

Comments to the National Telecommunications and Information Administration Regarding
Report on Competition in the Mobile App Ecosystem

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On behalf of the Competitive Enterprise Institute (CEI), I respectfully submit the following comments regarding the National Telecommunications and Information Administration's (NTIA) development of a report on competition in the mobile app market. Founded in 1984, the Competitive Enterprise Institute is a non-profit research and advocacy organization that focuses on regulatory policy from a pro-market perspective.

My comments are directed to questions 2. and 2.a., but will also address related topics that are both included and not included in the NTIA's request for comment. The arguments will focus on the scope of NTIA's report and the inclusion and omission of entities relevant to the study of competition in the application market.

The NTIA should take a holistic approach to studying the app ecosystem. In doing so, it would be a mistake to omit entities outside of the mobile app ecosystem that compete with products and services within the mobile app ecosystem.

The NTIA's report should not be limited to mobile devices, such as smartphones and tablets. The notice and request for comment acknowledges that other app ecosystems for gaming consoles and personal computers (PCs) might be relevant to the NTIA's report.

These products are relevant to the NTIA's study of the app ecosystem. Gaming consoles, PCs, and other app-enabled devices offer applications for both gaming and non-gaming subscription applications, the two largest sources of revenue in the app ecosystem. Gaming applications account for over 67% of app revenue. The *Epic Games v. Apple* court ruling also revealed that 70% of Apple App Store revenue came from gaming apps, and that 70% was generated by less than 10% of Apple Store users.¹ Non-gaming subscription apps account for over 14% of app market revenue. Together, these categories amount to over 80% of app market revenue.

¹ *Epic Games, Inc. v. Apple Inc.*, No. 4:20-CV-05640, at *1 (N.D. Cal. Sept. 10, 2021), https://storage.courtlistener.com/recap/gov.uscourts.cand.364265/gov.uscourts.cand.364265.812.0_2.pdf.

Gaming consoles, mobile devices, PCs, and online game stores compete for both users and developers. Mobile devices and gaming consoles also provide for cross-platform interoperability, which allows players to engage with others using different devices and software.² Streaming services for games have emerged that allow for even greater interoperability among gaming hardware. And non-gaming subscription apps are available on app-enabled smart TVs, Roku devices, Amazon’s Fire TVs and Fire Sticks, PCs, gaming consoles, and smart home devices.

The NTIA’s report should include the following entities and products in measuring competition in the app market: (1) personal computers, (2) gaming consoles, (3) streaming devices and multichannel television, and (4) relevant digital and non-digital products.

1. Personal Computers

Smartphones and tablets are personal computing devices. As such, the NTIA report should consider other personal computing devices, including laptops, netbooks, and desktop computers. Tablets compete directly with laptops, netbooks, and even desktops, and both smartphones and tablets facilitate information, products, and funds to fulfill customer demand.³ Tablets essentially function as traditional PCs, particularly when paired with a Bluetooth keyboard and mouse.⁴

The most popular mobile apps are available in PC format more often than not. Of the top 10 most downloaded mobile apps in 2021, seven are fully functional on a traditional personal computer using a downloaded application or a web browser.⁵ The remaining three can still function using a third-party emulator application.⁶

Traditional PC applications are also available in the mobile app ecosystem. Microsoft’s Office applications are available on both iOS and Google-certified Android.⁷ CNET, a technology focused media site, has long provided an ecosystem of anti-malware and privacy software and games for download.⁸ Applications by McAfee, Avast, AVG, Norton, and Avira are available on PC as well as mobile devices.

² Jesse Lennox and Jacob Roach, “All Cross-platform Games (PS5, Xbox Series X, PS4, Xbox One, Switch, PC),” *Digitaltrends*, April 1, 2022, <https://www.digitaltrends.com/gaming/all-cross-platform-games/>.

³ Onur Kurt et al., “The Role of Mobile Devices and Applications in Supply Chains,” *International Journal of Economics and Management Systems*, Vol. 1 (April 2016), pp. 95-97, <http://www.iaras.org/iaras/filedownloads/ijems/2016/007-0013.pdf>.

⁴ Kimber Streams, “The Best Bluetooth and Wireless Keyboards,” *New York Times*, February 8, 2022, <https://www.nytimes.com/wirecutter/reviews/the-best-bluetooth-keyboard/>.

⁵ John Koetsier, “Top 10 Most Downloaded Apps And Games Of 2021: TikTok, Telegram Big Winners,” *Forbes*, December 27, 2021, <https://www.forbes.com/sites/johnkoetsier/2021/12/27/top-10-most-downloaded-apps-and-games-of-2021-tiktok-telegram-big-winners/?sh=92a86293a1fe>.

⁶ Whitson Gordon and Jason Cohen, “5 Ways to Run Android Apps on Your PC for Free,” *PCMag*, March 14, 2022, <https://www.pcmag.com/how-to/3-free-ways-to-run-android-apps-on-your-pc>.

⁷ “Office Applications,” Documents, Microsoft, last modified August 31, 2021, <https://docs.microsoft.com/en-us/office365/servicedescriptions/office-applications-service-description/office-applications>.

⁸ “Download,” CNET, accessed May 19, 2022, <https://download.cnet.com/>.

The NTIA’s study should also include gaming applications and app stores for traditional PCs. In 2021, gaming was responsible for two-thirds (67%) of mobile app revenue.⁹ Therefore, gaming applications are particularly relevant to the study of the app ecosystem. PC games are projected to generate \$41 billion in 2022, accounting for over 20% of digital gaming market share.¹⁰

According to one survey, 31.4% of respondents stated that they played video games on a laptop or desktop computers in 2021.¹¹ The highest grossing app globally in 2021, a game called PUBG Mobile, was originally released for Microsoft Windows in 2017.¹² The highest grossing app in the U.S. in 2021 was Roblox, which was also originally released for Windows in 2006.¹³ It may also be important to note that Roblox and Microsoft’s Minecraft have their own ecosystems, which allow developers to host and create games and content within their respective platforms.

2. Gaming Consoles

The report should also consider gaming consoles by Nintendo, Sony, Microsoft, Sega, Steam, and others. In addition to being the primary source of app revenue, games represent the largest category of apps in both the Apple App Store and the Google Play Store.¹⁴ In 2022, console games are projected to generate \$58.6 billion, accounting for 29% of the digital gaming market share.¹⁵

Additionally, the report should not make a distinction between mobile gaming and stationary gaming. According to a 2020 industry report by the consultancy SaaS Scout, roughly 80% of adults play games while at home.¹⁶ This suggests that gaming on mobile devices is not significantly different than stationary game consoles.

The NTIA’s report should also include gaming application stores, such as the My Nintendo Store,¹⁷ the Microsoft Store,¹⁸ Sony’s PlayStation Store,¹⁹ and the Steam Store.²⁰ Subscription-

⁹ Mansoor Iqbal, “App Revenue Data (2022),” *Business of Apps*, last updated May 4, 2022, <https://www.businessofapps.com/data/app-revenues/>.

¹⁰ J. Clement, “Video Game Market Revenue Worldwide in 2022, by Segment,” *Statista*, May 17, 2022, <https://www.statista.com/statistics/292751/mobile-gaming-revenue-worldwide-device/>.

¹¹ J. Clement, “Share of Internet Users in the United States Who Play Video Games on Selected Devices as of 3rd Quarter 2021,” *Statista*, May 9, 2022, <https://www.statista.com/statistics/219679/household-penetration-of-gaming-devices-in-the-united-states/>.

¹² David Curry, “Top Grossing Apps (2022),” *Business of Apps*, last updated May 4, 2022, <https://www.businessofapps.com/data/top-grossing-apps/>.

¹³ Priyansh Sidhwani, “The History of Roblox: From 2004 Until Now,” *Tech Story*, March 12, 2021, <https://techstory.in/the-history-of-roblox-from-2004-until-now/>.

¹⁴ David Curry, “App Store Data (2022),” *Business of Apps*, last updated May 4, 2022, <https://www.businessofapps.com/data/app-stores/>.

¹⁵ J. Clement, “Video Game Market Revenue Worldwide in 2022, by Segment.”

¹⁶ SaaS Scout: Data Research Group, *Industry Report: Mobile Gaming Statistics, Revenue, Industry Data (2020 Report)*, accessed May 19, 2022, <https://saasscout.com/statistics/mobile-gaming-statistics/>.

¹⁷ “Games,” My Nintendo Store, Nintendo, accessed May 19, 2022, <https://www.nintendo.com/store/games/>.

¹⁸ “Games,” Microsoft Store, Microsoft, accessed May 19, 2022, <https://www.microsoft.com/en-us/store/games/windows>.

¹⁹ “Latest,” PlayStation Store, Sony, accessed May 19, 2022, <https://store.playstation.com/en-us/pages/latest>.

²⁰ “Your Store,” Steam, accessed May 19, 2022, <https://store.steampowered.com/>.

based game streaming services have also emerged as competitors in the digital gaming market. The Apple Arcade and Google Play Pass face competition from EA Play, PlayStation Now, Xbox Game Pass, Ubisoft Plus, and GameClub.²¹

3. Streaming Devices and Multichannel Television

The NTIA’s study should consider other digital products and services like streaming devices and multichannel television providers. These entities are particularly relevant when considering subscription-based revenue in the app ecosystem. Last year, 14% of in-app purchase revenue came from the top 100 non-game subscription apps. Video and music streaming apps consistently top the lists for highest revenue among non-game subscription apps. They account for seven of the top 10 for overall non-gaming revenue and eight of the top 10 for both the Apple App Store and the Google Play Store.²²

Most consumers still choose to stream movies and shows on app-enabled smart TVs. At the start of 2020, Internet-connected televisions were the most popular streaming device in North America, accounting for 30.8% of viewers. Roku devices and Amazon’s Fire TV, which are also app-enabled, combined for 29.7%. Mobile devices accounted for 16.3%.²³ According to another 2020 survey by Statista, U.S. viewers preferred to stream videos on TVs and computers rather than over phones and tablets.²⁴

The app ecosystems associated with smart TVs, Roku devices, and Amazon’s Fire TV should likewise be included in the NTIA’s study. Roku operates the Roku Channel Store on its smart TVs and streaming devices.²⁵ Amazon also operates its own app store for the company’s Fire TV devices. These products operate their own app ecosystems that compete for users and developers. Music streaming or consumption also takes place on a variety of devices and platforms. In 2019, smartphones accounted for only 27% of time spent listening to music.²⁶

Multichannel Video Programming Distributors (MVPDs) like—Xfinity, Spectrum, DirectTV, and Dish Network—also compete with video streaming apps. According to a 2021 Pew Research report, 56% of U.S. adults still subscribe to a satellite or cable TV service.²⁷ Nielsen also

²¹ Shelby Brown, “So Many Game Subscription Services, So Little Time: Here’s How to Choose,” CNET, April 27, 2022, <https://www.cnet.com/tech/gaming/best-game-subscription-services/>.

²² Stephanie Chan, “Global Consumer Spending in Top 100 Subscription Apps Climbed 41% to \$18.3 Billion in 2021,” *Store Intelligence* (blog), *SensorTower*, February 2022, <https://sensortower.com/blog/subscription-apps-revenue-2021/>.

²³ Julia Stoll, “Most Popular Streaming Media Devices in North America in 1st Quarter 2020,” *Statista*, January 13, 2021, <https://www.statista.com/statistics/1132062/top-streaming-devices-north-america/>.

²⁴ Julia Stoll, “Devices Used to Watch Online Streaming Videos in the United States as of the 4th Quarter of 2020,” *Statista*, March 4, 2022, <https://www.statista.com/statistics/784383/online-video-devices-in-the-us/>.

²⁵ “Apps,” Channel Store, Roku, accessed May 19, 2022, <https://channelstore.roku.com/browse/apps>.

²⁶ Marie Charlotte Götting, “Share of Time Spent Listening to Music on Selected Devices Worldwide as of May 2019,” *Statista*, September 17, 2021, <https://www.statista.com/statistics/1102356/music-device-usage-worldwide/>.

²⁷ Lee Rainie, “Cable and Satellite TV Use Has Dropped Dramatically in the U.S. since 2015,” Pew Research Center, March 17, 2021, <https://www.pewresearch.org/fact-tank/2021/03/17/cable-and-satellite-tv-use-has-dropped-dramatically-in-the-u-s-since-2015/>.

released data last year showing that network and cable TV accounted for 64% of the time spent watching television, while streaming services like Netflix, Hulu, and HBO Max accounted for 26%.²⁸ Both MVPDs and video streaming apps charge a monthly subscription for access to shows, movies, and other video programs. MVPDs also provide “on-demand” video products. These competing products are both comparable and measurable.

4. Relevant Digital and Non-digital Products

Software downloaded from app stores also competes with digital and non-digital products sold in the retail industry. The World Bank’s 2016 *World Development Report: Digital Dividends* acknowledges: “Although many internet firms seem to operate in separate markets, most if not all compete with offline firms.”²⁹ It goes on:

Instant messaging apps compete with telecoms, search engines and social media sites compete with traditional media for advertising revenue, e-commerce firms compete with brick-and mortar firms, and mobile money competes with traditional banks. Innovations triggered by this online-offline competition generally benefit consumers, especially when offline markets are distorted. Transport service companies such as Uber, Lyft, Olacabs, and Didi-Kuaidi Dache have disrupted taxi markets that tend to be overregulated with restricted entry and high prices.³⁰

This is also true for mobile applications, as they often serve as alternatives for both digital and non-digital products. Categories of apps that compete with products outside of the app ecosystem are easily identified, defined, and measured.

One example is the bubble level, or spirit level app. Bubble levels are tools used to indicate how parallel or perpendicular a surface is relative to the ground.³¹ Academic research has illustrated that bubble level apps are comparable to traditional bubble levels.³² These products are available for purchase at a variety of retail outlets.³³ And the spirit level industry is valued at \$471

²⁸ Jessica Bursztynsky, “About One-quarter of U.S. TV time is Spent Watching Streaming Services, Says Nielsen,” *CNBC*, last updated June 17, 2021, <https://www.cnn.com/2021/06/17/nielsen-streaming-makes-up-only-26percent-of-time-spent-in-front-of-tv.html>.

²⁹ World Bank Group, *World Development Report 2016: Digital Dividends*, 2016, p. 14, <https://elibrary.worldbank.org/doi/abs/10.1596/978-1-4648-0671-1>.

³⁰ *Ibid.*

³¹ “Spirit Level Information,” Johnson Level, accessed May 19, 2022, <https://www.johnsonlevel.com/News/SpiritLevelInformation>.

³² Syed Hasan Askari Rizvi, Shreya Gupta, and Vedika Mishra, “Digital Spirit Level,” *International Journal of Innovation in Management, Science and Engineering*, Vol. 1, No. 2 (December 2020), pp. 21-30, http://hasanaskari.in/wp-content/uploads/2021/07/IJIMSE010212202006_Digital_Spirit_Level_Final.pdf.

³³ Search results for “bubble level,” Shopping, Google, accessed May 19, 2022, https://www.google.com/search?rlz=1C1CHBF_enUS991US991&tbm=shop&sxsrf=ALiCzsZnGZlhBtqEXzlnrfsA0hgnysyMfQ:1652123279279&q=bubble+level&tbs=mr:1&sa=X&ved=0ahUKEwjP_r3pjtP3AhVInnIEHZFVCaEQ-bAGCLEIKAA&biw=970&bih=802&dpr=1.5.

million.³⁴ At present, there are over 180 bubble level applications available on the Google Play Store.³⁵ More than 90% are free, and paid bubble level apps range from \$1 to \$4. The Apple App store contains over 60 bubble level applications, and over 66% are available for free download. Paid bubble level apps for iOS range from \$1 to \$5.

There are other examples. The document scanner market is valued at \$1.431 billion,³⁶ and the Google Play Store offers 250 document scanner applications.³⁷ The car GPS navigation system market is valued at over \$13 billion, and those products compete against Apple Maps, Google Maps, Waze, and other mobile navigation apps.³⁸ The wall calendar market is valued at \$1.38 billion,³⁹ and the Google Play Store offers over 200 calendar apps.⁴⁰ The guitar tuner market is valued at \$1.7 million,⁴¹ and the Google Play Store offers over 100 guitar tuning apps.⁴² The graphing calculator market is valued at between \$286 million and \$437 million,⁴³ and the Google Play Store offers over 50 graphing calculator apps.⁴⁴

Conclusion

The NTIA's report on competition in the app ecosystem should not be limited to mobile devices, like smartphones and tablets. Limiting the scope to mobile devices would improperly omit relevant applications, app stores, products, and services that exist outside of the mobile device

³⁴ Market Watch, "Spirit Levels Market Size 2022 Global Statistics, Share, Growth Factors, Industry Trends, Competition Strategies, Revenue Analysis, Key Players, Regional Analysis by Forecast to 2028," press release, March 14, 2022, <https://www.marketwatch.com/press-release/spirit-levels-market-size-2022-global-statistics-share-growth-factors-industry-trends-competition-strategies-revenue-analysis-key-players-regional-analysis-by-forecast-to-2028-2022-03-14>.

³⁵ Search results for "bubble level," Apps, Google Play Store, accessed May 19, 2022, https://play.google.com/store/search?q=bubble%20level&c=apps&hl=en_US&gl=US.

³⁶ Market Watch, "Document Scanner Market Growth 2022 Industry Challenges, Leading Players, Forthcoming Developments, Competitive Scenario, Forecast till 2027," press release no. COMTEX_405966568/2598/2022-04-20T02:30:49, April 20, 2022, <https://www.marketwatch.com/press-release/document-scanner-market-growth-2022-industry-challenges-leading-players-forthcoming-developments-competitive-scenario-forecast-till-2027-2022-04-20>.

³⁷ Search results for "document scanners," Apps, Google Play Store, accessed May 19, 2022, <https://play.google.com/store/search?q=document%20scanners&c=apps>.

³⁸ "Car Gps Navigation System Market Statistics 2022-2030," Latest Reports, Allied Market Research, accessed May 19, 2022, <https://www.alliedmarketresearch.com/car-GPS-navigation-system-market>.

³⁹ "Wall Calendar Market Report: Global Forecast from 2020 to 2030," Reports, Data Intelo, accessed May 19, 2022, <https://dataintel.com/report/wall-calendar-market/>.

⁴⁰ Search results for "calendar," Apps, Google Play Store, accessed May 19, 2022, <https://play.google.com/store/search?q=calendar&c=apps>.

⁴¹ "AP Guitar Tuner Market Report: Global Forecast from 2022 to 2030," Reports, Data Intelo, accessed May 19, 2022, <https://dataintel.com/report/global-ap-guitar-tuner-market/>.

⁴² Search results for "guitar tuner," Apps, Google Play Store, accessed May 19, 2022, <https://play.google.com/store/search?q=guitar%20tuner&c=apps>.

⁴³ "Graphing Calculator Market size worth \$286.41 Million, Globally, by 2027 at 5.04% CAGR," Verified Market Research, Globe Newswire, November 29, 2021, <https://www.globenewswire.com/news-release/2021/11/29/2342358/0/en/Graphing-Calculator-Market-size-worth-286-41-Million-Globally-by-2027-at-5-04-CAGR-Verified-Market-Research.html>.

⁴⁴ Search results for "graphing calculator," Apps, Google Play Store, accessed May 19, 2022, <https://play.google.com/store/search?q=graphing%20calculator&c=apps>.

industry and compete against applications within the mobile app ecosystem. That is particularly true in regard to gaming apps and non-gaming subscription apps.

These products exist within a larger ecosystem of devices, software, and products that facilitate the consumption of media. Applications in the mobile app space also compete directly with other digital and non-digital products in the retail industry. In order to accurately assess the nature of competition in the app market, the NTIA should take a holistic approach and include the relevant products addressed in this comment.

Sincerely,

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