

THE 2018 TMT VALUE CREATORS REPORT

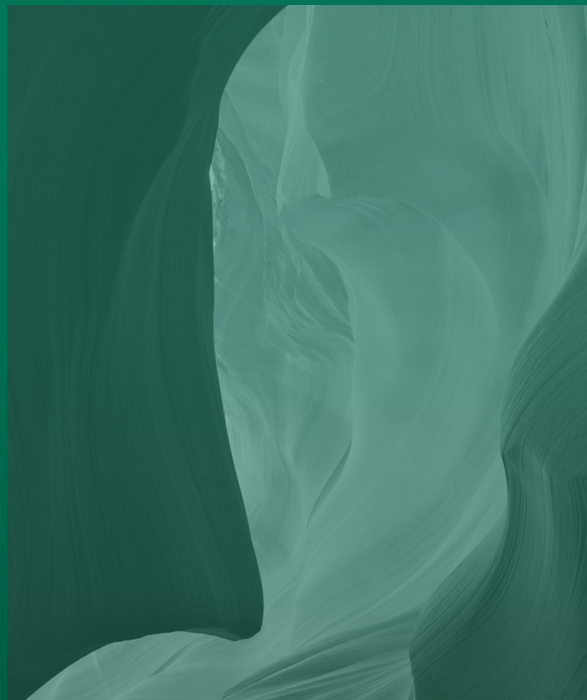
HARDWIRING DIGITAL TRANSFORMATION



BCG

THE BOSTON CONSULTING GROUP

The Boston Consulting Group (BCG) is a global management consulting firm and the world's leading advisor on business strategy. We partner with clients from the private, public, and not-for-profit sectors in all regions to identify their highest-value opportunities, address their most critical challenges, and transform their enterprises. Our customized approach combines deep insight into the dynamics of companies and markets with close collaboration at all levels of the client organization. This ensures that our clients achieve sustainable competitive advantage, build more capable organizations, and secure lasting results. Founded in 1963, BCG is a private company with 90 offices in 50 countries. For more information, please visit [bcg.com](https://www.bcg.com).



THE 2018 TMT VALUE CREATORS REPORT

HARDWIRING DIGITAL TRANSFORMATION

SIMON BAMBERGER

WOLFGANG BOCK

HADY FARAG

PATRICK FORTH

ANNA GREEN

DEREK KENNEDY

FREDRIK LIND

FLORENT RODZKO

NEAL ZUCKERMAN

CONTENTS

- 3 DIGITAL NATIVES LEAD THE BATTLE FOR VALUE CREATION**
 - Outsized Companies Are Creating Outsized Value
 - The Value Creation Scorecard
 - A Playbook for Digital Transformation

- 8 TECHNOLOGY: THE ENGINE OF DIGITAL TRANSFORMATION**
 - The Titans of TSR
 - Thwarting Volatility with Reinvention
 - Broadening Portfolios and Horizons
 - Driving Digital Innovation

- 13 MEDIA’S UNASSAILABLE CASTLES AND NEW BUSINESS MODELS**
 - Digital Media Leads the Field
 - Traditional Companies Can Be Winners, Too

- 18 TELECOMMUNICATIONS: BREAKING THROUGH THE BOTTLENECKS**
 - Time to Stop Treading Water
 - A Customer-Centric Approach to Improving Experiences and Networks
 - Strengthening the Building Blocks of B2B
 - The New Frontiers of Diversification
 - M&A and the Regulation Wildcard

- 24 UNLOCK VALUE CREATION THROUGH DIGITAL ENABLERS**
 - Jump-Starting a Digital Journey: The Four Categories of Enablers
 - Transform and Win

- 28 FOR FURTHER READING**

- 29 NOTE TO THE READER**

DIGITAL NATIVES LEAD THE BATTLE FOR VALUE CREATION

“YOU’RE DIGITAL OR YOU’RE dead.” Across industries, those words have evolved from prophecy to mantra to no-brainer. But the need to live and breathe digital is greatest in the technology, media, and telecommunications industries. TMT companies are leading the charge in creating a global economy that is increasingly centered around digital technologies and business models, and TMT companies are reaping the rewards of that transition.

The overall 2018 BCG Value Creators study analyzed more than 2,000 companies across 33 industries. Of the 200 largest companies, TMT players claim 13 of the top 20 spots in terms of TSR. (See Exhibit 1.) And in BCG’s 2018 ranking of the 20 most innovative companies, 17 are TMT companies or digital natives, or both. (Digital natives are companies that were started using an internet- or mobile-based business model or that switched to one early in their life cycle.) (See *The Most Innovative Companies 2018: Innovators Go All In On Digital*, BCG report, January 2018).

But TMT companies are not leading or reaping the rewards equally. Digital natives are increasingly generating a larger share of the TMT sector’s value creation, with the largest digital natives producing the most. This is ratcheting up the pressure on more traditional companies—those that weren’t born with digital in their DNA—to transform.

Transformations can take different paths, however; traditional companies need to create one that’s right for their organization. They can enter new, high-growth areas, such as cloud computing, artificial intelligence (AI), robotic process automation, or data and analytics. They can change their operating models to innovate faster, reduce costs, and improve the customer experience. They can even change their business models to evolve with new trends and opportunities. The list goes on. For most companies, though, the right path is pursuing a combination of options.

Yet transformations are hard. Indeed, we’ve found that only about one-third of companies navigate major change successfully. (See “Creating Value from Disruption (While Others Disappear),” BCG article, September 2017.) Businesses must not only define a strategy that best suits them but also rigorously execute it to ensure success.

Outsized Companies Are Creating Outsized Value

To determine which companies are generating the most value, we analyzed the TSR of 235 TMT companies over a five-year period from 2013 through 2017. The results provide stark evidence that traditional and digital giants—those companies with a market capitalization in excess of \$300 billion—as well as

EXHIBIT 1

TMT Dominates 2018’s Top-20 Rankings of the Largest Companies by Market Capitalization

2012

5

TMT companies in the top 20

Average five-year annual TSR (%)

Baidu	59.5
Tencent	41.8
Apple	36.7
Amazon	34.4
IBM	15.6

2016

5

TMT companies in the top 20

Average five-year annual TSR (%)

Naspers	41.1
Tencent	35.5
Netflix	35.4
KDDI	34.9
Amazon	30.3

2018

13

TMT companies in the top 20

Average five-year annual TSR (%)

Nvidia	76.1	Keyence	39.9	Texas Instruments	31.0
Netflix	70.7	Amazon	36.1	Microsoft	29.6
Broadcom	54.6	Adobe Systems	36.0	Altaba	28.5
Tencent	53.6	Naspers	34.6		
Facebook	46.0	Charter Communications	31.8		

Sources: S&P Global Market Intelligence; S&P Capital IQ; Thomson Reuters Eikon; Bloomberg; BCG Value Creators reports; BCG analysis.
Note: TSR percentages are calculated from January 1 through December 31 in each period. The average five-year annual TSR is the average CAGR of an individual company from January 1, 2013, through December 31, 2017. The 2012 Value Creators study analyzed the period from 2007 through 2011; 141 global companies were large-cap companies with a market capitalization greater than \$35 billion. The 2016 study analyzed the period from 2011 through 2015; 200 companies were large-cap companies with a market capitalization greater than \$44 billion. The 2018 study analyzed the period from 2013 through 2017; 200 companies were large-cap companies with a market capitalization greater than \$57 billion.

digital natives are increasingly generating a larger share of the TMT sector’s value creation.

The top seven TMT companies in terms of market capitalization—Apple, Alphabet, Microsoft, Amazon, Facebook, Tencent, and Samsung—generated \$3.1 trillion of the \$8.4 trillion in absolute value that TMT players created during those five years.¹ (See Exhibit 2.) In other words, seven companies account for 37% of the value generated by 235 companies. These seven also have a median five-year annual TSR of 30%, compared with 18% for the remaining 228 TMT companies.

Digital giants, such as Amazon and Facebook, are not the only ones doing well. Digital natives as a whole seem to be outpacing traditional companies. Looking at digital natives that have a five-year TSR history (31 companies in all), we found that they had a median five-year annual TSR of 24%—7 percentage points higher than traditional companies. The average market capitalization of digital natives, meanwhile, grew by 56% over the past year, more than double the growth rate of traditional companies’ average market capitalization.

To be sure, digital natives benefit from an intrinsic advantage: they don’t have to manage

a transformation. These companies have been built, from day one, around digital technologies and the business models they’ve inspired. But the most successful digital natives have also developed a set of critical capabilities. These companies have a fast, iterative approach to innovation. They focus on creating great customer experiences. They have simplified and automated internal processes. And they attract great talent. These are all important advantages in the digital era. And they are advantages that companies have to keep developing and building upon. Digital natives may be doing well overall, but there will invariably be a lot of fallout as markets mature.

The Value Creation Scorecard

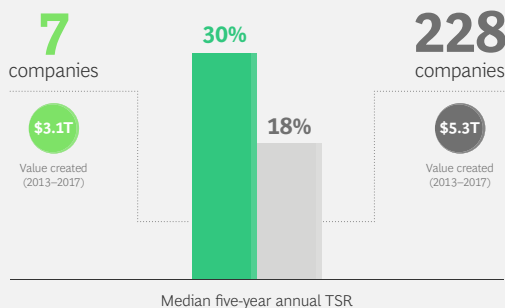
Of the 33 industries that we analyzed, those that make up the TMT sector are leading the way in creating value in a digital world. However, within the TMT sector, there are some noteworthy differences among the three industries.

- Technology is the star of the TMT show. Of the \$8.4 trillion in value that the three industries created from 2013 through 2017, technology accounts for nearly 65%, or \$5.5 trillion. The median five-year annual TSR for the tech companies

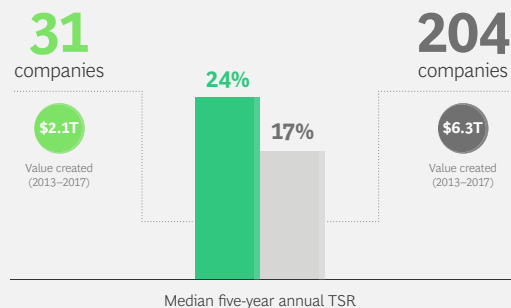
EXHIBIT 2

Giants and Digital Natives Lead in Value Creation

Traditional and digital giants versus all other TMT companies



Digital natives versus all other TMT companies



Sources: S&P Global Market Intelligence; Thomson Reuters Eikon; Bloomberg; company disclosures; BCG analysis.

Note: Traditional and digital giants are TMT companies with a market capitalization greater than \$300 billion as of December 31, 2017. The sample consists of Alphabet, Amazon, Apple, Facebook, Microsoft, Samsung, and Tencent. Digital natives are companies that were founded with an internet- or mobile-based business model or that switched to one early on. Value created is calculated by multiplying a company's market capitalization as of January 1, 2013, by the CAGR in TSR from January 1, 2013, through December 31, 2017. The median five-year annual TSR is the median of all the CAGRs at which a group of companies in an industry has created value from January 1, 2013, through December 31, 2017.

analyzed is 21%, a significant increase from 14% for the period from 2011 through 2015. (See *Unleashing Technology, Media, and Telecom with Digital Transformation*, the 2016 TMT Value Creators report, October 2016.) This performance—driven by digital natives as well as by semiconductor companies benefiting from demand from new markets such as AI and the Internet of Things (IoT)—enabled the technology industry to rise to number 4 of the 33 industries. This ranking is up from number 11 for the period from 2011 through 2015.

- Media and telecommunications drop in the overall rankings.** The media and telecommunications industries' median five-year annual TSR have modest changes from the previous five-year period (2011 through 2015): media is up from 20% to 21%; telecommunications is down from 11% to 10%. But both industries drop in the overall rankings. Media is down two spots to number 5, and telecommunications is off 13 places to 30th. Notable, too, is a particularly wide gap between higher- and lower-performing players: in both industries, the value created by the top-quartile companies is almost four times greater than that generated by the bottom-quartile companies. (See Exhibit 3.)

A Playbook for Digital Transformation

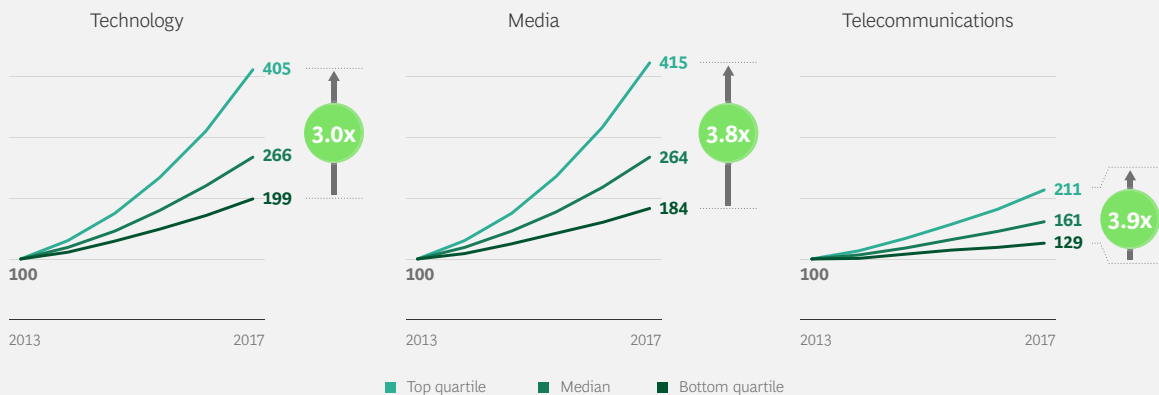
By now, most traditional companies have started down the road to digital transformation. But the performance gaps we found—not only in media and telecommunications but also to a lesser extent in technology—suggest that some companies are moving faster and more successfully than others. What are the winners doing to get out ahead? Or perhaps more to the point, what can other companies do to join them?

For starters, high-performing companies have defined their strategy for the digital era, an effort that requires deciding how much emphasis to put on transforming their core business and how much attention to devote to newer, high-growth areas and business models. Some companies—particularly telcos such as NTT Docomo and Orange—have revitalized their core, providing customers with omnichannel experiences that are intuitive and personalized and that enable self-service. Others have also made bold moves. Microsoft has shifted from on-premises software to cloud-based offerings. Video game leaders such as Electronic Arts, Ubisoft Entertainment, and Take-Two Interactive Software have found a steadier source of revenue through in-game purchases that extend the value-creating lifetime of their hits.

EXHIBIT 3

Value Creation Varies Widely Within Each TMT Industry

The growth of a \$100 investment, 2013–2017



Sources: S&P Global Market Intelligence; Thomson Reuters Eikon; Bloomberg; company disclosures; BCG analysis.

Note: The index was set to 100 starting on January 1, 2013. The total sample consists of 235 companies, with 105 companies in technology, 73 companies in media, and 59 companies in telecommunications. Two companies (Facebook and Google) are included in both the technology and media industries. The difference in value creation = (top-quartile ending value – index value) / (bottom-quartile ending value – index value).

For most companies, the key will be to strike the right balance between digitalizing the core business and identifying—and pursuing—new paths to growth. Within the core business, digital technologies can be applied throughout the value chain to improve the customer experience, simplify processes, and reduce costs. At the same time, companies can take advantage of technical developments and emerging customer needs to create new routes to revenue. Examples include telcos that are moving from 3G and 4G networks to 5G networks and software companies that have shifted their focus from products to solutions and services.

For companies whose existing portfolios are deep in slow-growing legacy products, the need to discover emerging, high-potential business opportunities is particularly acute. Many options exist across the disruptive technology landscape. Three areas are particularly fertile ground for opportunities:

- **Artificial Intelligence.** Momentum in AI continues, with applications and opportunities growing. Machine learning, in particular, is a hot spot, with heightened activity in areas as diverse as autonomous driving, medical engineering, and marketing. Yet many companies have yet to seize on AI's potential. A recent study found

that only one-quarter of responding companies had incorporated AI in some manner.² TMT companies can break down common barriers to adopting AI by sourcing high-quality data, reskilling their workforces, educating their leaders, and promoting an experimental approach to using AI technologies.

- **The Internet of Things.** IoT continues to mature with an expanding array of applications, notably in areas such as transportation, industrial automation, and medical care. M&A activity is increasing as well: the number of IoT-related deals rose 60% from 2015 through 2016. Some TMT players are moving into specific IoT verticals: for example, GE Digital acquired logistics-focused ServiceMax for \$900 million in 2016, and Intel acquired Mobileye—a company active in the autonomous driving space—for \$15 billion in 2017. Meanwhile, concerns about IoT security have raised the profile of areas such as edge computing and blockchain. Already, players such as Cisco and Micron Technology have made IoT security a new focal point.
- **Cybersecurity.** Incidents of stolen intellectual property, lost customer data, crippling ransomware, and other forms of

cybercrime continue to rise. Securing traditional IT is far from a solved problem, and new trends, such as the increasing adoption of hybrid cloud platforms, add to the challenge. AI, meanwhile, has emerged as a double-edged sword. Companies such as Illusive Networks are using machine learning to create solutions that defend against threats. But AI can also be used for malicious purposes, and companies will need to prepare for these new types of attacks.

As the cybersecurity landscape evolves, new areas are growing in importance and potential. One such area is agile security development: as companies deploy software faster and faster, they need more nimble security testing and scanning capabilities. Cyberresilience—the ability to deter and withstand cyberattacks—is also gaining prominence, as companies require increasingly robust incident management capabilities. In the future, the private sector—with TMT companies in the lead—will play a key role in fostering partnerships with public institutions and strengthening personal data protection.

As they shape their strategies, companies should view digital transformation through two lenses. First and foremost, there is the customer lens. This requires companies to ask how they can design great customer experiences. But at the same time, companies shouldn't overlook the value lens. Digital transformations take time, and they don't come cheap. So while companies are defining how to win in the medium term, they also need to run their business and fund their journey.

We've found that companies that hope to flourish in the digital era need to spend at least 10% of their market capitalization on transformation initiatives. And they need to spend that money well. Investors (and employees) generally aren't convinced that a company is serious about—and seriously working toward—change until 20% of its revenue is coming from new business models. A value-based perspective ensures that a company hits all the necessary notes and helps it decide which initiatives to prioritize.

Creating a well-defined strategy is crucial, but so is the ability to execute it. High-performing companies do a great job managing both the “hard,” or technology, side of change and the “soft” side, which includes a company's people, culture, and ways of working. High performers also have—without exception—a strong commitment from senior management.

The ability to manage large, complex, two- to three-year programs and hit financial targets is a huge differentiator between the winners and losers. So, too, is the ability to accelerate change in a disrupted landscape. Standout companies have developed an array of new but vital skills and capabilities—digital enablers—that let them do this. Nvidia, for example, has used a customer-centric approach to product design to create new growth opportunities in areas such as AI. Other companies have adopted agile methodologies to foster a faster, more flexible development process or are using sophisticated analytics capabilities to better understand customer behavior and preferences.

These digital enablers, explored later in this report, fall into four main categories: people and organization, data and analytics, technology, and ecosystems. Applied wisely, digital enablers can help a business survive and thrive in the digital era. It's time to join that elite third: companies that not only define the digital transformation that's right for them but also deliver on it.

NOTES

1. Absolute value is calculated by multiplying a company's market capitalization by the CAGR of TSR over a specified time frame.

2. *Reshaping Business With Artificial Intelligence: Closing the Gap Between Ambition and Action*, MIT Sloan Management Review, September 2017.

TECHNOLOGY

THE ENGINE OF DIGITAL TRANSFORMATION

IN AN INDUSTRY DEFINED by constant change and innovation, technology companies have sparked tremendous value creation. The tech industry leads the TMT sector in TSR and ranks fourth among the 33 industries in the overall BCG Value Creators study. Tech companies hold five of the top six spots among the more than 2,000 companies analyzed in terms of absolute value created from 2013 through 2017.

Perhaps even more significantly, tech businesses are the engines of digital transformation. They develop the tools—such as cloud solutions and analytics platforms—that help companies in all industries plan and execute a digital transformation. And they lead by example. Tech companies are the first to adopt, master, and prove these tools on a broad scale. They also originate many best practices, such as agile methodologies and DevOps, which drive success. Indeed, to study the industry's top performers is to take a master class in how to use the capabilities and strategies that fuel value creation.

The Titans of TSR

Value creation in the tech industry stands out from both relative and absolute perspectives. The industry's median five-year annual TSR of 21% from 2013 through 2017 represents a jump of 7 percentage points since our previous report, which covered 2011 through 2015. The recent year-over-year increase has been

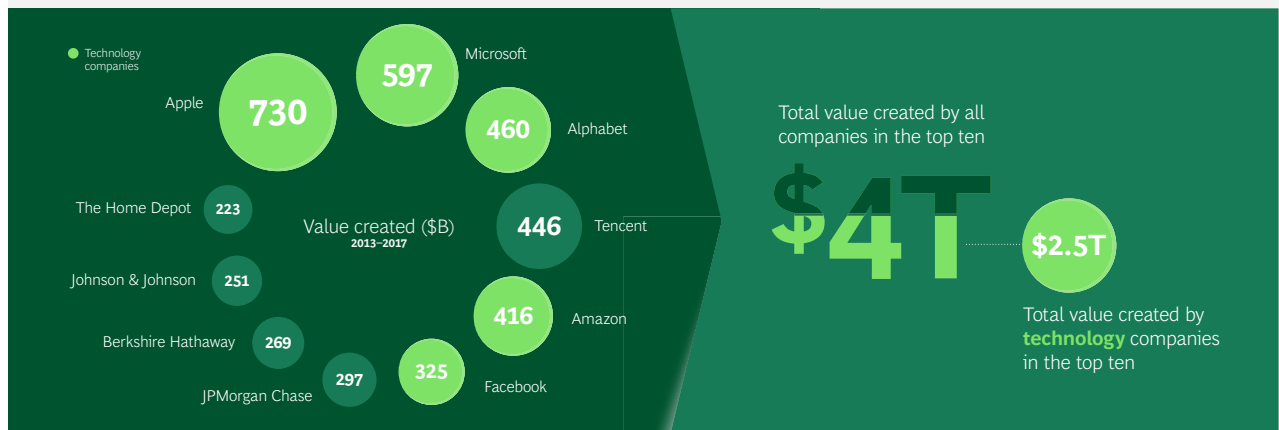
particularly impressive: in 2016, the median annual TSR was 12%; in 2017, it was 37%. Tech's momentum has outpaced nearly every other industry. In the 12-month period from October 2016 through September 2017, tech had the second-largest jump in TSR among all 33 industries.

Absolute value creation has been even more eye-catching. The tech companies we analyzed accounted for almost two-thirds of the \$8.4 trillion in value that TMT industries created from 2013 through 2017, dwarfing the amount contributed by media and telecommunications companies.

Large-cap companies, those with valuations exceeding \$50 billion, are driving the industry's performance. Although these players made up less than one-third of the analyzed tech companies, they generated more than three-fourths of the tech industry's total absolute value. The impact of the tech giants—Alphabet, Amazon, Apple, Facebook, and Microsoft—was even more pronounced. These big five, boasting the largest market capitalizations in the industry, created \$2.5 trillion in value—nearly half the industry total—from 2013 through 2017. (See Exhibit 4.) Currently, several of these tech companies are flirting with an unprecedented \$1 trillion market capitalization. That tech companies are the only contenders in the race to be first is particularly noteworthy.¹

EXHIBIT 4

Technology Giants Lead in Global Value Creation



Sources: S&P Global Market Intelligence; S&P Capital IQ; BCG analysis.

Note: Value created is calculated by multiplying a company's market capitalization as of January 1, 2013, by the CAGR in TSR from January 1, 2013, through December 31, 2017.

Large-cap companies lead in relative value creation as well, with Nvidia, Broadcom, and Facebook taking three of the top five positions on the industry's TSR leaderboard.

Thwarting Volatility with Reinvention

Tech's strong performance comes with a caveat: tech has long been among the most volatile industries in the economy. Indeed, over a period of 16 years, from 2001 through 2016, only the basic materials industry saw more volatility than tech in terms of annual TSR.

To keep volatility at bay, tech companies need to continually reinvent themselves. (See "Value Creation and Corporate Reinvention," BCG article, December 2017.) Reinvention isn't easy, but some companies have done it well. Microsoft, for instance, has successfully transitioned its focus from on-premises software to cloud-based offerings, having built a strong portfolio of software-as-a-service, platform-as-a-service, and infrastructure-as-a-service solutions. But a particularly insightful how-to story comes from Nvidia, the company with the second-highest TSR among tech companies. Its average annual TSR was a staggering 76.1%.

Slowing PC sales posed a potential threat to Nvidia's bread-and-butter business: selling

graphics processing units that are designed for computer gaming. So the company explored bringing its graphics processing technology to emerging, high-potential markets. To find the right areas, Nvidia adopted a more customer-centric approach to product and portfolio development. Traditionally, semiconductor companies have viewed these activities from a technical perspective and asked themselves, what *can* we build? But Nvidia asked, what *should* we build? The latter helped the company understand the uses and applications that resonated with customers. Then it built products that filled those needs. (See *When Chip Makers Look Through the Value Lens*, BCG Focus, April 2017.)

Reinvention isn't easy, but some companies have done it well.

This customer-centric approach led Nvidia to the AI space. Like gaming, AI requires the rapid completion of repetitive tasks. Nvidia's graphics processing units could be adapted to meet emerging needs and seize new opportunities. Meanwhile, partnerships with companies such as Baidu, Google, and Toyota

boosted Nvidia’s prominence within the emerging AI ecosystem.

Broadening Portfolios and Horizons

Within the tech industry, the performance of two segments stands out. The semiconductor segment has an outsized median five-year annual TSR of 31%; four companies in this segment have spots on tech’s TSR top-ten list. (See Exhibit 5.) The electronic components, equipment, and manufacturing services segments have a median five-year annual TSR of 23%; companies in these segments also have four spots on tech’s TSR top-ten list.

For some star performers, demand was strong from traditional sources. China’s Sunny Optical Technology Group and Taiwan’s Largan Precision profited from the continuing robust demand from manufacturers of advanced smartphone cameras. Other players—such as memory chip manufacturer Micron Technology—saw demand from a broadening array of customers, including manufacturers of AI and IoT solutions. Demand from such nontraditional customers is expected to only grow. The market research firm IDC estimates that the installed base of IoT devices—including the security cameras, baby monitors, smart appliances, and digital assistants that are

making their way into homes—will increase from 15 billion in 2016 to 30 billion in 2020.

While some companies, such as Nvidia, are pursuing organic growth in emerging markets, others are exploring potential M&As to plant stakes in new ground. Intel acquired Mobileye, an Israeli company active in the autonomous driving and IoT spaces, for \$15 billion in August 2017. Samsung purchased US-based Harman International for \$8 billion in March 2017. Among other things, Harman builds connected car solutions, including navigation and driver-assistance systems. Overall, the tech M&A market is booming. In 2016, tech deals totaled more than \$700 billion and accounted for nearly 30% of the overall M&A market. (See *The Technology Takeover*, the 2017 BCG M&A report, September 2017.)

Driving Digital Innovation

By its very nature, the tech industry is at the forefront of innovation, supplying the technology infrastructure and software that increasingly powers the economy. It provides many of the tools that help companies in all industries transform for a digital world. These tools include an array of cloud-based services, such as storage, computing, and applications; cybersecurity solutions; and data platforms. And because tech companies are not only cre-

EXHIBIT 5

Semiconductor and Electronic Components Companies Outperformed on the Technology Top-Ten Rankings

Rank	Company	Location ¹	Technology segment	Average five-year annual TSR (%) ²	Market capitalization (\$B) ³
1	Sunny Optical Technology Group	China	Electronic components	83.6	13.9
2	Nvidia	US	Semiconductors	76.1	117.3
3	Broadcom	Singapore	Semiconductors	54.6	105.2
4	DXC Technology	US	IT services	47.0	27.1
5	Facebook ⁴	US	Internet software and services	46.0	512.8
6	Nidec	Japan	Electrical components and equipment	46.0	41.6
7	Micron Technology	US	Semiconductors	45.3	47.5
8	Hangzhou Hikvision Digital Technology	China	Electronic equipment and instruments	42.9	55.3
9	AAC Technologies	China	Electronic manufacturing services	42.5	21.8
10	Tokyo Electron	Japan	Semiconductor equipment	42.3	29.7

Sources: S&P Global Market Intelligence; Thomson Reuters Eikon; Bloomberg; company disclosures; BCG analysis.
 Note: The technology sample consists of 105 companies.
¹Location of corporate headquarters.
²The average five-year annual TSR is the average CAGR of an individual company from January 1, 2013, through December 31, 2017.
³As of December 31, 2017.
⁴Facebook is ranked in both the technology and the media industries.

ators of these tools but also users, they’ve been able to adapt to a rapidly changing digital landscape.

Tech companies have also introduced some of the most important practices for boosting flexibility and speed. Agile methodologies, now used in a host of fields including financial services, are perhaps the best known. But while other industries are only beginning to implement these practices, the best performing tech businesses have mastered them. This helps explain the strong showing of large companies on tech’s TSR top-ten list. Conventional wisdom holds that as companies grow larger, they become less agile and adaptable and can have a harder time maintaining high TSR. But in the tech industry, large companies’ returns have challenged that notion. (See Exhibit 6.)

Digital giants, such as Amazon and Facebook, have understood and benefited from “hyper-scale.” (See “Borges’ Map: Navigating a World of Digital Disruption,” BCG essay, April 2015.) As the technology stack becomes increasingly modular and interoperable, three layers in particular can benefit disproportionately from scale: Platforms, such as social media, and their network effects can lead to winner-takes-all monopolies. Infrastructure, such as the cloud, can create true global scale. And

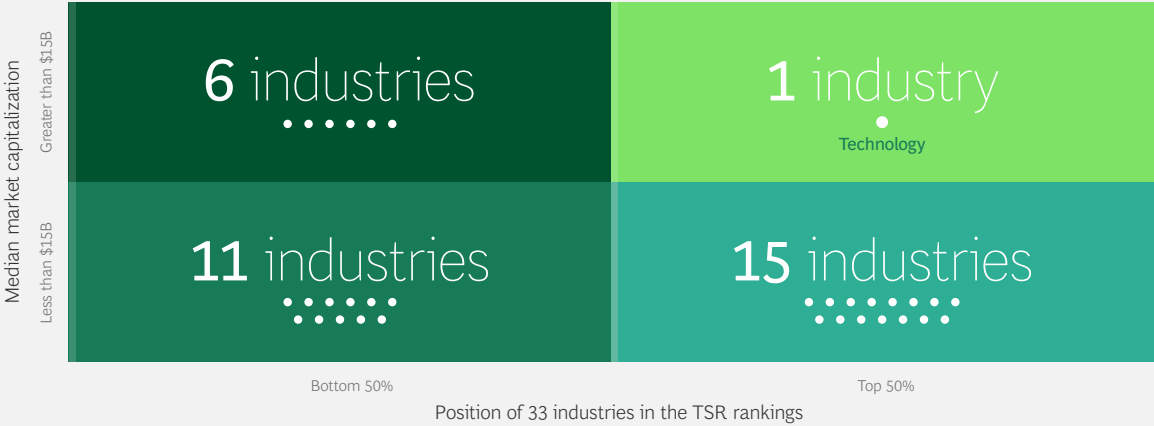
data—the increasing types as well as the higher volumes—can lead to better inferences in, for example, facial recognition.

The lessons from the high performers, such as the importance of reinvention and agility, are especially crucial for those companies further down in the tech industry rankings. Even though tech as a whole is doing well, strong performance is not guaranteed. Indeed, the value created by companies in the top quartile was three times greater than the value generated by players in the bottom quartile.

Companies trailing far behind the leaders can find themselves to be an acquisition target. Or they can be the target of activist shareholders, as is the case with more than 70% of companies in the bottom quartile. In fact, activist shareholders have had a dominant presence across the tech sector. Although many companies have been highly innovative and created tremendous value, many other companies have mature core offerings and haven’t sufficiently pivoted to new technologies and business models.

Instead of having a digital transformation imposed on them, tech companies need to make the commitment to drive it themselves. They need to bet sufficiently on new paradigms while reducing exposure in their declining core.

EXHIBIT 6
The Technology Industry Proves That Large Companies Can Be Agile and Adaptable
Technology is the only top-performing industry with a median company size that is greater than \$15 billion



Sources: S&P Global Market Intelligence; Thomson Reuters Eikon; Bloomberg; company disclosures; BCG analysis.
Note: Company data is based on the 2018 BCG Value Creators study that analyzed more than 2,000 companies.

That's no small task, and it requires companies to strike the right balance between seeking new areas of growth and revitalizing—or even reimagining—the core. But by applying the right levers and enablers, all tech companies can transform and reinvent themselves. They can accelerate innovation, change, and growth. Companies in every industry are racing to transform themselves, but tech companies have a special advantage: they're writing the playbook.

NOTE

1. "The Race Is on for the First \$1 Trillion U.S. Company," *Wall Street Journal*, January 25, 2018.

MEDIA'S UNASSAILABLE CASTLES AND NEW BUSINESS MODELS

IN MEDIA, IT IS especially good to be the king. A handful of digital giants are so dominant in their markets that their positions appear essentially untouchable. These unassailable castles are value-creation machines, but they're also something else: an aspiration for other companies. In media segments such as publishing and broadcast TV, many traditional players are looking—and even struggling—to transform themselves for a digital world. But some companies are succeeding in making the transition. Often these companies are doing so by taking a page from the digital giants' playbook: creating a strong and defensible position by building a moat, so to speak, around a new or reengineered business model. These companies are taking a number of approaches to fortify their position: acquisitions, partnerships, and the development of new capabilities. It's an effort that other media companies can undertake, too.

Digital Media Leads the Field

Media is a very volatile industry, yet paradoxically, its aggregate returns have been relatively stable. From 2013 through 2017, the media companies in our study have a median five-year annual TSR of 21%—a slight increase from our previous report, which covered the period from 2011 through 2015. Once again, Chinese companies make a strong showing in the five-year TSR rankings,

holding five of the top ten positions. Their performance tracks the continuing growth of the Chinese internet market; spending reached nearly \$1 trillion in 2016, second only to the US internet market.

A handful of digital giants are so dominant in their markets that their positions appear essentially untouchable.

But when we looked at individual segments, sharp differences in performance—and even some shifting tides—emerged. Digital media has had a particularly good run. (See Exhibit 7.) Its median five-year annual TSR of 28% surpasses that of a host of more traditional segments, including movie studio (17%), publishing (16%), advertising agency (15%), and broadcast TV, cable, and satellite (10%). (See Exhibit 8.) An analysis of absolute value creation reveals even more starkly the ascendancy of digital natives. Indeed, the numbers underscore the continued and growing dominance of Facebook, Alphabet, Amazon, and Netflix (FAAN). This quartet generated \$1.1 trillion in value in the three-year period from 2015 through 2017—or 140% as much as all other analyzed media companies *combined*. In our previous report, which looked at the

EXHIBIT 7

Digital Media and Video Game Companies Made a Strong Showing on the Media Top-Ten Rankings

Rank	Company	Location ¹	Media segment	Average five-year annual TSR (%) ²	Market capitalization (\$B) ³
1	East Money	China	Digital media	72.3	8.5
2	Netflix	US	Digital media	70.7	83.1
3	Take-Two Interactive Software	US	Video game	58.4	12.5
4	NetEase	China	Digital media	56.3	45.3
5	Tencent	China	Digital media	53.6	489.7
6	Ubisoft Entertainment	France	Video game	52.0	8.4
7	YY	China	Digital media	51.3	7.1
8	Electronic Arts	US	Video game	48.6	32.4
9	Leshi Internet Information & Technology	China	Digital media	46.9	9.4
10	Facebook ⁴	US	Digital media	46.0	512.8

Sources: S&P Global Market Intelligence; Thomson Reuters Eikon; Bloomberg; company disclosures; BCG analysis.
Note: The media sample consists of 73 companies.
¹Location of corporate headquarters.
²The average five-year annual TSR is the average CAGR of an individual company from January 1, 2013, through December 31, 2017.
³As of December 31, 2017.
⁴Facebook is ranked in both the technology and the media industries.

three-year period from 2013 through 2015, the FAAN companies generated a “mere” 80% of the value created by the rest of the media companies. (A three-year period was used since Facebook’s initial public offering was May 2012.) (See Exhibit 9.)

Companies can spark success by building the capabilities that let them run faster and further than the competition.

When it comes to value creation, the *how* is as significant as the *how much*, if not more so. The story of two FAAN companies shows why this is true. They created massive moats around resilient business models, becoming, in effect, kings without apparent heirs, challengers, or usurpers.

In the digital world, the various types of advertising models cover a wide spectrum—the so-called barbell of advertising—from low-touch solutions, such as programmatic advertising and analytics-based targeting, to high-touch formats, such as branded content and custom-tailored advertising. Facebook and Alphabet, Google’s parent, achieved domi-

nance in digital advertising spending by focusing on models that used their strengths: high-traffic platforms, strong analytics and programmatic capabilities, and the enormous amount of user data generated by their platforms. This approach led the two companies to capture nearly 60% of all digital advertising spending in 2016. Other media companies can spark success by identifying the advertising models along the barbell that fit them best and then building the capabilities that let them run faster and further than the competition.

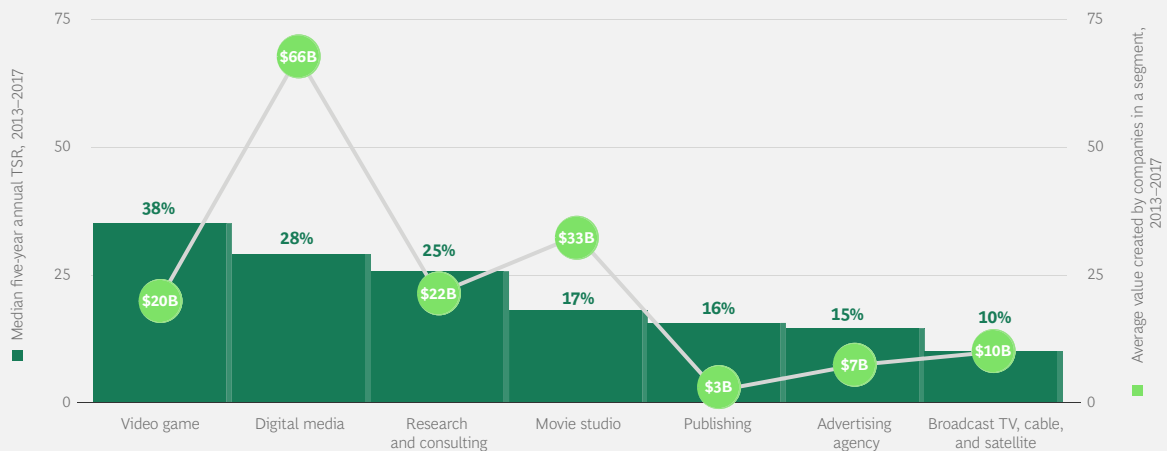
Moats aren’t the province of only the FAAN companies. Consider Tencent. In seven of the past nine TMT Value Creators reports, the company has been among the cross-industry top ten in terms of average five-year annual TSR. Messaging platforms WeChat and QQ are the core of an ecosystem of integrated services—including e-payments and mobile gaming—that Tencent monetizes.

Traditional Companies Can Be Winners, Too

In the digital era, success in media is about building these kinds of unassailable castles. But it’s a mistake to think that the concept applies only to digital natives. No matter the media segment, incumbents can establish

EXHIBIT 8

Sharp Differences in Performance Exist Within the Media Industry



Sources: S&P Global Market Intelligence; Thomson Reuters Eikon; Bloomberg; company disclosures; BCG analysis.

Note: The media sample consists of 73 companies. The median five-year annual TSR is the median of all the CAGRs at which a group of companies in an industry has created value from January 1, 2013, through December 31, 2017.

strong positions in the digital world to spark and sustain value creation.

The New York Times Company is a good success story for publishing. It has strengthened the subscription model of its newspaper by using an important asset—high-quality content—and new digital enablers. The paper’s newsroom is organized to drive its digital agenda and focused on digital formats and content. And the company is analyzing reader data to better understand the kind of content that subscribers want to see. The payoff has been significant: Digital subscription revenue rose 46% from October 1, 2016, through September 30, 2017. In addition, the number of digital subscribers increased by 59% during the same period.

Some traditional media companies are using yet another asset—their large base of customers—to build moats and drive value creation. New advertising models are enabling these companies to monetize customer data. For example, 21st Century Fox, Time Warner, and Viacom are working together on a platform that will help them use insights from their data to sell targeted advertising.

We’re also seeing media players building castles through M&A. Consider The Walt Disney Company. In December 2017, Disney an-

nounced its intent to acquire the bulk of 21st Century Fox’s film and TV assets—as well as Fox’s ownership stakes in over the top (OTT) providers Hulu and Roku—for \$52.4 billion. This is a deal that can readily be seen as a direct attempt to build global scale and counter Netflix’s domination in the subscription video-on-demand market. The deal gives Disney an expanded library of content for its own video service, and conceivably, the company could keep this content off Netflix’s service. The deal also makes Disney the majority owner of Hulu, an established platform that the company could use to attract OTT subscribers and further monetize its content.

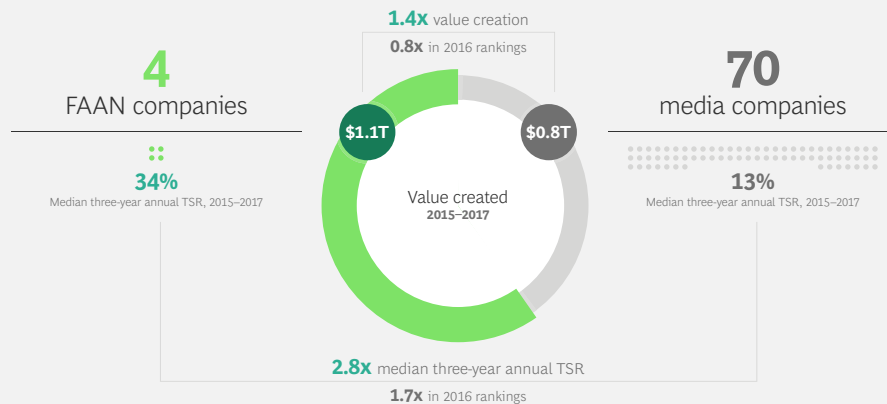
Some traditional media companies are using their large base of customers to drive value creation.

Disney isn’t the only major player to look to M&A to build or expand its online foothold. Warner Bros. Entertainment has invested in subscription platforms by acquiring DramaFever—an online service that originally focused only on South Korean dramas but now features content from across the globe—as

EXHIBIT 9

FAAN Companies Are Creating More Value

Facebook, Amazon, Apple, and Netflix versus the rest of the media industry



Sources: S&P Global Market Intelligence; Thomson Reuters Eikon; Bloomberg; company disclosures; BCG analysis.

Note: Amazon is included as a media company. Median three-year annual TSR is the median of all the CAGRs at which a group of companies in an industry has created value from January 1, 2013, through December 31, 2017. Median three-year annual TSR has been weighted by market capitalization. The 2016 rankings measured median three-year annual TSR from 2013 through 2015.

well as the gaming-oriented online video network Machinima.

Another noteworthy segment is the video game segment. Although it does not have giants such as Facebook or Google generating enormous absolute value, video game companies have the highest median five-year annual TSR at 38%. Traditionally, such performance would come with a caveat: video game TSR has historically been event-driven, or cyclical. A few big hits, and a company's performance improves dramatically; a few misses, and TSR suffers. But in the five-year period from 2013 through 2017, the business model of video game leaders, such as Electronic Arts, Take-Two Interactive Software, and Ubisoft Entertainment, has evolved to seek more stable sources of revenue. Whereas their traditional model was to sell PC and console games that were, for buyers, a one-time purchase, these companies are now emphasizing recurring digital sales—through in-app purchases, subscription-based online and mobile games, or microtransactions, or a combination of these business models.

Although it may be too soon to say that the video game segment will be less cyclical in the future, some companies are clearly seeing a shift from physical-based revenue (stemming from in-store sales of boxed games) to

digital-based revenue. Take-Two—home of the storied *Grand Theft Auto* franchise and the highest-ranked video game company on the media TSR top-ten list—increased its digital revenue from 13% of total revenue in 2012 to 57% in 2017. At Electronic Arts, digital revenue increased more than 30% from 2015 through 2017 and accounted for 59% of total revenue in 2017.

For most traditional media companies, one of the most pressing challenges is to integrate the digital and physical worlds. To do this well, companies must understand customers' needs and preferences and tailor products, platforms, and features accordingly.

Companies also need to push innovation out to the customer quickly. Using digital enablers can help. Live Nation, for instance, employs agile methodologies and a cloud-based IT platform to develop and deploy feature changes rapidly. Netflix, meanwhile, is a case study in how to use data and analytics to better make personalized recommendations. (See "Media Companies Must Reimagine Their Data for a Digital World," BCG article, September 2017.) The result has been a growing lineup of popular and award-winning original programming. In 2017, only HBO had more Emmy Award nominations than Netflix.

Traditional media companies have been challenged, sometimes greatly, by digital and the new Goliaths this era has born. Yet there are success stories, too—companies that reoriented their business models, “rightsized” their

cost bases, and shaped their portfolios toward growth. In doing so, these companies have transformed themselves—and their future.

TELECOMMUNICATIONS

BREAKING THROUGH THE BOTTLENECKS

FOR TELECOM COMPANIES, UNDERTAKING a digital transformation is especially challenging. These businesses are usually large and complex. They have legacy products and IT systems. And they have cultures and skill sets that often harken back to a predigital era. Yet, telecom companies have an especially strong need to transform. With a median five-year annual TSR of 10% from 2013 through 2017, the telecom industry trails far behind most others in our study.

Telecom companies have an especially strong need to transform.

Many operators continue to face an array of challenges. Chief among them is customers' ever-increasing data usage without a commensurate increase in average revenue per user for operators. The imbalance is especially acute in mobile, where globally, data traffic is expected to quadruple from 2017 through 2021. Telcos need to invest—and then continue to invest—in greater capacity, but in a more surgical, narrowly focused way. They need to transform their customer experience, their networks, their IT, and their ways of working. And, they need to find new paths to growth and value.

The best performers are discovering how to meet these challenges. They're actively seeking new growth opportunities, both inside and outside their core businesses. They're using digital technologies to improve the customer journey. And they're finding ways to put their two main strengths—infrastructure and relationships with large numbers of customers—to new and profitable use.

These steps are important for all telecom operators. But for every company, success will depend on its ability to monetize to some extent customers' increasing data usage and its capacity to develop the right enablers to spark, spur, and steer a transformation. A telco's regulatory environment can have a significant impact on its path forward as well.

Time to Stop Treading Water

While other industries are stepping up their value creation game, telecommunications is straining to maintain a steady course. When we look at the full spectrum of industries analyzed in the overall BCG Value Creators study, telecommunications ranks 30th of 33 industries. That represents a drop of 13 places from the previous report, which covered the period from 2011 through 2015. Perhaps even more telling is that among all TMT companies, Charter Communications—a top-three performer in two consecutive reports (2016 and 2018)—ranks only 49th overall.

Clearly, many other industries are doing a better job of finding ways to boost performance. Across industries, median annual TSRs increased by an average of 4 percentage points between the two five-year periods. Yet the telecom industry’s median annual TSRs dropped by 1 percentage point. High-performing companies have stories that shed light on what others can do to generate value. But at the same time, market structure—and how regulation influences it—has a big impact on value creation as well.

Within the top ten, Japanese telcos have four spots, and US cable companies have two. (See Exhibit 10.) In a way, this isn’t surprising: Japanese operators have benefited from a relatively favorable regulatory environment, as reflected by their expanding valuation multiples. And as a technology, cable is still highly competitive. As in our previous report, most of the top ten positions are occupied by operators in mature markets, which by now have reached penetration rates that aren’t likely to go much higher. Signing up new subscribers and paying dividends have historically been value drivers, but top performers are also seeking other value-creation opportunities. This willingness to shake up the business helps to explain why emerging market players have not been outperformers. In these markets, subscriber growth has waned as

well, but operators have been slow to transform. Meanwhile, the entry of radical players with disruptive business models, such as Reliance Jio Infocomm in India, has exacerbated the challenge for incumbent players.

To be sure, the success of the industry’s top performers is not quite at the level of the TSR titans in tech and media. But in the face of continuing market challenges, some historical incumbents have managed to protect their positions in their local markets and deliver new value. Orange has an average five-year annual TSR of 17.2%, which enabled it to jump from 39th place in the previous report to 12th. Deutsche Telekom and Telenor Group follow closely, with average five-year annual TSRs of 16.2% and 14.9%, respectively.

A Customer-Centric Approach to Improving Experiences and Networks

Performance can rarely be attributed to any single factor. For a telecom company, financial outcome is shaped by capital investments, productivity, complexity management, and customer and regulatory strategies, to name just a few inputs. But one particularly potent factor is customer centricity. Orange’s Essentials2020 initiative, for example, is examining every type of company-customer in-

EXHIBIT 10

Japanese Telcos and US Cable Companies Dominate the Telecom Top-Ten Rankings

Rank	Company	Location ¹	Telecommunications segment	Average five-year annual TSR (%) ²	Market capitalization (\$B) ³
1	Safaricom	Kenya	Wireless telecommunications services	46.3	10.4
2	T-Mobile USA	US	Wireless telecommunications services	37.2	52.8
3	Charter Communications	US	Cable and satellite	31.8	83.9
4	Nippon Telegraph and Telephone	Japan	Integrated telecommunications services	27.4	93.2
5	KDDI	Japan	Integrated telecommunications services	25.3	60.4
6	SoftBank Group	Japan	Integrated telecommunications services	24.0	86.3
7	Telekomunikasi Indonesia	Indonesia	Integrated telecommunications services	23.8	32.4
8	Emirates Telecommunications	United Arab Emirates	Integrated telecommunications services	22.8	41.4
9	NTT Docomo	Japan	Wireless telecommunications services	20.1	87.5
10	Comcast	US	Cable and satellite	18.4	187.2

Sources: S&P Global Market Intelligence; Thomson Reuters Eikon; Bloomberg; Thomson Reuters Datastream; company disclosures; BCG analysis.

Note: The telecom sample consists of 59 companies.

¹Location of corporate headquarters.

²The average five-year annual TSR is the average CAGR of an individual company from January 1, 2013, through December 31, 2017.

³As of December 31, 2017.

teraction and assessing how it can be simplified and improved. This kind of initiative can have a two-part payoff: a better experience for the customer and greater cost efficiencies for the company.

Digital is a powerful way to improve the customer experience. At Orange, a variety of technologies are being deployed, including self-service apps and AI-empowered chatbots, which allow the company to focus human intervention on value-adding interactions.

Digital is a powerful way to improve the customer experience.

Customer centricity also facilitates a more focused approach to network investment. Instead of taking the traditional—and unsustainable—approach of trying to build everywhere for everyone (a one-size-fits-all model that typically sees telcos “overshooting” their capital expenditures), operators can target key customer segments and needs, building out networks in a more selective and differentiated manner. They can focus on particular regions and deploy specific technologies in a way that better correlates investment with value. Advanced analytics plays a key role here, helping operators identify usage patterns and, in turn, understand what matters most to customers. Then telcos can direct their investments accordingly. (See *How Telcos Can Put Their Money Where Their Customers Are*, BCG Focus, July 2016.)

Some telcos are already prioritizing network investments on the basis of a customer-centric approach. For instance, Orange used this tack to identify scenarios—such as commuting—where demand for superior network quality was especially strong. The company then focused its capital expenditure spending on meeting these needs. For example, it has been upgrading infrastructure in high-traffic urban areas. This enabled the company to support its premium position in France—and increase its share in a highly competitive market.

An understanding of what customers value can also steer operators to new features and services that differentiate their networks. Comcast’s X1 platform was created in response to emerging preferences and habits, such as the trend toward time-shifted on-demand viewing and the increasing importance of seamless and intuitive navigation and discovery. Significantly, the X1 platform helps Comcast compete against nontraditional players.

Strengthening the Building Blocks of B2B

In the B2B space, the challenges keep growing. Telcos’ core market of enterprise mobile and fixed connectivity is slowly declining, and competition is fierce in every customer segment. Global technology companies and information and communication technology (ICT) players are winning over large B2B customers. B2C players are wooing smaller enterprises. Shifts to IP-based communication, software-defined networking, and the cloud have ratcheted up the heat, putting even more pressure on pricing and margins.

So what’s the solution? Savvy telcos are shoring up every building block of their B2B model, including the customer experience, service offerings, operating processes, and capabilities. For B2B service offerings, telcos can play to their historical strengths—such as infrastructure and access to customers—to expand into adjacencies (areas that are close to core businesses), such as ICT services, content generation, and advertising.

NTT Communications and Verizon are two examples of telcos that are pursuing such expansion. NTT Communications is now one of the five largest data center operators globally. Verizon’s recent acquisitions—the \$4.4 billion takeover of AOL in 2015 and the \$4.5 billion purchase of Yahoo!’s core internet business in 2017—have given it access to digital advertising platforms and technology that could help the company generate additional revenue.

Some operators are casting their net even further. BT, for example, has invested heavily in cybersecurity and is now one of the world’s largest providers in that space. In 2016, its

managed security services and cyberconsulting businesses generated an estimated combined \$500 million in revenue.¹

The New Frontiers of Diversification

Two-thirds of the acquisitions and investments made by major telcos from 2012 through 2016 were in adjacencies and so-called new frontiers. (See Exhibit 11.) Although adjacencies are natural extensions of a telco’s business, new frontiers can take operators quite far from the core. These areas include solutions focused on specific industries, such as health care or education, as well as the Internet of Things (IoT). (See Exhibit 12.) Within the telecom industry, these areas have generated a fair measure of excitement. But as telcos move further from their comfort zone, they should proceed with caution—and a well-crafted strategy.

In IoT, for example, telcos need to be sharp about constructing value propositions. They need to identify the right market (or markets) to enter, whether it be logistics or manufacturing or another area. They need to decide where along the technology stack they should own assets and where they should partner with others. Beyond the core, there are few safe bets. Even moves into content—such as

European and US operators spending big for exclusive sports rights—have sometimes resulted in value *destruction*, with a company’s market capitalization taking a hit.

As telcos contemplate diversification, a smart strategy is to identify businesses that can grow fast and wide: data centers, advertising, and security, for instance. Otherwise, telcos may find that it takes years for a new revenue stream to account for a significant portion of revenue. During that time, momentum and funding for transformative initiatives can wane.

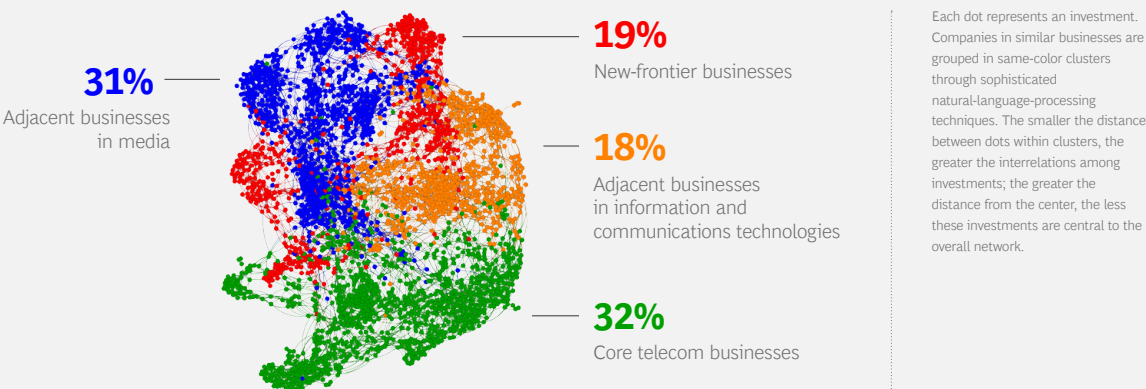
Telcos should also consider fostering opportunities that give them an advantage because they are a local incumbent. In many adjacent and new-frontier markets—such as media, health care, and even security—local ties are important. Many countries, for example, see security as a sovereign issue, and customers prefer to buy security services from local providers. This sets the stage for partnerships between local telcos and global technology companies. The collaboration between Deutsche Telekom and Microsoft in Germany is a good example.

M&A and the Regulation Wildcard

Diversification strategies run the gamut from relatively safe bets, such as in-market consoli-

EXHIBIT 11

Two-Thirds of the Acquisitions and Investments Made by Major Telecom Companies Are in Adjacencies and New-Frontier Businesses

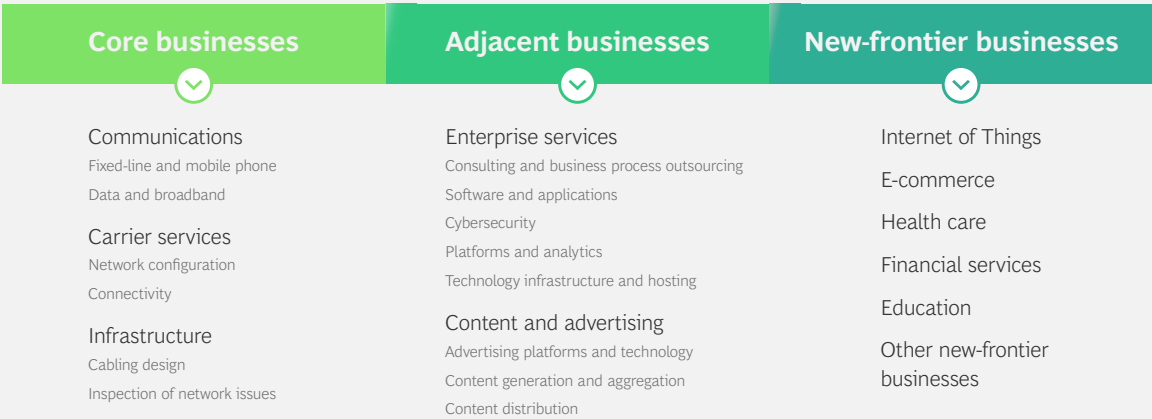


Sources: Quid; BCG analysis.

Note: The analysis comprises 3,041 deals from 2012 through 2016 (1,847 acquisitions and 1,194 investments), for a global titans sample of the telecom industry, including Airtel India, Altiice, América Móvil, AT&T, BCE, BT, China Mobile, China Telecom, Deutsche Telekom, Eutelsat, KDDI, KPN, KT, MTN, Nippon Telegraph and Telephone, NTT Docomo, Ooredoo, Orange, Rogers Communications, SK Telecom, Singtel, Softbank Group, Swisscom, Telefónica, Telenor, Telia, Telstra, Telecom Italia, Verizon, and Vodafone Group.

EXHIBIT 12

Opportunities Lie Beyond the Core Businesses of Telecom Companies



Source: BCG analysis.

dation, to bold moves, such as investing in an array of high-growth areas. Across that gamut, M&A has been an important strategy.

Some operators are pursuing horizontal integration to broaden their customer base and leverage the benefits of scale. Telefónica Germany purchased E-Plus Group in October 2014, Telia Company acquired Tele2’s network in Norway in 2015, and Vodafone merged its subsidiary in India with a local operator, Idea Cellular, in a \$23 billion deal in 2017, creating the country’s largest mobile carrier.

Other telcos are using an M&A strategy to gain entry into adjacencies and new frontiers. In December 2017, T-Mobile agreed to acquire Layer3 TV, with plans to use the company’s video platform to help launch its own subscription TV service. Verizon has pursued multiple deals in the IoT space, for example, acquiring companies that are involved in fleet management and smart cities.

But M&A is a lever that telcos aren’t always able to apply. The wildcard is regulation. In the telecom industry, regulation can have a significant impact on value creation. The impact varies by country or region, however. In Japan, for instance, the regulatory environment sparked multiples changes, because it

encourages telcos to take the kind of actions that create value: invest in next-generation infrastructure and new technologies, such as 5G, and partner with other players. NTT Docomo is an example of a company that is doing the latter, having established partnerships with Ericsson, Nokia, and others.

In Europe and the US, regulators are sending a more mixed message, as some acquisitions—particularly the larger horizontal deals—have been opposed. In May 2016, the EU Commission blocked the proposed £10.5 billion Three-O2 merger in the UK. In November 2017, the US Department of Justice filed suit to block AT&T’s blockbuster \$85 billion bid for Time Warner—pushing the companies to extend the deadline for the merger to mid-2018.

And sometimes a win can come with a catch. The remedy regulators imposed in the €20 billion merger of Italian telecoms Wind and H3G in 2016 allowed a new provider to enter the market. New entrants can have a significant impact on price realization and market size, driving down overall value creation. They also can take significant market share, dampening the benefits of consolidation. In India, Reliance Jio Infocomm captured approximately 14% of the market within a year of starting operations in 2016.

The uncertainty of regulation’s impact makes it even more important for telecom companies to think and work in new ways. Telcos had a good run with the tried and true. But to spark growth and generate more value, they need to shake things up—in their core business and, increasingly, beyond it. The winners aren’t playing their greatest hits: they’re singing remixed and new tunes.

NOTE
1. *Competitive Landscape: Managed Security Services*, Gartner, June 30, 2016, and *Market Guide for Security Consulting Services, Worldwide*, Gartner, September 29, 2016.

UNLOCK VALUE CREATION THROUGH DIGITAL ENABLERS

THE QUESTION IS NO longer *if* a company needs to pursue a digital transformation, but rather *how quickly* it can achieve meaningful customer and economic impact. It's clear that the companies that are hardwired to operate in a digital world—that are able to identify new opportunities and seize them, doing both with speed and efficiency—are the ones that will lead in value creation.

TMT leaders have developed, and keep building, digital enablers in-house.

This is not a prediction or a theory. As this year's rankings show, digital natives, as well as some traditional players that are transforming themselves, are creating superior value and leading the TMT pack. However, the gap between the leaders and everyone else is likely to widen unless more companies undertake a serious and sustained transformation.

In 2017, BCG conducted a digital maturity study of more than 1,300 companies in Europe and the US. (See “Beyond the Hype: The Real Champions of Building the Digital Future,” BCG article, July 2017.) The study's foundation was BCG's Digital Acceleration Index, a metric based on companies' self-

assessment of their digital maturity. These companies' scores fell along a wide spectrum. Although about one-quarter of the companies scored above 75 (out of 100), a similar proportion scored below 25. For those at the lower end, the gap represents real business risk. Slow starters will be less capable of innovating and responding to quickly evolving markets and customers' needs.

This isn't a revelation to businesses at the top or at the bottom. In a survey of companies across a wide swath of industries, BCG found that 79% of self-described “strong innovators” felt they had properly digitalized innovation processes, while only 29% of “weak innovators” said the same.

What's less clear is how to get to the other side of the chasm. What do companies need to do to join the leaders?

The TMT leaders share one crucial trait: they have developed, and they keep building, specific skills and capabilities, or digital enablers, in-house. These enablers infuse digital efforts with increased speed, agility, and flexibility. They help companies better understand customers' needs. And without a doubt, they are indispensable. Many companies are already making important strides in digitalizing their core and seeking new digital growth. But to unlock and sustain value creation, they also need to develop their digital enablers.

Jump-Starting a Digital Journey: The Four Categories of Enablers

Digital enablers fall into one of four broad categories, each of which is defined by core ideas and goals. (See Exhibit 13.)

People and Organization. High-performing companies do not approach digital as a series of isolated tactical initiatives. Instead, they establish a digital vision for the organization. The New York Times Company embodies the critical role that leadership plays in creating an enterprise-wide digital vision and embarking all employees on the journey. Crucially, the company empowered the paper’s newsroom to drive the organization’s digital agenda.

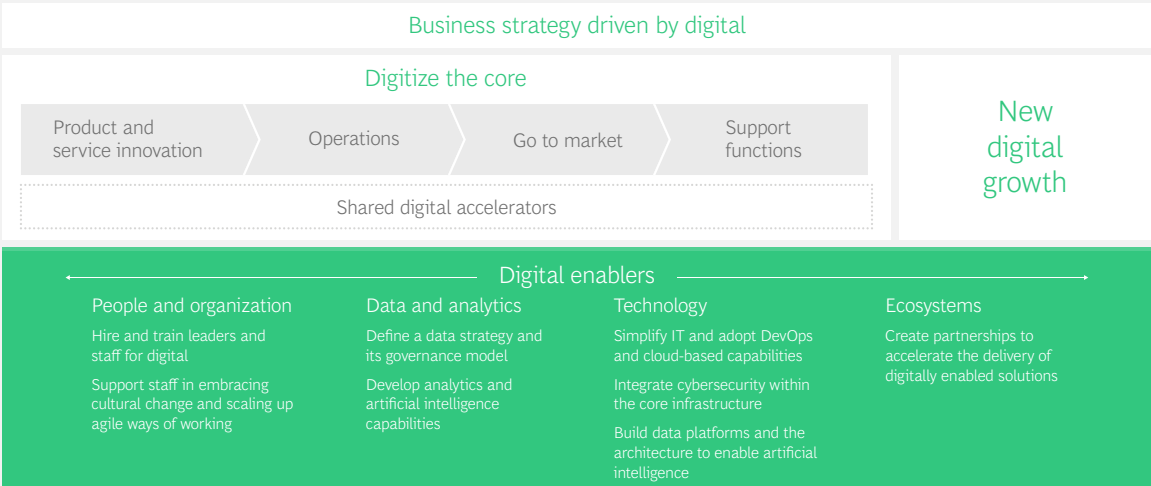
Building in-house teams to fulfill a digital vision likely means that companies will have to venture into new areas: for example, a publishing company may need to create a team of in-house app developers, or a telecom operator may need to build a team of data scientists and an agile approach to reimagine the business for digital.

These are bold moves—and essential ones. Digital natives have in-house engineering or technology teams. So do many high-performing traditional companies. But tellingly, the latter also have teams that are centered around new capabilities. For example, Orange has

data and analytics teams, BT has cybersecurity ones, Recruit Holdings has teams for its on-line platforms, and Comcast has teams for customer experience. In some cases, these teams let companies not only better leverage new expertise in their business but also build new businesses around it. BT, for instance, is now one of the largest cybersecurity providers in the world, with a team of 2,500 experts. Recruit has successfully extended its publishing business with its web-based platforms to bring together digital and physical companies in various topic areas, such as tourism, dining, and recreation. (See “Getting Physical: The Rise of Hybrid Ecosystems,” BCG article, September 2017.) Indeed, building such teams can arguably be seen as one of the main reasons that some companies successfully complete their digital transformation while others do not.

To transform the way they work, incorporate fast-moving changes, and evolve products quickly, many companies have embraced agile methodologies. These practices originated in the software industry, and they are rooted in the culture and business models of most digital natives (Facebook, Google, Salesforce, and Spotify, for example). But agile has been increasingly embraced by other types of businesses. (See “Five Secrets to Scaling Up Agile,” BCG article, February 2016.) It’s little

EXHIBIT 13
A Roadmap for Digital Transformation



Source: BCG analysis.

wonder why: agile helps to break silos in established companies and, ultimately, spur faster and better outcomes. Virtually any form of output—a pricing or advertising platform, a marketing plan, a customer service strategy, or even a postmerger integration—can be delivered in an agile fashion. (See “Taking Agile Way Beyond Software, BCG article, July 2017.)

Virtually any form of output can be delivered in an agile fashion.

More and more traditional companies are investing in an agile capability; Deutsche Telekom, Electronic Arts, IBM, Telstra, and Verizon are just a few. Companies that have effectively implemented agile have discovered several keys to success, but two are critical. First, make an investment in change management. Second, ensure that there’s a commitment—and leadership—from the top to shift to a more experimental, fail-and-learn culture. Engaging employees to pursue new, even risky ideas is another practice that can help companies attract and retain talent—an essential requirement for any digital effort.

Data and Analytics. Many companies are developing and investing in capabilities around data, including sophisticated analytics. Although there is no textbook approach to creating value from data, there are some general traits that define a data-driven company. Such an organization understands the role that data and analytics play in its business, such as providing insight or guidance in product development or tracking performance. A data-driven company is also adept at identifying and pursuing use cases—often creating value in direct or indirect ways. In the telecom sector, for example, data and analytics are being used to help reduce churn rates—a particular concern in markets where penetration rates have peaked, limiting growth from new subscribers. T-Mobile USA has reduced its churn rate by 50% by analyzing social media information to identify high-value customers and target them with

personalized retention offers.¹ Live Nation’s Verified Fan is what the company calls “a really big robot” that uses data and analytics to separate legitimate ticket buyers from automated scalper bots. According to the company, the program has reduced the number of tickets resold on secondary markets by more than 90%.

There is a good chance that any TMT company is sitting on a trove of data—information that, at a minimum, can help company leaders and teams alike make decisions more efficiently and effectively. But there is also a good chance that such a company can run into problems if it tries to do too much too soon. Large-scale, multiyear projects, involving enormous volumes of data, can quickly bog down. The better way is to adopt a phased approach, using pilots as proofs of concept and steadily building results, expertise, and momentum. Choose pilots wisely. Pick those that are meaningful to the business but not overly ambitious. The best pilots rely on skills and capabilities that are readily available—not ones that are still works in progress. (See *Are You Set Up to Achieve Your Big Data Vision?*, BCG Focus, June 2017.) Here, too, specialized teams can be invaluable, with in-house analytics experts supporting projects across the company.

Technology. Savvy digital players define their technical infrastructure and architecture in a more flexible and modular way. They use cloud-based solutions, integrate cybersecurity with their delivery platforms, and stress automation. One enabler that is rapidly gaining adoption among high-performing companies is DevOps—a software development culture and set of practices that relies heavily on automation. (See “Leaner, Faster, and Better with DevOps,” BCG article, March 2017.) DevOps works as a complement to agile, extending many of its core tenets, such as cross-functional teams, to the full software life cycle—not only development but also deployment, release, operation, and monitoring.

When Adobe shifted to internet-based business models, DevOps accelerated the company’s pace of deployment. Adobe can now push changes from testing to production environments in a matter of minutes. These capa-

bilities go hand in hand with agile ways of working, enabling companies to deploy secure solutions to end users quickly and efficiently. Even companies outside the technology sector are using DevOps—especially as they become increasingly involved with software development, whether to support a product or a business model. Sony Interactive Entertainment and Sony Pictures Entertainment, two media subsidiaries of Sony, have been using DevOps for their cloud-based solutions. It has helped both scale up their respective platforms as the number of users and the volume of data have dramatically increased.

Ecosystems. As technologies evolve and market boundaries blur, companies will increasingly need partners and relationships in order to access the resources they require, such as talent, data, and marketplaces. These communities of players, or ecosystems, can accelerate a company's digital journey, letting them innovate, go to market, and even enter all-new spaces without having to start from scratch alone.

Some companies aren't only a member of an ecosystem, but a driving force behind it. Nvidia, for example, has emerged as an important player in the artificial intelligence ecosystem, investing in an array of AI startups through its GPU Ventures program and supporting others through its Nvidia Inception program. Verizon is buoying its entry into the Internet of Things space by launching the platform ThingSpace for application developers. By building platforms and ecosys-

tems, companies gain access to users and data—and the more users and data they have, the more they can grow their own business. Already, some 14,000 developers are hosted on Verizon's platform.

Transform and Win

Not all companies are born with digital in their blood, but the critical traits for success can be built and acquired. Deciding to undertake a digital transformation is now table stakes. Organizing for—and committing to—a multifaceted effort to truly transform a company's portfolio and core value chain will be a differentiator. But the actions taken at the top are critical: CEOs need to take responsibility for getting the digital transformation right and show leadership. They must create the inspiration and momentum that enables their organization to move ahead of competitors and create outsized value.

NOTE

1. "How Data Analytics Can Transform Your Business," Auth0, November 27, 2017.

FOR FURTHER READING

The following publications by The Boston Consulting Group will help readers explore several of the topics in this report more closely.

Cyber Resilience: Playbook for Public-Private Collaboration

A report by the World Economic Forum, prepared in collaboration with The Boston Consulting Group, January 2018

The Most Innovative Companies 2018: Innovators Go All In On Digital

A report by The Boston Consulting Group, January 2018

Value Creation and Corporate Reinvention

An article by The Boston Consulting Group, December 2017

Creating Value from Disruption (While Others Disappear)

An article by The Boston Consulting Group, September 2017

Getting Physical: The Rise of Hybrid Ecosystems

An article by The Boston Consulting Group, September 2017

Media Companies Must Reimagine Their Data for a Digital World

An article by The Boston Consulting Group, September 2017

Reshaping Business with Artificial Intelligence: Closing the Gap Between Ambition and Action

A report by MIT Sloan Management Review, prepared in collaboration with The Boston Consulting Group, September 2017

The 2017 M&A Report: The Technology Takeover

A report by The Boston Consulting Group, September 2017

Beyond the Hype: The Real Champions of Building the Digital Future

An article by The Boston Consulting Group, July 2017

It Takes a Coalition to Protect the Internet of Things

An article by The Boston Consulting Group, July 2017

Taking Agile Way Beyond Software

An article by The Boston Consulting Group, July 2017

Are You Set Up to Achieve Your Big Data Vision?

A Focus by The Boston Consulting Group, June 2017

Who Will Win the IoT Platform Wars?

An article by The Boston Consulting Group, June 2017

When Chip Makers Look Through the Value Lens

A Focus by The Boston Consulting Group, April 2017

Leaner, Faster, and Better with DevOps

An article by The Boston Consulting Group, March 2017

Building a Cyberresilient Organization

An article by The Boston Consulting Group, January 2017

The 2016 TMT Value Creators Report: Unleashing Technology, Media, and Telecom with Digital Transformation

A report by The Boston Consulting Group, October 2016

How Telcos Can Put Their Money Where Their Customers Are

A Focus by The Boston Consulting Group, July 2016

Digital Technologies Raise the Stakes in Customer Service

A Focus by The Boston Consulting Group, May 2016

The Digital Revolution Is Disrupting the TV Industry

A Focus by The Boston Consulting Group, March 2016

Five Secrets to Scaling Up Agile

An article by The Boston Consulting Group, February 2016

Uncovering Real Mobile Data Usage and the Drivers of Customer Satisfaction

A Focus by The Boston Consulting Group, November 2015

Borges' Map: Navigating a World of Digital Disruption

An essay by The Boston Consulting Group, April 2015

NOTE TO THE READER

This is BCG's seventh report in the Technology, Media & Telecommunications Value Creators series. Our main purpose is to help clients understand how these dynamic industries are evolving. As the digital era advances, the gap between leaders and everyone else is growing. To join the winners, companies must identify, implement, and execute the transformation that is right for them. Commitment and leadership are essential, but so, too, are the digital enablers described in this report.

About the Authors

Simon Bamberger is a partner and managing director in the Los Angeles office of The Boston Consulting Group. **Wolfgang Bock** is a senior partner and managing director in the firm's Munich office and the global leader of the telecommunications sector. **Hady Farag** is a principal in BCG's New York office. **Patrick Forth** is a senior partner and managing director in the firm's Sydney office and the global leader of the Technology, Media & Telecommunications practice. **Anna Green** is a partner and managing director in BCG's Sydney office and the global coleader of the media sector. **Derek Kennedy** is a senior partner and managing director in the firm's San Francisco office and the global leader of the technology sector. **Fredrik Lind** is a senior partner and managing director in BCG's Stockholm office, the leader of the Technology, Media & Telecommunications practice in Sweden, and the practice's marketing partner. **Florent Rodzko** is a project leader in the firm's Los Angeles office. **Neal Zuckerman** is a partner and managing director in BCG's New York office and the global coleader of the media sector.

Acknowledgments

The authors would like to thank the dozens of colleagues around the globe who assisted with the research and analysis for this report. Several partners, consultants, and knowledge team members made contributions. The authors would especially like to thank Christian Adler, Sonny Ali, Alex Asen, Akash Bhatia, Astrid Blumstengel, Walter Bohmayr, Joseph Brilando, Stefan Deutscher, Val Elbert, Jody Foldesy, Maya Gavrilova, Jaison Justin, David Kim, Christoph Lay, Martin Link, Qiang Liu, Franck Luisada, Megan Morrato, Roger Premo, Vikas Taneja, David Taube, Arnaud Voguet, Maikel Wilms, Mike Wu, and Zia Yusuf for their insights; Paola Oliviero and Alex Perez for their marketing support; and Alan Cohen for his writing assistance. The authors would also like to thank Katherine Andrews, Mickey Butts, Gary Callahan, Kim Friedman, Abby Garland, Trudy Neuhaus, and Mark Voorhees for their editorial and production support.

For Further Contact

If you would like to discuss this report, please contact one of the authors.

Simon Bamberger

Partner and Managing Director
BCG Los Angeles
+1 213 621 2772
bamberger.simon@bcg.com

Wolfgang Bock

Senior Partner and Managing Director
BCG Munich
+49 89 231 740
bock.wolfgang@bcg.com

Hady Farag

Principal
BCG New York
+1 212 446 2800
farag.hady@bcg.com

Patrick Forth

Senior Partner and Managing Director
BCG Sydney
+61 2 9323 5600
forth.patrick@bcg.com

Anna Green

Partner and Managing Director
BCG Sydney
+61 2 9323 5600
green.anna@bcg.com

Derek Kennedy

Senior Partner and Managing Director
BCG San Francisco
+1 415 732 8000
kenedy.derek@bcg.com

Fredrik Lind

Senior Partner and Managing Director
BCG Stockholm
+46 8 402 44 00
lind.fredrik@bcg.com

Florent Rodzko

Project Leader
BCG Los Angeles
+1 213 621 2772
rodzko.florent@bcg.com

Neal Zuckerman

Partner and Managing Director
BCG New York
+1 212 446 2800
zuckerman.neal@bcg.com

© The Boston Consulting Group, Inc. 2018. All rights reserved.

For information or permission to reprint, please contact BCG at:

E-mail: bcg-info@bcg.com

Fax: +1 617 850 3901, attention BCG/Permissions

Mail: BCG/Permissions

The Boston Consulting Group, Inc.

One Beacon Street

Boston, MA 02108

USA

To find the latest BCG content and register to receive e-alerts on this topic or others, please visit bcg.com.

Follow The Boston Consulting Group on Facebook and Twitter.



BCG

THE BOSTON CONSULTING GROUP