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2017 Technology Trends

Increasing stratification and changing competitive dynamics

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Contacts

Dubai

Jad Hajj
Partner, Strategy&
Middle East
+96-4-390-0260
jad.hajj
@strategyand.ae.pwc.com

Düsseldorf

Stefan Eikelmann
Managing Director,
PwC Strategy& Germany
+49-221-3890-140
stefan.eikelmann
@strategyand.de.pwc.com

Frankfurt

Olaf Acker
Partner, PwC Strategy&
Germany
+49-69-97167-453
olaf.acker
@strategyand.de.pwc.com

Hong Kong

Huw Andrews
Partner, PwC Hong Kong
+852-6222-4162
huw.andrews
@hk.pwc.com

Horatio Wong
Partner, PwC Hong Kong
+852-6076-9323
horatio.kk.wong
@hk.pwc.com

New York

Patrick Gordon
Principal, PwC US
+1-646-471-7978
patrick.g.gordon
@pwc.com

Paris

Pierre Péladeau
Partner, PwC France
+33-1-5657-8558
pierre.peladeau
@strategyand.fr.pwc.com

San Francisco

Roger Wery
Principal, PwC US
+1-415-498-6401
roger.wery@pwc.com

Seattle

Henning Hagen
Principal, PwC US
+1-917-545-6720
henning.hagen
@pwc.com

Shanghai

SiuFung Chan
Partner, PwC China
+86-136-3650-6250
siufung.chan
@cn.pwc.com

Tokyo

Toshiya Imai
Partner, PwC Japan
+81-3-6757-8600
toshiya.imai@pwc.com

Masahiro Ozaki
Partner, PwC Japan
+81-3-6250-1200
masahiro.ozaki
@pwc.com

About the authors

Olaf Acker is a partner with PwC Strategy& Germany, PwC's strategy consulting business, based in Frankfurt. He leads PwC digital services in Europe, the Middle East, and Africa, and has more than 20 years of strategy consulting and industry experience, serving clients in Europe, North America, and the Middle East. He focuses on leveraging emerging technologies to change the way people work and interact with customers and to revolutionize B2B businesses.

Henning Hagen is an advisor to executives at technology companies for Strategy&. He is a principal with PwC US based in Seattle. He focuses on issues involving corporate and business unit strategy, growth and go-to-market strategy, ecosystem evolution, and operating model design. He primarily works with companies at the intersection of technology, telecom, and e-commerce.

Jad Hajj is a partner with Strategy& Middle East with 15 years' experience in the information and communications technology industry working throughout the U.S. and the Middle East. He specializes in helping telecom operators develop winning strategies and build distinctive capabilities in B2B/enterprise and digital innovation, and has led multiple large-scale transformations.

PwC's Sahil Bhardwaj, Matt Kramer Coakley, Ariel Futter, Yolande Wilson, David Wu, and Eric Yeh contributed research and analysis to this report.

Introduction

The trends and innovations that will shape the technology industry over the next several years came into sharper focus in 2016. Cloud computing has gone mainstream for many enterprises, and the Internet of Things (IoT) is changing how both industrial and consumer-oriented companies do business. Drones and autonomous vehicles, blockchain, augmented and virtual reality, increasingly sophisticated digital assistants, machine learning (artificial intelligence, or AI) — the list of technological megatrends just keeps growing.

At the center of this continuing wave of innovation is the technology industry, and in particular a set of U.S.-based supercompetitors we call the "Big Five": Alphabet (Google), Amazon, Apple, Facebook, and Microsoft. Already dominant in their own fields — high-end devices, digital content distribution and app stores, online search and advertising, social media, e-commerce, cloud services, and productivity software — they are actively branching out into new businesses. And they have substantial advantages in doing so: positive network effects inherent in their hyper-scale platform businesses, formidable innovation capabilities, and massive financial muscle.

The Big Five are actively branching out into new businesses.

And yet the Big Five have competition. Many other technology players are making strong efforts to recover (if they have fallen behind) and to build sustainable businesses. These are exemplified by the "Next 20": the largest U.S.-based technology companies after the Big Five, based on enterprise value: Adobe, Analog Devices, Applied Materials, Broadcom, Cisco Systems, Dell Technologies, Hewlett Packard Enterprise, HP Inc., IBM, Intel, Intuit, Micron, Nvidia, Oracle, Qualcomm, Salesforce.com, Symantec, Texas Instruments, VMware, and Western Digital. Each in its own way is shifting from pure hardware to software-defined hardware and from products to services, managed services, and solutions.

Further disruption will come from five other companies, all of them based in China: Alibaba, Baidu, Huawei, JD.com, and Tencent. Highly successful in their home market, these companies have been expanding their scope around the globe; Huawei, for instance, has been active outside China for more than 10 years. The competitive struggle within and among these three groups of companies — the Big Five, the Next 20, and the Chinese Challengers — will define the technology industry for the foreseeable future.

One final arena of competition should be mentioned: sectors such as industrial operations, financial services, and healthcare, where battles are being fought for dominance in the IoT and related fields. As GE CEO Jeffrey Immelt has pointed out, established companies in many traditional fields have no choice but to become more like software companies. For example, with its Predix platform, GE has recast itself as a digital and software-driven company and is developing a leadership position in the Industrial Internet of Things. A few healthcare chiefs, most notably Aetna CEO Mark Bertolini, have begun to create technology platforms for taking costs out of and transforming the overall system. Telecommunications firms, including Verizon and AT&T, are investing in 5G, the IoT, content, advertising, and emerging distribution technologies. In other nascent areas, such as blockchain and augmented and virtual reality, no clear leader has emerged, but here too, companies in financial services or media may compete.

Why the Big Five will continue to dominate

The Big Five have developed an enormous advantage over their rivals in the tech industry. Four core factors combine to form a self-reinforcing cycle that allows them to keep building on their success.

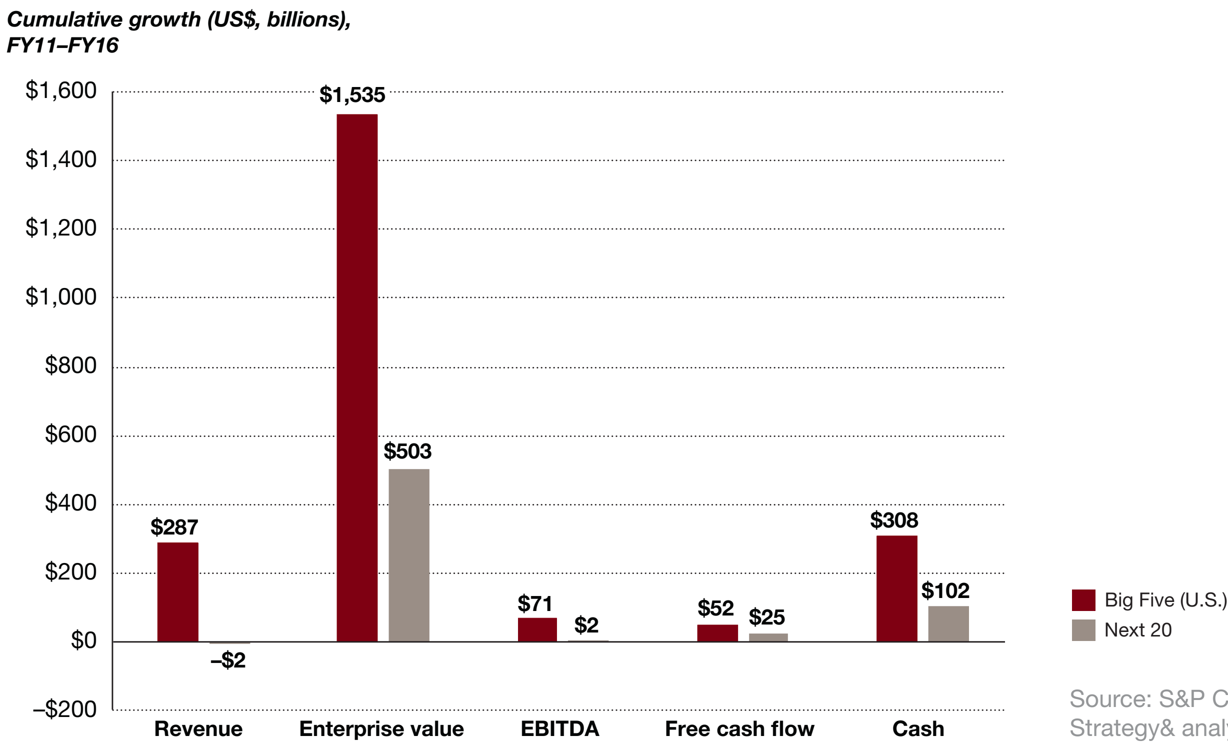
- **Platform strength.** Over the past decade or so, the Big Five have built highly successful businesses based on the ubiquity of their platforms and business ecosystems, that is, the networks of smaller companies that gravitate toward them. That in turn has enabled them to reach virtually unprecedented levels of enterprise value, revenue, profits, and cash flow. Just since 2011, these companies have grown revenues by US$287 billion, while, taken together, the Next 20 have seen their revenues shrink. When it comes to enterprise value, the contrast is even more dramatic: In that period, the Big Five created more than $1.5 trillion in enterprise value, while the Next 20 combined created only a third of that. In addition, the huge cash hoards that the Big Five have accumulated serve only to reinforce their dominant position, through innovation and the acquisition of both capabilities and talent.

- **Innovation reinvestment.** The Big Five continually reinvest much of their profit in research and development. Together, they have averaged $44 billion per year in innovation spending since 2011. In fact, they represented five of the top 11 spenders on R&D in 2016 across all industries, according to the 2016 Global Innovation 1000 study by Strategy&, PwC's strategy consulting business.

  These investments are paying off. For Alphabet, Amazon, and Microsoft, the large and growing market for public cloud infrastructure will continue to drive growth and profits.

  Amazon's story is particularly noteworthy, because it shows the unpredictable nature of success in the tech sector today. Cloud computing was a logical business model extension for Microsoft and Alphabet, but Amazon's move from consumer-oriented e-commerce retail to cloud services for business customers was originally seen as a stretch.

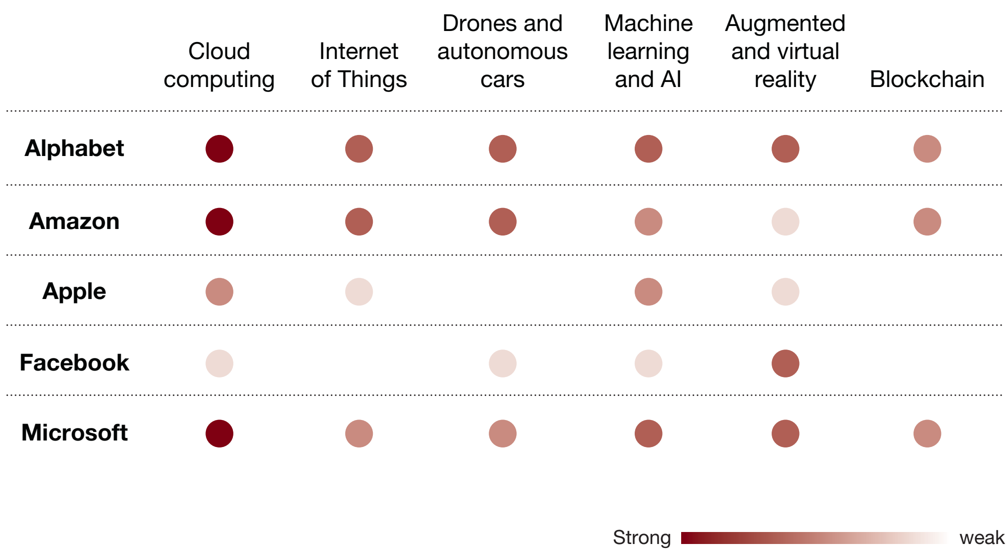
Exhibit 1
Key metrics: The Big Five vs. the Next 20



Source: S&P Capital IQ, Strategy& analysis

Exhibit 2
Varying strengths among technology's Big Five

Capabilities in technology megatrend areas, 2017



Source: Company reports, Strategy& analysis

When it launched its Amazon Web Services (AWS) cloud unit in 2006, Amazon had often been under fire for the size of its investments, which had resulted in lower margins and lower profits that could be used to pay back investors. Outsiders were skeptical that the company could successfully launch the new offering, let alone compete with Microsoft and Google. Nonetheless, as of late 2016, Amazon's AWS unit has captured by far the largest share of the corporate cloud computing business, controlling 70 percent or more of the public cloud infrastructure market, according to Oppenheimer & Co. Microsoft and Alphabet are second and third, respectively.

- **Acquisition strategy.** The outsized war chests of the Big Five, especially Alphabet, Apple, and Microsoft, allow them to be very active acquirers of companies and capabilities. That said, despite Microsoft's recent acquisition of LinkedIn, these players have avoided blockbuster acquisitions that might complicate their business models with large-scale postmerger integrations. Instead, the Big Five have been methodical in their M&A, making strategic deals for mostly small to midsized companies that will add to their capabilities systems in such areas as artificial intelligence, machine learning, virtual reality, and augmented reality. As a result of both organic and inorganic activity, many of them are positioned to be leaders across a wide spectrum of new technologies that will disrupt companies across industries.

- **Talent attraction.** The competition for top talent in the U.S. is fierce, but skilled technologists know that after a successful stint at one of the Big Five, they are eminently employable elsewhere. The Big Five also continue to hire aggressively to support new product development and capital deployment. In absolute employment gains since 2011, the Big Five have led the way, adding more than 418,000 net jobs among them, compared with a loss of 40,900 for the Next 20.

  Meanwhile, the war for talent rages on — and indeed, may even heat up, if it becomes more difficult for U.S. companies to hire talented immigrants under the new U.S. administration. In early January 2017, Amazon announced it would be hiring 100,000 new employees in the United States. Although many of these jobs will be in distribution centers and logistics networks, some recruits will be software and hardware engineers, joining areas of the firm dedicated to growing AWS, Alexa, drones, and other highly technical offerings.

The path forward

What's left for the Next 20? Many of them are trying to reposition themselves by focusing on high-growth areas. IBM, for example, is placing a large bet on artificial intelligence with its Watson business. Texas Instruments is targeting analog chip markets for sensors and video processors, booming areas in the automotive and industrial sectors. And Adobe is aggressively marketing its products in cloud computing environments. Other hardware, software, and technology service firms, including many that gained prominence in the 1980s and 1990s, are struggling to compete, and going through major restructurings in hopes of moving away from their legacy offerings.

Many of these companies — and other long-established but smaller tech companies — already recognize their disadvantaged position compared with the Big Five. To compete, even in a relatively focused way, they must make significant changes to their operating models and corresponding cost structures, shift the talent mix of their workforce to build new capabilities, and embrace "as-a-service" business models (under which software and other products are sold by subscription or through online relationships, rather than with a one-time purchase). They must also keep their legacy businesses profitable for as long as possible to generate the cash flow and profits needed to reinvest in growth areas. Though just about every tech leader recognizes the urgent need to make these changes, some are executing them more effectively than others. These changes, such as moving from a licensed software business model to a software-as-a-service (SaaS) model — a transformation few of the Next 20 companies have completed — hold significant implications for revenue, cash flow, and margins in addition to their operating models, go-to-market strategies, and talent pools.

To compete, many of the Next 20 must make significant changes to their operating models.

One of the most commonly prioritized growth areas for companies today is the IoT and its many components, including sensors, actuators, connectivity, real-time analytics, and managed services. Lots of companies will likely benefit considerably as the build-out of the IoT gains momentum. According to Gartner, the installed base of connected devices will grow from about 6.5 billion in 2016 to more than 20 billion by 2020. But many participants in the IoT ecosystem face a perennial risk: Value is often a function of scale in their business, and as end-user markets become saturated and new technologies rise, they will experience the shrinking margins of commoditization. When this shift occurs, technology companies that have developed platforms and scale will be in the best position, especially if they also have access to the data generated by their customers' use of the hardware and software. In those cases, companies will try to employ the data to expand the relationship with these customers into new applications, such as information analytics and equipment networking.

Challengers from China

As successful as the Big Five have been and will likely continue to be, they face increasing competition from China's own tech supercompetitors. Their efforts correspond in some ways to those of the Big Five: Amazon faces off with Alibaba and JD.com in e-commerce, Google with Baidu in search, and Facebook with Tencent in chat, photo sharing, and social media. Huawei's primary focus has been a bit different; the company offers networking services and equipment, including mobile phones, and has strong backing from the Chinese government. Its evolving phone business will pit it more closely against Apple (and Samsung).

All these companies are highly successful in their home market and are growing more rapidly than the Big Five, and far more rapidly than the rest of the U.S. tech industry. As they gain even more traction in markets traditionally served by their Western competition or not yet dominated by any single player in a given segment, a land grab among these platforms is likely to ensue, in particular in emerging markets.

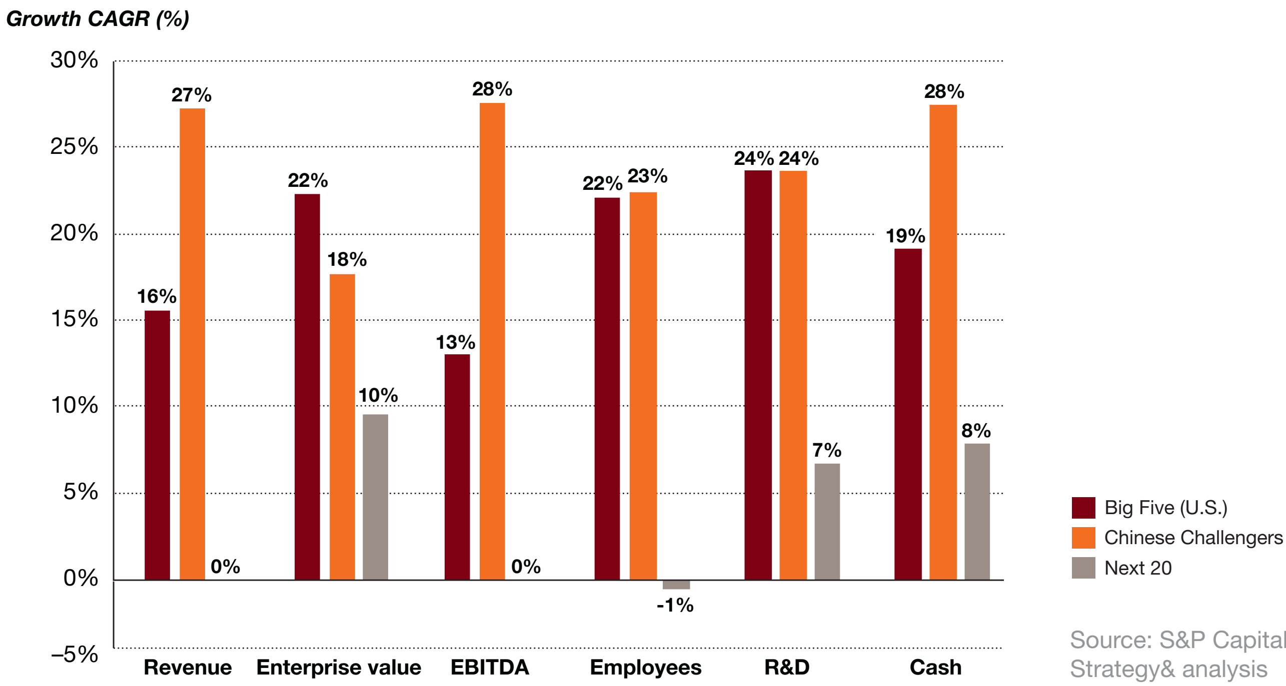
As they continue to expand, the Chinese Challengers will face tougher competition, especially from U.S. companies.

The Chinese Challengers do not compete on an entirely level playing field, especially within China. The Big Five are seen as outsiders in the country, and they continue to face challenges in serving consumers or companies in China — as of January 2017, consumers in mainland China were still unable to access many of Alphabet's consumer-facing Web properties and applications, including Google, Gmail, and YouTube, and Facebook was also blocked. Within China, the Chinese companies have been designated as winners by the Chinese government, a base on which they have captured the lion's share of their home markets.

The Chinese Challengers have also used that base to gain share in markets abroad; Huawei in particular has been able to compete effectively on price with telecom equipment rivals from other countries. But as they continue to expand, the Chinese Challengers will face tougher competition, especially from the U.S. companies, such as Alphabet, Amazon, and Facebook, that they have so successfully emulated at home. Will these players be able to develop the products, business models, and go-to-market innovation needed to compete

Exhibit 3
Chinese tech leaders' growth threatens U.S. Big Five

Average annual growth, FY11–FY16



Source: S&P Capital IQ, Strategy& analysis globally? Will they put in place security and censorship policies that are flexible enough to placate powerful regulators at home, while still satisfying varied interests abroad? And what might rising nationalism and protectionism around the world mean for the evolution of their ambitions?

The Chinese Challengers will no doubt continue to solidify their lead at home. Alibaba and Amazon will likely compete on the e-commerce front across many global markets. Huawei competes with Apple in devices, and with companies such as Cisco and Nokia in infrastructure, albeit at very different price points so far.

The next winning strategies

What does the increasing power of the Big Five and their Chinese Challengers mean for the technology industry as a whole? Winning in the tech space is no longer simply a matter of understanding a customer need and using a new technology or channel to build a product or service value proposition to fulfill it.

The Big Five have succeeded by developing a clear strategic identity, the distinctive set of capabilities required to translate their strategy into winning business models, and a well-defined portfolio of platforms, products, and services.

There is no inherent reason why the Next 20 can't follow the same playbook, define a strategy and capabilities system based on a strong identity, build a future-oriented operating model and cost structure, and leverage a distinctive talent base and culture to differentiate themselves by customer value. That said, it is certainly not wise to choose a strategic identity that puts one in direct competition with Alphabet, or Amazon, or Facebook. But given the multitude of growth areas, new technologies, and cross-vertical disruptions surrounding technology companies, there is still ample opportunity to define winning strategies and create new multibillion-dollar businesses — even in areas where the Big Five and Chinese Challengers are already competing as well. As long as the Next 20 (and beyond) don't try to do too much with too little commitment, there is hope and a lot of opportunity.

As for the Chinese Challengers, they are both helped and hindered by their established dominance in their home market. That market will potentially be larger and more lucrative in the long term than the U.S. market; China already exceeds the U.S. in online customer count and in mobile phone users. But as these companies begin to compete in international markets, they will have to force themselves to build capabilities that are not very important in their home markets. In some ways, they are already rising to this challenge — they are fierce and persistent competitors — but they have not yet demonstrated the type of product or business model innovation that can easily translate beyond China and that would allow them to play the kind of global role that the Big Five play today.

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