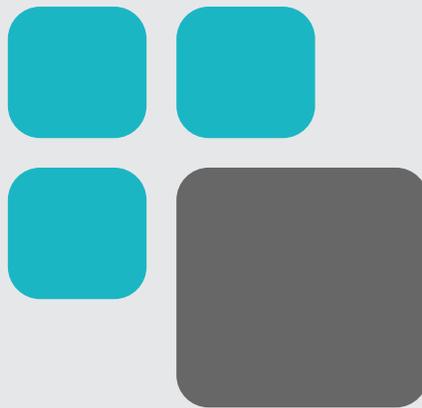


## The Relationship Between App Developers and Platforms: Why It Matters

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It is often easy to forget the journey once we arrive at the destination. We forget the bumps in the road and often overlook factors that made the trip possible. The app economy's trajectory is no different. In nearly a decade of existence, the app ecosystem grew exponentially alongside the rise of the smartphone. Valued at \$1.7 trillion, the app economy is driven by app developers and innovators who depend on software platforms to reach consumers around the globe. In 2018, the total number of app downloads was 194 billion; up from 178 billion in 2017, and the reach of software applications continues to grow.

The single most important factor in the app ecosystem's dynamic growth and unrivaled success is the presence of established, curated platforms (e.g., Apple's App Store or Google Play for mobile – and Steam for games). Trusted app stores serve as a vital foundation for the growing uses of apps across industries and enterprises. Three key attributes led to the revolution in software distribution:

1. Provision of bundled services that reduce overhead costs;
2. Built-in consumer trust mechanisms; and
3. Cost-effective access to a global market.

Today every successful platform for mobile, desktop, gaming, and even mainframe computing must provide those features, or they fail in the marketplace. Apps serve as the driving force in both the popularity and development of the smartphone.

## How Developers Distributed Software Before Platforms

Much has changed for consumers and developers since the early days of software applications. In the early 1990s, consumers were tasked with the challenge of locating and then traveling to a brick-and-mortar store that sold software. Once internet connectivity became a standard feature in most private residences, consumers began to download applications from the comfort of their homes without having to step foot in a physical store. Despite the changes brought by internet connectivity, the golden age of PC software pales in comparison to the size and scale of the mobile app revolution where software developers evolved into app developers.

Before the ubiquity of mobile platforms, the software ecosystem ran on personal computers, and software companies had to cobble together a distribution plan, including the creation of consumer trust from the ground up. This forced early app companies, often with teams of one to two developers, to wear many hats to develop, market, and benefit from the sale of their products. App companies were not only required to write code for their products, but they were also responsible for:

1. Managing their public websites;
2. Hiring third-parties to handle financial transactions;
3. Employing legal teams to protect their intellectual property; and
4. Contracting with distributors to promote and secure consumer trust in their product.

The skillsets required to manage the overhead of online software distribution were often not “core competencies” of small development companies, and the additional steps cost app developers valuable time and money, with little tangible benefit.

Bungie—developer of popular games Halo, Myth, Oni, and Marathon—chronicled in 1996 the difficult and sometimes oppressive distributor requirements placed on software developers that predated the platform ecosystem. When dealing with retail distributors, Bungie was required to guarantee a competitive price, pay 3-6 percent of sales as a marketing fee in addition to \$10,000 for product launch marketing, pay shipping to deliver their products to distributors, and agree to buy back unsold products. Once contracts like Bungie’s were negotiated, software developers often times were required to spend additional money on marketing their products, so that in-store catalogs would feature their product or retail stores would place their product on an end cap display, all before consumers even saw the products.

However, with the advent of the smartphone, the experience Bungie described is now a relic of the past. The smartphone, in its brief history, revolutionized the economy at large and established a symbiotic relationship between software platforms and developers.

## How Software Developers Established Consumer Trust Before Platforms

Before the introduction of the smartphone, software developers built consumer trust slowly and at great expense. During that time and still in today's app market Back trust was and remains essential for a software developer to bring a product to market. Most new developers did not have a widely recognizable brand to endorse their software. Therefore, prior to mobile platforms like the App Store or Google Play, software developers often had to break through the trust barrier by handing over their products to companies with a brand-recognized reputation.

In the internet economy, immediate consumer trust is almost impossible without a substantial online reputation, and not attaining it spells death for any app company. However, what does "trust" mean?

In this context, trust refers to an established relationship between the app company and consumer where the consumer demonstrates confidence to install the app and disclose otherwise personal information to an app company. Prior to platforms, software developers often had to hand over their products to companies with a significant reputation to break through the trust barrier.

Even shareware products that could be digitally distributed would end up partnering with trusted brands to gain consumer trust. For example, in 1996, the developers of computer game Ultimate Doom contracted with Chex cereal to augment their consumer base and become associated with a household name. Developers converted their game software to create the child-friendly game Chex Quest that the cereal company usually affixed to its boxes. Today, consumers can download games like these for free on platforms like the Apple App Store, Google Play, or independent game-specific platform Steam. These platforms not only lower cost by taking care of the significant overhead involved in selling their product, but they can also reach consumers beyond those who buy a particular brand of cereal or another trusted product.

But the trust mechanism provided by the platforms is not merely an aspect of size. Consumer trust requires constant maintenance and vigilance because loss of trust hurts both the platforms and the developers who depend on them. The immediate consumer trust embedded into platform brands worth billions of dollars allows developers to clear the critical hurdle of achieving trust from consumer adoption.

## How Software Developers Dealt with Piracy Before Platforms

Before the age of platforms, software developers struggled to safeguard their intellectual property (IP) against piracy and theft. Software companies faced serious challenges in protecting their products in retail stores because the licensing codes remained active and easy to steal. Once developers overcame the significant barriers to bring their products to market, they were faced with the threat of piracy and theft which limited their volume of business and hurt their bottom line. In 2006, the Business Software Alliance found that, on average, U.S.-based software developers lost \$7.28 million in revenue per year.

Prior to software developers being able to leverage dispute resolution mechanisms provided by platforms, developers were left with the oppressive burden of copyright infringement litigation in federal court. As a result, IP owners had the potential to be left with several thousand dollars per month in legal fees and months or years of time diverted from company matters. Software developers and copyright holders continue to benefit from platforms' cost-effective avenues, such as their dispute resolution mechanisms referenced above, to distribute and protect the integrity of their products. Currently software platforms play a significant role in helping small developers enforce their intellectual property (IP) rights. App developers' IP helps eliminate the inherent disadvantages of being a small, innovative company by enabling them to protect the fruits of their ingenuity from larger firms that might want to take it.

## The Smartphone Paved the Way for the Platform

On June 29, 2007, Apple made the first iteration of the iPhone available for purchase. Beyond making calls and sending text messages, apps opened a new world of innovation and opportunity for smartphones. Today, smartphones outnumber the world's population, and more than 80 percent of Americans own, and depend on, smartphones. The rise of smartphones is inextricably linked to apps because apps give value to platforms on smartphones.

Though it is hard to imagine a smartphone without apps, the first iPhone did not host the third-party apps we use today. In October 2007, Apple announced that it would provide a software development kit in 2008 that would allow third-party developers to upload their apps, and in July 2008, Apple launched the App Store that revolutionized the app economy.

At first, developers were reluctant to join platforms, worried that the model might not accommodate their ability to “launch fast and iterate” their apps. But successful platforms changed the app ecosystem by providing app developers with ubiquitous access to a broader swath of consumers. Platforms provide a centralized framework for app developers to engage and secure visibility with the 5 billion app users worldwide. With lower costs and barriers to entry, both fledgling and established app developers can find success. For example, educational app company L'Escapadou secured 1.3 million downloads and earned more than \$1.5 million from app sales between 2010 and 2014, a success attributed to the centralized nature of platforms. Founder Pierre Abel specialized the language, content, and pricing of each of his apps based on consumer and market needs and marketed them on different platforms to reach a variety of consumers around the world.

One of the central markets at issue is for developer services, where a developer pays a platform for assorted services including distribution, marketing, etc. This market also experiences vigorous competition. There is a tendency to include only two platform companies, Apple and Google, in this category of competitors. But for developers, the market is much wider. A game developer can choose platforms like Epic or Steam, and enterprise developers can look to hundreds of proprietary, custom platforms, or could create their own. For example, companies like App47 create app platforms for everything from “bulldozers to ultrasound devices.”

Moreover, for developers looking to reach a general audience, using the web is an alternative, especially for companies that are looking for different kinds of distribution or search services than those available on platforms. Additionally, software developers could choose to advertise on Facebook or distribute their products through Amazon or one of the giant Chinese platforms. It is worth noting, however, that there are some important distinctions between software platforms—like the App Store or Google Play, which provide a marketplace for software apps—and social media platforms or “aggregators” that connect people with information and run on data. Aggregators like Facebook and Twitter, for example, connect people with information and other people (and generate valuable data in the process), while the Google Play store and the App Store provide a marketplace for consumers and app developers to transact directly. These differences illustrate the diversity in the market for distribution methods, as developers may prefer one model over another.

## There's a Platform for That

As successful as the past 12 years have been for the app economy, the next decade could be even better. In just the third quarter of 2019, the two major app stores generated \$21.9 billion in revenue—a robust 23 percent year-over-year increase from the third quarter of 2018. This growth suggests the developer-platform model is still succeeding. Moreover, app economy growth is likely to endure because developers are continuing to create new products, services, and markets that did not exist prior to platforms.

Perhaps the most notable of these is the market for ridesharing. Connecting a driver—using his or her own car—to a potential passenger in real-time for an on-demand ride to a destination selected by the passenger was impossible before developers could use the GPS capabilities and data connections of smartphones. Ridesharing is an important example of how app developer ingenuity meets the capabilities, built-in trust, and developer services of platforms to create new options for consumers.

Perhaps most importantly, the universe of platforms is continuing to evolve and expand as diverse kinds of hardware connect to the network. New platforms are cropping up for wearables made by companies like Garmin. Connected home devices and cars drive cross-platform interoperability so that Alexa or Siri can communicate with your Samsung appliances or your Ford Fusion—further weighing against conceptions of platform markets where a single player wields market power. These characteristics tend to show that developer services will continue to improve and evolve along with demand. Federal intervention may be necessary where market power exists and raises prices undisciplined by competition or maintain a monopoly position in order to reduce quality or decrease output. But when those factors are not present and competition drives the market, as it does in developer services, intervention is unlikely to help and may harm competition or consumer welfare.

## Platforms Aren't Perfect and Are Still Striving to Improve

Although developers can choose from multiple platforms, there is no such thing as a perfect platform. Many app developers pay a fee to platforms for developer services, and they expect those services to meet their needs. Just as online companies must clearly communicate their data practices to consumers, so must platforms clearly define the requirements and details of their terms of service to developers. For example, when platforms change their developer guidelines, they must communicate clearly and ensure developers understand what the changes mean for them and their customer relationships.

Developers do report that ill-defined changes to platform policies can significantly impact their business. For example, a software platform recently put an app company that provides a call blocking app on notice for temporary removal, unless it made changes to how it obtained permission for gathering incoming call data. The platform did not clearly explain how its policies changed or why they would require action on the app's part, but it was the first removal notice of its kind in the app's nine years on the platform. Ultimately, the platform did not remove the app, but the process for remaining on the store was opaque and difficult enough to navigate that the company looked to outside organizations for help. Pertinently, this occurred amid a major update to California's privacy laws, so it may be an example of the unintended consequences of government intervention.

Especially for enterprise app developers, a software platform's safety and security are essential elements of developer services. Software platforms' security features improved markedly over the course of their existence. Whereas unlocking a device used to require a four-digit passcode, devices are now capable of biometric-based authentication, and software platforms make these authentication measures available to developers as well so that they can also benefit from these heightened security measures. But the game of cat-and-mouse between cybersecurity professionals and hackers will never end, and security must continue to evolve to meet and beat the threats. Although some platforms do not control device security, developers want the platform's security features to work seamlessly with any relevant hardware and that they account for all attack vectors.

Software platforms should continue to improve their threat sharing and gathering capabilities to ensure they protect developers across the platform, regardless of where threats originate. Moreover, they should approve and deploy software updates with important security updates rapidly to protect consumers as well as developers and their clients and users. The same is true when it comes to privacy controls. App developers strongly desire platform-level privacy controls they can adapt for their products and services. The types and nature of these controls vary among platforms and this variation should result in continuously improving options that iterate with end user expectations and privacy risks.

Unfortunately, some app developers fall victim to IP thieves that succeed in selling pirated content or use it to steal ad revenue on platforms. Ad networks can and do help mitigate the pirated ad revenue problem, but platforms must also vigorously police their app stores for stolen content. With vast online stores, it is difficult for a platform to verify legitimate requests to remove allegedly pirated content. But a single app developer should not need the help of a legal team or trade association to resolve the issue. IP resolution processes are improving across the board, but platforms must keep in mind that they are important and in-demand developer services that platforms should improve in order to compete for developers.

## What Does All of This Mean?

App developers, especially small to medium sized businesses, have a strong interest in maintaining a competitive app economy that enables them to compete with larger firms worldwide through innovative products and services for their customers and clients.

The entry of platforms created novel opportunities for consumers and developers. But while platforms provide some of the infrastructure, developers bring smart devices to life. Without apps, a smartphone is just a phone. The symbiotic relationship between apps and platforms is not perfect, but it has created a powerful ecosystem that continues to benefit consumers.