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9B21M044

GOOGLE PLAY IN INDIA: PLAYING WITH NETWORKS[[1]](#endnote-1)

Tulsi Jayakumar wrote this case solely to provide material for class discussion. The author does not intend to illustrate either effective or ineffective handling of a managerial situation. The author may have disguised certain names and other identifying information to protect confidentiality.

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In October 2020, Google LLC (Google) found itself involved in a controversy with both India’s government and the country’s developers of mobile applications (apps). Google announced that it would be enforcing its global payment policy for Google Play, the company’s digital distribution platform for apps and digital media, including books, movies, magazines, music, and television programs.[[2]](#endnote-2) The policy required app developers to pay a 30 per cent commission on all in-app purchases of digital goods bought on Google Play.[[3]](#endnote-3) Google’s policy would become effective worldwide starting in September 2021, when all developers who sold digital goods on their apps would have to use Google’s billing system and pay Google a 30 per cent commission on all “app sales, in-app purchases and subscriptions made within apps.”[[4]](#endnote-4)

Google justified this commission as the price for providing consumers the benefits of a “trusted system” that allowed them to “safely, securely, and seamlessly buy from developers worldwide.”[[5]](#endnote-5) Google clarified that the commission would not be charged on in-app advertising or purchases of physical goods made through an app.[[6]](#endnote-6)

Google’s announcement drew particular opposition in India. Technology start-up companies that used Google Play to distribute their products strongly objected to paying the 30 per cent commission, which they referred to as a “Google tax.”[[7]](#endnote-7) They challenged Google’s imposition of the commission and threatened to file an antitrust complaint against the company. India’s technology companies began discussions on building an alternative local version of Google Play that would make Indian apps available.[[8]](#endnote-8) In addition, the Indian government suggested that it was prepared to launch its own version of an app store in support of the country’s start-ups and technology entrepreneurs.[[9]](#endnote-9)

As the market leader in India’s app distribution industry, Google had to resolve these issues to retain its top position. What was the basis of Google’s advantage that allowed it to impose a “Google tax” for use of the Google Play Store as alleged by the Indian start-ups and app developers? Could such an advantage be replicated by the alternative platform envisaged by Indian start-ups or by the Indian government? How should Google respond to these start-ups’ complaints and their threats to initiate antitrust complaints?

GOOGLE

Google was founded in the United States in 1998 by Larry Page and Sergey Brin with a mission “to organise the world’s information and make it universally accessible and useful.”[[10]](#endnote-10) Google’s core business was web search services, and many of its products and other services were related to its core business.[[11]](#endnote-11) Google’s revenues in 2019 reached US$160.74 billion,[[12]](#endnote-12) after exponential growth from only $0.4 billion in 2002.[[13]](#endnote-13) Google’s search-based advertising provided one of the most lucrative business models in the world. The model was based on consumer access and use of the Internet. However, the way people accessed the Internet was changing. More and more people were using cell phones (especially smartphones) rather than computers to access the Internet, which made apps far more popular than websites.[[14]](#endnote-14) Therefore, the company’s most important tool became Google Play, its distribution service for apps.

Google Play and the App Market

In October 2008, Google launched a service named Android Market that offered apps and games written specifically for the Android operating system (OS). In 2012, Google added books, movies, and music on the platform and renamed it Google Play.[[15]](#endnote-15) All devices that were powered by the Android OS had the Google Play app pre-installed on them to allow users to easily access apps, games, and digital content.[[16]](#endnote-16)

By 2020, the market for apps included 3.5 billion smartphone users around the world. In India, 36 per cent of the population owned mobile devices, representing a user base of 500 million.[[17]](#endnote-17) In 2019, India was the second-largest smartphone market in the world, after China.[[18]](#endnote-18) In August 2020, 74.25 per cent of mobile devices across the world were powered by the Android OS. Its main competitor, the iOS by Apple Inc. (Apple), had the second-largest OS user base in the world, with 25.15 per cent of all mobile devices being Apple products. Other platforms held miniscule shares of the market (see Exhibit 1). In India, the mobile devices market was even more skewed. In September 2020, 95.85 per cent of mobile devices in India were powered by the Android OS, while the iOS accounted for a miniscule 0.54 per cent (see Exhibit 1). Google Play, which dominated the app market, listed over 2.7 million apps that were available for downloading on Android devices.[[19]](#endnote-19)

Globally, the number of apps downloaded increased by 45 per cent from 2016 to 2019. In India, the rate over that same period was 190 per cent. With 7 billion app downloads in the second quarter of 2020, it was also the global leader.[[20]](#endnote-20) Across the world (other than in China),[[21]](#endnote-21) most app downloads came from Google Play (see Exhibit 2). From 2016 to 2019, Google Play app downloads increased at a significantly higher rate than iOS app downloads,[[22]](#endnote-22) especially for videos and games, although the rate for social media and entertainment apps also increased considerably (see Exhibit 3).

App use around the world also increased significantly. From 2017 to 2019, the average time spent using apps on Android devices globally increased by approximately 35 per cent to 3 hours 40 minutes. In the first half of 2020, usage time on Android devices was registered at a total of 1.6 trillion hours. India experienced similar increases in app use. Its daily mobile usage hours grew by 25 per cent from 2017 to 2019 and by 37 per cent between 2019 and the second quarter of 2020. Only Canada saw higher growth during this time.[[23]](#endnote-23)

App Revenues

During the period of 2017–18, app revenues grew steadily for both Google and Apple (see Exhibit 4). Industry analysts projected combined Google and Apple app revenues to reach $156 billion by 2023, based on an assumed compound annual growth rate of 16.8 per cent. In July 2020, Google Play reported $17.3 billion in app revenues, growing at a rate of 20 per cent year on year, while Apple’s App Store reported app revenues of $32.8 billion, growing at a rate of 24.7 per cent year on year. Globally, the app ecosystem had generated revenues of $50 billion, representing 23 per cent growth over the previous year’s figure of $40.6 billion for the same period.[[24]](#endnote-24)

Although Google Play revenues grew at high rates, most apps were available to users for free. In fact, the proportion of free apps on Google Play had actually grown between 2019 and September 2020 to a high of 96.5 per cent (see Exhibit 5).[[25]](#endnote-25) To generate revenue from their products, app developers could choose from various business models (see Exhibit 6). Interestingly, the business model that contributed the highest amount of Google Play global revenue (at 98 per cent) was the “freemium” model,[[26]](#endnote-26) which made available a basic version of the app for free to users, who could pay to get premium features.[[27]](#endnote-27)

For monetization of their apps, developers again had several different options for pricing models including in-app purchases; paid app downloads; in-app advertising; subscriptions; rewarded video advertisements, where users were required to watch a short video to receive a reward;[[28]](#endnote-28) and interstitial video advertisements, where users had to wait for full-screen (rather than banner or pop-up) advertisements to complete before they could resume the use of the app.[[29]](#endnote-29) Of all monetization models, in-app purchases and interstitial video advertisements were considered most effective by developers, whereas paid app downloads and subscriptions scored low on their perceived monetization effectiveness[[30]](#endnote-30) (see Exhibit 7).

**Revenue Model for Google and Its Competitors**

Google and Apple used similar revenue models. The share of revenue generated by paid app downloads and in-app purchases was 70 per cent for the developer and 30 per cent for Google or Apple. For in-app subscriptions, the share that Google or Apple charged was 30 per cent in the first year and 15 per cent in successive years. However, for in-app advertising and in-app sales of physical goods, the developers kept all revenue (100 per cent).[[31]](#endnote-31) The pricing model of 30 per cent commission that Google and Apple charged was also adopted by many smaller app distributors including the Galaxy Store, by Samsung Electronics Co. Ltd. (Samsung); the Amazon Appstore; and the Microsoft Store.[[32]](#endnote-32)

Google’s Android OS and Google Play

Google claimed that its OS Android was open source software that was free for anyone’s use without any licensing fees. Analysts, however, noted that Google had monetized the Android OS by combining it with firm-specific advantages. The OS was thereby able to earn the company estimated revenues of $9.1 billion in 2019 through Google Play, broken down into $7.3 billion from apps and $1.8 billion from music, books, and videos. This revenue could not have been possible without the Android OS.[[33]](#endnote-33)

In reality, only a stripped down or bare version of the Android OS (without Google Play and other core Google services) was free to use as open source. However, smartphone manufacturers were reluctant to use the bare version of the Android OS. Most consumers considered Google Play and other Google system services essential for the full operation of their mobile device. As manufacturers soon realized, Google Play and Google Play Services—an integral background technological service—were core components of the overall Android ecosystem. They were critical to the proper function of all Android phones.[[34]](#endnote-34)

Google and Apple enjoyed nearly total domination of the global smartphone market. Smartphone manufacturers around the world (other than Chinese companies) who rejected Google’s Android and tried to create their own OS were doomed to fail, as proven by Mozilla Corporation (Firefox OS), Canonical Ltd. (Ubantu Phone), Microsoft Corporation (Windows phone), Samsung (Tizen OS), and BlackBerry Limited (BlackBerry OS).[[35]](#endnote-35)

Amazon.com Inc. also attempted to enter the smartphone market with its Fire Phone in June 2014, as a rival to Apple and Samsung.[[36]](#endnote-36) However, the product failed to capture enough market share[[37]](#endnote-37) and was discontinued in 2015.[[38]](#endnote-38) Huawei Technologies Co. Ltd. met a similar fate to when it attempted to adopt a bare version of the Android OS⎯in the wake of trade hostilities between China and the United States⎯and create its own app store to compete against Google Play.[[39]](#endnote-39) One analyst made the following observation:

If we disregard this “bare” Android version than [sic] we can clearly say that *Android is not open source but Google’s proprietary software.* [emphasis in the original] To use it, the manufacturer does not need to pay anything, but they need to comply with many of Google’s conditions to be able to use the full version of Android with [Google] Play and other Google’s apps.[[40]](#endnote-40)

With a search market share of about 90 per cent worldwide, Google had managed to create and control “a suite of apps like Chrome, Gmail, YouTube, Google Maps, Google Docs, and many other popular web services.”[[41]](#endnote-41) In fact, it had been accused of using its dominance to force partners to bundle Google’s apps, including Google Search and Google Maps, into their offerings.[[42]](#endnote-42)

THE CONTROVERSY

Google’s Stance

Google announced on a blog post in September 2020 that it would enforce its policy of levying a 30 per cent commission on all in-app purchases of digital goods bought on Google Play.[[43]](#endnote-43) The blog post was intended to provide “clarity” on billing policies among app developers on the types of transactions that required the use of its app store’s billing system.[[44]](#endnote-44) It also addressed Google’s concerns regarding developers such as Netflix and Spotify, who had been bypassing the billing system requirement by prompting users to pay directly using a credit card.[[45]](#endnote-45)

Google stated: “We’ve always required developers who distribute their apps on Play to use Google Play’s billing system if they offer in-app purchases of digital goods, and pay a service fee from a percentage of the purchase.”[[46]](#endnote-46) Google Play Console Help sought to clarify the language and make the requirements of using Google Play’s billing system more explicit for app developers selling digital goods in their apps.[[47]](#endnote-47)

Google pre-empted any criticism of its announcement by stating that choice had been a core tenet of its policy, allowing developers who failed to come to an agreement with Google on business terms to operate their own app stores and distribute their apps on the Android OS.[[48]](#endnote-48) It provided the example of app developer Epic Games, which had benefited from Android’s third-party app store policy by distributing its popular game Fortnite directly from its own app store, as well as from other companies’ app stores, including Samsung’s Galaxy Store.[[49]](#endnote-49)

Google insisted that its 30 per cent commission was part of the commitment to honour consumer trust and provide consumers with security benefits:

Consumers get the benefit of a trusted system that allows them to safely, securely, and seamlessly buy from developers worldwide. Google protects consumers’ payment info with multiple layers of security, using one of the world’s most advanced security infrastructures.[[50]](#endnote-50)

Google claimed that the commission also sought to fulfill developer expectations for powerful tools and devices needed to grow their businesses, thus providing them with marketing benefits: “For developers, Google Play’s billing system provides an easy way for billions of Android users to transact with them using their local, preferred method of payment.”[[51]](#endnote-51)

Google expected the enforcement of its billing policy to affect a small proportion, less than 3 per cent, of app developers who had sold digital goods over the past year. Within this small group, the vast majority (97 per cent) were already using Google’s billing system. Google also spoke of equal treatment among all of its own apps and third-party apps, including competitor apps that were featured in its Editor’s Choice picks for providing a great user experience.[[52]](#endnote-52)

Contention of Indian Start-Ups

App developers across the world challenged Google’s 30 per cent commission as an excessively high fee, compared to the standard credit card fee of approximately 2 per cent, for example.[[53]](#endnote-53) Indian start-ups who had apps hosted on Google Play claimed that because 99 per cent of the country’s 500 million users were running smartphones on the Android OS, Google could exert excessive control over the types of apps and other services they could offer. Vijay Shekhar Sharma, the founder of India’s largest mobile payments company, Paytm, called Google the “big daddy” that controlled the “oxygen supply of (app) distribution” on Android phones.[[54]](#endnote-54) His anger and frustration was not surprising, given that Google had removed Paytm from its app store in September 2020, citing policy violations. Paytm had been forced to make certain changes before it could be relisted on Google Play.[[55]](#endnote-55)

In October 2020, Indian start-up founders and venture capitalists decided to meet to discuss filing antitrust complaints against Google.[[56]](#endnote-56) However, some were skeptical about the ability of Indian app developers to take on Google, especially with US standards for legal disputes, as one start-up founder expressed:

Taking on a giant like Google in the Indian courts involves the hefty court and legal fees, and the battle will be incredibly long drawn . . . because these big Internet firms do not fully follow the rules and regulations in India and a developer might have to fight a concurrent case in the US court as well.[[57]](#endnote-57)

App developers were highly dependent on Google Play, as Gaurav Garg, a co-founder of the educational technology start-up Study IQ, stated: “I think it is impossible for a digital company to move out from the Play Store. I don’t think we will do that, we have 1.5 Mn [million] subscribers on our Android app.”[[58]](#endnote-58) But the 30 per cent commission was an extreme amount to pay for many app developers, especially small companies. For some of them, the commission would mean absorbing a 30 per cent loss on their calculation of earnings before interest, depreciation, and amortization.[[59]](#endnote-59) Therefore, to reduce their dependence on Google, some Indian start-ups were considering building a local app distribution service that charged only a reasonable service fee.[[60]](#endnote-60) According to Vishal Gondal, co-founder of the Bengaluru gaming firm nCore Games, “If we have to give 30 per cent fees to Google and also pay for customer acquisition, how will our budding businesses survive?”[[61]](#endnote-61)

DOMINANCE AND ABUSE OF DOMINANCE

To gain a dominant position, companies could consider using barriers of entry into their market by controlling access to key resources, by using exclusive rights and licences granted by the government, or by creating natural monopolies through economies of scale. A natural monopoly occurred when a single company could produce the entire output at a lower cost, compared to the cost when several companies were involved.[[62]](#endnote-62) Natural monopolies, which were normally based on supply-side economies of scale, occurred during the industrial era. In the era of the Internet, market power (or dominance) of large platform monopolies, such as Google, were based on network externalities. They were created by demand-side economies of scale.[[63]](#endnote-63)

Digital Platform Businesses and Network Externalities

Network externalities referred to the incremental benefits that current users gained with each new user joining the network, and could be direct or indirect. For example, the phone industry represented *direct network externalities*, where the value of the service went up simply as the number of users went up. Only when all family members, friends, and relevant network members also had a phone could an individual user benefit from the phone service. On the other hand, digital platform businesses represented *indirect network externalities*, where two or more types of *user groups* exchanged value with each other. With consumers and app developers representing the relevant user groups for app stores such as Google Play, an increase in the number of consumers increased the value of the network for the app developers, while an increase in app developers increased the value for consumers.[[64]](#endnote-64)

Such externalities could also be classified into within-country or cross-country externalities, based on their location. Food delivery platforms such as Just Eat or the Indian Zomato represented *within country indirect network externalities* because the customers and restaurants in one country did not benefit from other customers and restaurants that joined the platform. However, dating platforms such as the US-based app Tinder or the Indian matrimonial platform Shaadi.com represented *within-country direct network externalities* because users were seeking partners from other users in their respective geographies. App store platforms such as Google Play and Apple’s App Store combined both *cross-country direct and indirect network externalities*. Cross-country direct network externalities could be seen in the increasing number of entrants in multi-player online gaming platforms, whereas cross-country indirect network externalities resulted when other app developers sold complementary software applications *globally*. App users on these platforms could benefit from the existing global user base, while the growth of the user base helped stimulate further app development.[[65]](#endnote-65)

Digital platform businesses based on network externalities had three unique features. First, the cost for the user groups outweighed the value from joining the network until the network attained a critical mass. After that point, the network was able to deliver greater value than the cost of joining the network. Therefore, these companies had to grow user groups through incentivizing and promoting early usage through initial referral fees and other means. As one analyst noted, “In a platform’s early days, there’s a chicken and egg problem—consumers only want to be on a platform with an existing network of producers, and vice versa.”

Second, digital platform businesses differed from traditional non-platform businesses (called linear businesses) in the shape of their cost curves. As traditional businesses scaled up, their per-unit average costs at first decreased, followed by increasing costs per unit, leading to U-shaped cost curves.[[66]](#endnote-66) Digital Platform businesses, on the other hand, experienced a logarithmic reduction in costs per unit, leading to continuously declining average cost curves. The difference was due to traditional businesses needing to acquire assets and expand capacity to grow, whereas digital platform businesses needed to acquire more users for growth, entailing a near-zero cost. Third, digital platform businesses also had near-zero marginal distribution costs. After an app was developed, it could be simply copied and distributed.[[67]](#endnote-67)

These network effects had a positive impact on both consumers and vendors, but they also led to allegations of predatory business practices and winner-take-all behaviour[[68]](#endnote-68) because they imposed their terms and conditions on ecosystem partners, as one analyst explained:

While sellers feel squeezed, consumers may continue to benefit from better prices. This wards off scrutiny by regulators who are often looking for predatory pricing on the consumer side as evidence of antitrust practices. This is the dark side of winner-take-all platforms.[[69]](#endnote-69)

Other observers, however, felt that network effects did not restrict competition, nor did they present an insurmountable barrier to new competition.[[70]](#endnote-70)

Competition Commission of India and Antitrust

The Competition Commission of India (CCI) was India’s regulatory body for fostering competition in India and restricting anti-competitive practices under the *Competition Act, 2002*. An important objective of the CCI, covered under Section 4 of the *Competition Act, 2002*, was to prevent “abuse of dominance” by enterprises in their exercise of market or monopoly power, which was also known as having a dominant position. Dominance was determined by the enterprise’s economic strength in the relevant market that enabled it to “act independently of the market forces prevailing in the market” and to “affect its competitors, customers or the *relevant market* in its favour.”[[71]](#endnote-71) The relevant market to determine dominance could be a substitutable products market (for both goods and services) or a relevant geographical area. The level of concentration could be assessed by using the concentration ratio, which was based on the market share of the top five competitors, or by using the Herfindahl-Hirschman Index, which was based on the sum of squared market shares.[[72]](#endnote-72)

The CCI identified 10 factors of an enterprise as being responsible for dominance: (1) market share, which referred to the size and resources of the enterprise; (2) size and importance of competitors; (3) economic power of the enterprise; (4) vertical integration, where the enterprise owned the supply chain; (5) dependence of consumers on the enterprise; (6) extent of entry and exit barriers in the market; (7) countervailing buying power; (8) market structure and size of the market; (9) source of dominant position (i.e., how it was gained); and (10) social costs and obligations, as well as contribution to economic development by the enterprise enjoying a dominant position.[[73]](#endnote-73)

The CCI did not consider it a problem for an enterprise to occupy a dominant position within its relevant product or geographical market.[[74]](#endnote-74) The need for regulation arose only when the enterprise, or a group of enterprises, abused dominance through exclusion (e.g., by denying market access) or exploitation (e.g., by using predatory pricing). A dominant enterprise’s *exclusionary practices* constituted abuse of dominance if they were “directly or indirectly imposing unfair or discriminatory conditions in the purchase or sale of goods or services; limiting or restricting production of goods or provision of services or markets; denying market access in any manner.”[[75]](#endnote-75)

The CCI also applied an *essential facilities* *doctrine* to invoke abuse of dominance. The doctrine applied if a dominant enterprise controlled an essential infrastructure or facility that was necessary to access and compete in the market. If that infrastructure or facility was not easily reproducible in the short term or replaceable with other products and services, the dominant enterprise could not refuse to share it with its competitors at a reasonable cost (without sound justification). If the CCI deemed that this doctrine was being violated, it could order the dominant enterprise to share its facilities with competitors in downstream markets.[[76]](#endnote-76)

The CCI had the authority to direct enterprises found to be abusing their dominance to stop their practices. Its actions were seen as helping foster competition and also mitigating the societal loss caused by market power, which was theoretically referred to as *deadweight loss*.[[77]](#endnote-77)

**GOOGLE AND ANTITRUST LEGISLATIONS**

Google had been under antitrust scrutiny for a long time. It also had experienced a series of conflicts with antitrust regulatory authorities across the world, including the European Union, the United States, and Russia.[[78]](#endnote-78) In 2017, it reached a $7.8 million settlement with Russia’s Federal Antimonopoly Service in an antitrust case involving the bundling of Google’s search engine with the Android OS. The regulators ruled that Google had to actively provide users with a choice of different search engines, rather than simply making Google Search the default search engine. The ruling had the effect of overturning Google’s monopoly in the Russian market.[[79]](#endnote-79)

In March 2019, Google had to pay €1.49 billion[[80]](#endnote-80) for breaching European Union antitrust rules in a case involving abusive practices in online advertising.[[81]](#endnote-81) After the regulator’s decision, Google was required to allow users a choice of browser and search engine on their phones, rather than pre-installing Google’s own services.[[82]](#endnote-82) However, Google’s chief executive officer, Sundar Pichai, defended Google’s position:

Rapid innovation, wide choice, and falling prices are classic hallmarks of robust competition, and Android has enabled all of them. Today’s decision rejects the business model that supports Android, which has created more choice for everyone, not less.[[83]](#endnote-83)

Google’s goal was to expand its presence in India. In July 2020, the company invested $10 billion in Jio Platforms, India’s largest technology conglomerate, with a plan to begin producing its own, low-cost smartphones for the Indian market.[[84]](#endnote-84) However, the company soon faced three major antitrust challenges. In 2018, the CCI fined Google $21 million for “abuse of a dominant position in the market for online search through practices leading to ‘search bias’ and search manipulation, among others.”[[85]](#endnote-85) In 2019, the CCI initiated a probe against Google to investigate the misuse of its dominant position for preventing smartphone manufacturers from opting for other Android mobile operating systems. In May 2020, another complaint was raised against Google in India for abusing its dominant position to unfairly promote its mobile payments app, Google Pay, over that of competitors Paytm (backed by SoftBank Group Corp.) and PhonePe (backed by Walmart Inc).[[86]](#endnote-86)

Google’s conflicts with Indian start-ups was straining the technology giant’s relationship with app developers, who were actively working on an alternative app distribution service with lower fees. The developers were also taking their complaints to the CCI.[[87]](#endnote-87) Even the Indian government was contemplating launching a new app store as part of its *Atmanirbhar Bharat* vision to make the country self-reliant. The initiative would make it mandatory for all Android devices in India to have pre-installed the government’s app store (instead of Google Play). The government’s service would then support Indian start-ups and entrepreneurs without charging the Google commission fee of 30 per cent.[[88]](#endnote-88) Would this alternative platform, or the one being planned by Indian start-ups, succeed in reducing Google’s monopoly? Could Google defend its position of charging a high fee for “trust” while facing multiple antitrust allegations?

**EXHIBIT 1: MOBILE OPERATING SYSTEM MARKET SHARE WORLDWIDE AND IN INDIA, 2019–20**

|  | **Global Market Share (%)** | | **Indian Market Share (%)** | |
| --- | --- | --- | --- | --- |
| **Operating System** | **August 2019** | **August 2020** | **September 2019** | **September 2020** |
| Android | 76.23 | 74.25 | 94.2 | 95.85 |
| iOS | 22.17 | 25.15 | 2.62 | 3.24 |
| KaiOS | 0.59 | 0.08 | 2.08 | 0.53 |
| Samsung | 0.21 | 0.23 | 0.32 | 0.17 |
| Unknown | 0.26 | 0.13 | 0.09 | 0.03 |
| Windows | 0.2 | 0.03 | 0.13 | 0.01 |
| Nokia Unknown | 0.09 | 0.03 | 0.15 | 0.05 |
| Series 40 | 0.09 | 0.03 | 0.1 | 0.02 |
| Tizen | 0.07 | 0.02 | 0.24 | 0.08 |
| Linux | 0.03 | 0.02 | - | - |
| BlackBerry | 0.03 | 0.01 | - | - |
| Symbian | 0.02 | 0.01 | 0.03 | 0.00 |
| Other | 0.02 | 0.01 | 0.03 | 0.01 |

Source: “Mobile Operating System Market Share Worldwide, Aug 2019–Aug 2020,” StatCounter, accessed October 11, 2020, https://gs.statcounter.com/os-market-share/mobile/worldwide/#monthly-201908-202008; “Mobile Operating System Market Share India, Jan 2020–Jan 2021,” StatCounter, accessed October 11, 2020, https://gs.statcounter.com/os-market-share/mobile/india.

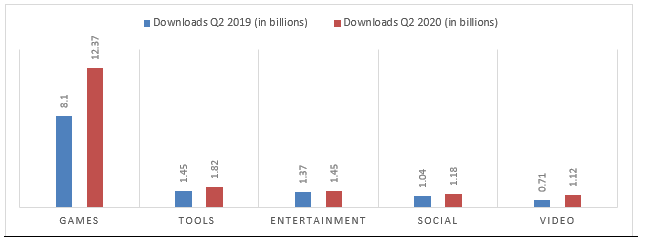
EXHIBIT 2: GLOBAL APP DOWNLOADS (PER YEAR) IN BILLIONS

| **Year** | **Google Play** | **Apple’s App Store** | **Total** | **Global Total  (Including Chinese Third-Party App Downloads)** |
| --- | --- | --- | --- | --- |
| 2016 | 57.8 | 26 | 83.8 | 140 |
| 2017 | 66.9 | 27.9 | 94.8 | 175 |
| 2018 | 75.5 | 29.8 | 105.3 | 194 |
| 2019 | 84.3 | 30.6 | 114.9 | 204 |
| H1 2020 | 52.3 | 18.3 | 70.6 | 64 |

Note: H1 = first half year; app = mobile application.

Source: Mansoor Iqbal, “App Download and Usage Statistics,” Business of Apps, October 9, 2020, accessed October 10, 2020, www.businessofapps.com/data/app-statistics.

EXHIBIT 3: Comparison of TOP GOOGLE PLAY STORE CATEGORIES for the   
Second Quarter of 2020 and 2019

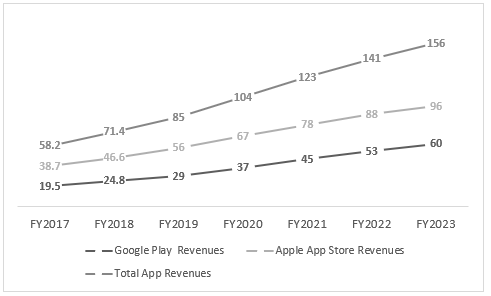


|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Date** | **Android** | **iOS** | **KaiOS** | **Samsung** | **Unknown** | **Windows** | **Nokia Unknown** | **Series 40** | **Tizen** | **Linux** | **BlackBerry** | **SymbianOS** | **Other** |
| 2019−08 | 76.23 | 22.17 | 0.59 | 0.21 | 0.26 | 0.2 | 0.09 | 0.09 | 0.07 | 0.03 | 0.03 | 0.02 | 0.02 |
| 2020−08 | 74.25 | 25.15 | 0.08 | 0.23 | 0.13 | 0.03 | 0.03 | 0.03 | 0.02 | 0.02 | 0.01 | 0.01 | 0.01 |

Note: Q2 = second quarter.

Source: Mansoor Iqbal, “App Download and Usage Statistics,” Business of Apps, October 9, 2020, accessed October 10, 2020, https://www.businessofapps.com/data/app-statistics.

EXHIBIT 4: GOOGLE PLAY AND APPLE’s App STORE REVENUES, 2018–2023



Note: FY = financial year; app = mobile application; user spending figures for 2019–2023 estimated assuming a compound annual growth rate of 16.8 per cent.

Source: Mansoor Iqbal, “App Revenue Statistics,” Business of Apps, July 30, 2020, accessed October 11, 2020, www.businessofapps.com/data/app-revenues.

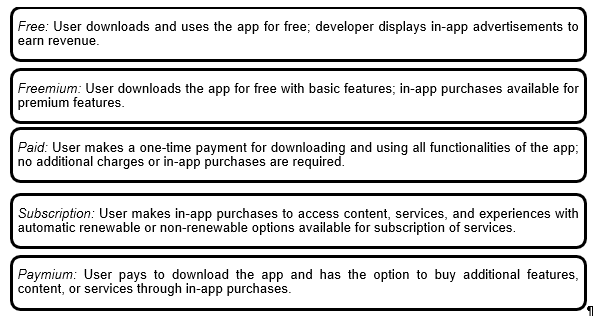
EXHIBIT 5: PROPORTION OF FREE Versus PAID Mobile APPlicationS ON GOOGLE PLAY

| **Month** | **Free Apps** | **Paid Apps** |
| --- | --- | --- |
| June 2019 | 95.6 | 4.4 |
| March 2020 | 96.3 | 3.7 |
| September 2020 | 96.5 | 3.5 |

Note: apps = mobile applications

Source: J. Clement, “Distribution of Free and Paid Android Apps in the Google Play Store as of September 2020,” Statista, September 25, 2020, accessed October 10, 2020, www.statista.com/statistics/266211/distribution-of-free-and-paid-android-apps.

EXHIBIT 6: BUSINESS MODEL Options Available to Mobile APPlication DEVELOPERS



Note: app = mobile application

Source: Adapted from “Choosing a Business Model,” Apple Inc., accessed October 9, 2020, https://developer.apple.com/app-store/business-models; Kamil Franek, “How Google Makes Money from Android: Business Model Explained,” Kamil Franek, accessed October 9, 2020, www.kamilfranek.com/how-google-makes-money-from-android.

EXHIBIT 7: Various APP MONETIZATION METHODS AND Their EFFECTIVENESS   
(According to Developer Perception)

|  |  |
| --- | --- |
| **Monetization Method** | **Effectiveness of Monetization  (Percentage of Respondents)** |
| Rewarded video advertisements | 75 |
| In-app purchases | 63 |
| Interstitial video advertisements | 44 |
| Playable advertisements | 32 |
| Interstitial display advertisements | 31 |
| Native advertisements | 26 |
| Banner display advertisements | 24 |
| Pre-roll video advertisements | 22 |
| Paid app downloads | 14 |
| Paid subscriptions | 14 |
| In-feed video advertisements | 13 |
| Affiliate programs | 6 |

Note: app = mobile application

Source: Mansoor Iqbal, “App Revenue Statistics,” Business of Apps, July 30, 2020, accessed October 11, 2020, www.businessofapps.com/data/app-revenues.

Endnotes

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