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## TECHNOLOGY

# A Murky Road Ahead for Android, Despite Market Dominance

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In 2005, Google bought a tiny mobile software company named Android, and almost nobody in the technology industry saw its potential — not even Eric Schmidt, Google’s chairman and then chief executive. “One day Larry and Sergey bought Android, and I didn’t even notice,” Mr. Schmidt told reporters in 2009, referring to Larry Page and Sergey Brin, Google’s founders.

A company spokesman later assured me that Mr. Schmidt was joking; Android reportedly cost at least \$50 million, a big enough sum for the chief to get involved. But the joke suggests how little regard even Google’s executives held for Android a decade ago. Android, software that runs smartphones, tablets and a variety of other machines, was a side bet, and few considered it consequential to the search company’s fortunes.

Things have changed. In an era ruled by portable computers, Android has become essential to Google’s future. Like an unstoppable friendly bacteria advancing upon a powerless host planet, Android, in the last five years, has colonized much of the known world. Android is now not just the globe’s most popular smartphone operating system but the most popular operating system of any kind. More than a billion Android devices were sold in 2014, according to the research firm Gartner. That’s about five times the number of Apple iOS devices sold, and about three times

the number of Windows machines sold.

In other words: About one of every two computers sold today is running Android. Google's once underappreciated side bet has become Earth's dominant computing platform.

Yet all is not well on planet Android. On the eve of Google IO, the company's annual developer conference that starts Thursday, where Android will once again be a primary topic of discussion, cracks are emerging in Google's hold over the operating system. Google's version of Android faces increasing competition from hungry rivals, including upstart smartphone makers in developing countries that are pushing their own heavily modified take on the software. There are also new threats from Apple, which has said that its recent record number of iPhone sales came, in part, thanks to people switching from Android.

Hanging over these concerns is the question of the bottom line. Despite surging sales, profits in the Android smartphone business declined 44 percent in 2014, according to the independent analyst Chetan Sharma. Over the holidays last year, according to the research firm Strategy Analytics, Apple vacuumed up nearly 90 percent of the profits in the smartphone business. The stark numbers prompted a troubling question for Android and for Google: How will the search company — or anyone else, for that matter — ever make much money from Android?

Google is sanguine about Android's prospects and said the company's original vision for Android was never solely about huge profits. "The bet that Larry, Sergey and Eric made at the time was that smartphones are going to be a thing, there's going to be Internet on it, so let's make sure there's a great smartphone platform out there that people can use to, among other things, access Google services," said Hiroshi Lockheimer, Google's vice president for engineering for Android.

Google points out that its bet has benefited users. The fact that Google does not charge for Android, and that few phone manufacturers are extracting much of a profit from Android devices, means that much of the globe now enjoys decent smartphones and online services for low prices. So we should all be thankful for Google's largess — but, at the same time, given the increasing threats to Google's advertising business, we might also wonder how long that largess can continue.

Google faces several major Android-related headaches. First, while Google makes most of its revenue from advertising, Android has so far been an ad dud

compared with Apple's iOS, whose users tend to have more money and spend a lot more time on their phones (and are, thus, more valuable to advertisers). Because Google pays billions to Apple to make its search engine the default search provider for iOS devices, the company collects much more from ads placed on Apple devices than from ads on Android devices. A recent analysis by Goldman Sachs estimated that Google collected about \$11.8 billion on mobile search ads in 2014, with about 75 percent coming from ads on iPhones and iPads.

A brighter spot for Google is the revenue it collects from sales via Android's app store, called Google Play. For years, Android apps were a backwater, but sales have picked up lately. In 2014, Google Play sold about \$10 billion in apps, of which Google kept about \$3 billion (the rest was paid out to developers). Apple makes more from its App Store. Sales there exceeded \$14 billion in 2014, and rising iPhone sales in China have led to a growing app haul for Apple. Still, Google's app revenue is becoming an increasingly meaningful piece of its overall business, and it is also growing rapidly.

Google is investing heavily to make sure that continues. Purnima Kochikar, business development director for Google Play, told me her team supporting Android app makers grew "by 15 times" in the last two and a half years. She added that even if hot Silicon Valley start-ups still create apps for iOS first, app makers in other parts of the world see Android as a surer path to the masses. "The reality is that folks like you should play a role in educating the Silicon Valley," she said.

But how long Google can expect Play to keep paying remains an open question, thanks to the second Android-related headache. Google's strategy of giving Android to phone makers free has led to a surge of new entrants in the phone business, several of which sell high-quality phones for cut-rate prices. Among those is Xiaomi, a Chinese start-up making phones that have become some of the most popular devices in China.

Because Xiaomi and others don't make much of a profit by selling phones, they're all looking for other ways to make money — and for many, the obvious business is in apps offering mail, messaging and other services that compete with Google's own moneymaking apps.

The situation is especially painful for Google in China, the world's fastest-growing smartphone market, where Google's apps are blocked. Even in the rest of

Asia, where many low-cost phone manufacturers do include Google's apps on their phones, there's growing interest in finding some alternative to Google's version of Android. About 30 percent of Android smartphones shipped in the last quarter of 2014 were actually modified, or forked, versions of the OS that may not be very hospitable to Google's services, according to the firm ABI Research. To address this problem, last year the company began a program, Android One, to get its services on high-quality, low-priced phones aimed at the developing world.

One software start-up, Cyanogen, has raised about \$100 million from several investors — and has signed a “strategic partnership” with Google's arch-competitor Microsoft — to sell phone makers an alternative user interface that works on top of Google's Android.

“We share services revenue with the phone makers — and today they get very little of that from Google,” said Kirt McMaster, Cyanogen's chief executive. “There are very few companies in the world today that really like Google. Nobody wants Google to run the table with this game. So it's a good time to be a neutral third party. We're Switzerland, and we want to share that revenue with our ecosystem partners in a meaningful way.”

Google, for its part, said there was ample room in the Android world for a variety of services to thrive. “It's up to any party in these ecosystems to figure out how they want to make money,” Mr. Lockheimer said.

The final threat for Google's Android may be the most pernicious: What if a significant number of the people who adopted Android as their first smartphone move on to something else as they become power users? In Apple's last two earnings calls, Timothy D. Cook, the chief executive, reported “a higher rate of switchers than we've experienced in previous iPhone cycles.” Apple has not specified the rate of switching, but a survey by Cowen & Company found that 16 percent of people who bought the latest iPhones previously owned Android devices; in China, that rate was 29 percent.

For Google, this may not be terrible news in the short run. If Google already makes more from ads on iOS than Android, growth in iOS might actually be good for Google's bottom line. Still, in the long run, the rise of Android switching sets up a terrible path for Google — losing the high-end of the smartphone market to the iPhone, while the low end is under greater threat from noncooperative Android players like Xiaomi and Cyanogen.

Android has always been a tricky strategy; now, after finding huge success, it seems only to be getting even trickier.

***Correction: May 27, 2015***

*An earlier version of this article misstated Microsoft's role in Cyanogen, a software start-up. Microsoft and Cyanogen have a "strategic partnership," and Microsoft is not an investor.*

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