

How Large Is the Apple App Store Ecosystem?

A Global Perspective for 2019



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When Apple opened the App Store in July 2008, it was the first of its kind. With the App Store, Apple provides developers with distribution, search, and validation services, as well as a set of tools to build and monetize apps. Originally offering approximately 500 apps for the iPhone and iPod touch, the App Store has grown to distribute millions of apps for the full suite of Apple devices (iPhone, iPad, Apple TV, Mac laptops and desktops, and Apple Watch) in 175 countries. Cumulative downloads are in the hundreds of billions.¹

Earlier this year, Apple reported that earnings it has paid to app developers who sell digital goods and services through the App Store or within their apps totaled more than \$155 billion worldwide since 2008, with a quarter of those earnings paid in 2019. Such direct monetization through the App Store occurs through paid apps and digital content or services obtained using Apple's in-app payment system.

While such direct monetization of apps is substantial, it significantly underestimates the size of the Apple App Store ecosystem. This is because developers can choose to monetize their apps in different ways, including several that do not involve transacting directly through the App Store. These other monetization strategies include selling digital goods and services outside of the App Store that can be used within apps on Apple devices (such as streaming apps), selling physical goods and services (such as grocery delivery apps), and offering ad-supported content (such as social networking apps).

Study Goal

The goal of this study is to capture total billings and sales generated through app developers' various monetization strategies.² In other words, **our purpose is to estimate total billings and sales facilitated by the Apple App Store ecosystem.**³ Our study accounts for billings generated through direct monetization via the App Store and sales generated through monetization outside the App Store.⁴

Our analysis focuses on third-party iPhone and iPad apps⁵ in 2019, the most recent full year at the time this report was prepared. The coronavirus pandemic has dramatically impacted the mobile economy and the app ecosystem. More consumers are turning to apps to make purchases and to stay informed, connected, and entertained. While our primary results focus on 2019, we briefly discuss the pandemic's potential effects on the app ecosystem at the end of this report.

1 App Annie, *The Data Behind 10 Years of the iOS App Store*, 2018.

2 We use the term "billings" to refer specifically to payments generated by paid downloads and in-app purchases (including subscriptions) that use the Apple in-app payment system, and the term "sales" to refer to money spent by customers purchasing goods and services in general.

3 We use the term "facilitated" to include the various ways in which apps contribute toward generating billings and sales. We describe these different mechanisms for generating billings and sales below.

4 The following apps and associated billings and sales are excluded from this analysis: apps developed by Apple, such as Apple Music, and mobile browser apps such as Google Chrome or Safari.

5 Apple TV apps are also included in our estimates of usage and engagement for video streaming.

Results

We estimate that the Apple App Store ecosystem facilitated more than \$500 billion in billings and sales worldwide in 2019. More than 85% of that accrues solely to third parties. Table 1 shows that our estimated total of \$519 billion consists of \$61 billion from billings and sales of digital goods and services (12% of the total), \$413 billion from sales of physical goods and services through apps (80% of the total), and \$45 billion from in-app advertising (9% of the total).⁶ We consider these estimates to be conservative for reasons we describe later in this section.

The Apple App Store ecosystem facilitated more than \$500 billion in billings and sales worldwide in 2019.

One important methodological note is that our estimate for the category of digital goods and services is not the same as App Store billings (i.e., from paid downloads and in-app purchases, including subscriptions). As discussed in the methodology section, our estimate also includes the volume of sales from digital goods and services purchased elsewhere but used on apps on Apple devices, and, conversely, subtracts billings from in-app purchases made via the App Store but used elsewhere. For example, a subscription to a video streaming service may be purchased on a website but the majority of the consumption may happen on an app on an Apple device, or vice versa. Other examples include enterprise apps, which are frequently used on Apple devices but are typically paid for by corporations and institutions, rather than purchased via the App Store.

Table 1: Estimated Billings and Sales Facilitated by the Apple App Store Ecosystem Worldwide, 2019

| | Estimated Billings and Sales (\$ billion)* |
|--|---|
| Digital Goods and Services** | \$61 |
| Physical Goods and Services | \$413 |
| In-App Advertising | \$45 |
| Total Estimated Billings and Sales (\$ billion) | \$519 |

* Totals may not sum due to rounding.

** Estimated billings and sales from digital goods and services is not the same as total App Store billings. Our estimate also includes the volume of sales from digital goods and services purchased elsewhere but used on apps on Apple devices, and, conversely, subtracts billings from in-app purchases made via the App Store but used elsewhere. The estimate is based on a combination of third-party sources and Apple data. See methodology section.

⁶ We round all numbers in this report to the nearest billion dollars. Because of this rounding, individual numbers may not add up to the indicated totals, and individual percentages may not sum to 100%.

More than 85% of total billings and sales supported by the App Store ecosystem accrue solely to third parties.

Table 2 provides a more detailed breakdown of total estimated billings and sales for certain app categories. The three largest streams of sales from physical goods and services facilitated by the App Store ecosystem in 2019 were from general retail (\$268 billion), travel (\$57 billion), and ride hailing (\$40 billion), all of which are part of the substantial mobile commerce, or m-commerce, category. We estimate that in-app ad sales were \$20 billion for gaming apps and \$25 billion for non-gaming apps in 2019. Apple does not disclose disaggregated billings for digital goods and services. Therefore we do not break out total estimated billings and sales (\$61 billion in 2019) for this category.

Table 2: Estimated Billings and Sales Facilitated by the Apple App Store Ecosystem Worldwide, by App Categories, 2019

| | Estimated Billings and Sales (\$ billion)* |
|--|---|
| Digital Goods and Services** | \$61 |
| Includes: | |
| Games | |
| Video and Music Streaming | |
| E-books and Audiobooks, News and Magazines | |
| Dating Apps, Fitness, Photo and Video Editing | |
| Enterprise and Education | |
| Physical Goods and Services | \$413 |
| M-Commerce | |
| General Retail | \$268 |
| Travel | \$57 |
| Ride Hailing | \$40 |
| Food Delivery | \$31 |
| Grocery | \$14 |
| Digital Payment | \$4 |
| In-App Advertising | \$45 |
| Gaming | \$20 |
| Non-gaming | \$25 |
| Total Estimated Billings and Sales (\$ billion) | \$519 |

* Totals may not sum due to rounding.

** Estimated billings and sales from digital goods and services are not the same as total App Store billings. See methodology section. Apple does not disclose disaggregated billings for digital goods and services. Therefore we do not break out total estimated billings and sales for this category.

How Large Is the Apple App Store Ecosystem?

Table 3 breaks down the results in Table 2 by geography. We estimate that China accounted for \$246 billion, or 47%, of total global billings and sales facilitated by the App Store ecosystem in 2019, while the US accounted for \$138 billion, or 27%, of the global total. Europe, Japan, and the rest of the world accounted for 10%, 7%, and 9%, respectively, of the global total.

We see variation in estimated billings and sales by region. For example, China led the category of physical goods and services in 2019 (\$225 billion, or 54% of the total for the category), while the US accounted for most of the in-app ad sales in 2019 (\$23 billion, or 51% of the total for the category). China's large share in the physical goods and services category involves transactions that occur outside of the App Store, from which Apple gets no commission. This large share reflects the speed at which Chinese commerce has migrated to mobile commerce, on apps in particular, compared with the rest of the world.

Table 3: Estimated Billings and Sales Facilitated by the Apple App Store Ecosystem by Region and App Categories, 2019 (\$ Billion*)

| | US | China | Europe** | Japan | Rest of the World | Total Estimated Billings and Sales |
|--|--------------|--------------|-------------|-------------|-------------------|------------------------------------|
| Digital Goods and Services*** | \$22 | \$13 | \$6 | \$11 | \$9 | \$61 |
| Physical Goods and Services | \$93 | \$225 | \$39 | \$24 | \$32 | \$413 |
| M-Commerce | | | | | | |
| General Retail | \$44 | \$175 | \$22 | \$14 | \$13 | \$268 |
| Travel | \$16 | \$16 | \$10 | \$6 | \$9 | \$57 |
| Ride Hailing | \$23 | \$8 | \$4 | \$1 | \$5 | \$40 |
| Food Delivery | \$8 | \$16 | \$3 | \$1 | \$3 | \$31 |
| Grocery | \$2 | \$7 | \$1 | \$2 | \$1 | \$14 |
| Digital Payment | \$1 | \$3 | - | - | - | \$4 |
| In-App Advertising | \$23 | \$8 | \$6 | \$2 | \$6 | \$45 |
| Gaming | \$11 | \$4 | \$3 | \$1 | \$3 | \$20 |
| Non-gaming | \$13 | \$4 | \$3 | \$1 | \$3 | \$25 |
| Total Estimated Billings and Sales (\$ billion) | \$138 | \$246 | \$51 | \$37 | \$47 | \$519 |

* Totals may not sum due to rounding.

** Europe includes countries in Western, Central, and Eastern Europe (including the UK and Nordic Region). Russia is included in the Rest of the World category.

*** Estimated billings and sales from digital goods and services are not the same as total App Store billings.

While our analysis captures the major app monetization strategies in 2019, we do not capture *all* of the ways in which the App Store ecosystem facilitates sales or *all* of the benefits created by apps. For example, we do not include any benefits companies derive from providing free apps that work with, and improve, their products or services. These “companion apps” raise the value of the goods or services. Popular examples include banking and finance apps, airline apps, smart home apps (e.g., Nest, Ring), and health apps, among others. Nor do we take into account the role that apps have played in generating new markets and platforms for businesses, including in the financial sector, the benefits of mobile apps to businesses (e.g., lower costs or increased productivity), or the consumer surplus generated by apps (in particular, free apps).

Moreover, for the monetization strategies included in our analysis, we choose inputs and assumptions that tend to generate conservatively low estimates of the billings and sales facilitated by the App Store ecosystem. For all of these reasons, our results should be considered a lower bound on how much value was facilitated by the Apple App Store ecosystem in 2019. For context, Deloitte estimated the total app economy – including the Android platform – at \$340 billion in 2018 in the US alone. App Annie estimated that the global app economy, including all platforms, was worth \$1.3 trillion in 2016 and will grow to \$6.3 trillion in 2021.⁷

We consider our estimates to be conservative and a lower bound on how much value was facilitated by the App Store ecosystem in 2019.

Methodological Approach

To arrive at our results, we distinguish among three primary app monetization strategies that developers use:

- **The first monetization strategy is to sell and distribute digital goods and services.** Sales and distribution of digital goods and services can occur through the App Store in the form of paid app downloads and in-app purchases, or through the sale of digital content and subscriptions from multi-platform apps that allow for the use and consumption of the app both in the App Store ecosystem and elsewhere. Examples of apps using this monetization strategy include those for gaming, dating, video and music streaming, fitness and health, and news and magazines.
- **The second monetization strategy is to sell physical goods and services through the app.** Apps using this monetization strategy are mobile commerce apps generally, including apps for ride hailing, food delivery, grocery delivery and pickup, general retail, and travel, as well as digital payment apps.
- **The third monetization strategy is to sell in-app advertising.** Examples of apps using in-app advertising as their primary monetization strategy are social network and short video sharing apps.

We employ different methodologies to estimate billings and sales facilitated by the App Store ecosystem for each of these monetization strategies. In so doing, we rely on a variety of data sources, including data from Apple, app analytics companies, market research firms, and individual companies. To ensure the reliability and robustness of our estimates, we validate and compare key inputs from different data sources.

⁷ Both studies include the three major types of monetization: app stores, in-app advertising, and mobile commerce. Deloitte, *The App Economy in the United States*; App Annie, *The App Economy Forecast: \$6 Trillion in New Value*.

Sales and Distribution of Digital Goods and Services

Apps used to sell and distribute digital goods and services fall into two subcategories:

- Certain app developers choose to monetize their iOS apps only through the App Store, and those apps can only be used on the iOS platform.⁸ Most billings from these apps come from games, which involve a one-time payment or, more often, in-app payments that allow app users to remove ads, unlock bonus levels, or access premium features. This category also includes most photo-editing apps and dating apps, as well as apps for short video, weather, and others.
- Other apps allow for the consumption of digital goods and services both within the App Store ecosystem and elsewhere. These so-called **multi-platform apps** allow consumers to pay through either the App Store or another platform or device. In other words, consumers use non-device-specific subscriptions or purchases to enjoy the digital goods and services provided. Multi-platform apps can be further divided into consumer apps and enterprise apps.
 - **Consumer apps** typically offer paid digital content – such as movies, music, audiobooks, news, meditation courses, and fitness classes – that can be consumed within the app. Moreover, they may offer paid digital services obtained on the app, such as educational services, password management, job search, and access to job platforms.
 - **Enterprise apps** allow businesses and organizations to provide tools and capabilities through smartphones and tablets. Those include, among others, communication and collaboration apps, mobility management solutions, cloud-based business apps, and file hosting services. These apps usually make money by selling subscriptions to corporations and institutions outside of the App Store.

To distinguish between these two subcategories of apps, we manually review the most popular apps in each App Store category, focusing on their business models and monetization strategies. We use this information to ascertain (1) whether the app can be used on mobile or computer browsers or on a different app platform; and (2) whether an app on an Apple device can be used through a subscription or purchase made outside the App Store.

Methodology for iOS Apps That Sell Only Through the App Store

For iOS apps that sell digital goods and services only through the App Store, we count total billings, which include Apple's commission.⁹ We use billings because they represent the total amount customers pay.

8 Developers may also offer the same digital goods and services through apps on other platforms, such as Android.

9 Apple's commission rate is 30% for the sale of digital goods and services; for subscriptions, it is 30% for the first year and 15% for any subsequent years.

Methodology for Multi-Platform Apps

Background. For multi-platform apps, estimating the volume of sales facilitated by the App Store is complex because subscriptions and purchases associated with them are not device specific. The lack of device specificity creates a dual challenge:

- First, consumers can pay to access multi-platform digital goods and services in different ways, regardless of where they consume those goods and services. In some cases, consumers pay through the App Store, but sometimes they do not.
- Second, multi-platform apps allow users to access content and services across different devices, including non-Apple devices. For example, consumers can stream videos through smart TVs, smartphones, tablets, and web browsers, and across different platforms (Apple, Android, etc.).

Because of these two characteristics of multi-platform apps, billings that flow through the App Store are not necessarily a reliable indication of Apple users' engagement with multi-platform apps. Consequently, we must be deliberate about attributing the appropriate share of billings and sales to the App Store ecosystem.

Example. To illustrate these challenges, consider the video streaming service Hulu. The Hulu app is free to download, but a subscription is necessary to watch content on the iPhone, iPad, and Apple TV apps. A Hulu subscription can be purchased in one of two ways:

- Through the Hulu app on an Apple device, in which case the purchase happens through the App Store. But a subscription purchased through the App Store can also be used to watch Hulu on other platforms. Consequently, it would be incorrect to attribute all of the App Store billings (the full subscription amount) to the App Store ecosystem, because it would overstate the value of the Hulu product enjoyed on Apple devices specifically.
- Outside of the app (on a Mac or PC via web browser, for example), in which case the purchase does not happen through the App Store, and there are no App Store billings. However, the subscription can be used to watch content on Hulu using apps on Apple devices. Consequently, it would be incorrect to use the App Store billings (which are zero) as an input to our App Store ecosystem results, because it would understate the value of the Hulu product enjoyed through apps on Apple devices.

Methodology. To address these challenges, we generally do not rely on App Store billings for multi-platform apps. Instead, we rely on the proportion of use that occurs on apps in the App Store ecosystem to estimate how much of the total sales of multi-platform apps (App Store plus non-App Store) is facilitated by the App Store ecosystem.

Consider, for example, not just Hulu but the entire video streaming industry, a market with nearly \$20 billion in total annual sales in the US.¹⁰ Users consume video streaming content over a mix of smartphone apps, tablet apps, desktop browsers, smart TVs, cable boxes, and video game consoles. To estimate the volume of sales facilitated by the App Store ecosystem, we first take the portion of hours streamed on smartphone apps, tablet apps, and smart TVs of all types. We then apportion this share to Apple devices specifically using the Apple market share for each device category.

Using this framework and approach, we estimate the volume of sales facilitated by the Apple App Store ecosystem for several categories of apps offering similar types of goods and services. The app categories for which we estimate sales facilitated by the App Store are video and music streaming, e-books and audiobooks, news and magazines, and enterprise. We use third-party research to account for the variation in users' app consumption habits across categories and countries. For example, consumers often listen to music and audiobooks through apps on mobile devices, while they are more likely to stream videos on smart TVs and read e-books on e-readers. Those consumption habits may also vary by geography. Additionally, when the data are available, we take into account any variation in the consumption patterns of iOS (and non-iOS) users by app type and geography.

For each app category, we estimate total sales by geography relying on inputs from third-party sources, typically market research firms.¹¹ We then apportion those sales using the share of content consumed on apps on any platform by geography, based on information collected from marketing surveys or data on usage patterns.¹² Finally, we apportion usage to Apple devices specifically using the Apple market share for each device category in each geography.¹³

We use a more tailored approach for enterprise apps for a number of reasons. First, usage patterns are more heterogeneous for enterprise apps. Second, app-based usage and desktop-based usage of enterprise products tend to be more integrated. Third, the pricing of enterprise products is less transparent and more complex than for consumer apps. With these complexities in mind, we individually estimate sales from 10 major apps or families of apps, including Microsoft Office 365, G Suite (i.e., enterprise versions of Google productivity tools such as Gmail and Google Docs), Adobe (Acrobat), Box, Zoom, and Slack. We also include an aggregate market-level estimate for mobility management apps, which allow employees to securely access business content.

Finally, for some categories of apps, we use billings from the App Store as a proxy for sales facilitated by the App Store ecosystem. We do this for categories of apps, such as

10 eMarketer.

11 Statista Digital Market Outlook, eMarketer, iResearch, and other market research.

12 Company press releases, Comscore, and marketing surveys (e.g., The NPD Group, GlobalWebIndex).

13 StatCounter, Kantar.

meditation or fitness apps, for which consumers typically consume the content within the app, but may purchase it outside of the App Store. This methodology likely results in a conservative (or lower) estimate compared with an estimate relying on usage-based apportionment.

Additional Dimensions Not Included in Our Estimates

In addition to providing an outlet for users to consume digital goods and services, the App Store has also made it generally easier for consumers to sign up for subscriptions through what App Annie described as “the App Store’s simple, frictionless and secure payment channel,” in particular for smaller apps.¹⁴ Making it easier and more secure to sign up for new subscriptions or make purchases may lead to incremental sales for app developers – regardless of the platform chosen by users to consume the digital goods and services.

Sales of Physical Goods and Services Through the App

Many developers monetize their apps by selling physical products through their apps. These include:

- Apps that let customers **purchase physical goods and services**. We broadly refer to these as m-commerce apps. The group includes apps for general retail, ride hailing, food delivery, grocery delivery and pickup, and travel.
- Apps that enable **digital payments or transfers**, such as mobile point-of-sale apps that rely on QR codes and peer-to-peer transfer apps.

M-Commerce

Globally, mobile apps are an increasingly important e-commerce channel due to their convenience. This growth has been most pronounced in China, the leader in m-commerce.¹⁵ Apps of retailers such as Amazon and Target allow consumers to browse and purchase physical goods directly in the app, and offer in-store pickup or delivery. In addition, mobile apps – including those for ride hailing, food delivery, grocery delivery and pickup, and mobile pickup ordering – have been central to the creation or expansion of certain business models.

Sales on m-commerce apps do not flow through the App Store.¹⁶ We therefore use third-party data to estimate the volume of sales of physical goods and services from transactions on mobile apps.¹⁷ We provide results for several categories of apps. The list of app categories and estimated sales is presented in Table 2.

14 App Annie, *The State of Mobile 2019*.

15 In China, about 80% of online retail is mobile. Additionally, most mobile commerce occurs through apps and to a lesser – but increasing – extent through “mini-programs” on platforms such as WeChat, Baidu, and Alipay. See: eMarketer; *China Mobile Internet 2019 Half Year Report*, QuestMobile; *2019 Mini-Programs White Papers*, Aladdin, January 2, 2020.

16 Since the launch of the App Store, Apple’s policy has been not to charge a commission on sales of physical goods and services or advertising.

17 The sales associated with purchases made on mobile browser apps are excluded.

For each app category, we estimate the total volume of e-commerce or m-commerce sales by geography, relying on estimates of third-party sources, typically market research firms.¹⁸ We then apportion the volume of sales, if necessary, to purchases that occur via smartphone and tablet apps. For example, for online food delivery, customers may place orders via an app, a mobile browser, or a desktop browser. We estimate the share of each app category's sales that occur via mobile apps, within each geography, using information collected from marketing surveys or data on usage patterns.¹⁹ Finally, we apportion usage to Apple platforms based on the overall iOS share of spend in each region where available, or based on the overall iOS market share elsewhere.^{20,21}

Digital Payments

Digital payment apps have become increasingly popular worldwide, although the landscape differs substantially across countries. In China, currently the largest market for digital payments, two QR code-based payment apps, Alipay and WeChat Pay, dominate both online and brick-and-mortar points of sales. These apps charge merchants a fee on purchases paid for with their apps. In the US, app-based payment systems are a relatively nascent market,²² while peer-to-peer transfer apps such as Venmo and Cash App are already popular.

We estimate the transaction fees collected by developers from customers or merchants for payments and transfers occurring through apps on the iOS platform.²³ For QR code-based payment apps in China, we start with an estimate of total payment volume (TPV) from a third-party research firm.²⁴ We then estimate WeChat Pay and Alipay total transaction fees using their published fee rates and deductible policies. For peer-to-peer transfer apps in the US, we use the ratio of total transaction fees to TPV from Venmo and Cash App to estimate the transaction fees collected by the apps. Finally, we apportion usage to Apple platforms based on data on the overall iOS share in each region.²⁵

In-App Advertising

In-app advertising is a frequently used and effective method of monetizing apps whereby developers publish advertisements within their apps. Prominent examples of apps that primarily make money through in-app advertising are Facebook, Instagram, Twitter, YouTube, Pinterest, and TikTok. Examples of games are Rolly Vortex and Helix Jump.

18 Statista, eMarketer, iResearch, and Analysys, among others.

19 Research and marketing surveys conducted by firms such as Comscore, The NPD Group, Aladdin, QuestMobile, and JD.com.

20 Apportioning by iOS market share almost certainly results in a conservative estimate because owners of iOS devices tend to spend relatively more than owners of Android devices. (See, e.g., Comscore.)

21 Comscore, Kantar, StatCounter.

22 Dmitriy (Jim) Kolchin, "Council Post: Why the US Still Lags Behind China in Mobile Wallet Adoption," *Forbes*, September 27, 2019.

23 Our study excludes digital payment apps and services based on near-field communication (NFC), such as Apple Pay. Mobile commerce transactions that occur within an app and are paid with Apple Pay are included in m-commerce sales.

24 iResearch.

25 StatCounter, Kantar.

These apps tend to be free to download and use, but in-app advertising can also be a complementary monetization strategy for paid apps or apps with in-app purchases.

Users have been spending more and more time on their mobile devices, particularly using apps, which has led to an increased share of digital marketing expenditures going toward in-app advertising. Given that apps are used frequently throughout the day, for example, during commutes or moments of downtime, in-app advertising allows advertisers to reach users in ways that other marketing channels cannot. Compared with mobile web, the app environment is a more effective way for advertisers to reach their audiences, with in-app advertisements allowing for personalized and contextually relevant ad messages.

Technology research firm Omdia estimated that in-app ad sales for iOS apps²⁶ were \$45 billion in 2019, with \$20 billion (45%) tied to gaming apps.²⁷ Omdia derived this estimate based on ad sales reported by large digital advertising firms, and then used data analytics from mobile ad platforms to apportion the iOS share, limited to in-app advertising only (i.e., by removing mobile web advertising), and to adjust for ad price differences between the iOS and Android app platforms. We use Omdia's research in this study.

The Impact of the Coronavirus Pandemic on the App Ecosystem

Our estimate of total billings and sales facilitated by the App Store ecosystem in 2019 is a snapshot in time and does not account for the dramatic impact of the coronavirus pandemic on the mobile economy and the app ecosystem.

With widespread social distancing around the globe, more consumers are turning to mobile to make purchases and to stay informed, connected, and entertained. Many companies and their employees have had to adjust to working from home, while universities, schools, and students have switched to remote teaching and learning. During this time, app downloads, usage, billings, and sales have seen an overall surge. Some of the more pronounced changes are:²⁸

- Increased use of educational and business collaboration apps.
- Massive growth in demand for food and grocery delivery, in addition to a shift toward mobile pickup ordering.
- Growing use of health and fitness apps for such activities as home exercise and meditation.
- Increased consumer spending on mobile gaming.
- Increased use of video streaming apps.
- Increased popularity of social apps, which are filling the void felt during social isolation.

26 This estimate does not include advertising on mobile web (including mobile browser apps), or search advertising.

27 Omdia, *App Ecosystems Forecast 2019–2024*.

28 App Annie, *The Impact of Coronavirus on the Mobile Economy*, April 2020.

However, downloads, usage, billings, and sales for certain apps have been negatively affected by the pandemic. For example, the use of apps related to businesses that have faced restrictions or closure (e.g., airline travel, hotels, restaurants) or those that require in-person interactions (e.g., ride hailing) has seen a sharp drop-off. Spending on digital advertising also fell sharply as the pandemic wreaked havoc on the economy.

Some changes in consumer behavior caused by the pandemic will be temporary, while others may be permanent. While the purpose of this study is not to project how the app economy will look during and after the pandemic, many trends observed in early 2020, such as increased remote work and learning and growing mobile commerce (e.g., grocery delivery and pickup), are likely to persist.

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Analysis Group is one of the largest international economics consulting firms, with more than 1,000 professionals across 14 offices in North America, Europe, and Asia. Since 1981, Analysis Group has provided expertise in economics, finance, health care analytics, and strategy to top law firms, Fortune Global 500 companies, and government agencies worldwide.

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