



# App Annie Mobile App Forecast: The Path to \$100 Billion

RESEARCH & ANALYSIS



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## RESEARCH & ANALYSIS

# KEY FINDINGS

- Global mobile app store gross revenue will grow to \$51 billion in 2016 and exceed \$101 billion in 2020. Growth will be largely driven by two factors: strong app adoption in developing economies across the globe and mobile apps' ability to capture greater wallet share in mature economies.
- Global mobile app store downloads will reach 284 billion in 2020, as the global installed base more than doubles between 2015 and 2020. Much of the growth will be driven by smartphone adoption in emerging markets.
- Mature markets like the United States are in the midst of a shift from a download growth phase to one that is characterized by strong growth in app usage and resulting revenue expansion.
- The iOS App Store will retain gross revenue leadership until 2017, at which point the combination of Google Play and third-party Android store revenue will surpass it due to the wider proliferation of Android devices.
- While games revenue will dominate through the forecast period, revenue for apps excluding games will exceed 2015 levels more than 4x by 2020, accounting for over 25% of all app store spend. Time spent in apps from categories like Social, Shopping and Transportation strongly suggests that advertising and commerce will form a significant proportion of economic activity in the app ecosystem beyond the \$101 billion we are projecting in store sales.



# Introduction





# Apps: The Primary Interface

Apps have become the primary way we engage with media, brands and ultimately with each other. They are the digital interface through which we live, work and play. As a result, the strategic importance of the app market spans well beyond gaming and media industries. Now all companies need to view themselves as app publishers irrespective of their mobile strategy. Apps drive engagement and brand loyalty and can be monetized directly through app stores, advertising, commerce or any combination of the above.

Apps will become even more important in the coming years as the installed base of smartphones and tablets is expected to more than double from 2.6 billion in 2015 to 6.2 billion in 2020. This growth will primarily come from smartphone adoption in emerging markets, as prices continue to fall to feature phone levels.

Smartphone sales in developed economies like the United States, United Kingdom and South Korea will primarily be driven by replacements, with some installed base expansion at lower income levels of the population.

While smartphone sales continue to climb, tablet adoption has been decelerating. This is largely because large-screen smartphones have cannibalized many tablet use cases. Platform owners are now targeting enterprises with even larger-screened devices like Apple's iPad Pro, Microsoft's Surface Pro and Google's Pixel C to offset declines in consumer sales.

Meanwhile, emerging markets exhibit widely varying levels of maturity. China, for example, is a tale of two markets. Its first- and second-tier cities, like Beijing and Chengdu, are roughly as saturated as mature

markets, but other regions within the country have significant growth potential. Mexico, Brazil, Turkey, Indonesia, China and especially India are poised for some of the strongest growth over the next five years. In the years ahead, billions of new smartphone owners in these emerging markets will join the app ecosystem. This opens up a huge opportunity for developers to target unmet needs and create whole new markets.

# Usage Is the New Currency: Apps Are Eating the Web

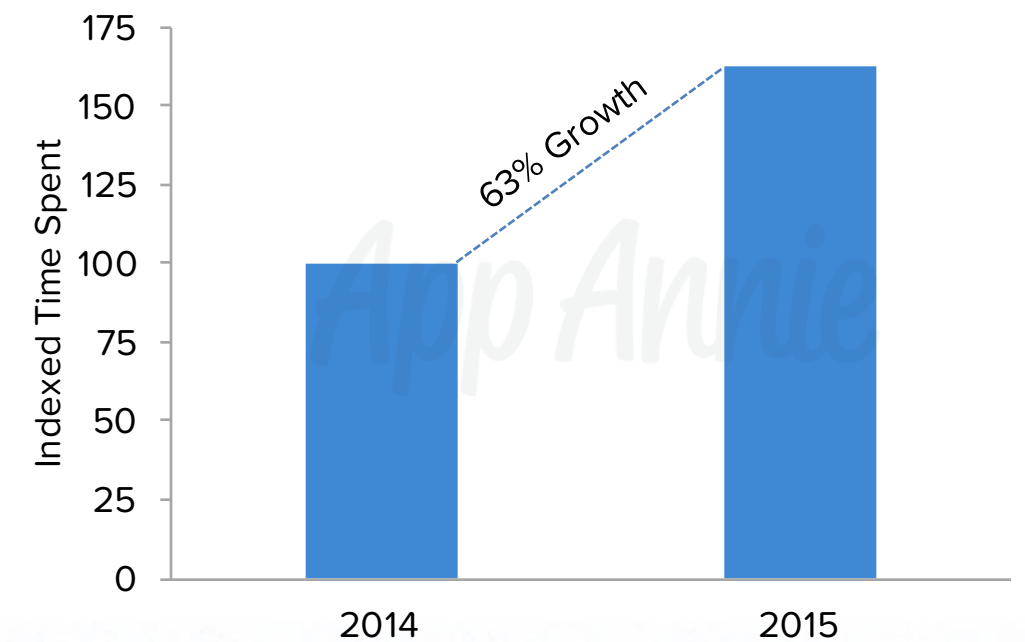
Apps are increasingly becoming the go-to resource for communication, entertainment, shopping and productivity. As a result, the time consumers spend on their mobile devices has exploded. Globally, total time spent in apps grew by 63% on Android phones from 2014 to 2015 according to App Annie's [Usage Intelligence](#). This dramatic shift is a result of enhanced services and engaging interfaces developed for the app ecosystem.

Apps have not only subsumed the delivery of online services but have done so in a way that delivers value and delights users. For example, online dating has existed for years, but the simple mechanism of a swipe made [Tinder](#) a cultural phenomenon. Equally important, apps leverage amazing technology advancements. These include a multitude of sensors unique to this highly personal, nearly always-on

“appendage device” used in ways that were never possible with the PC.

The app market shows signs of being incredibly resilient despite macroeconomic pressures. For example, despite a domestic economic downturn, app revenue in Brazil will grow more than 40% this year. That said, this year's growth is somewhat muted given macroeconomic factors related to commodities and energy prices being pushed to exceptionally low levels. These have had a limited, yet adverse impact on the overall market growth. While global GDP growth will remain weak into 2017, we nonetheless expect mobile app demand and usage to flourish. In doing so, apps will capture a greater percentage of consumer spending and deliver stronger store revenue growth during that period.

**Total Time Spent in Apps**  
Worldwide\*, Android Phones

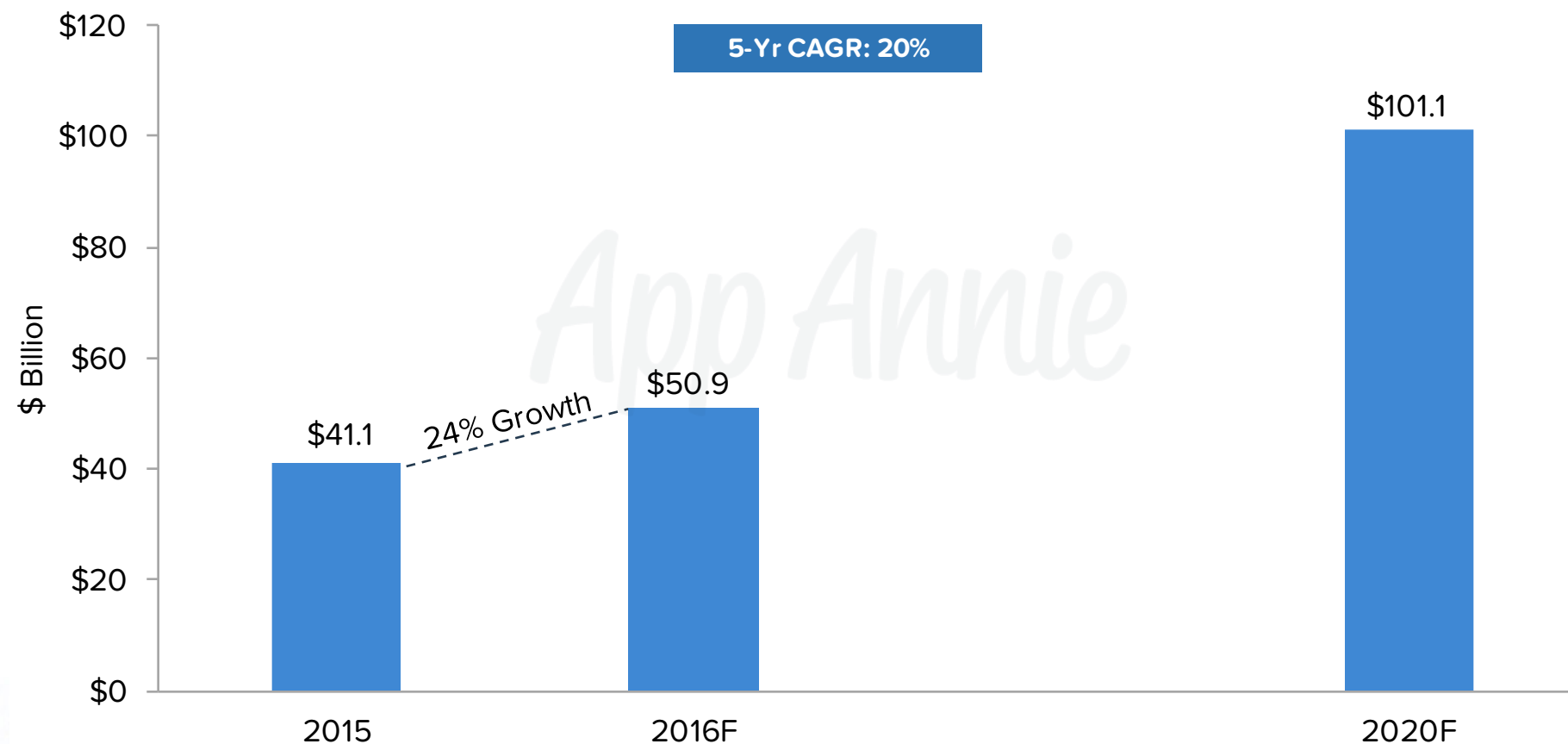


\*Excludes China



# App Store Consumer Spend to Exceed \$100 Billion in 2020

**Mobile App Forecast – Annual Gross Revenue**  
Worldwide, in Billions

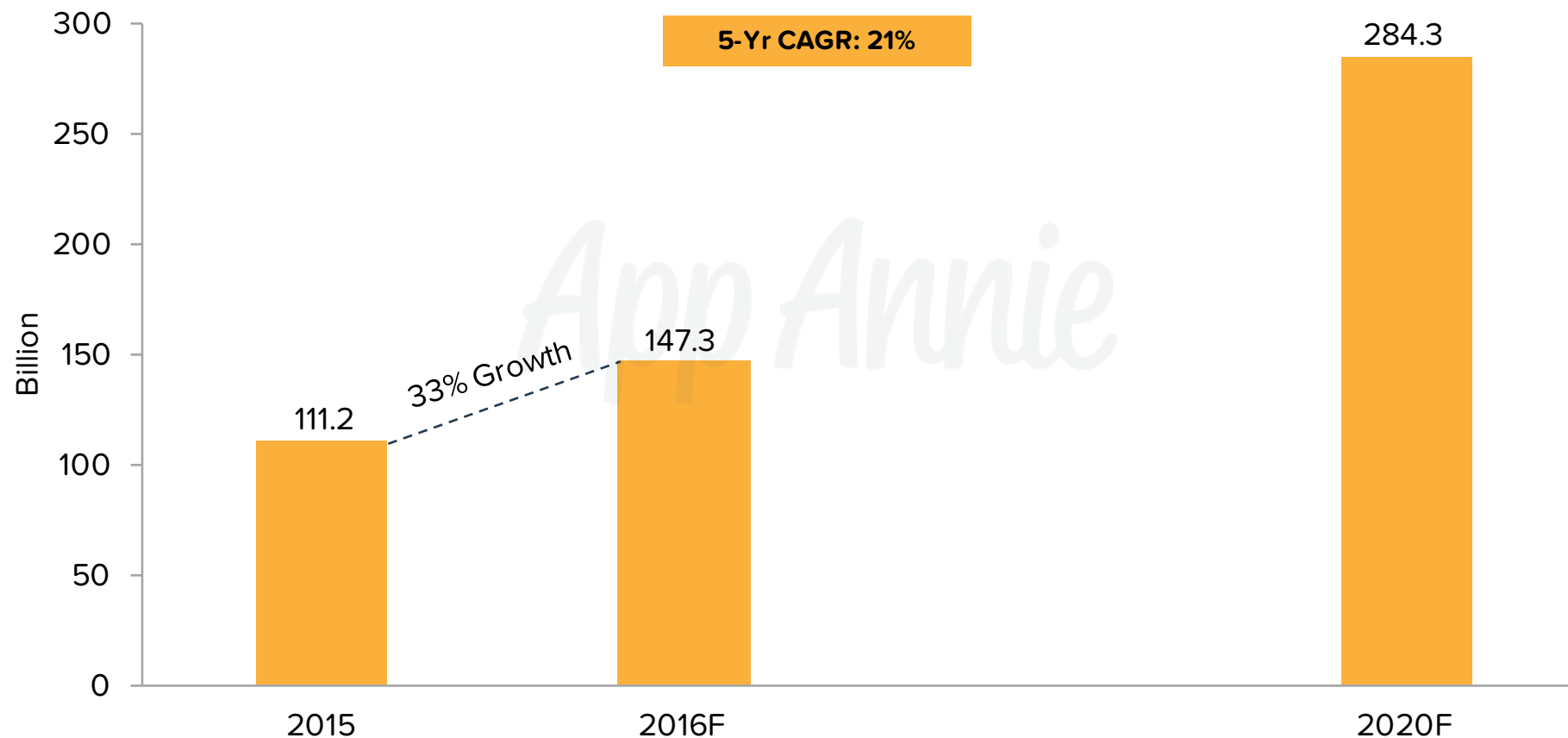


As apps deliver more value to users and device penetration rises, we forecast consumer spend on app stores (gross app revenue) to grow by 24% to \$50.9 billion in 2016 and reach \$101.1 billion in 2020. And even beyond the store revenue for mobile apps included in this report, there will be explosive growth in mobile commerce and advertising revenue. There will also be a growing contribution from apps as they expand into new platforms, namely wearables, TVs, virtual and augmented reality (VR and AR), home Internet of Things (IoT) and automotive.

**Global mobile app store revenue is expected to grow by 24% to \$50.9 billion in 2016.**

# App Store Downloads to Exceed 284 Billion in 2020

**Mobile App Forecast – Annual Downloads**  
Worldwide, in Billions



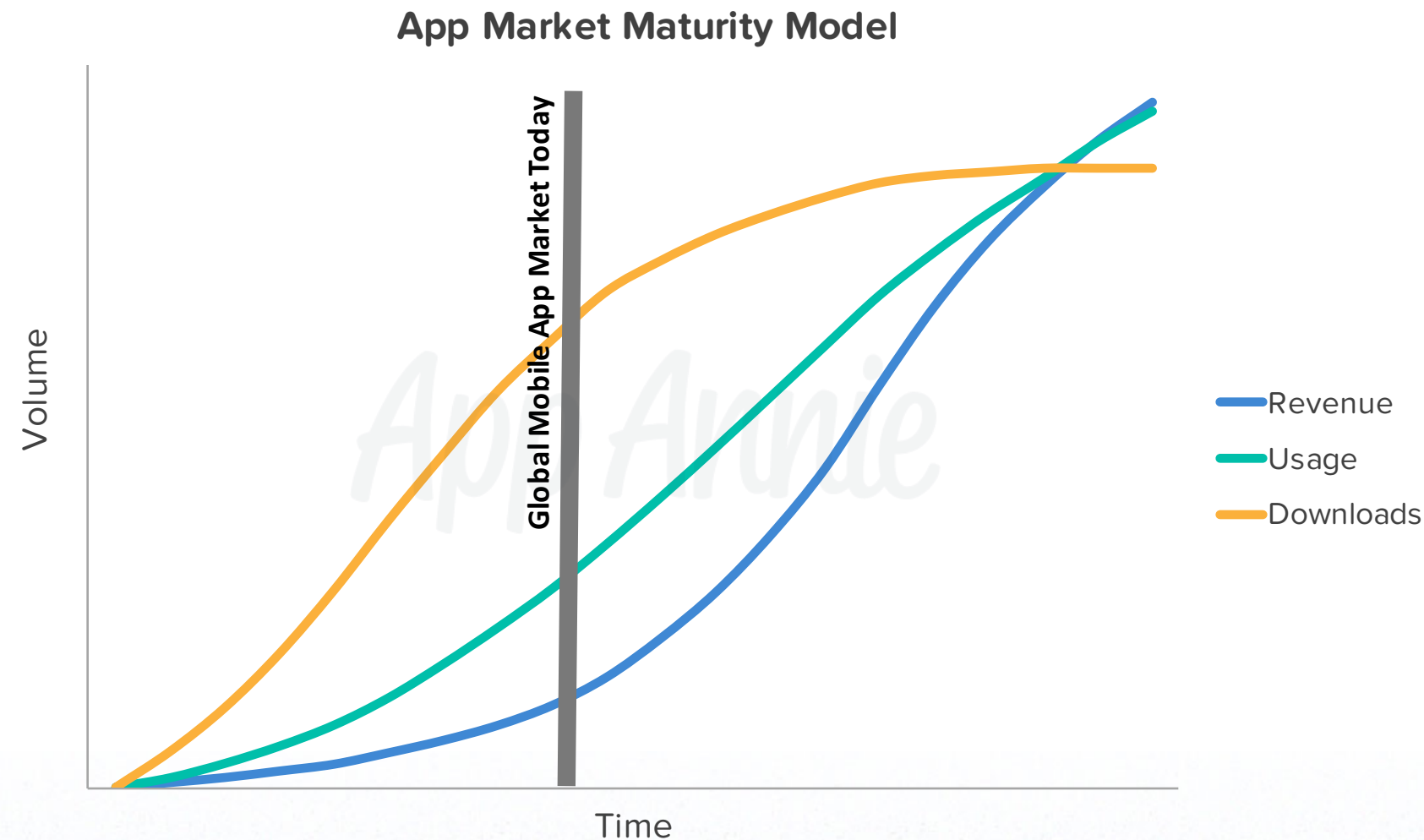
We forecast app store downloads to grow 33% to 147.3 billion in 2016 and reach 284.3 billion in 2020 as smartphones continue to proliferate in emerging markets and reach ever-growing numbers of first-time mobile app users. Much of this growth will be a function of developers tapping into latent needs unique to each region.

China drives the most downloads of any country — roughly one out of every three — and we expect it to remain the greatest contributor to downloads through 2020, even as India's app store downloads soar.

**Global app store downloads are expected to grow by 33% to 147.3 billion in 2016.**



# The App Market Maturity Model: The Relationship Between Downloads, Usage and Revenue



Before getting into the details of this forecast, it is important to understand how the app market develops over time and the relationship between downloads, usage and revenue. This chart shows the relative relationship between these metrics.

The initial adoption of devices ushers in the golden age of app store downloads. Users are in an exploratory mode and have not yet established “app habits” — relatively predictable usage of a core set of apps — so they explore, search, download and repeat at a much higher frequency than a user that has owned a smartphone for several years. Once installation of an app occurs, active users emerge and over time those “app habits” develop. As users become more engaged with a subset of the apps they have downloaded, many begin to spend money on unlocking premium features (through in-app virtual goods or subscriptions) that then drives revenue growth.

As markets begin to mature, the number of *net new* smartphone users exposed to the app ecosystem decreases, resulting in a slowdown and eventual flattening of downloads. This is likely more acute when users remain with the same platform as they upgrade. However, cumulative downloads and app usage continue to grow, resulting in revenue expansion. This pattern causes downloads, usage and revenue to be out of phase with each other, with downloads growing faster earlier on, followed by usage and finally revenue. Therefore, rather than signaling a peak in overall app market, declining or flattening downloads point to a maturing market, where app usage and revenue are on the rise.

We see this pattern across countries, but with different magnitudes of downloads, usage and revenue depending on market characteristics (population, disposable income, etc.). Mature markets like the US and Japan are to the right of the vertical line in the maturity model, with download growth slowing, but with growing usage and revenue. Early emerging markets like India are typically far to the left side of the vertical line, with rapidly growing downloads, more modest usage increases and low revenue. We note that our model projects a slowing of download growth, but no country is forecast to see contraction of mobile app downloads through 2020.





# App Annie Mobile App Forecast

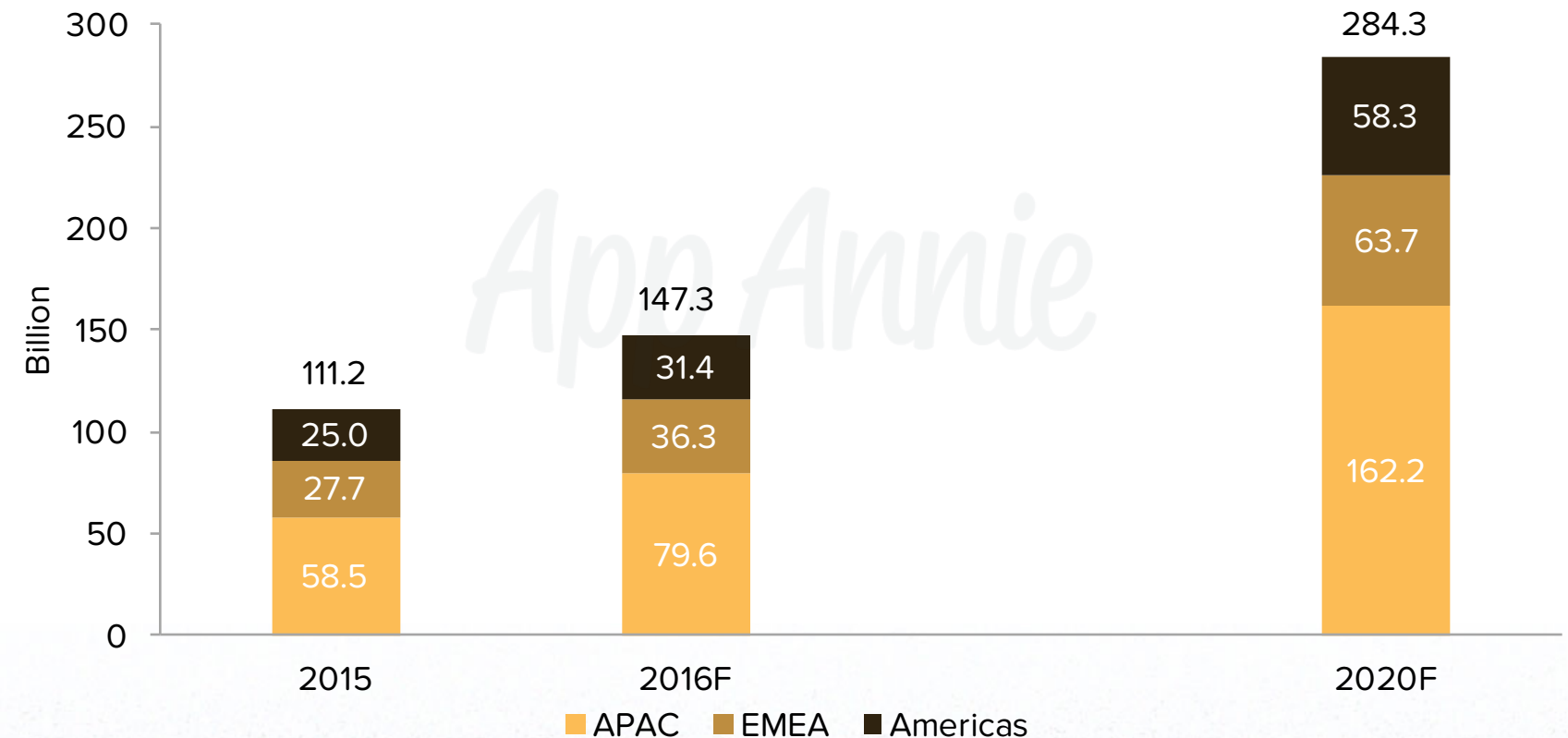


## Apps Are Global: Emerging Markets Drive Growth, Yet Mature Markets Remain Strong

We expect download growth to follow installed base growth as first-time smartphone users are introduced to the app ecosystem. As a result, global app store downloads will grow from 111.2 billion in 2015 to 284.3 billion in 2020.

Much of this growth will be driven by emerging markets as experienced smartphone users in developed countries settle on their go-to apps. We expect these mainstays to include both globally popular and locally developed apps. India will be a significant contributor to download growth thanks to the influx of capable smartphones priced below \$50, boosting smartphone adoption.

**Mobile App Forecast – Annual Downloads**  
By Region, in Billions



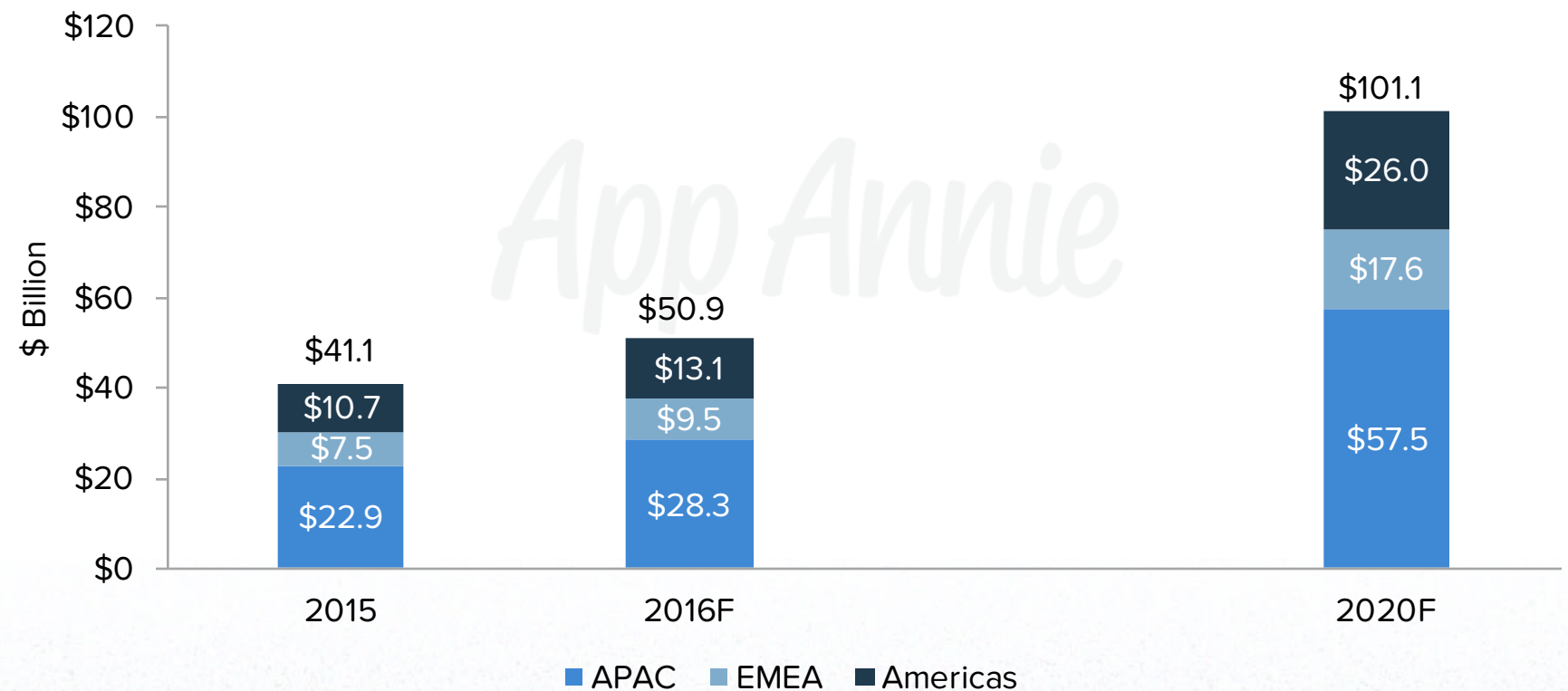


Global revenue will grow to \$101.1 billion by 2020, a nearly 20% compound annual growth rate (CAGR) from 2015. Revenue in the Americas and EMEA will nearly double over the next five years from 2016 levels, but both will be outpaced by the growth in APAC. We forecast that APAC will grow to \$57.5 billion in 2020 with China driving more than half the revenue in the region by the end of the forecast period.

Revenue generated per device will grow from \$15.42 in 2015 to \$16.22 in 2020, with growth being driven by existing smartphone users in mature markets. And even though new smartphone owners will generally come from lower income brackets, mobile will continue to capture more and more of consumers' share of wallet, driving revenue per device up in the Americas, EMEA and globally. Meanwhile, revenue per device in APAC will see a small decline from 2015 to 2020 as less affluent users in India, Malaysia and Indonesia balance results from Japan and China.

**App revenue in APAC is expected to grow 2.5x to \$57.5 billion from 2015 to 2020, with China already leading app store monetization in the region.**

**Mobile App Forecast – Annual Gross Revenue**  
By Region, in Billions

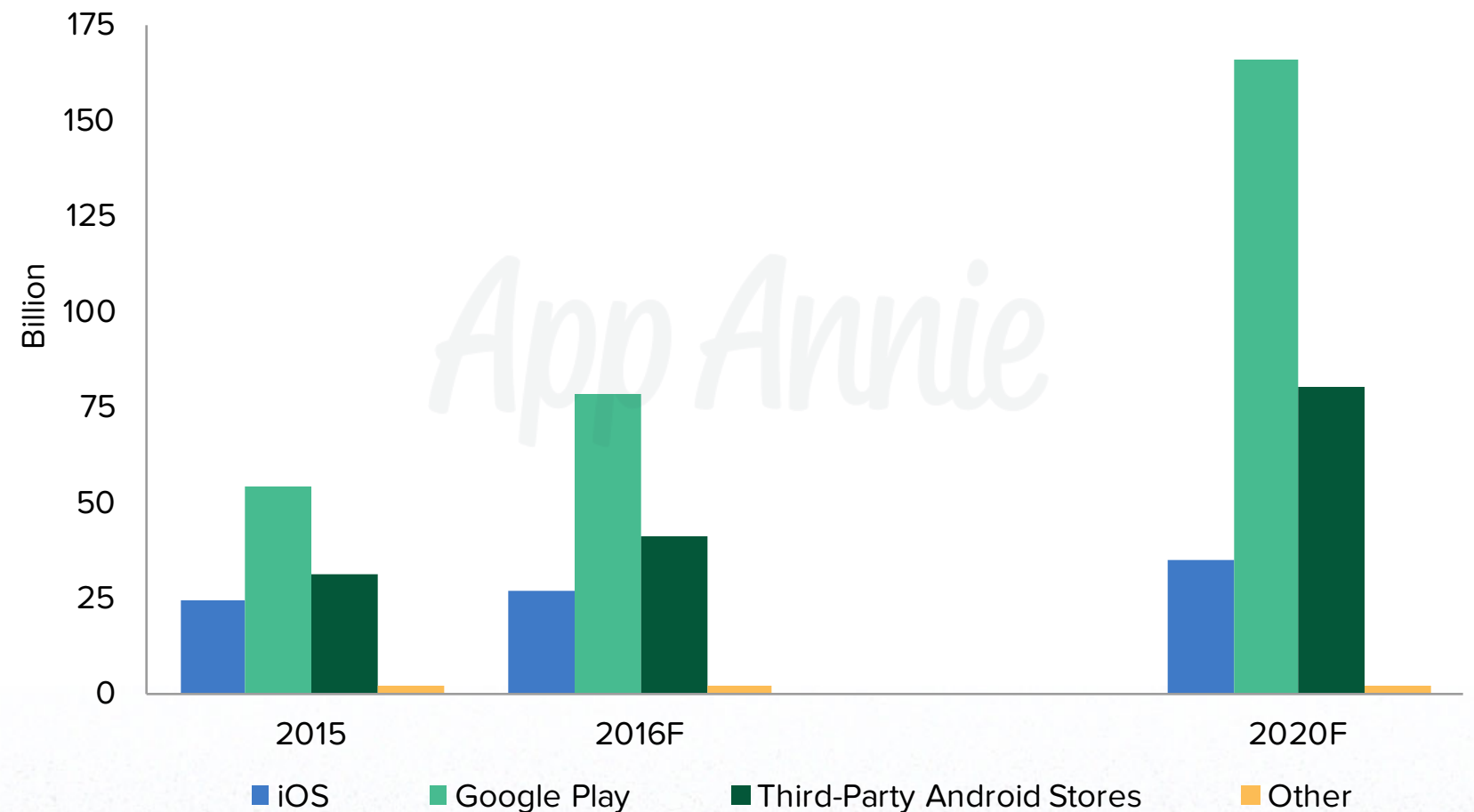


## App Store Downloads: Google Play Leads Through 2020, While Third-Party Android Expands 160%

App downloads are set to grow on all major platforms through the duration of our forecast — but with very different trajectories. As we mentioned earlier in this report, this disparity is a function of the relative maturity of each platform's core markets. Google Play will be the primary driver of global growth as its downloads are set to more than triple from 2015 and reach 166.4 billion in 2020. The vast majority of this growth will be driven by rapidly growing smartphone adoption in underpenetrated emerging markets like India, Mexico, Brazil and Indonesia.

Meanwhile, we expect iOS downloads to grow 46% to 35.2 billion over the same time period as key Western markets and tier-one and tier-two cities in China begin to mature. App downloads on third-party Android stores are set to grow by 158% to 80.3 billion, mostly because of growth in China as lower-tier cities continue to adopt Android smartphones.

**Mobile App Forecast – Annual Downloads**  
By Store, in Billions





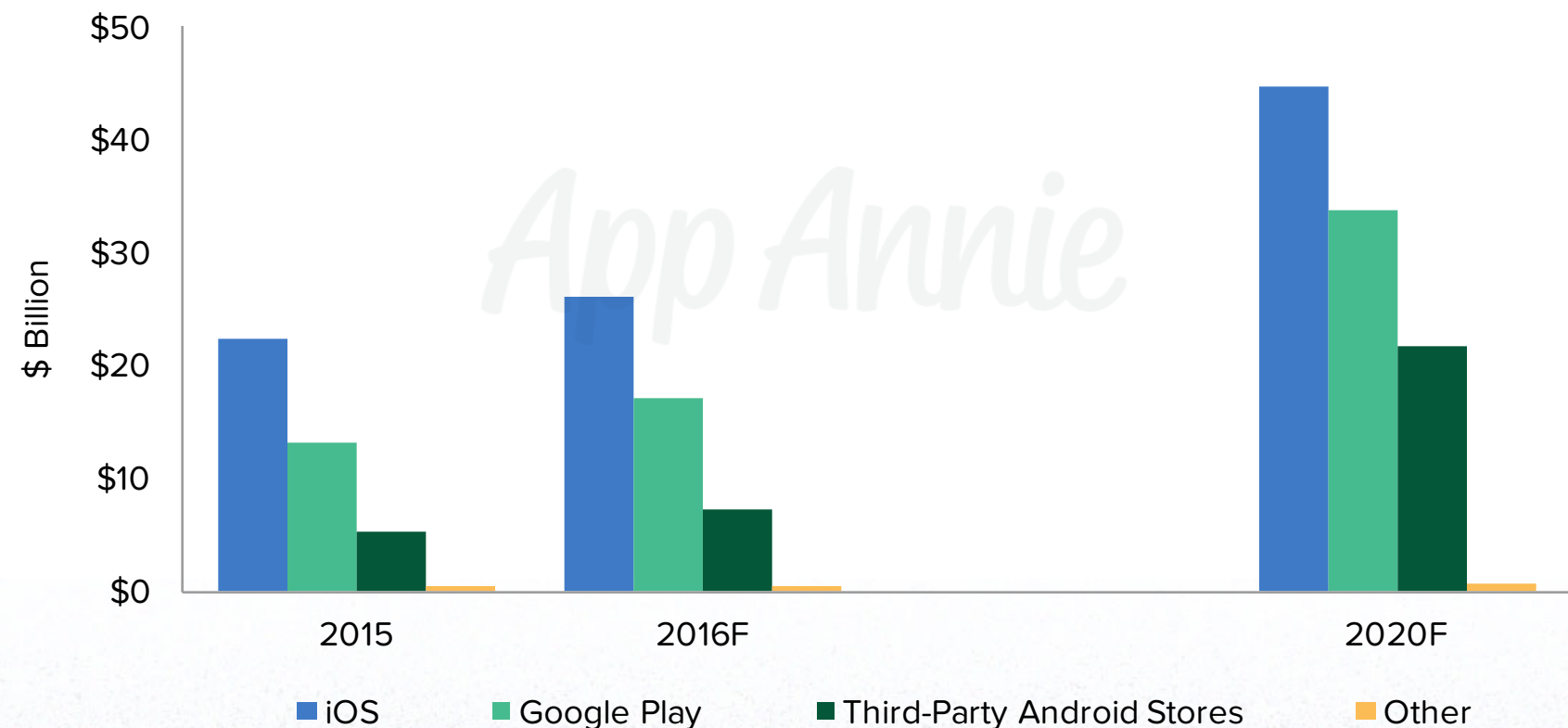
# App Store Revenue: iOS Retains Top Spot for a Single Store While All Android Stores Combined Surpass It in 2017

On the revenue side, we expect the iOS App Store to remain the highest-grossing store through 2020, doubling from 2015 to reach \$44.8 billion. However, Google Play and third-party Android stores will experience stronger growth during this timeframe, with combined revenue growing from \$18.3 billion in 2015 to \$55.7 billion in 2020.

The Chinese app store market remains highly fragmented with many dozens of third-party Android stores. While we expect some consolidation over the forecast period, we do not expect to see this market become dominated by two stores like in other countries.

**Combined app revenue from Google Play and third-party Android stores is forecast to grow 3x from 2015 to \$55.7 billion in 2020.**

**Mobile App Forecast – Annual Gross Revenue**  
By Store, in Billions

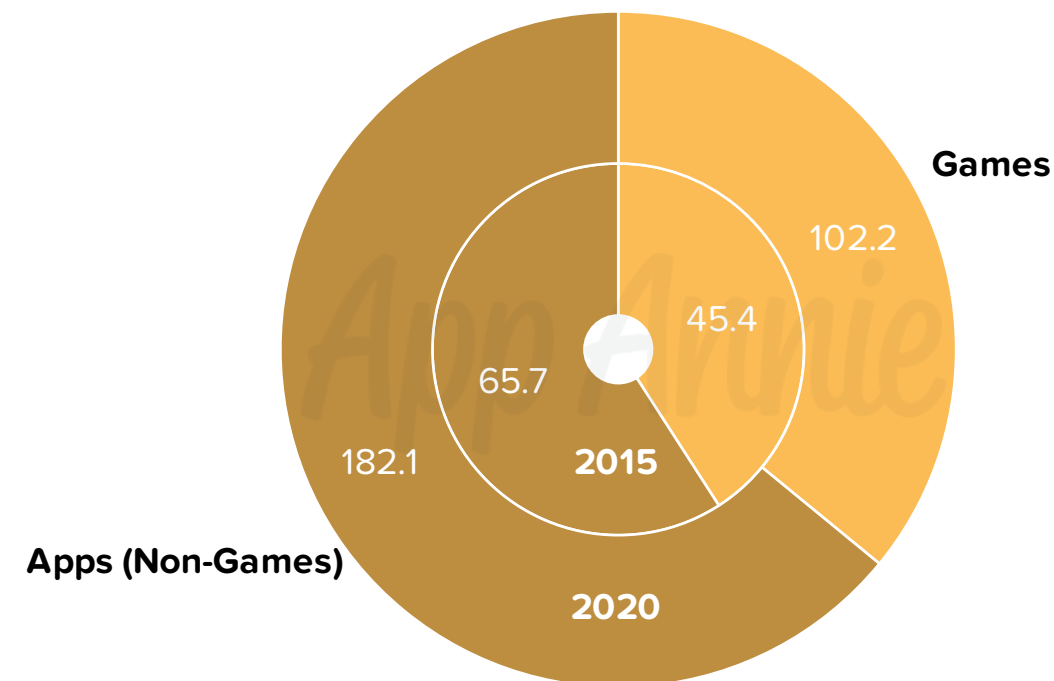


## Category and Monetization Highlights: Game Revenue Remains Strong, While New Categories Accelerate Download and Revenue Growth

Games often serve as a leading indicator for developer innovation and consumer readiness. We have witnessed this via the adoption of broadband, surround-sound audio and DVD to support great gameplay. This has held true in the mobile app ecosystem. Early smartphone uptake tends to be followed by a wave of strong growth in game downloads and then revenue, often before other categories begin to make their mark. Games were already a significant driver of installs in 2015, totaling 45.4 billion downloads and accounting for 41% of overall downloads across app stores. Driven by surging smartphone penetration in emerging markets like India and Southeast Asia, we expect game downloads to hit 102.2 billion in 2020.

Downloads of other app categories will increase even faster as apps deliver ever-increasing utility, entertainment, productivity, social connection and overall value to an expanding base of users. We forecast these apps to grow from 65.7 billion in 2015 to 182.1 billion in 2020.

**Mobile App Forecast – Annual Downloads**  
2015 vs. 2020, by Category



*All figures in billions*

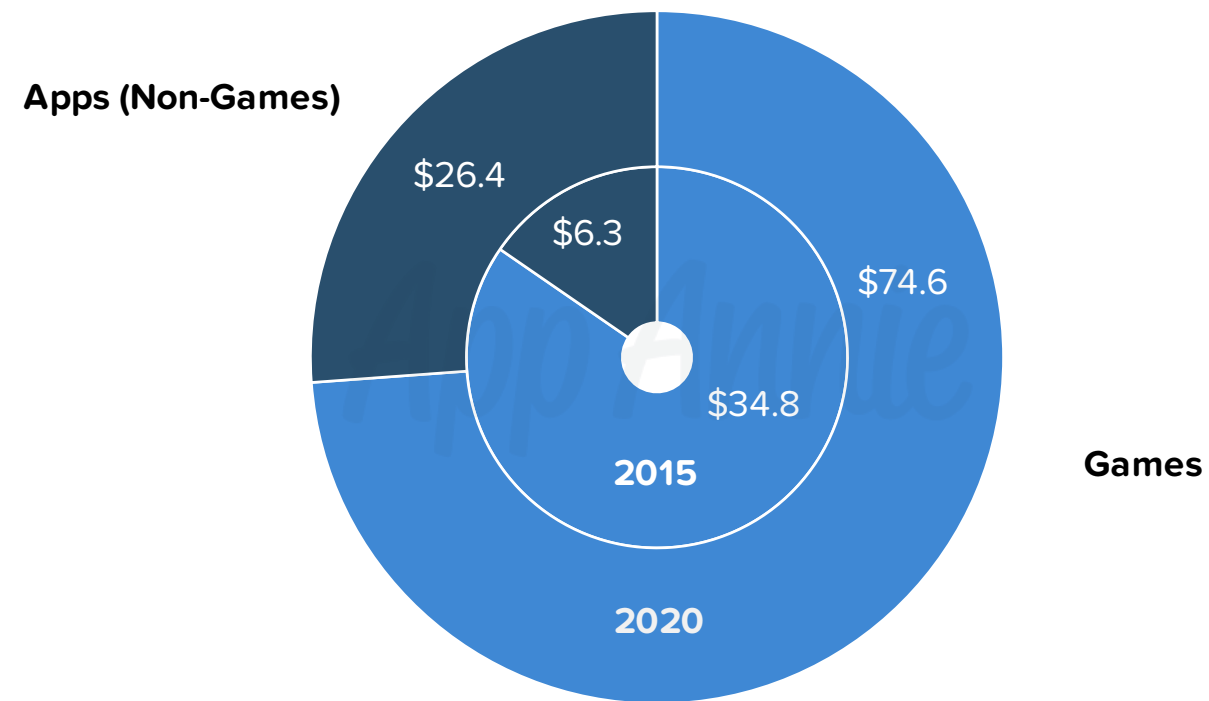
**Non-game app downloads are projected to grow at a five-year CAGR of 23%, exceeding 182 billion in 2020.**



Games generated approximately 85% of app market revenue in 2015, representing a total of \$34.8 billion across the globe. We expect the Games category to grow to \$41.5 billion in 2016 and \$74.6 billion in 2020 thanks to strong monetization in mature markets, especially China's tier-one and tier-two cities, as well as Japan and South Korea.

Meanwhile, revenue from other apps is expected to grow even faster — from \$6.3 billion in 2015 to \$9.4 billion in 2016 to \$26.4 billion in 2020 — thanks to the growing popularity of subscription-based revenue models. In particular, music streaming, video streaming and dating apps have become [major revenue drivers in these markets](#) and we expect them to continue building on their success. On the whole, app store revenue is poised for strong growth — but this is only one part of the monetization story in the app ecosystem.

### Mobile App Forecast – Annual Gross Revenue 2015 vs. 2020, by Category

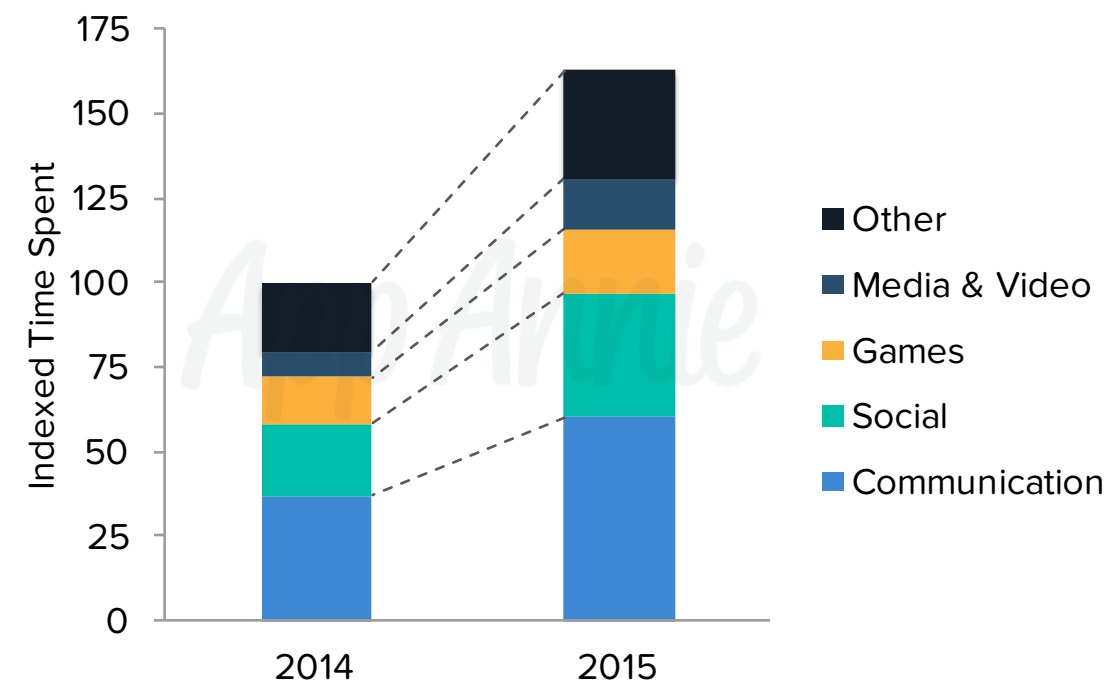


*All figures in billions*

**Revenue from non-game apps is expected to grow 4.2x to \$26.4 billion in 2020.**

The true value of the app ecosystem is significantly larger than the revenue figures in our forecast. Based on data from our [App Annie-IDC App Monetization Report](#), we believe that in-app advertising revenue is comparable to that from app stores — this would roughly double the size of the market. In addition to this, we also need to take into account subscriptions paid for on other platforms but consumed through mobile apps (e.g., [Netflix](#)). We must also consider massive transactional revenue from e-commerce, on-demand and travel commerce apps which are also not routed through app stores. Given the nature of these apps, usage is expected to be strongly correlated with revenue performance.

### Time Spent by App Store Category Worldwide\*, Android Phones



\*Excludes China

As we saw earlier, overall time spent in apps in 2015 grew 63% year over year on Android phones according to [Usage Intelligence](#). Time spent in Media & Video jumped by 93% while time spent in the Transportation and Shopping categories grew by a staggering 123% and 160%. In particular, downloads and usage of [top retail and ridesharing apps exploded in 2015](#), implying strong revenue growth. Underpenetrated emerging markets drove much of their growth, which suggests that they are only scratching the surface of their potential. As we mentioned in our [2016 Predictions](#), we expect market consolidation and improved unit economics to further fuel their growth.



# Looking Beyond The Mobile Horizon



# What's Next for Apps?

When Apple's App Store and Google's Android Market burst onto the scene in 2008, they created two powerful consolidated channels for app distribution and enabled a mobile computing revolution that overtook the PC era in terms of installed base and pace of adoption. Since then, the app market has evolved to become an indispensable repository, meeting day-to-day needs for consumers across the globe. Therefore, it should come as no surprise that time spent in apps on Android smartphones has grown by nearly 60% in just the past year. As developers continue to innovate and device installed base expands, we expect gross app store revenue to grow from \$41.1 billion in 2015 to \$101.1 billion in 2020.

Furthermore, now that apps have reached critical mass via smartphones, they are expanding into new devices. Apple and Google are driving development of optimized apps for VR, wearables, TVs, smart home devices and cars. Clearly not all app types lend

themselves equally well to all device form factors. And conversely, these new devices will redefine apps and their utility. We believe the smartphone will remain the anchored center of this connected universe for as far out as we can see, while these newer devices pave the way for app interaction in a broader array of contexts.

In addition, monetization models will continue to evolve and expand beyond in-app virtual goods. Thanks to the shift of media consumption to mobile devices, subscription models have been gaining steam in developed markets; we expect this trend to accelerate in the coming years. In emerging markets, smartphones have allowed many to experience the Internet for the first time, which has led to exponential growth in mobile commerce.

Mobile advertising has tremendous untapped potential as mobile [owns 24% of time spent in media, but just](#)

[8% of overall ad spend](#). And as time spent in mobile apps continues to climb, this gap will close, driving billions more in mobile advertising revenue. Furthermore, while performance advertising already plays an important role in driving many publishers' revenue across the globe, as we spend more time in apps across more screens and as brand advertisers come to apps, the app economy will explode even further.

We are only in the early stages of the app market's maturity cycle. Apps are set to become the most important interface between consumers and businesses as mobile consumes more of our time and as apps expand into new device platforms. Mobile apps have already dwarfed previous computing revolutions and we can look forward to even more growth ahead for the app economy.



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# Market Factors, Definitions and Methodology

# Forecast Factors: From Macroeconomics to Developer Resources, the Mobile App Market Is Resilient

## Behavioral Shifts and Macroeconomics

Increasingly, consumers rely on apps for entertainment, social networking, banking, commerce, education, and even government and social services. Some of these services may have migrated from physical or digital channels, while others have been designed specifically for mobile. One example is banking apps, which have allowed customers to take advantage of biometric security available on millions of smartphones ahead of other platforms like the PC and even ahead of the banks' own automated teller machines.

A deceleration in overall consumer spending will likely delay device upgrades and extend replacement cycles for existing device owners. But even if this slows the growth in device installed base, we expect little impact on revenue per device due to the resilience of app-

driven services. Multiple factors bolster this. First, app store spend constitutes a very small share of overall consumer spend and, unlike larger purchases, is not likely to be meaningfully affected by economic headwinds. Second, economic activity is continuing to migrate from other channels, including the web and physical world, onto apps. This service migration will lead to growing consumer spend on mobile apps even if overall spend declines.

## Developer Resources

Relatively similar capabilities between iOS and Android have laid the foundation for the millions of apps that are available on both platforms. Furthermore, improvements in hardware and standardization of smartphone components have delivered economies of scale and driven strong competition among component suppliers and OEMs,

allowing consumers across the globe inexpensive entry into the app economy.

However, as they advance their ecosystems, platform providers are asking developers to not only incorporate new OS-level features but also support new form factors such as wearables and TV. This requires resource-constrained developers to balance their resources. Any shift from cross-platform mobile development to new form factors is likely to have minimal impact on mobile app revenue. We believe any shortfall in mobile app revenue would be offset by the revenue generated from those other device categories — otherwise publishers will abort development for those devices and continue to prioritize mobile.

## Revenue Model Diversification, Especially Outside of Games

There are many ways in which app monetization is evolving beyond today's models of paid apps and in-app virtual goods. From a store revenue standpoint, we have seen subscription revenue accelerate in 2015 as video, music and dating apps using this model have performed incredibly well, especially in mature markets. Meanwhile, off-store revenue models, namely advertising and commerce, are gaining prominence in mature and emerging markets. For top publishers that have a proven track record for generating store revenue — including the industry's successful game publishers — we do not see a material change in how they monetize. However, diversifying revenue models beyond in-app virtual goods can provide options to challengers and new marketplace entrants — especially

for apps outside of games.

Over the course of the forecast period, we expect publishers will experiment with less common monetization methods. Ultimately, we believe that diversification of app revenue streams — inside the app stores and/or outside of the app stores — is beneficial to the overall app economy. New forms of monetization will be additive to the overall market and allow publishers an opportunity to experiment in an effort to generate revenue from new customer segments.

## Regional Infrastructure

Even when disconnected from a network, many apps — especially games and productivity apps — have utility, but these and others take on new vitality on a high-speed wireless network. As network upgrades are

built out (3G to 4G in mature markets, and even when moving from 2.5G to 3G in some emerging markets), consumers have proven to increase usage, which is a virtuous cycle. For instance, data from App Annie's [\*Usage Intelligence for Operators & OEMs\*](#) shows that the average data usage per smartphone user in India and Indonesia grew by more than 50% from November 2014 to November 2015.

In mature markets, revenue growth is driven largely from usage growth — which is supported by the combination of escalating network speeds via cellular buildout and Wi-Fi — and less expensive data plans as device penetration growth slows. Similarly, the rapid app market growth in emerging markets is largely a function of first-time smartphone buyers and is deeply intertwined with the rollout of 3G, 4G and/or Wi-Fi infrastructure.



# Definitions

App Annie’s forecast includes download and gross revenue from smartphone and tablet app stores including the iOS App Store, Google Play, all third-party Android app stores (including the Amazon app store and those in China), Windows Phone Store, Samsung Galaxy Apps, etc. It does not cover new app platforms like wearables, smart TV boxes and virtual or augmented reality devices.

**Revenue:** App Annie’s revenue forecast sizes the gross spend by users across these app stores and includes revenue generated from in-app purchases, subscription and paid downloads. Because it is reflective of consumer spend on apps — not net to publishers — it is inclusive of any sales taxes and app store fees. It does not include advertising

revenue or any transactional revenue from commerce-centric apps like *Expedia*, *Amazon* or *Uber*.

**Download:** App Annie’s download forecast includes only the first instance of installing an app on at least one of a user’s devices from an app store. Downloads do not include downloading a previously downloaded app to the same device, a newer device or a different device that is using the same user’s store account. Downloads do not include sideloaded apps (apps acquired outside of app stores).

## Regional Definitions

<b>APAC</b>	Includes all countries in South Asia, East Asia, Southeast Asia, Australia and New Zealand.
<b>EMEA</b>	Includes all countries in Europe, the Middle East and Africa.
<b>Americas</b>	Includes all countries in North and South America.

# Methodology

The App Annie Forecast makes use of a proprietary algorithm to forecast the app marketplace for generally accepted metrics. In order to do so, App Annie has accumulated well over 10,000 separate sources comprising economic, demographic behavioral, and technology sector-specific data including that provided by our *Intelligence* product. The type of forecast methodology we have employed is most analogous to economic sector analysis and trading forecasts.

Rather than a “top-down” approach where certain assumptions about the app market are made and projected into the future, we have constructed a “bottom-up” system using our own proprietary data from our [Store Intelligence](#) and [Usage Intelligence](#) offerings, as well as a wide range of

public sources such as the US Census Bureau and financial institutions like the European Central Bank. In concert with our internal cross-validation of market sizing, we use a testing methodology for the forecast projections similar to those used by major investment banks.



# About App Annie

App Annie delivers the most trusted app data and insights for your business to succeed in the app economy globally. App Annie is used by more than 1 million apps to track their performance, and now has over 500,000 registered members — including 94 of the top 100 publishers. The company is headquartered in San Francisco with 425 employees across 15 global offices. App Annie has raised \$157 million in financing to date from investors such as e.Ventures, Greenspring Associates, Greycroft Partners, IDG Capital Partners, Institutional Venture Partners and Sequoia Capital.

**For more information, please visit**

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Report methodology and updates are available [here](#).

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