant
28 expertise, including the hardware that operates the smartphone display, the multi-touch interface, the
communications chips, the CPUs, the assembly, the heat dissipation systems, encryption and decryption
hardware, and the power management system, among many other components.

1 275. The assembly of smartphones must also occur using skilled labor, but not expensive labor.
2 Indeed, Apple assembles its smartphones in China, then imports the finished product to the United States
3 for sale. The assembly of the product not only requires a sophisticated manufacturing system tailored to
4 building a smartphone, which is an integrated device, but also a complex supply chain to ensure adequate
5 parts are transported to manufacturing plants in time for assembly.

6 276. Put simply, smartphone manufacturers employ unique production facilities to design,
7 assemble and generally manufacture their smartphone products. The manufacturing process required for
8 a smartphone is bespoke to the product, meaning a manufacturer must build a manufacturing process
9 tailored to the components, price point, and functionality of the smartphone. Almost all smartphone
10 manufacturing requires significant scale for viability, including as to the fabrication of the chips used in
11 the smartphone device.

12 277. ***Distinct customers.*** Smartphone manufacturers sell to distinct customers from those that
13 purchase cellular phones and dumbphones.

14 278. Indeed, the customer base for cellular phones is far narrower and mostly geared towards
15 a minority of the population that does not want to—or cannot—operate a complex device or interact with
16 a complex user interface.

17 279. Flip phones, such as the “Jitterbug,” for example, are marketed and used by some of the
18 elderly population. The large buttons and simple user interface appeal to this target demographic. As
19 such, flip phones and other non-smartphone devices are purchased by a distinct set of customers.

20 280. Moreover, for customers that use smartphones for business purposes, the ability to open
21 third-party apps, make conference and VOIP calls, and browse documents on a large screen make any
22 cellular phone other than a smartphone impossible to use for such purposes.

23 281. As a general matter, smartphones are marketed to almost all of the U.S. population. Only
24 a small subset of the United States population uses a dumbphone or a flip phone. As Statista explains in
25 on a page titled “Smartphones in the U.S. – statistics & facts”:

26 Since the introduction of the smartphone, the device has played an
27 increasingly important role in people’s life, to the point that today, we
28

1 could not image a day without it. The smartphone market in the United
2 States is one of the world's largest, with over 310 million smartphone users
3 as of 2023. In line with the overall growth of the smartphone market
4 worldwide, the smartphone penetration rate in the United States has
5 continuously risen over the past several years, reaching around 92 percent
6 in 2023. Revenue from smartphone sales is forecast to reach close to
7 roughly 102 billion U.S. dollars in 2023, recovering from the lower revenue
8 recorded in 2022.

9 282. ***Distinct prices and sensitivity to price changes.*** Smartphones are sold at significantly
10 higher prices than cellular phones, including flip phones and feature phones. Flip phones sell at a fraction
11 of the price of smartphones, including those sold by Samsung and Apple, which reach prices well over
12 \$1,000 near the high end.

13 283. Smartphones include high-resolution cameras, high-resolution screens, and other
14 expensive components. This requires that they sell for at least a certain price—one well above the price
15 of cellular phones. Apple's iPhone 15 Pro begins at \$999, and its Pro Max product at \$1,199. Samsung's
16 S23+ sells for approximately \$1,199.99. Google's Pixel Pro sells for \$999. At bottom, smartphones
17 generally sell for prices well above the price of dumb phones or flip phones.

18 284. Smartphones are generally priced competitively, meaning phones with comparable
19 features are priced similarly. Prices for smartphones are not sensitive to prices for other cellular phones
20 since they are not reasonably interchangeable with them. For example, a price reduction on a flip phone
21 used by a small subset of the population has little or no effect on the price of the full-featured iPhone.

22 285. ***Specialized vendors.*** There are specialized vendors to the Smartphone market. On the
23 manufacturing side, companies such as TSMC and Samsung sell components to manufacturers of
24 smartphones.

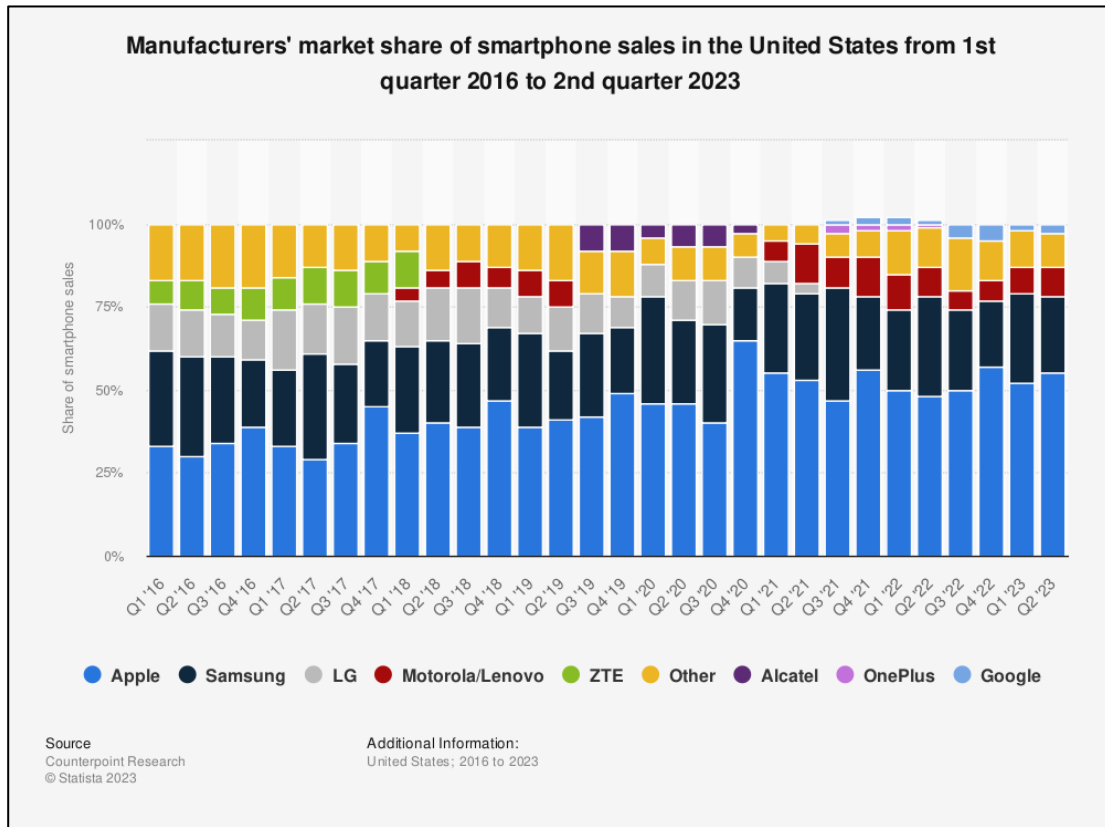
25 286. For purchasers, there are many specialized vendors, including vendors that repair damaged
26 smartphones, create protective cases and enclosures for smartphones, and who provide aftermarket
27 accessories for smartphones, such as tripods and charging devices.

28 287. Specialized vendors include Belkin, Insignia, Anker, Caseology, Totallee, Incipio, and
Otterbox. There are many more specialized vendors.

2. Market Participants and Market Concentration

288. The Smartphone Market includes several participants. The largest among them is Apple, which maintains the largest individual share of the market. Other market participants from 2016 to the present include Google, Samsung, LG, Motorola/Lenovo, ZTE, OnePlus, and Alcatel. Some of these market participants, such as OnePlus, have withdrawn from the market or lost market share below measurable thresholds.

289. In the United States, Apple has consistently maintained the largest individual share of the market since 2016, currently maintaining more than half of the U.S. Smartphone Market Share. The market shares for each market participant in the U.S. Smartphone Market is set forth below:



290. As of Q2 2023, Apple had a 55% share of the U.S. Smartphone Market, with Samsung at 23%, Motorola at 9%, and Google at 3%. Other brands combined constitute approximately 10% of U.S. Smartphone Market Share.

1 291. Apple and Google are direct horizontal competitors in the U.S. Smartphone Market, as
2 they both design, manufacture, and sell comparable smartphones. Indeed, Apple’s iPhone competes
3 directly with Google’s Pixel line of smartphones.

4 292. The market is highly concentrated. The United States Department of Justice Antitrust
5 Division applies the Herfindahl-Hirschman Index (“HHI”) to measure market concentration. Applying
6 that metric here, the HHI of the U.S. Smartphone Market is approximately 3,644 among named brands
7 with more than 1% individual shares, and 3744 if the remaining 10% of small market participants are
8 aggregated. Under any variation of this measure, the U.S. Smartphone Market is highly concentrated.
9 Indeed, the U.S. Department of Justice considers HHIs greater than 1,800 to be “highly concentrated.”
10 *See* U.S. Department of Justice & FTC, Merger Guidelines § 2.1 (2023).

11 **3. The Relevant Geographic Market**

12 293. The relevant geographic market is the United States Smartphone Market.

13 294. To begin with, smartphones are pre-configured, sold by, and generally locked to work
14 with particular U.S. carriers, such as AT&T, T-Mobile, and Verizon. Agreements with U.S. carriers do
15 not automatically allow for connection in other countries—that is, absent reciprocity agreements among
16 carriers or roaming charges. Smartphones purchased in the United States are generally purchased for use
17 in the United States.

18 295. U.S. smartphones are also not necessarily compatible with cellular networks outside of the
19 United States. Certain geographic regions operate on different radio bands than in the United States, and
20 fallback or legacy networks available in the United States are unavailable in other countries (or vice
21 versa).

22 296. Moreover, smartphone manufacturers also market cell phones for different bands used in
23 various countries. For example, Apple sells the model A2848 and A2849 of its iPhone 15 Pro and Pro
24 Max for the United States and Puerto Rico, but sells different versions of the iPhone 15s (A3101 and
25 A3105) for Canada, Guam, Japan, Mexico, Saudi Arabia, and the USVI. Apple distributes another
26
27
28

1 variation for other countries, including Australia, Brazil, Denmark, German, Greece, India, Israel,
2 Sweden, and Switzerland, among many others. *See* <https://www.apple.com/iphone/cellular/>.

3 297. United States Smartphones are regulated by United States regulatory agencies, including
4 the Federal Communications Commission. Their sale in the United States is also subject to U.S. patent
5 and intellectual property laws, as well as import and export restrictions imposed by United States
6 regulatory agencies, such as the United States International Trade Commission.

7 298. To the extent software on a smartphone includes encryption, the smartphone may also be
8 subject to export controls under U.S. laws, which Apple warns third-party developers about on its
9 developer page.¹

10 299. Put simply, cross-elasticity of demand for U.S. smartphones is generally limited to the
11 United States geographic region, where smartphones are reasonably interchangeable.

12 4. Barriers to Entry

13 300. The U.S. Smartphone Market is protected by powerful barriers to entry, including the
14 MEBE.

15 301. To begin with, manufacturing a smartphone requires economies of scale, a robust supply
16 chain and access to components, access to expensive manufacturing facilities, design and engineering
17 personnel, software and hardware engineers, and a means of distributing and supporting the product.

18 302. A new entrant is unlikely to be able to enter at scale without acquiring some or all of the
19 above from an incumbent firm, such as Samsung. For example, Samsung is one of the few sources for
20 high-resolution multitouch displays.

21 303. Even Apple often relies on Samsung to produce the OLED displays it needs for its iPhone
22 products. As PC Magazine noted in a March 27, 2023 article titled, “Apple Will Be more Reliant on
23 Samsung Display for iPhone 15 Production”:

24
25
26
27 ¹https://developer.apple.com/documentation/security/complying_with_encryption_export_regulations.
28

1 Chinese manufacturer BOE can't mass produce the OLED displays
2 required for the iPhone 15, leaving Apple with little choice other than ask
3 Samsung to make more of them.

4 As TheElec reports, Apple awarded BOE an order for iPhone standard
5 model displays, but the company has struggled to produce them. The
6 problem is one of light leakage around the hole near the top of the display
7 used for the dynamic island. BOE couldn't solve the problem in time, so
8 Apple has been left with a production hole that needs filling.

9 The solution is a bigger order for Samsung Display, which is now expected
10 to start production of standard model iPhone 15 OLED panels a month
11 early in May. Samsung Display's production of the higher-end iPhone 15
12 model displays will go ahead as planned in June. BOE is expected to
13 continue working on a solution to its light leakage problem in the hope that
14 mass production becomes possible soon.

15 304. The communications chips in smartphones are subject to a complicated web of patent and
16 IP licensing, including for Standard Essential Patents. New entrants would have to obtain costly licenses
17 to enter at scale.

18 305. An additional aspect of the barrier to entry surrounding the U.S. Smartphone Market is the
19 high cost of designing and manufacturing mobile CPUs and systems-on-a-chip ("SOCs"). Apple, for
20 example, has historically developed its own custom SOCs, including by licensing CPU and other
21 technology from ARM, which it packages as part of its own "Apple Silicon."

22 306. Creating custom SOCs, among other components, is extremely costly. A new entrant is
23 unlikely to be able to obtain the engineering skill and manufacturing capability to compete with
24 incumbents, such as Apple, on this important basis.

25 307. To sell a smartphone, an entrant must also obtain a mobile operating system, which must
26 be tailored to operate mobile chipsets, conserve power, operate third-party applications, and interact with
27 communications systems on the smartphone—among many other things. A new entrant cannot generally
28 license Apple's iOS operating system, or the distributed versions of Android used in competing
smartphones. A new entrant would have to extensively adapt or customize the open-source version of
Android to provide the minimum functionality necessary to sell a competitive product, which, as
explained below, locks the new product into Google's ecosystem.

1 308. Moreover, as explained above, the MEBE protects the U.S. Smartphone Market (as well
2 as the U.S. Smartphone Operating System Market as explained below).

3 309. The MEBE arises from the feedback loop created by a critical mass of third-party apps for
4 the device. The greater the number of apps, the more individuals are attracted to the product, and in turn,
5 the more developers develop apps for the platform.

6 310. The U.S. Smartphone Market is protected by the MEBE because a new entrant will have
7 to convince developers to create apps for its device and also convince new users to use the device.
8 Because users will not adopt a smartphone with no third-party apps, developers will also not develop for
9 the platform because of inadequate users, creating a chicken-or-the-egg problem for a new entrant.

10 311. As explained above, Microsoft was unable to traverse the MEBE because it could not
11 garner enough developer support to build third-party Apps for its Windows Phones. The MEBE prevented
12 Microsoft from selling smartphones.

13 312. The MEBE in conjunction with other manufacturing and scale-related barriers to entry
14 also prevented Firefox from entering the U.S. Smartphone Market with its own device. Even with a means
15 of running third-party apps through its browser engine, Firefox could not build smartphones at scale and
16 with the necessary hardware features to compete with incumbents. Moreover, Firefox could not ensure
17 cross-platform support due to Apple's anticompetitive agreements with horizontal smartphone
18 competitors, including Google.

19 313. In other words, there is direct evidence of powerful barrier to entry surrounding the U.S.
20 Smartphone Market, particularly the MEBE. Indeed, Microsoft, with its large user base, direct access to
21 scaled manufacturing, an existing operating system, and unparalleled ability to invest in a new product,
22 could not traverse the barriers to entry surrounding the U.S. Smartphone Market.

23 **B. The United States Smartphone Operating System Market**

24 314. The U.S. Smartphone Operating System Market (the "SOS Market") is also relevant to
25 the claims asserted here, including because Apple's anticompetitive conduct harmed competition in that
26 market and because the same MEBE protects both the SOS Market and the Smartphone Market.

1 315. As explained below, the SOS Market is a distinct submarket of the general market for
2 operating systems. The SOS Market includes operating systems designed to run on smartphones. As
3 explained below, there are only two products in the SOS Market with non-trivial market share, Apple’s
4 iOS and Google’s Android. Together, the two SOS Products form a duopoly, with each occupying
5 approximately half of the U.S. SOS Market.

6 **1. Distinct Submarket**

7 316. The SOS Market is a distinct submarket of operating systems. Several relevant factors
8 indicate that the SOS Market is distinct from others, including the general market for computer operating
9 systems.

10 317. *Industry and public sources recognize the SOS submarket as a separate economic entity.*
11 The SOS Market is widely recognized as a distinct submarket of the general market for operating systems.

12 318. For example, as reported by Statista, Comscore compiles and publishes market share data
13 for the smartphone operating system market (set forth below). Statista Research also describes the SOS
14 Market as distinct:

15 Apple’s iOS continues to hold the largest share of the smartphone operating
16 systems market in the United States, claiming more than half of the market
17 as of July 2023. Apple’s share of the US market has risen steadily since
18 early 2012, when it accounted for around 30 percent. The growth is not
19 reflected in all markets. However, with Apple’s global share remaining
20 year-on-year.

21 319. Counterpoint Research also recognizes the distinct SOS Market, and sets forth U.S. SOS
22 Market shares separately from global market shares. Counterpoint reports that Apple has a 55% market
23 share to Android’s 45% as of Q3 2023.

24 320. The SOS Market is recognized as encompassing a distinct operating system product
25 designed for smartphones.

26 321. As Howstuffworks.com explains in an article titled, “How Smartphones Work”:

27 The most important software in any smartphone is its **operating system**
28 **(OS)**. An operating system manages the hardware and software resources
of smartphones. Some platforms cover the entire range of the software
stack. Others may only include the lower levels (typically the kernel and

1 middleware layers) and rely on additional software platforms to provide a
2 user interface framework. We've added some snapshots of specific
3 smartphone operating systems.

4 322. Smartphone Operating Systems are also considered distinct from other operating systems
5 by the industry. Such operating systems are defined by the constraints under which they must run and the
6 minimum functionality they must provide.

7 323. For example, TechTarget defines "mobile operating system," a term used interchangeably
8 with smartphone operating system, as:

9 A mobile operating system (OS) is software that allows smartphones,
10 tablets and other devices to run applications and programs.

11 A mobile OS provides an interface between the device's hardware
12 components and its software functions. It typically starts when a device
13 powers on, presenting a screen with icons or tiles that show information
14 and provide application access. Mobile operating systems also manage
15 cellular and wireless network connectivity and phone access.

16 Millions of people use mobile operating systems worldwide, powering a
17 wide range of devices, from smartphones to tablets to wearable technology.
18 These systems offer users a wide selection of features, including calling
19 and messaging, internet and cellular data connectivity, multitasking
20 capabilities, interactive user interfaces and access to a wide range of third-
21 party applications and services to enhance the user experience even further.

22 324. The United States Department of Defense ("DOD") also recognizes mobile operating
23 systems that run on smartphones as distinct. For example, in an August 10, 2022 memorandum (posted
24 publicly on the DOD website) titled, "Use of Non-Government Owned Mobile Devices," the DOD
25 recognizes mobile operating systems as distinct:

26 This memorandum and attachment establish minimum requirements for the
27 use of non-government owned mobile devices (e.g., personally or
28 commercially owned), hereinafter "Approved Mobile Device" (AMD), to
store, process, transmit, or display up to Department of Defense Controlled
Unclassified Information (CUI). This memorandum's scope is limited to
mobile device information technology (IT) with **mobile operating systems
(OS) (e.g., Apple iOS, Android)** used to access and process up to DOD
CUI (e.g., Impact Level 5 data), as defined in references (a) and (b).

(emphasis added).

1 325. Put simply, industry and public sources consistently recognize the SOS Market as distinct
2 from other operating systems, including those that run on general PCs.

3 326. *Peculiar characteristics and uses.* Smartphone operating systems have peculiar
4 characteristics and uses that make them distinct from other OSes.

5 327. To begin with, smartphone OSes are designed specifically for smartphone hardware. The
6 kernel of the operating system, which is the core software of the operating system that manages memory
7 and hardware, is optimized to operate a system on a battery.

8 328. Smartphone operating systems also maintain application programming interfaces
9 (“APIs”) that are different from other OSes, particularly as to the user interface. Apple’s iOS, for
10 example, is based on Cocoa Touch with UIKit, a user interface optimized for the smartphone’s multitouch
11 user interface. Apple’s desktop PC operating system, MacOS, uses a different interface called Cocoa,
12 with APIs from the AppKit UI framework.

13 329. As a February 16, 2023 article posted on Medium by iOS Guru, titled “Cocoa Touch and
14 UIKit Frameworks in iOS Development with Swift,” explains:

15 Cocoa Touch is the application programming interface (API) used to create
16 native iOS applications. It provides a set of frameworks and classes that
17 provide the basic infrastructure for building iOS apps. UIKit is a
18 framework that provides the basic user interface elements and the
19 infrastructure for managing them. Together, they provide the building
20 blocks necessary to create a full featured iOS app.

21 **Cocoa Touch**

22 Cocoa Touch is the API used to create native iOS applications. It is based
23 on the Cocoa API that is used for Mac OS X apps. Cocoa Touch provides
24 a set of frameworks and classes that provide the basic infrastructure for
25 building iOS apps. It provides access to the hardware and software features
26 of iOS devices, such as the accelerometer, the camera, the GPS, and the
27 touch screen. It also provides the user interface elements, such as the views,
28 the navigation bar, the tab bar, and the table view.

29 **UIKit**

30 UIKit is a framework that provides the basic user interface elements and
31 the infrastructure for managing them. It provides the views, the navigation
32 bar, the tab bar, and the table view. It also provides the event handling

1 infrastructure, such as the touch events, the motion events, and the gesture
2 recognizers. UIKit also provides the animation infrastructure, such as the
3 view transitions, the view animations, and the Core Animation framework.

4 330. In other words, unlike general operating systems that run PCs and laptops, smartphone
5 OSes are designed for multitouch interfaces—particularly the interfaces available on small-screened
6 devices. Due to limited screen space and significant differences in how users interact with smartphone
7 applications, smartphone OSes must provide APIs tailored for smartphones. These APIs built into
8 smartphone OSes are not reasonably interchangeable with those built into general operating systems
9 designed to run PCs and laptops.

10 331. Operating systems must provide essential applications, such as applications that allow a
11 change in OS settings, that allow a user to obtain a “shell” or means of interacting with the OS’s kernel
12 (which can be a graphical user interface), and that facilitate communication with other computers. At the
13 lowest level, smartphone operating systems provide APIs that allow apps to send and receive packets
14 over protocols such as TCP/IP and UDP.

15 332. At the user level, every modern operating system includes a web browser. The web
16 browser and its constituent parts, including its rendering engine or web engine, is one of the central-most
17 functions of a modern operating system. Indeed, for smartphones, every major OS since the introduction
18 of the iPhone has featured a web browser designed to render and present web pages on the smartphone’s
19 more limited screen space and to provide user interfaces for multitouch displays.

20 333. Smartphone OSes provide both the user interface needed to browse the web and the engine
21 needed to render web pages as part of its web browser. On Apple devices, the default web browser is
22 Safari, and the web engine is called WebKit. On Google’s Android operating system, the default web
23 browser is Google Chrome, and the web engine is called Blink.

24 334. The web engine provided by the operating system is not only used to render web pages on
25 a web browser; it is used to render content in third-party apps. On iOS, WebKit even handles rendering
26 when third-party apps incorporate their own web browsing functionality into their apps.

27 335. On desktop PCs, users are free to use whatever web browser and web engine they choose.
28 Smartphone operating systems, however, are configurable to restrict the use of other web engines. As

1 explained above, Apple does not permit any other web engine to run on its devices other than its WebKit
2 web engine. This means that even third-party apps on Apple's iPhones must use WebKit as part of their
3 apps. Apple's laptop and desktop computers are not so restricted.

4 336. Unlike PC and Desktop operating systems, which can generally run third-party software
5 downloaded from the Internet or distributed physically on a disk, smartphones are almost universally
6 limited to allow downloading apps from a pre-configured distribution source. For Apple, all third-party
7 apps for iPhones must be obtained through Apple's App Store. The iOS operating system uses
8 cryptographic signature checking against an embedded Apple public key to ensure that this restriction is
9 in force at execution time of any third-party application.

10 337. Android devices are generally configured to permit distribution through Google's Play
11 Store. Indeed, although Android devices can be configured by an OEM to operate with another "app
12 store," almost no devices sold with Android are, as Google bundles significant portions of OS
13 functionality with its "Google Play services." Without configuring Android to obtain apps through
14 Google's Play Store, a smartphone manufacturer loses the benefits of the Android developer ecosystem.
15 Indeed, most smartphone apps for Android rely on Google Play's APIs for important operating system
16 interactions.

17 338. Put simply, unlike general operating systems, smartphone operating systems are designed
18 and configured to allow only centralized third-party app distribution through channels controlled by the
19 OS maker. None of the general operating systems, such as Microsoft Windows, Linux, and even Apple's
20 MacOS, are designed or configured this way.

21 339. On Apple's iOS, the restriction on distribution of third-party apps is reinforced and
22 maintained by Apple's WebKit restriction, which prevents the distribution of third-party apps through
23 Apple's own Safari web browser, through an in-app browser in a third-party app, or directly in an app
24 that provides browsing or web-rendering functionality.

25 340. As a result of this app distribution system, smartphone operating systems almost always
26 run third-party apps that have been pre-approved by the OS manufacturer pursuant to an express
27 agreement as to what functionality and features can be provided.

28

1 341. Apple even enters into agreements with third-party developers requiring approval of their
2 app’s “business model.” Specifically, Section 3.2 of Apple’s App Store agreement sets forth “acceptable”
3 and “unacceptable” “business models” for third-party apps.

4 342. Smartphone operating systems have mechanisms that prevent superuser access by users
5 of the device, whereas general operating systems allow superuser access. To obtain “root” or superuser
6 privileges on iOS, which runs on the iPhone, a user must “jailbreak” their iPhone. Doing so, however,
7 will void the user’s warranty and degrade essential OS functionality, including functionality that relies
8 on communications with Apple’s systems (*e.g.*, iCloud, iMessage, FaceTime, Apple Pay, Visual
9 Voicemail, Weather, and Stocks).

10 343. Apple also restricts a user’s ability to obtain software updates if they jailbreak their iPhone.

11 344. On Android, obtaining superuser access requires jailbreaking or rooting the operating
12 system. For many smartphone manufacturers, this will void the warranty. Google’s Play store will
13 generally recognize any modifications to third-party applications and will not update them.

14 345. Whether on Android or iOS, obtaining superuser access to the smartphone OS requires
15 unauthorized and technically complex measures. General operating systems require no such effort,
16 technical knowledge, or unauthorized access to obtain superuser access.

17 346. Smartphone OSes also prevent access to low-level hardware systems, unlike general OSes.
18 For example, a device driver—software written to interact with third-party hardware—can run on general
19 operating systems, such as Linux, MacOS, and Windows, but third-party device drivers are generally
20 prohibited from running on smartphone operating systems.

21 347. Smartphone developers must generally write code using the development framework
22 provided by the OS manufacturer. For example, iOS developers must use Apple’s XCode toolkit and
23 write apps in Objective C or Swift. Developers are not permitted to write low-level instructions, such as
24 assembly language or C code for the iPhone, particularly to access hardware components, such as the
25 onboard 5G or WiFi hardware. There are no such restrictions on general operating systems, including
26 those that run on PCs or laptops.

1 348. Smartphone operating systems are distributed with pre-configured device drivers designed
2 and tested for specific hardware. For example, Apple’s iOS supports only hardware systems designed
3 and implemented by Apple in its devices. Third-party hardware is not supported at the OS level. A general
4 operating system, however, must operate hardware, such as graphics cards or network adapters, that is
5 developed by third parties.

6 349. This requires that APIs and system interfaces on general operating systems handle errors
7 and exceptions caused by third-party hardware. Smartphone OSes do not require such infrastructure and
8 generally only come equipped to handle a particular hardware configuration’s errors and exceptions.

9 350. Smartphones must provide location-based services, as smartphones are highly portable.
10 Applications, such as streaming services with content restrictions and digital rights management
11 (“DRM”) requirements, rely on such services to ensure that access is restricted to certain regions and/or
12 usage contexts.

13 351. Smartphones provide robust and tamperproof services for these apps. General operating
14 systems must be configured with additional hardware and/or software for such functionality.

15 352. Moreover, because video, audio, and streaming content is distributed to smartphones
16 through the OS manufacturers, namely Apple and Google, smartphone OSs contain the necessary
17 encryption/decryption systems, geolocation services, and tamper proofing required to download and play
18 such content on smartphone devices.

19 353. OSes therefore provide APIs that app makers can rely upon for such functionality. For
20 example, Android provides the Android.drm APIs.

21 354. As the Android Developer Page explains:

22 **android.drm**

23 Provides classes for managing DRM content and determining the
24 capabilities of DRM plugins (agents). Common uses of the DRM API
25 include:

26 Determining which DRM plug-ins (agents) are installed on a device.
27
28

1 Retrieving information about specific plug-ins, such as the MIME types
and file suffixes they support.

2 Registering a user or device with an online DRM service.

3 Retrieving license constraints for rights-protected content.

4 Checking whether a user has the proper rights to play or use rights-
5 protected content.

6 Associating rights-protected content with its license so you can use the
7 MediaPlayer API to play content.

8 355. Smartphone OSes are also designed to ensure smooth buffering and playback of content,
9 particularly on limited battery power.

10 356. ***Distinct customers.*** Smartphone OSes are generally purchased by smartphone purchasers
11 as part of the device. Indeed, because smartphones are highly integrated, smartphone OSs are distributed
12 as an essential part of the smartphone.

13 357. Because smartphones are almost never sold without an OS, as the smartphone would not
14 have even the minimum functionality to communicate with a cellular network, smartphone customers are
15 distinct from general OS customers, who may purchase an OS separate from their hardware.

16 358. Moreover, smartphone OSes with minimum operating system functionality are not
17 available without a hardware purchase. Apple’s iOS can only be purchased and used (with authorization)
18 in connection with an Apple device. Moreover, because iOS is tailored to Apple’s hardware, it cannot
19 run natively on other devices.

20 359. Google distributes the source code for a base version of Android separately, but that
21 version cannot be run on a smartphone, as it is missing “services” and “service providers” that are
22 necessary for minimum OS functionality. For example, Google’s Android must be configured to interact
23 with an App Store—in almost every case, Google’s Play Store—to achieve minimum software
24 compatibility and to access certain vital APIs needed for development.

25 360. In other words, there are generally no smartphone OSes that are distributed or sold
26 separately from hardware. Almost none of the smartphones sold in the United States are sold without a
27
28

1 smartphone OS, and almost all smartphones are sold as integrated with either the Apple iOS or Android
2 smartphone OS.

3 361. Put simply, smartphone OS customers are distinct from customers that purchase general
4 operating systems.

5 362. *Distinct prices and sensitivity to price changes.* Smartphone Oses are sold with a
6 smartphone. As such, the price for smartphone Oses is paid as part of the price of the smartphone.

7 363. Apple markets and sells iOS as a distinct part of the smartphones it sells. Indeed, Apple’s
8 iOS marketing page features descriptions of iPhone features:

9 Every day. More extraordinary.

10 iOS 17 brings new features to enhance the things you do every day. Express
11 yourself like never before when you call or message someone. Share
12 content in convenient new ways. And do even more with new experiences
for your iPhone.

13 364. Apple’s iOS is, however, marketed and sold as a distinct product from the phone, even
14 though it is sold and marketed with the iPhone. Apple’s marketing material describes iOS’s features,
15 including messaging, location services, search of device content, audio messages, video conferencing
16 through FaceTime, sharing over local and near-field networks (*e.g.*, Airdrop), input and output systems
17 (such as the software keyboard that ships with iOS), password management and security, web browsing
18 features, user interface improvements, power management, and its Siri integrated personal assistant.

19 365. Because iOS is responsible for much of the iPhone’s functionality, including cloud-based
20 services, it is what allows Apple to charge a significant price premium for its devices. Indeed, iOS
21 inducts—and locks in—an iPhone purchaser into Apple’s ecosystem, as it is the software responsible for
22 virtually every aspect of that ecosystem.

23 366. Because of the ecosystem provided by iOS, Apple’s iPhone hardware garners a higher
24 price. As a May 2, 2017 CNBC article titled, “Here’s why people keep buying Apple products,” explains:

25 There’s one big reason people buy Apple products: the ecosystem.

26 People don’t buy iPhones by the tens of millions just because they like the
27 hardware, though that’s a huge part of it, but because they’re tied into an
28

1 ever-growing, sprawling ecosystem of software and services that allow you
2 to do more *with* the products if you continue to invest in that ecosystem.

3 367. Almost every major feature of Apple’s ecosystem is provided by iOS, including
4 FaceTime, Messages, content sharing, and iCloud.

5 368. The price of Apple’s iOS is also sensitive to the features it offers. An increase in features
6 offered through iOS results directly in a price premium charged as part of the purchase price of an iPhone.
7 Indeed, iPhones garner a price premium on comparable hardware as compared to hardware sold with the
8 Android smartphone operating system.

9 369. Apple’s iOS is sold directly to consumers.

10 370. As to Android, the open-source version of Android available from Google is not sufficient
11 to run a smartphone. It requires additional components that are licensed to Google’s “partners” and
12 OEMs—namely, smartphone manufacturers—who then incorporate a fully configured, and
13 foundationally different, version of Android as part of their smartphones.

14 371. The version of Android that is pre-loaded onto Android-based smartphones is sold to
15 customers as a distinct product, with distinct features, but the price of that operating system is
16 incorporated into the price of the Android phone, as well as in the content and third-party apps sold
17 through Google’s service providers, such as the Google Play Store.

18 372. In addition to selling fully configured and featured versions of the Android operating
19 system to OEMs, Google also distributes the Android operating system directly as part of its Pixel phones.
20 It incorporates the price of its version of Android as part of the price of its Pixel phone, though it markets
21 features and functionality provided by Android distinctly.

22 373. Apple and Google are direct, horizontal competitors in the SOS Market, including because
23 both sell their smartphone OSES directly to consumers as included with their smartphone products.

24 374. ***Specialized vendors.*** Smartphone OSES have specialized vendors. The most significant
25 vendors for smartphone OSES are third-party developers, which distribute their apps through the app stores
26 associated with each OS.
27
28

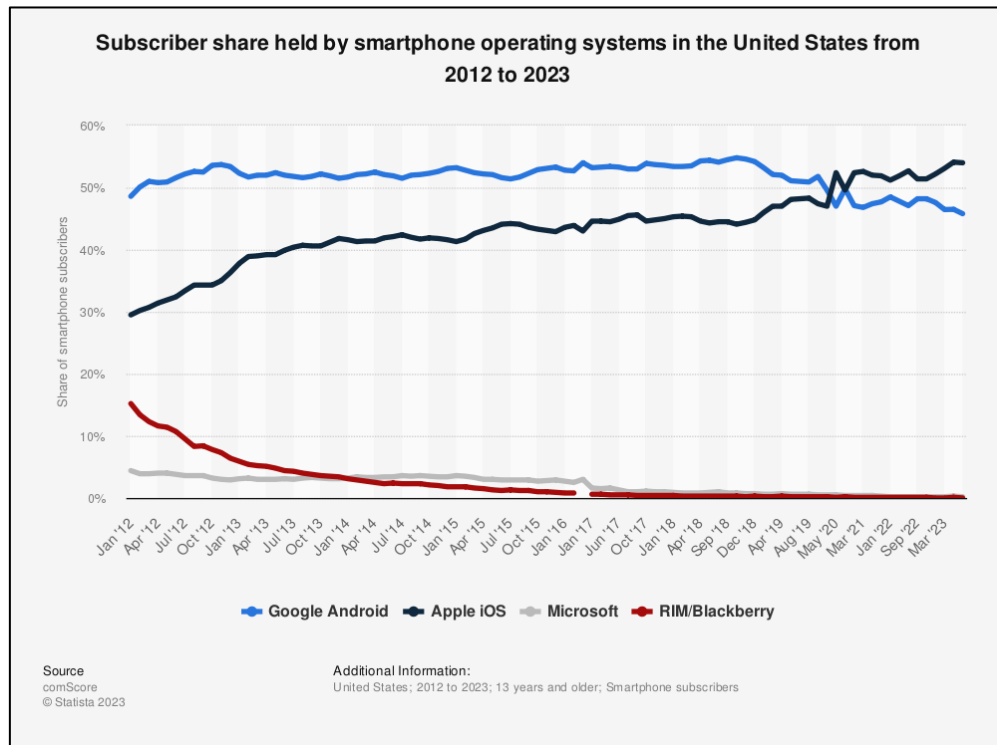
375. In addition, specialized vendors exist to diagnose and troubleshoot smartphone OS problems. These specialized vendors, including Apple’s own AppleCare, are trained specifically to service smartphone OSes.

2. Market Participants and Market Concentration

376. The Smartphone OS Market structure is a duopoly controlled by Apple and Google. Both companies are direct, horizontal competitors in the Smartphone Market, and their SOSs compete directly on features.

377. Each company’s market share is approximately half of the total. As of July 2023, Google had 45.8% of the market share, and Apple had 54%. The companies together control 99.8% of the market.

378. There are currently no other significant market participants remaining. SOSes distributed by Microsoft and Research in Motion (RIM)/Blackberry are no longer sold in significant numbers in the United States and have essentially been eliminated from the market since late 2017, and definitively by 2018.



1 379. The HHI metric for the Smartphone OS Market is 5013.64—well beyond the 1,800 HHI
2 that the U.S. Department of Justice considers indicative of a “highly concentrated.” *See* U.S. Department
3 of Justice & FTC, Merger Guidelines § 2.1 (2023).

4 380. If the two companies merged or combined, they would have an uncontested monopoly of
5 the SOS Market, with nearly 100% of the market share.

6 381. Such a combined entity would have unmitigated and unchecked market power and the
7 ability to impose significant barriers to entry, particularly in light of Apple and Google’s combined
8 control of all third-party smartphone app distribution.

9 **3. The Relevant Geographic Market**

10 382. The relevant geographic market is the United States.

11 383. The iOS operating system is distributed with Apple’s smartphones, and because those
12 devices are sold in the United States geographic market (as explained above), so is the iOS operating
13 system.

14 384. The Android operating system, as configured and licensed by smartphone manufacturers,
15 is also distributed with U.S. smartphones, which are bound to a United States geographic region (as
16 explained above).

17 385. Moreover, Apple limits the export of iOS to the extent limited by United States law,
18 including restrictions by the U.S. Treasury Department. Apple also maintains separate licensing terms
19 for U.S. purchasers of iOS. Google, when it distributes Android as part of its Pixel smartphones, imposes
20 similar restrictions and maintains separate U.S.-based agreements concerning iOS.

21 **4. Barriers to Entry**

22 386. The U.S. SOS Market is protected by significant barriers to entry. To begin with, and as
23 explained above, the U.S. SOS Market is protected by the MEBE, which is described extensively above.

24 387. The SOSes themselves are responsible for much of the functionality that creates the
25 ecosystems that are part of the MEBE.

1 388. Moreover, because of the MEBE, a new entrant would have to provide APIs for developers
2 to make third-party apps. As explained above, however, developers will not develop apps for platforms
3 that do not have sufficient users, particularly where there are technical differences, including in design
4 and exposed APIs, among competing platforms that would require significant investment.

5 389. Because iOS and Android are the only two dominant platforms, a new entrant would have
6 to provide a platform for third-party apps that could run not only on its new operating system, but could
7 be ported to one of the other dominant operating systems—particularly the most dominant smartphone
8 operating system, iOS.

9 390. Additional barriers to entry in the U.S. SOS Market include the engineering personnel and
10 technical knowledge required to implement a high-end operating system that can run under significant
11 power constraints.

12 391. Operating system kernels are so difficult to implement that only two are currently in use
13 in the Smartphone OS Market, both based on modified versions of Unix or Linux OS kernels. A new
14 entrant would have to similarly modify an available OS kernel to enter the SOS Market.

15 392. A new entrant would also have to provide hardware. If the new entrant wanted to create a
16 product with its own bespoke hardware, it would have to design the SOS in tandem with its hardware
17 design. Such design is extremely expensive and imports many of the barriers to entry protecting the
18 Smartphone Market as a condition for entry.

19 393. A new entrant in the U.S. SOS Market would also have to comply with extensive
20 regulation by the United States government, including as to encryption services provided by the SOS.
21 This imposes significant regulatory costs for entry.

22 394. A new entrant to the SOS Market must expend large resources for the testing, marketing
23 and distribution of the SOS. As for testing, the SOS would have to provide error-free functionality,
24 including for mission-critical and high-stakes applications (*e.g.*, those involving driving).

25 395. A new entrant would also need to secure agreements with hardware manufacturers or
26 distribute its own hardware in order to distribute its operating system, as neither Apple nor Android-based
27 smartphone manufacturers allow users to change the SOS on their smartphones.
28

1 396. A new entrant must therefore acquire a means of distributing the SOS with smartphone
2 hardware as precondition for entry.

3 397. A new entrant must also provide high-speed web rendering as part of its operating system
4 to be competitive. As such, a new entrant must develop a web engine and web browser that is compliant
5 with most web servers and web content. It must also maintain compatibility with the dominant developer
6 of web browsers, Google. In other words, a new entrant must design its SOS in parity with what is
7 available through either Google or Apple’s existing products, including as to the web browser and engine
8 it distributes.

9 398. Development of an SOS is capital intensive. A new entrant would likely have to spend
10 hundreds of millions of dollars in R&D, development, and testing to create an SOS that is comparable in
11 functionality to Android and iOS.

12 **V. HARM TO COMPETITION**

13 399. Apple’s anticompetitive conduct is a direct restraint of two distinct markets, the U.S. SOS
14 Market and the U.S. Smartphone Market, and directly harms competition and consumers in those two
15 distinct markets.

16 **A. Harm to Competition in the U.S. Smartphone Market**

17 400. Apple’s anticompetitive agreements, including with Google, prevent entry of a rival that
18 could provide a meaningful price check on Apple’s smartphones. Apple’s agreements do so by
19 strengthening the MEBE.

20 401. Specifically, Apple’s anticompetitive agreements eliminate the threat of a cross-platform
21 web engine that could run PWAs and other web apps on its smartphones—particularly outside of Apple’s
22 App Store exclusive distribution channel.

23 402. With the threat of a cross-platform browser engine eliminated, Apple maintains the
24 MEBE, which requires that a new entrant provide both comparable hardware and a third-party software
25 platform and ecosystem that can attract a critical mass of users and developers.

26 403. Because of Apple’s anticompetitive agreements, including with Google, the MEBE
27 remains a direct barrier to entry to smartphone manufacturers seeking to enter without adopting Google’s
28

1 Android operating system. Just as with Microsoft’s failed attempt at entry, a new entrant would have to
2 develop its own smartphone operating system and third-party software platform, attract sufficient
3 developers to build apps for the entrant’s smartphone, and achieve a user base large enough to attract
4 such developers.

5 404. A third-party app and ecosystem platform’s success is dependent on both network effects
6 and powerful feedback loops. Namely, developers need a critical mass of users to warrant an investment
7 in developing for a platform; users need a critical mass of apps to attract them to a new platform and
8 induce them to incur switching costs. Apple’s anticompetitive agreements, including with Google,
9 prevent a new entrant from starting this feedback loop, preventing viable entry.

10 405. The existence of a cross-platform browser engine on iOS would threaten the MEBE,
11 allowing a new smartphone manufacturer to enter with new hardware and obtain the immediate benefits
12 of apps written for other platforms. In other words, entry would be possible because developers need not
13 make a significant investment in a new smartphone platform in order to reach users of the new entrant’s
14 smartphone. And, because developers could deploy their cross-platform apps on the new entrant’s
15 smartphones, users would be attracted to the new entrant’s smartphone product.

16 406. Apple’s anticompetitive agreements fragment 136 million U.S. smartphones from any
17 such cross-platform web app ecosystem, and in effect block the development of any meaningful cross-
18 platform web app solution for mobile devices. These agreements therefore impede and prevent entry into
19 the smartphone market, and as a result, allow Apple to charge supracompetitive prices.

20 407. Apple’s agreement with Google not to deploy a non-WebKit browser engine on iOS also
21 directly harms consumer choice. Indeed, users are unable to guard against security risks to their
22 smartphones posed by Apple’s repeatedly vulnerable WebKit engine. This has a direct effect in the U.S.
23 smartphone market, as it impedes the functionality and security of Apple’s smartphones and artificially
24 inflates prices for the products above their economic value.

25 408. Apple has no legitimate technical justification for its agreements regarding WebKit—
26 including Apple’s agreement with Google—as these agreements degrade the functionality and economic
27 value of its smartphones.
28

1 409. Apple's agreement with Google directly restrains immediately viable browser engines
2 from deploying on iOS, which in turn prevents smartphone entrants from entering with hardware
3 independent of iOS and Android. This directly inflates prices in the U.S. Smartphone Market, including
4 for Apple's iPhones.

5 410. Apple's anticompetitive conduct also provides it with market power in the U.S.
6 Smartphone Market. Because of Apple's anticompetitive agreement with Google and other web engine
7 makers, such as Mozilla and Microsoft, Apple is able to charge supracompetitive prices for its iPhones.
8 Apple obtains this market power as a direct result of its ability to exclude or impede potential rivals from
9 entry. As such, Apple has increased prices for iPhones from December 2020 to the present without
10 sacrificing market share (as explained above).

11 411. Plaintiffs have paid the resulting supracompetitive prices for their iPhones and are injured
12 as a direct and proximate result of Apple's anticompetitive conduct.

13 **B. Harm to Competition in the U.S. Smartphone OS Market**

14 412. Apple's anticompetitive conduct directly and separately restrains the SOS Market.

15 413. Specifically, Apple's agreement with its horizontal competitor in the SOS Market—
16 Google—directly prevents the development of PWAs and cross-platform apps that run through a browser
17 engine available across all, or even most, U.S. smartphones. Indeed, the Apple-Google agreement
18 regarding browser engines perfectly fractures the available smartphone market for browser engine-based
19 web apps such that no potential PWA could reach more smartphone users than a native app developed
20 for one of the legacy owned-and-controlled smartphone app stores (Apple's App Store and the Google
21 Play Store).

22 414. This strengthens the MEBE protecting the Apple-Google SOS duopoly, allowing both
23 companies to divide the U.S. SOS Market among themselves and obtain a combined monopoly of almost
24 100% of the share of the U.S. SOS Market.

25 415. Moreover, Apple and Google's agreement strengthens the MEBE protecting their duopoly
26 and combined monopoly.

1 416. Because Apple’s agreement with Google restrains the ability to write a third-party app or
2 PWA that can run on multiple operating systems, it prevents the creation of a rival SOS. In particular, a
3 new entrant in the SOS market would have to attract sufficient developers to its SOS to offer a critical
4 mass of apps to users. At the same time, users will not adopt a new SOS unless there is a critical mass of
5 third-party apps. The network economics in the SOS require that a new entrant start a feedback loop in
6 order to become viable—and Apple’s agreements prevent any such virtuous circle from forming.

7 417. By strengthening the MEBE, Apple and Google ensure the maintenance of their own
8 halves of the U.S. SOS Market, and of their combined monopoly of the U.S. SOS Market.

9 418. Apple’s anticompetitive agreement with Google also erects additional barriers to entry,
10 particularly as a result of increased switching costs. Specifically, by restricting the ability to develop and
11 run cross-platform apps through a browser engine, an iOS or Android user must incur significant
12 switching costs to adopt a new entrant’s SOS.

13 419. Apple’s anticompetitive conduct also limits consumer choice, as it prevents users from
14 changing the browser engine in iOS, including in response to serious security risks. This directly degrades
15 the performance of a significant share of products sold in the U.S. SOS Market, diminishes the value of
16 iOS, and provides no procompetitive or technical benefits to users.

17 420. Apple and Google’s anticompetitive agreement not to deploy any other browser or
18 browser engine on iOS also makes no sense but for its anticompetitive effect. The existence of alternate
19 browsers and browser engines on iOS improves the security and functionality of iOS, and it increases the
20 number of third-party apps that will be written for iOS, as a developer could write once and deploy on all
21 of the platforms that have a cross-platform web engine. Moreover, Google is the largest developer of web
22 browsers, and would—but for its agreement with Apple—deploy the full version of its Chrome web
23 browser and plugins on iOS. Apple and Google forgo any such benefits, with no legitimate technical or
24 business justification. This makes no sense except for the anticompetitive effect of excluding a cross-
25 platform threat to the Apple-Google combined monopoly and the MEBE protecting it from competition.

26 421. Apple’s anticompetitive conduct also provides it with market power in the SOS Market.
27 Because of Apple’s anticompetitive agreement with Google, it is able to charge supracompetitive prices
28

1 for the OS it sells with its iPhones. Indeed, as explained above, Apple has increased prices for iPhones
2 from December 2020 to the present without sacrificing market share.

3 **CLASS ACTION ALLEGATIONS**

4 422. Plaintiffs bring this action and seek to certify and maintain it as a class action under Rules
5 23(a), (b)(2), (b)(3), and/or (c)(4) of the Federal Rules of Civil Procedure, on behalf of themselves and
6 on behalf of the proposed class of persons (the “Class”) defined below.

7 423. The Class’s claims derive directly from a course of conduct by Apple.

8 424. Apple has engaged in uniform and standardized conduct toward the Class. Apple did not
9 materially differentiate in its actions or inactions toward members of the Class. The objective facts on
10 these subjects are the same for all class members.

11 425. Within each Claim for Relief asserted by the Class, the same legal standards govern.
12 Accordingly, Plaintiffs bring this lawsuit as a class action on their own behalf and on behalf of all other
13 persons similarly situated as members of the proposed class pursuant to Fed. R. Civ. P. 23.

14 426. This action may be brought and properly maintained as a class action because the
15 questions it presents are of a common or general interest, and of many persons, and also because the
16 parties are numerous, and it is impracticable to bring them all before the court. Plaintiffs may sue for the
17 benefit of all as representative parties pursuant to Federal Rule of Civil Procedure 23.

18 **The Class**

19 427. Plaintiffs bring this action and seek to certify and maintain it as a class action under
20 Federal Rule of Civil Procedure 23 on behalf of themselves and a class defined as follows:

21 All United States persons, including business associations, entities, or
22 corporations, that purchased any model iPhone from Apple from January
23 25, 2020 to the present, inclusive (the “Class Period”).

24 428. Excluded from the nationwide class defined above is Apple, its employees, officers,
25 directors, legal representatives, heirs, successors, and wholly or partly owned subsidiaries or affiliates;
26 and the judicial officers and their immediate family members and associated court staff assigned to this
27 case.
28

1 **Numerosity**

2 429. This action satisfies the requirements of Fed. R. Civ. P. 23(a)(1).

3 430. The members of the Class are so numerous that a joinder of all members would be
4 impracticable. Apple has sold hundreds of millions of iPhones during the Class Period.

5 **Ascertainability**

6 431. The Class is ascertainable.

7 432. The defined Class consists of individuals who purchased Apple iPhones. The identity of
8 these individuals can be readily determined, including through records maintained by Apple.

9 433. This information can be used to provide members of each class with direct notice pursuant
10 to the requirements of Rule 23 and the Due Process Clause of the United States Constitution.

11 **Typicality**

12 434. Plaintiffs' claims are typical of the members of the Class.

13 435. Plaintiffs' claims are the same as those asserted by members of the Class. Each Plaintiff,
14 like the members of the Class, has purchased an iPhone integrated with the iOS operating system, and
15 has been harmed by an overcharge associated with their purchase.

16 436. Each Plaintiff alleges injury that is not unique to them, but is typical of members of the
17 Class, including measures of damages, such as damages resulting from the overcharge caused by Apple's
18 unlawful monopolization.

19 437. Each Plaintiff alleges that their injury flows from the common course of conduct alleged
20 as to Apple.

21 438. Each Plaintiff is similarly positioned as to each member of the Class. As such, their injury
22 can be redressed in the same manner as any redress provided to the members of the Class (and *vice versa*).

23 **Adequate Representation**

24 439. Plaintiffs will fairly and adequately protect the interests of the Class members.

25 440. Plaintiffs are committed to putting the interest of the Class ahead of their own and to act
26 in the best interest of members of the Class.

1 441. Plaintiffs understand their obligations to the Class and are committed to
2 monitoring/supervising developments in the case and class counsel.

3 442. Plaintiffs have retained competent counsel experienced in computer science, antitrust law,
4 and consumer class actions.

5 443. Plaintiffs have retained counsel with the resources and capital to litigate the case on behalf
6 of the Class.

7 444. Plaintiffs and their counsel intend to prosecute this action vigorously and to obtain relief,
8 including both injunctive and monetary relief, that will remedy Apple's unlawful conduct.

9 **Superiority**

10 445. This action satisfies the requirements of Fed. R. Civ. P. 23(b)(2) because Apple has acted
11 and/or refused to act on grounds generally applicable to the Class, thereby making final injunctive and/or
12 corresponding declaratory relief appropriate with respect to the Class as a whole.

13 446. The class device is superior to all other available methods of adjudication, as it would
14 make little sense for each of the millions of class members to separately prove the common conduct in
15 which Apple has engaged.

16 447. Moreover, damages suffered by each individual member of the Class may be small,
17 meaning that the expense or burden of individual litigation would make it very difficult or impossible for
18 individual class members to redress their injury individually.

19 448. Because damages may be small, individual members of the Class may not have a rational
20 economic interest in individually controlling the prosecution of a single action, and the burden imposed
21 on the judicial system from having to individually adjudicate such claims will be significant in
22 comparison to the value of individual claims.

23 449. Class litigation is thus superior to individual litigation and is the best procedural device to
24 vindicate the rights of the members of the Class.

25 450. In addition, class litigation will streamline the management of the litigation, such that the
26 expense, burdens, inconsistencies, economic infeasibility, and other negative effects of individual
27 mitigation will be lessened if not eliminated.

1 451. In sum, class litigation is superior because it mitigates significant inefficiencies and
2 barriers that would result from individual litigation. In fact, absent invocation of the class device, the
3 Class's claims would likely not be vindicated individually, Apple's unlawful and anticompetitive
4 conduct, and the resulting overcharge, will go unaddressed.

5 **Commonality and Predominance**

6 452. This action and the claims asserted by the Class satisfy the requirements of Fed. R. Civ.
7 P. 23(a)(2) and 23(b)(3) because there are many questions of law and fact that are common as to all of
8 the members of the Class.

9 453. These questions of fact and law concern Apple's conduct, which is common as to the
10 members of the Class, and answers to those questions would provide answers to issues posed by claims
11 asserted by all members of the Class.

12 454. These common issues will predominate at trial, and any individual issues that may arise
13 would not outweigh the predominance of common issues.

14 455. Common issues that will predominate at trial include, without limitation, the following:

- 15 a. Whether Apple's agreements with Google and other browser engine and browser
16 developers violate Section 1 of the Sherman Act;
 - 17 b. Whether Apple and Google have divided the SOS Market, in violation of Section 1 of
18 the Sherman Act;
 - 19 c. Whether Apple and Google have conspired to monopolize the SOS Market in violation
20 of Section 2 of the Sherman Act;
 - 21 d. Whether Apple's agreements with Google and other browser engine makers results in
22 harm to competition in the Smartphone and SOS Markets that is outweighed by any
23 procompetitive benefits;
 - 24 e. Whether Apple's agreement with Google is *per se* unlawful, or in the alternative
25 whether it violates the rule of reason because the agreement lacks pro-competitive
26 benefits or the anticompetitive effects of the agreement outweigh its pro-competitive
27 benefits;
- 28

- 1 f. Whether Apple’s agreement with Google and other browser engine and browser
2 developers violates the rule of reason;
- 3 g. Whether the members of the Class are entitled to injunctive relief;
- 4 h. Whether Apple has unlawfully and anticompetitively reinforced and strengthened
5 barriers to entry surrounding the U.S. Smartphone and SOS Markets.

6 **Grounds Generally Applicable to the Classes**

7 456. Plaintiffs intend to seek injunctive relief ending Apple’s anticompetitive conduct.

8 457. Plaintiffs are properly situated to seek such an injunction because Apple has acted and/or
9 refused to act on grounds generally applicable to Plaintiffs and the members of the Class.

10 458. This means that final injunctive relief or declaratory relief will redress Plaintiffs’ harm as
11 well as the harm to members of the Class.

12 459. An injunction will prevent Apple from continuing its anticompetitive conduct in the
13 future.

14 **CLAIMS FOR RELIEF**

15 **REALLEGATION AND INCORPORATION BY REFERENCE**

16 460. Plaintiffs reallege and incorporate by reference all the preceding paragraphs and
17 allegations of this Complaint, as though fully set forth in each of the following Claims for Relief asserted
18 on behalf of the classes.

19 **COUNT ONE**

20 **Section 1 of the Sherman Act (15 U.S.C. § 1)**
21 **Unlawful Restraint of Trade in the U.S. Smartphone Market**
(On behalf of Plaintiffs and the Class)

22 461. Apple has entered into agreements with Google, Mozilla, Microsoft, and other browser
23 and browser engine developers not to release their own web browser or engine on iOS, but to instead
24 deploy their browsers exclusively using Apple’s WebKit web engine on iPhones.

25 462. These agreements prevent the existence of a cross-platform web engine on iPhone, which
26 could be used to run PWAs and other apps written to run on any mobile platform and smartphone. Absent
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1 these agreements, a developer could write a single app and deploy it on any smartphone—and smartphone
2 OS—that runs a cross-platform web engine or browser. This would remove Apple’s stranglehold over
3 third-party app distribution on iPhone, in which Apple’s App Store is the exclusive means by which
4 iPhone users can download, run, and update third-party apps.

5 463. The ability to deploy a PWA or other cross-platform application on a smartphone’s cross-
6 platform web engine would immediately erode the MEBE protecting Apple’s position and market power
7 in the U.S. Smartphone Market.

8 464. As a result of Apple’s agreements, no cross-platform web engine can be deployed by a
9 potential entrant. This means that entry at scale requires overcoming a powerful feedback loop at the
10 heart of the MEBE: A new Smartphone Market or SOS Market entrant would have to develop a
11 smartphone with a critical mass of third-party apps to attract a large user base, but to attract developers
12 to the new platform, the entrant’s smartphone would need a large enough user base to induce developers
13 to invest in the platform.

14 465. Moreover, the new smartphone would have to overcome significant switching costs that
15 would be incurred by users of iOS and Android if they adopted the new smartphone, meaning that the
16 new smartphone must provide a viable ecosystem at scale—and must do so upon entry.

17 466. At present, Google and Mozilla have developed cross-platform engines and browsers that
18 could currently run, or could be configured to run, on Apple’s iPhones. However, they have agreed with
19 Apple not to deploy such software. Thus, even the Google Chrome or Mozilla Firefox web browsers
20 deployed on iOS are nothing more than reskinned versions of Apple’s Safari iPhone web browser, as
21 even web browsers deployed on iOS must use WebKit to render web pages.

22 467. Absent Apple’s anticompetitive agreements, several companies could immediately
23 overcome the MEBE and enter the U.S. Smartphone Market at scale, including Mozilla and Microsoft,
24 both of which have in the past developed a U.S. smartphone. This is because a new smartphone could run
25 a critical mass of PWAs and web apps that run on a cross-platform browser engine, such as Firefox’s
26 Gecko, obviating the need for the smartphone manufacturer to license Android from Google or develop
27 a new SOS for its smartphone as a precondition for entry.

28

1 468. Entry would also be possible because developers would not need to invest in developing
2 apps for an entirely new platform, and users would not incur significant switching costs to use the new
3 platform, as the apps they use and rely upon will exist on any platform so long as it runs a cross-platform
4 web engine.

5 469. At present, and as a result of Apple's anticompetitive agreement, no such cross-platform
6 apps can be developed because a developer cannot write an app or PWA for a web engine present on
7 Apple's iPhones, segmenting a large fraction of the U.S. Smartphone Market and eliminating the threat
8 from cross-platform web-based apps and PWAs.

9 470. The absence of Apple's anticompetitive agreement would unwind Apple's stranglehold
10 over third-party apps through its App Store, as it would no longer be the exclusive means of distributing
11 third-party applications to iPhone users. In turn, the MEBE protecting the U.S. Smartphone Market would
12 be disrupted and new smartphones would be able to enter the market at potentially lower prices or with
13 better features or more functionality.

14 471. The net result would be the destruction of Apple's market power in the U.S. Smartphone
15 Market and an end to its ability to charge supracompetitive prices for smartphones.

16 472. Plaintiffs have overpaid for iPhones because of, and as a proximate result of, Apple's
17 ability to prevent a cross-platform threat on the iOS platform. They are injured and damaged in the ways
18 the antitrust laws were meant to protect against.

19 473. Apple's WebKit agreements are unlawful under Section 1 of the Sherman Act, which
20 prohibits such restraints of trade:

21 474. ***The Apple-Google Agreement.*** Apple's agreement with Google is condemned by the
22 antitrust laws under the *per se* rule. To begin with, Apple and Google are direct, horizontal competitors
23 in the U.S. Smartphone Market. Apple, which makes and sells the iPhone, competes directly with Google,
24 which makes and sells the Pixel smartphone.

25 475. The agreement between Apple and Google has the purpose and effect of strengthening the
26 MEBE, preventing and impeding new entry in the U.S. Smartphone Market, as a result protecting their
27 respective positions in the U.S. Smartphone Market.

1 476. Moreover, Apple and Google’s agreement is unlawful because it is an agreement to divide
2 and/or allocate positions in the U.S. Smartphone Market. Google agrees not to deploy its cross-platform
3 web browser and engine on iPhones, and Apple forces all other developers to use the WebKit engine on
4 iPhones. The result is that the MEBE protecting the U.S. Smartphone Market is strengthened, and Google
5 and Apple do not compete on the merits by agreement, maintaining their shares of the U.S. Smartphone
6 Market, and preventing new entry, which also maintains each company’s stranglehold on third-party app
7 distribution.

8 477. This agreement between Apple and Google makes no sense but for its anticompetitive
9 effect. Absent the agreement, Google could deploy its web browser and engine on iOS, not only
10 increasing the reach of its web browser, but also providing Google a platform on which it can run cross-
11 platform apps, including those developed for its Chrome web browser. As for Apple, allowing a non-
12 WebKit browser engine on iPhones would, among other things, increase the security of iPhones, result
13 in more third-party apps, and increase the value of Apple’s ecosystem. Both companies forgo these
14 benefits to prevent the emergence of a cross-platform web browser or engine on iOS, which would erode
15 the MEBE and their ability to charge supracompetitive prices for the smartphones they sell.

16 478. In the alternative, Apple’s agreement with Google violates the rule of reason because the
17 agreements anticompetitive effects outweigh any procompetitive benefits. Indeed, as explained above,
18 Apple’s agreement with Google does not have any procompetitive or legitimate economic or technical
19 benefit, nor is the WebKit agreement necessary to the creation of a smartphone product.

20 479. ***Apple’s Agreements with browser and browser engine developers.*** Apple’s agreements
21 with browser and browser engine developers, including Google, Mozilla, and Microsoft, prevent the use
22 of any web engine other than Apple’s WebKit on Apple’s iPhone smartphones.

23 480. These agreements, taken in the aggregate and considered as a whole, violate the rule of
24 reason because they prevent the emergence of a cross-platform web engine on iPhones that would erode
25 the MEBE and make new entry possible at scale.

1 481. Each counterparty to Apple’s agreement either has, or is capable of, developing a cross-
2 platform web engine. Moreover, both Firefox and Microsoft are capable of developing smartphones.
3 Indeed, both have attempted entry in the U.S. Smartphone Market and failed because of the MEBE.

4 482. The anticompetitive effects of Apple’s agreements with browser and browser engine
5 developers outweigh any procompetitive benefits. Indeed, there are no legitimate or procompetitive
6 benefits emanating from Apple’s web of anticompetitive agreements with browser and browser engine
7 developers.

8 483. Apple’s agreements with Google as well as with browser and browser engine developers
9 are transactions in interstate commerce, and Apple delivers its iPhone products through the
10 instrumentalities of interstate commerce, including through sales on its website and its physical stores
11 throughout the United States.

12 484. Plaintiffs are direct purchasers of iPhones from Apple.

13 485. Apple’s agreements have proximately caused injury to Plaintiffs’ property, as Plaintiffs
14 have paid supracompetitive prices for their iPhones. Plaintiffs therefore have suffered both injury in fact
15 and antitrust injury.

16 486. Plaintiffs seek damages and injunctive relief as a remedy for Apple’s anticompetitive
17 conduct.

18 **COUNT TWO**

19 **Section 1 of the Sherman Act (15 U.S.C. § 1)**
20 **Market Division and Unlawful Restraint of**
21 **Trade in the U.S. Smartphone Operating System Market**
(On behalf of Plaintiffs and the Class)

22 487. Apple and Google have entered into an agreement to divide the SOS Market. Their
23 agreement is *per se* unlawful under Section 1 of the Sherman Act.

24 488. Apple and Google are direct, horizontal competitors in the SOS Market. Both companies
25 make and distribute operating systems for smartphones. Apple develops iOS and sells it with its iPhones
26 directly to consumers. Google develops the Android operating system, which it distributes directly to
27
28

1 consumers of its Pixel phone and to consumers through OEMs of other smartphone manufacturers, such
2 as Samsung.

3 489. As explained above, Apple and Google together possess a duopoly in the SOS Market,
4 and both companies have the ability to increase the price and monetization of their SOS products without
5 sacrificing market share. Indeed, Apple has raised the price of its iPhone products, which are sold with
6 iOS, since December 2020.

7 490. Apple and Google each maintain “app stores,” through which they approve and distribute
8 third-party apps. Both companies earn substantial revenues through the exclusive app, subscription, and
9 content distribution channels associated with their platforms—Apple through the App Store and Google
10 through the Google Play Store.

11 491. Apple and Google’s duopoly is protected by powerful barriers to entry, including the
12 MEBA, which arises from a feedback loop consisting of app developers, available third-party apps, and
13 SOS users.

14 492. Specifically, a new entrant in the SOS Market must offer a critical mass of third-party
15 apps to attract users, but developers will not incur the cost to develop for a new platform without the
16 existence of a critical mass of users. Moreover, users will not incur switching costs from the Android and
17 iOS ecosystem unless there is a critical mass of apps available for a new SOS.

18 493. To prevent a new entrant from obtaining the necessary ingredients to trigger such a
19 feedback loop, both companies have agreed to prevent the emergence of a cross-platform web engine on
20 the iOS operating system. Specifically, Apple and Google have agreed not to deploy Google’s web
21 engine—or any other web engine—on the iOS operating system. This prevents a developer from writing
22 a single PWA or app that runs on a cross-platform web engine and deploying an app on both Android
23 and iOS devices.

24 494. Pursuant to this agreement, Google has released major versions of its Chrome browser for
25 iOS without the Google Blink web engine. Instead, Google uses Apple’s WebKit web engine, which is
26 used as part of Apple’s Safari, as the engine for Chrome on iOS. Moreover, Google has agreed with Apple
27 to use WebKit for all of its apps.

28

1 495. Apple, for its part, has maintained a strict requirement preventing any other developers for
2 iOS from using any other web engine besides WebKit. This prevents potentially cross-platform web
3 engines, such as Firefox’s Gecko, from supplanting the WebKit engine that is deployed by Apple as part
4 of iOS.

5 496. As a result, development for Android and iOS must be done separately by third-party
6 developers, and any new entrant SOS would have to obtain developers and apps for its new platform
7 either by contracting with Google for a version of Android, or by creating its own application ecosystem
8 from scratch, as a result of the MEBE’s powerful network and feedback loop effects.

9 497. The agreement therefore has the purpose and effect of preserving the Apple-Google
10 duopoly in the SOS Market by strengthening the MEBE and therefore impeding or preventing entry of a
11 rival SOS.

12 498. Because of this anticompetitive agreement among the only two direct horizontal
13 competitors in the SOS Market, cross-platform apps based on a browser or browser engine, particularly
14 PWAs, cannot exist.

15 499. This maintains both Apple’s and Google’s dominant positions in the SOS Market, as well
16 as their market power.

17 500. The agreement divides the SOS Market among Apple and Google because so long as no
18 cross-platform threat to the duopoly emerges on iOS, developer, user, and app bases remain fragmented,
19 and the MEBE protecting the companies’ respective halves of the SOS Market is strengthened, preventing
20 competitive entry at scale.

21 501. But for, and as a proximate cause of, the anticompetitive agreement between Google and
22 Apple, a new entrant operating system could overcome the MEBE, creating price and feature competition
23 in the SOS Market.

24 502. Because of the agreement, which strengthens the MEBE protecting the SOS Market,
25 Apple and Google are able to agree among themselves not to compete on price or SOS features and not
26 to incur into each other’s portions of the SOS Market. For example, Google could obtain market share
27 from Apple by deploying its own web engine on iOS or deploying a browser that is superior to the Safari
28

1 browser iOS users are currently forced to use. Google does not do so pursuant to its agreement with
2 Apple.

3 503. For its part, Apple prevents the unification of both the iOS and Android parts of the SOS
4 Market by banning non-WebKit browser engines, protecting the Android Platform from cross-platform
5 apps that run on both iPhone and Android. Indeed, if Apple allowed a cross-platform web engine on its
6 platform, a developer could write a single PWA and deploy it on both Google and Android, destroying
7 or significantly diminishing the MEBE protecting both companies' halves of the SOS Market.

8 504. Moreover, because of this market division among direct horizontal competitors, Apple and
9 Google maintain their stranglehold over third-party app distribution on their respective platforms. Indeed,
10 if single-coded apps could be deployed across the two major SOSes as a PWA, on a web browser, or
11 using a web engine, then developers would not need to obtain Apple's permission to deploy apps on iOS
12 devices, nor would they have to pay Apple to do so. The same is true as to Google's control of the Android
13 app ecosystem through its Google Play Store.

14 505. In the alternative, for the reasons stated above, the agreement between Apple and Google
15 violates the rule of reason because the anticompetitive effects of the agreement, including the
16 strengthening of the MEBE and the cessation of merits competition in the SOS Market, outweighs any
17 procompetitive benefits of the agreement. Indeed, as explained above, there are no legitimate technical
18 or business reason for the agreement, nor is the agreement between Apple and Google necessary for the
19 creation of an SOS product.

20 506. Apple's agreement with Google is a transaction in interstate commerce, and Apple
21 delivers its iOS smartphone operating system with the iPhones it sells through the instrumentalities of
22 interstate commerce, including through sales on its website and its physical stores throughout the United
23 States.

24 507. Plaintiffs' injuries are inextricably intertwined with the harm to competition caused by
25 Apple and Google in the SOS Market. Indeed, because Apple does not sell iOS separately from its
26 smartphones, Apple's conduct inextricably injures smartphone purchasers by inflating iPhone prices.

1 508. All Plaintiffs, and all members of the Class, are direct purchasers of iPhones, sold with
2 iOS as an integrated part, and thereby suffered this price inflation.

3 509. Apple’s agreements have proximately caused injury to Plaintiffs’ property, as Plaintiffs
4 have paid supracompetitive prices for iOS when they purchased their iPhones. Plaintiffs therefore have
5 suffered both injury in fact and antitrust injury.

6 510. Plaintiffs seek damages and injunctive relief as a remedy for Apple’s anticompetitive
7 conduct.

8 **COUNT THREE**
9 **Conspiracy to Monopolize**
10 **the Smartphone Operating System Market**
11 **Section 2 of the Sherman Act (15 U.S.C. § 2)**
12 **(On behalf of Plaintiffs and the Class)**

13 511. Apple and Google have entered into a conspiracy to monopolize the SOS Market. Each
14 company possesses approximately half of the SOS Market, and together they form a near 100% monopoly
15 of the SOS Market.

16 512. Apple and Google have entered into an express agreement that has the intended purpose
17 and effect of obtaining a near 100% monopoly of the SOS Market and to strengthen the MEBE protecting
18 that monopoly.

19 513. Specifically, Apple and Google have expressly agreed not to deploy any other web engine
20 but WebKit on the iOS operating system. Pursuant to this agreement, Google has released major versions
21 of its Google Chrome browser without the central part of the product—the web engine—instead using its
22 horizontal competitor’s web engine for its product. Put simply, Google has repeatedly and overtly acted
23 pursuant to the express agreement with Apple and has built its web browser with WebKit.

24 514. In service of this agreement, Apple maintains a strict prohibition on the use of any other
25 web engine on iOS other than WebKit. Apple has overtly acted in service of its agreement with Google
26 by incorporating this prohibition in its third-party developer agreements and enforcing that provision.

27 515. The net effect of the agreement is to strengthen the MEBE surrounding the SOS Market,
28 impeding and preventing entry at scale in the SOS Market.

1 516. As a result of the anticompetitive conspiracy to monopolize, a new entrant must develop
2 a new SOS and deploy it with smartphone hardware comparable to incumbent products to traverse the
3 MEBE. In the alternative, a new entrant must license Android from Google, Apple’s co-conspirator.

4 517. A new entrant must also obtain a critical mass of third-party developers and users to create
5 the feedback loop necessary to traverse the MEBE and enter at scale. Without a cross-platform web
6 engine that can run PWAs and other apps, entry is impeded and prevented.

7 518. Indeed, companies such as Microsoft and Mozilla, which have in the past developed
8 smartphones, cannot viably enter the SOS Market as a result of Apple and Google’s conspiracy to
9 monopolize the market.

10 519. As a result, Apple and Google enjoy an unopposed, near-100% monopoly of the market.
11 Moreover, both can and do exercise market power in the SOS Market as a result of their elimination of
12 cross-platform threats and the strengthening of the MEBE. Apple has consistently increased the price of
13 the iPhones it sells with iOS since December 2020.

14 520. Apple and Google have specific intent to monopolize. To begin with, Apple and Google’s
15 agreement banning WebKit is unambiguous and express. Both parties intentionally entered into, and
16 currently abide, by that agreement. Moreover, Apple has expressly imposed the same requirement on all
17 other third-party developers, including browser and browser engine developers as well as third-party app
18 developers for iOS. Google has intentionally and willfully abided by its agreement with Apple because
19 it has overtly removed the core of its Chrome browser and replaced it with Apple’s WebKit in its major
20 releases of Google Chrome.

21 521. Apple and Google’s anticompetitive agreement has created a near 100% monopoly for the
22 combined companies, provided both companies with market and monopoly power (which Apple has used
23 to raise prices), and strengthened the MEBE protecting their combined monopoly.

24 522. As a but-for and proximate result of this conspiracy to monopolize, Plaintiffs have paid
25 supracompetitive prices for iOS as part of their purchase of the Apple iPhone.

26 523. Indeed, absent Apple and Google’s conspiracy to monopolize, new entry would provide a
27 price check in the SOS Market and competition on the merits would ensue.

1 524. Apple's agreement with Google is exclusionary and violates the rule of reason. Apple's
 2 agreement with Google to prevent non-WebKit browser engines on iOS harms competition in the SOS
 3 Market, and the harm to competition outweighs any procompetitive benefit. Indeed, there are no
 4 procompetitive benefits or justifications for the agreement, as explained above.

5 525. Apple's agreement with Google is a transaction in interstate commerce, and Apple
 6 delivers its iOS smartphone operating system with the iPhones it sells through the instrumentalities of
 7 interstate commerce, including through sales on its website and its physical stores throughout the United
 8 States.

9 526. Plaintiffs' injuries are inextricably intertwined with the harm to competition caused by
 10 Apple and Google in the SOS Market. Indeed, because Apple does not sell iOS separately from its
 11 smartphones, Apple's conduct inextricably injures smartphone purchasers by inflating iPhone prices.

12 527. All Plaintiffs, and all members of the Class, are direct purchasers of iPhones, sold with
 13 iOS as an integrated part, and thereby suffered this price inflation.

14 528. Apple's agreements have proximately caused injury to Plaintiffs' property, as Plaintiffs
 15 have paid supracompetitive prices for iOS when they purchased their iPhones. Plaintiffs therefore have
 16 suffered both injury in fact and antitrust injury.

17 529. Plaintiffs seek damages and injunctive relief as a remedy for Apple's anticompetitive
 18 conduct.

19 **PRAYER FOR RELIEF**

20 WHEREFORE, Plaintiffs, individually and on behalf of members of the Proposed Classes,
 21 respectfully request that the Court enter judgment in their favor and against Apple, as follows:

- 22 A. Certification of the proposed Class, including appointment of Plaintiffs' counsel as Class
 23 Counsel;
- 24 B. Injunctive relief;
- 25 C. An order temporarily and permanently enjoining Apple from continuing the unlawful,
 26 anticompetitive practices alleged in this Complaint;
- 27
 28

- 1 D. Damages (including punitive damages), costs, and disgorgement in an amount to be
2 determined at trial;
- 3 E. An order requiring Apple to pay both pre- and post-judgment interest on any amounts
4 awarded;
- 5 F. An award of costs and attorneys' fees; and
- 6 G. Such other or further relief as may be appropriate.

7 **JURY DEMAND**

8 Plaintiffs demand a trial by jury on all claims so triable as a matter of right.

9
10 Dated: January 25, 2024

Respectfully submitted,

11 /s/ Brian J. Dunne

12 Brian J. Dunne (CA 275689)
13 bdunne@bathaeedunne.com
14 Edward M. Grauman (*p.h.v.* to be sought)
15 egrauman@bathaeedunne.com
16 **BATHAEE DUNNE LLP**
901 South MoPac Expressway
Barton Oaks Plaza I, Suite 300
Austin, TX 78746
Tel.: (213) 462-2772

11 /s/ Yavar Bathaee

12 Yavar Bathaee (CA 282388)
13 yavar@bathaeedunne.com
14 Andrew C. Wolinsky (CA 345965)
15 awolinsky@bathaeedunne.com
16 **BATHAEE DUNNE LLP**
445 Park Avenue, 9th Floor
New York, NY 10022
Tel.: (332) 322-8835

17 *Attorneys for Plaintiffs and*
18 *the Proposed Class*

ClassAction.org

This complaint is part of ClassAction.org's searchable class action lawsuit database and can be found in this post: [iPhones Cost More Due to Apple's Agreements with Web Browser Makers, Class Action Alleges](#)
