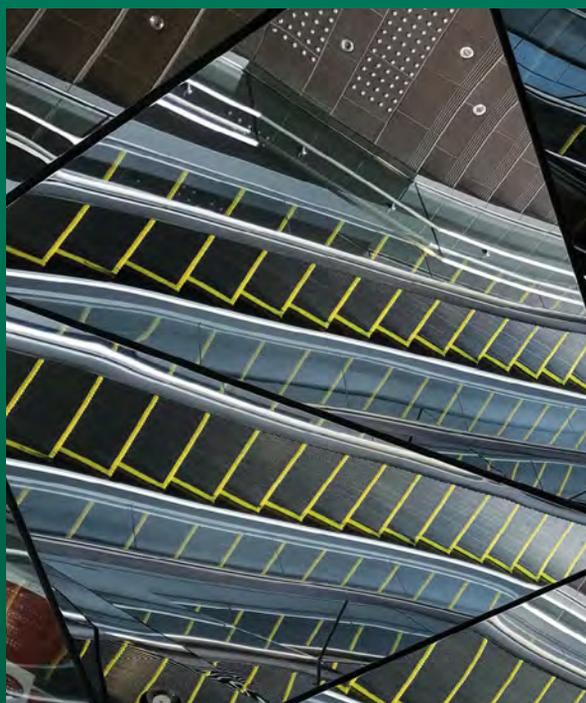


THE 2020 TMT VALUE CREATORS REPORT

STAYING VITAL IN THE NEW DECADE



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SIMON BAMBERGER

ROCÍO LORENZO

WOLFGANG BOCK

VAISHALI RASTOGI

HADY FARAG

STEFFEN STERN

ANNA GREEN

MAIKEL WILMS

DEREK KENNEDY

NEAL ZUCKERMAN

FREDRIK LIND

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THE LAST DECADE WAS GREAT, BUT WHAT ABOUT THE NEXT?

TECHNOLOGY, MEDIA, AND TELECOMMUNICATIONS (TMT) companies clearly won the last decade, but will they have the right ingredients to sustain that performance in the 2020s? Can these companies continue to innovate as they expand, reshaping ecosystems that fueled their past success, and can they excite consumers and businesses while grappling with issues of privacy, influence, trust, and regulation?

We explore these companies' past performance and future potential through the lens of value

creation. As the 2010s closed, the TMT sector was standing strong. Seven TMT companies were among the ten most valuable public companies in the world. (See Exhibit 1.) A decade earlier, three energy companies, three banks, and just two TMT companies made the list, so a broad economic and social shift from physical to digital has clearly occurred.

The end of a decade is a convenient time to take a long look backward. We analyze value creation on the basis of total shareholder return (TSR) over five years, a time horizon

EXHIBIT 1 | TMT Companies Won in the 2010s

TOP TEN MARKET-CAP COMPANIES¹

2009				2019			
Rank	Company	Market value (\$billions)	Sector	Rank	Company	Market value (\$billions)	Sector
1	PetroChina	353	Oil and gas	1	Saudi Aramco	1,879	Oil and gas
2	Exxon Mobil	323	Oil and gas	2	Apple	1,305	Technology
3	Microsoft	271	Technology	3	Microsoft	1,203	Technology
4	ICBC	269	Banking	4	Alphabet	923	Technology/Media
5	Walmart	204	Retail	5	Amazon	916	Technology/Retail
6	CCB	201	Banking	6	Facebook	585	Technology/Media
7	BHP	201	Mining	7	Alibaba	569	Technology
8	Petrobras	199	Oil and gas	8	Berkshire Hathaway	554	Conglomerate
9	HSBC	197	Banking	9	Tencent	458	Media
10	Alphabet	197	Technology/Media	10	JPMorgan Chase	437	Finance

■ = TMT company

Source: S&P Global.

¹Based on market capitalization at the end of the year.

that smooths out blips and reveals the impact of strategic and operational choices on shareholders' true bottom line.

Past Rewards

The 2010s will be known as the decade of social media, smartphones, streaming, sharing, machine intelligence, and the cloud. Many of the top TMT performers rode those trends to great heights. Netflix, Amazon, and Microsoft all finished in the top 20 in TMT value creation for the period from 2015 to 2019. Taking advantage of strong demand for parallel-processing chips to power artificial intelligence (AI), Nvidia rose to number three, while number-eight WWE built a subscription business around pro wrestling. (See Exhibit 2.)

WWE and many of the other top TMT performers are still relatively small. Almost half of the top 20 TMT companies have market caps of less than \$30 billion, just a fraction of the market caps of Amazon, Microsoft, and others that continue to create the greatest amount of absolute value.

Value creation is not distributed equally. For the second year in a row, no telecom operator

earned a spot in the top 20. The telecom industry finished 28th out of 33 industries in median five-year value creation, weighed down by risk aversion, regulation, national footprints, heavy investment, and old business models. (See Exhibit 3.) We explore these underlying reasons elsewhere and suggest ways for operators to break away from the pack.

Tech and media finished third and fourth in median value creation across the 33 industries. Semiconductor companies and gaming companies, respectively, led the top ten in those two industries.

Even the most successful companies, however, should not rest on their accomplishments. Many tech companies must make challenging business model transitions if they are to compete on rate of learning or in the development of ecosystems. Meanwhile, traditional media companies are struggling to build direct-to-consumer and subscription businesses amid a sea of free content. Many of these companies need to reinvent and transform themselves as deeply as any telecom operator.

Notably, the bottom performers in tech and media are doing no better than the bottom

EXHIBIT 2 | A Mix of Large and Small Companies Powered TMT's Overall Performance

Rank	Company	Headquarters	Industry	Average five-year annual TSR (%) ¹	Market value (\$billions) ²
1	Advanced Micro Devices	US	Technology	76.5	51.1
2	CD Projekt	Poland	Media	76.3	7.1
3	Nvidia	US	Technology	64.8	144.0
4	Sunny Optical Technology	China	Technology	63.6	18.9
5	Luxshare Precision Industry	China	Technology	49.9	28.0
6	Netflix	US	Media	46.0	141.8
7	Amazon	US	Technology	42.8	916.2
8	World Wrestling Entertainment	US	Media	41.9	5.1
9	Adobe	US	Technology	35.3	159.1
10	Take-Two Interactive Software	US	Media	34.3	13.1
11	IAC/InterActiveCorp	US	Media	33.1	21.1
12	ServiceNow	US	Technology	33.0	53.2
13	STMicroelectronics	Switzerland	Technology	32.5	24.0
14	Ubisoft	France	Media	32.3	8.3
15	Lam Research	US	Technology	32.0	42.4
16	Microsoft	US	Technology	30.5	1,203.1
17	Tencent	China	Media	30.4	457.9
18	Nintendo	Japan	Media	30.4	48.2
19	NetEase	China	Media	30.0	39.2
20	Cadence Design Systems	US	Technology	29.6	19.5

Sources: S&P Global Market Intelligence; annual reports; BCG analysis.

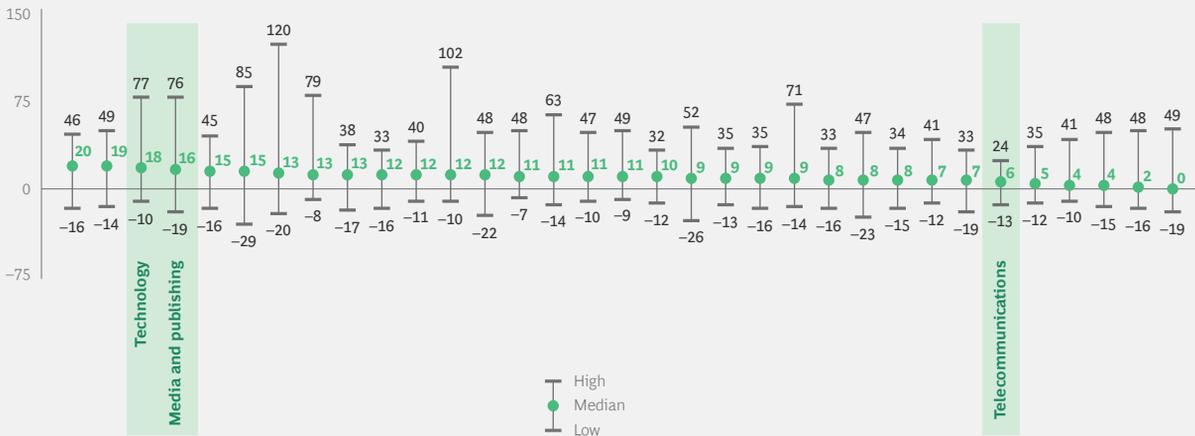
Note: Sample includes 228 companies.

¹From January 1, 2015, to December 31, 2019.

²As of December 31, 2019.

EXHIBIT 3 | Technology, Media, and Telecommunications Ranked 3rd, 4th, and 28th in Value Creation

Median five-year annual TSR, 2015–2019¹ (%)



Sources: S&P Capital IQ; company disclosures; BCG analysis.

Note: Identities of the remaining industries will be revealed later in the year when the main value creators report is published. Sample includes 2,320 companies.

¹From January 1, 2015, to December 31, 2019.

performers in telecommunications. For every company that has built a successful subscription business—such as Amazon’s Prime Video, the number-two video streaming service in the US, or Apple Music, which has more paid subscribers in the US than Spotify—there are others that may struggle for relevance in the 2020s. Their situation calls for bold moves, not just efficiency gains. In the US market, for example, operators are placing bets on TV programming and feature films.

Companies that advance from the top of the bottom quartile to the bottom of the top quartile in value creation will generate outsize returns for shareholders. (See Exhibit 4.) This is especially true for media companies, but it also holds for telecom operators. A dollar invested in an operator ranked at the top of the bottom quartile for the five-year period from 2015 to 2019 would barely have appreciated. A dollar invested in the bottom company of the top quartile would have been worth \$1.70.

What the Future Holds

Some global trends that helped propel growth in the 2010s are fading. The number of Internet users will not more than double in the next decade, as it did in the previous

one. The rate of smartphone adoption has also begun to slow, even in emerging markets.

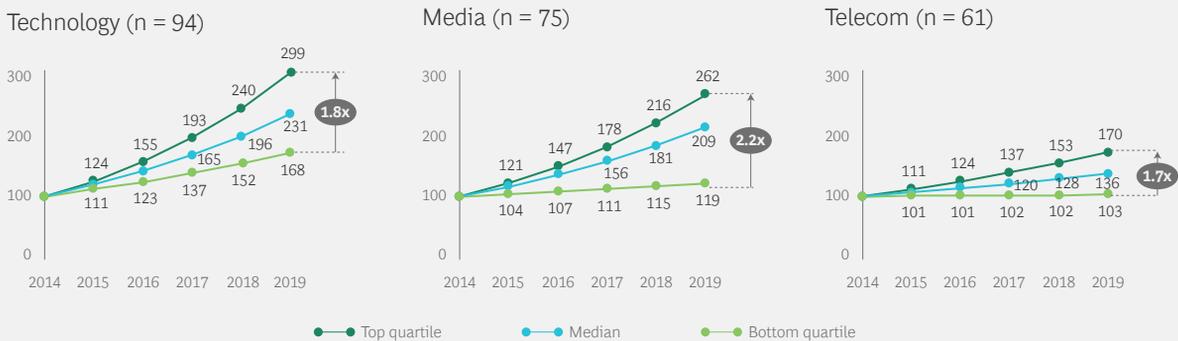
In their place, a mix of productive tailwinds and troublesome headwinds are emerging. AI will almost certainly play an ever-larger role in the 2020s. The decade will also likely see the long-awaited mass emergence of augmented and virtual reality.

On the other hand, global growth is at risk of slowing. US–China trade tensions are rising, driven by trade disputes and issues of national security. US semiconductor companies could face export restrictions, bringing a strong stretch of value creation to a close and undermining the industry’s ability to maintain its current high level of R&D investment and to continue to deliver technological breakthroughs. Barriers to technology and markets could slow the rollout of 5G infrastructure and the development of the next generation of digital services. Investors share many of these concerns.

The TMT sector will continue to face regulatory and public scrutiny over its ability to monitor and limit unintended uses of its products and services; to control the spread of falsehoods and deep fakes; and to keep pace with unending developments on social media. At the same time, companies will be

EXHIBIT 4 | Breaking into the Top Quartile Pays Big Dividends

INDEXED FIVE-YEAR RETURN ON INVESTMENT



Sources: S&P Global Market Intelligence; annual reports; BCG analysis.

Note: The index was set to 100 on December 31, 2014. Values for top quartile and bottom quartile performers represent the corresponding lower and upper thresholds. The values shown represent return on investment and net of 100 starting point index, calculated by applying the annualized CAGR TSR for the 2015–2019 period. Sample includes 228 companies. Amazon and Facebook are listed as both media and tech companies.

facing new scrutiny over their commitment to the environment.

Still, the TMT sector remains vibrant. As we wrote last year, its companies can lead consumers, companies, and the public sector into the future. Their work will improve lives, livelihoods, and productivity while creating shareholder value. TMT companies stand to benefit from growth in the cloud, the Internet of Things (IoT), AI, 5G, and quantum computing.

The sector is balanced between global stress and vibrancy. As we look forward, six themes that cut across technology, media, and telecommunications emerge.

Staying Vital and Innovative. As companies age and enlarge, reinvention becomes harder. Business and organizational models grow old, the day-to-day business becomes a grind, and increased complexity poses a barrier to change. Almost inevitably, incumbents find themselves at risk of losing vitality. Our colleagues at the BCG Henderson Institute (BHI) have shown that only 44% of today’s industry leaders were able to maintain the top spot for five years. This figure is down from 77% in the mid-20th century.

The good news is that TMT companies may be well positioned for the future. In cooperation with *Fortune*, BHI created the Fortune Future 50, a forward-looking index that identifies companies with future growth potential

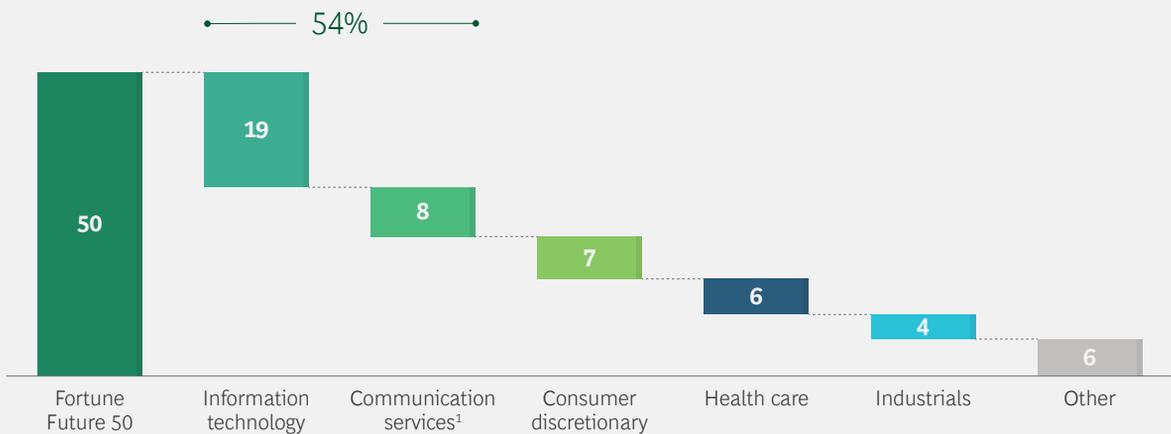
based on their market potential and their capacity (a combination of strategy, technology and investments, people, and structure). TMT companies make up more than half of the current Fortune Future 50 list. (See Exhibit 5.) Industry standard-bearers Adobe and Nvidia reinvented their business models to prepare for the future, while digital natives such as Spotify and Salesforce caught emergent trends.

For old and new companies alike, imagination, reinvention, and resilience will be critical in the next decade. Diversity can help companies achieve their goals. Diverse companies and teams are better able to innovate, take risks, solve problems creatively, bounce back from failures, and turn challenges into opportunities.

Creating and Maintaining Ecosystems. The seven TMT companies with the largest market capitalization at the end of 2019—Apple, Amazon, Microsoft, Alphabet, Facebook, Alibaba, and Tencent—all took advantage of multicompany, largely digital ecosystems. They were able to shape the market in their favor by coordinating with other companies. Amazon’s Alexa digital assistant ecosystem, for example, has around 40 core partners, one-third more than its competitors in the smart-home market.

In the future, these ecosystems will increasingly cross over into the physical world. The

EXHIBIT 5 | TMT Makes Up More Than Half of the Fortune Future 50



Sources: S&P Capital IQ; BCG Henderson Institute analysis.

Note: The analysis is based on a global sample of 1,050 firms with more than \$10 billion in sales or a market cap exceeding \$20 billion at the end of 2018. We excluded energy, metals and mining, commodity chemicals, and REIT companies. "Other" includes financials, real estate, consumer staples, utilities, and materials. We relied on GICS definitions.

¹Includes seven media companies and one telecommunications company.

rapid development of AI and the IoT will create many opportunities for blending bricks and clicks. TMT companies will enter places dominated by incumbents, such as groceries, cars, and even farming. Amazon's purchase of Whole Foods, Google's efforts to build self-driving cars, and John Deere's decision to embed sensors and intelligence in its equipment are all signs of this trend.

Blending Machine and Human Intelligence. TMT companies are in the vanguard of designing the organization of the future. The engine room of this new organization will be data and machines, and the control room will be human judgment and creativity. Early organizational models of this blended approach first emerged in tech startups such as Spotify.

Scaling these models will be one of the pressing challenges of the 2020s. Whether through agile or some other form of work, organizations must fundamentally refresh their leadership, talent, and operating engines. They must also become self-learning organizations that take advantage of AI and advanced analytics. As Microsoft CEO Satya Nadella said, "AI-powered digital feedback loops that connect products, operations, customers, and employees to create predictive power, automate workflows, and ultimately improve outcomes are key for all organizations."

Exciting Consumers in a Crowded Field. The competition to win the attention and loyalty of consumers will heighten. In one notable case, a content creator, Disney, is becoming a distributor and competing against a retailer, Amazon, to sell video subscriptions. The launch of 5G has attracted 4 million subscribers in South Korea, and they expect edgy, practical, and even life-saving new services to emerge from it. These examples, often requiring investments in the hundreds of millions or even billions of dollars, underscore the stakes.

This opportunity is especially salient for media companies, which no longer rely on ad spending for a majority of their revenue. Whether their focus is news, audio, or film, their success depends on building direct-to-consumer subscription businesses.

Getting Data and Privacy Right. For TMT companies, the data supernova carries rewards and risks. On the reward side, TMT companies can help consumers and corporate customers exploit sensor, location, and usage data to move from insight to action, building new businesses based on data platforms.

At the same time, TMT companies must strike a balance between monetizing data and respecting privacy, against a dark background of cyber-risk. Unlike during most of the past

few decades, TMT companies will not have unbounded room to operate. The economic survival of many companies will depend on their ability to manage trust and protection while fighting off cybercriminals, bullies, state actors, and predators. Ultimately, governments will hold TMT companies accountable for fixing their security weaknesses.

Saving the Planet. The time for climate action and not just talk has come to the TMT sector. In particular, the tech industry's cloud-related energy consumption demands attention. Many TMT companies are making progress, but it's not nearly enough. Employees, customers, and governments are pressuring all companies to make attention to the climate a priority.

THE future of TMT is harder to predict than ever before. At the end of 2018, the famous FAANG stocks (Facebook, Amazon, Apple, Netflix, and Alphabet's Google) had collectively lost \$1 trillion in market valuation from their all-time peaks—only to rebound in 2019. A trade war could provoke a similar selloff in the 2020s. The strongest TMT companies will withstand future shocks because they will offer both essential and playful services to their customers while protecting data and the climate. By doing those things, they will earn the right to operate in a decade in which technology, media, and telecommunications will continue to play a leading role.

THE TECH STAR KEEPS BURNING BRIGHT

WITH A MEDIAN FIVE-YEAR TSR (from 2015 to 2019) of 18.3%, technology finished third among 33 industries in value creation, its third consecutive year in the top five. The top-ten tech performers over that period provide a window into the state of the industry as we depart one decade and enter another. (See Exhibit 6.) In the 2010s, digital technology went mainstream. With the cloud, it went everywhere.

The list's four semiconductor and semiconductor equipment players have deftly positioned themselves to catch the wave of swelling demand in the cloud, artificial intelligence (AI), and the Internet of Things (IoT). The four software and cloud computing firms in the top ten, including the "retailer" Amazon, are built on subscription and consumption business models that generate recurring revenue and have supported

EXHIBIT 6 | Semiconductor and Subscription Businesses Lead the Way in TSR

Rank	Company	Headquarters	Segment	Average five-year annual TSR (%) ¹	Market value (\$billions) ²
1	Advanced Micro Devices	US	Semiconductors	76.6	51.1
2	Nvidia	US	Semiconductors	64.8	144.0
3	Sunny Optical Technology	China	Components	63.7	18.9
4	Luxshare Precision Industry	China	Components	50.0	28.0
5	Amazon	US	Cloud computing	42.9	916.2
6	Adobe	US	Software	35.3	159.1
7	ServiceNow	US	Software	33.0	53.2
8	STMicroelectronics	Switzerland	Semiconductors	32.5	24.0
9	Lam Research	US	Semiconductor equipment	32.0	42.4
10	Microsoft	US	Software	30.5	1,203.1

Sources: S&P Global Market Intelligence; annual reports; BCG analysis.

Note: Sample includes 94 companies.

¹From January 1, 2015, to December 31, 2019.

²As of December 31, 2019.

massive growth. ServiceNow, the number-seven value creator, illustrates the stickiness of these services. It has achieved a retention rate of 98% among customers of its digital workflow cloud platform. (See the sidebar, “ServiceNow Means Business.”)

The list also provides a window into the potential success of renewal and transformation. Seven of the top-ten tech companies were average performers or worse in the prior five-year period, from 2010 to 2014. (See Exhibit 7.) Chipmakers Nvidia, Advanced Micro Devices, and STMicroelectronics have adapted their product portfolio and tightened their execution in line with shifts in demand. Adobe sharply pivoted away from boxed software and toward a subscription model. And after seeing its stock price languish for more than a decade, Microsoft has jumped back into the top ten on the strength of a reinvigoration of its culture and a transformation of its offerings and approach. Today Microsoft is more collaborative and open source than it was a decade ago.

Microsoft is also a member—along with Apple, Amazon, Alphabet, and Facebook—of a familiar group of US tech companies that have built global platform businesses. This quintet generated 54% of the tech industry’s absolute value over the five years from 2015 to 2019. (See Exhibit 8.)

Amazon, the middle member of that list, is sandwiched between two industry elders, Apple and Microsoft, and two relative youths, Alphabet and Facebook.

Tech Grows Up

The tech industry itself is sandwiched between age and youth. Alphabet and Facebook aren’t startups anymore. Alphabet is no longer run by its founders. Both companies are in the regulatory spotlight that IBM and Microsoft once occupied. They face familiar growing pains.

Tech is still a comparatively young industry. But despite the success of a few elders, it is also among the most brutal industries: its companies tend to have shorter lifespans as public companies than peers in other industries. (See Exhibit 9.) [Our previous research](#) also shows that tech companies’ year-to-year performance can be highly volatile. But some of the largest companies are learning how to defy these forces, at least for now.

To thrive over the medium and perhaps long term, tech companies must manage a portfolio of mature and emerging product lines. They need to be experts in pricing, tapping into the value that they create without the benefit of simple cost-plus rules. The largest ones need operating models that can manage

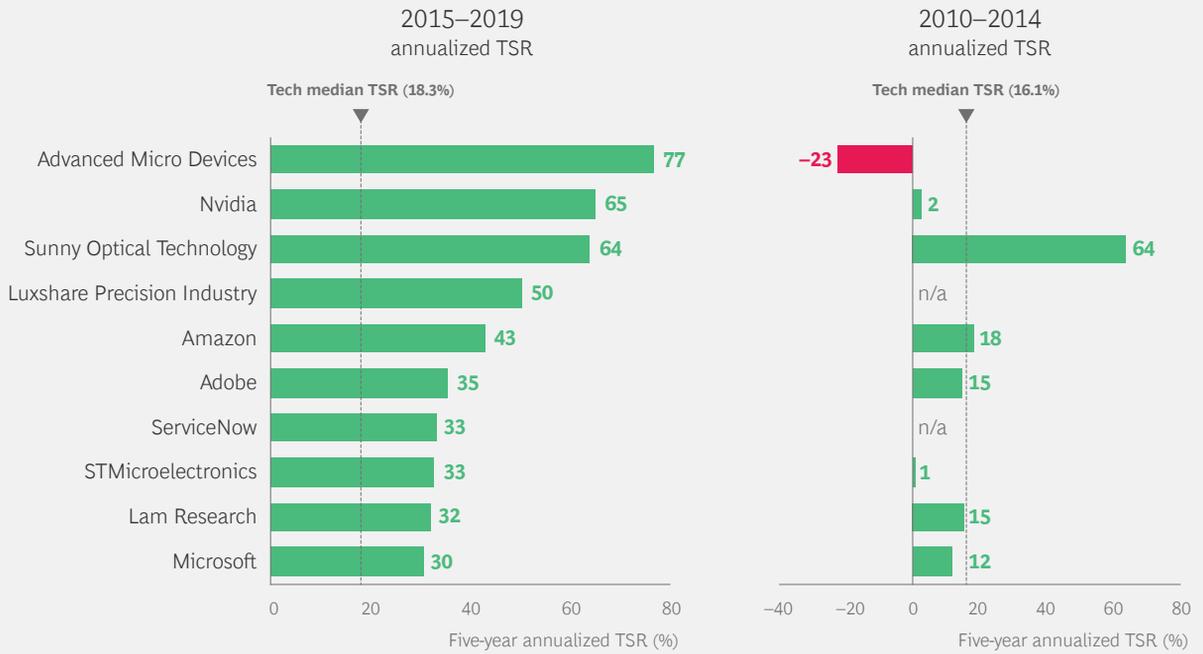
SERVICENOW MEANS BUSINESS

Fred Luddy, the founder of ServiceNow, has been a believer in selling software on a subscription basis since long before the idea went mainstream. ServiceNow was founded in 2004 and has offered simple, intuitive workflow tools to corporations on a monthly per-user basis ever since.

ServiceNow made its mark by helping companies manage their IT help desk, but one-third of its business now comes from newer areas such as HR and customer service. The company’s goal is to provide something akin to middleware to help companies manage their disparate business services solutions.

ServiceNow’s success during its first decade as a company was relatively modest. It turned down a \$2.5 billion offer from VMware in 2011 and went public the next year just as the consumerization of corporate IT was underway. Employees wanted to be able to get answers to their IT questions in as little time as it took them to hail a ride or change a password. ServiceNow’s focus on simplicity played well during latter half of the 2010s, and the company closed the decade valued at \$53 billion.

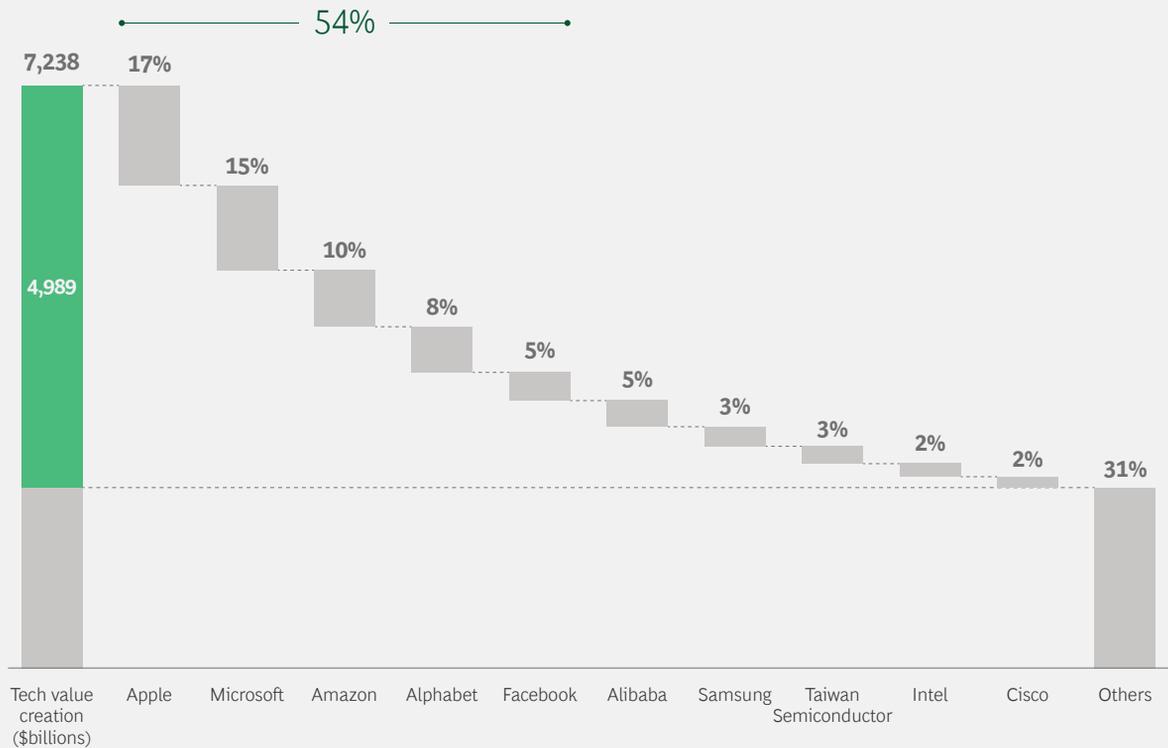
EXHIBIT 7 | Six of the Top Ten Tech Companies Underperformed in the Prior Five-Year Period



Sources: S&P Capital IQ; BCG ValueScience Center.

Note: Luxshare and ServiceNow were missing data for the prior five-year period, so information on them for the period 2010–2014 is labeled “n/a” (not available).

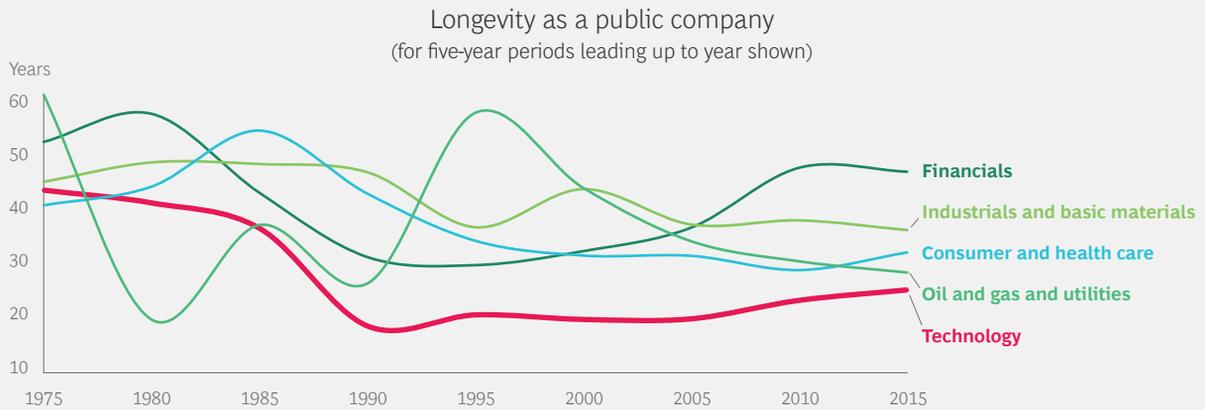
EXHIBIT 8 | Five Familiar Faces Generated More Than Half of Tech’s Value



Sources: S&P Global Market Intelligence; annual reports; BCG analysis.

Note: Sample consists of 94 companies. Value creation is computed by multiplying a company’s market capitalization on December 31, 2014, by its five-year CAGR. Figures are rounded to whole numbers.

EXHIBIT 9 | Public Tech Companies Have Short Lifespans



Source: BCG Henderson Institute analysis.

Note: Longevity measures the average time of operating as an independent public company at the time of delisting.

organizational complexity and allocate capital smartly across diverse businesses. They need to adapt their marketing and sales strategies to keep pace with upstart rivals whose innovation extends beyond products to go-to-market and business models. And they have to do all this while motivating employees who increasingly value their mission as much as their compensation and who have more employment options than ever before. Getting all of this right—or right enough—enabled Microsoft to reemerge from the shadows of more youthful companies to generate outside returns exceeding 30% annually over the past five years.

But not every company does get it right, and no company gets it right all the time. Although the software and semiconductor segments of tech had the strongest median performance from 2015 to 2019, large swings separated top and bottom performers in both (40 percentage points in software and 74 percentage points in semiconductors), as well as in technology materials and equipment (also 74 percentage points). (See Exhibit 10.)

Overall, end-user device makers and IT service providers did not match the strong performance of other tech segments. Other than Apple and Sony, none of the companies in devices or IT services broke out of the pack. But Apple is obviously more than a devices business. Although it generates most of its revenue from selling end-user devices, Apple creates outside returns by tightly integrating

them with its software, platform, and ecosystem business. Other device businesses have not successfully replicated this formula.

A Social License

More so than its media and telecom counterparts, tech is a global business. Tech companies can take advantage of scale and emerging-market growth and hire the best engineering and scientific talent in the world.

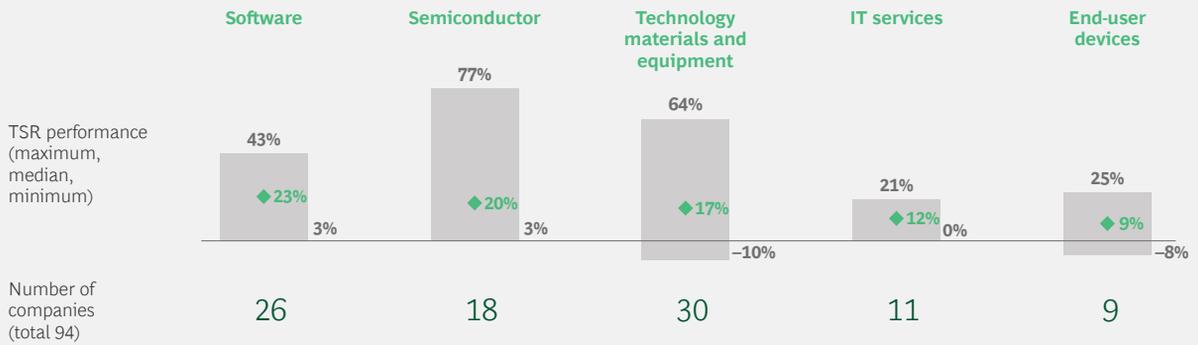
These benefits come paired with burdens. Tech companies are exposed to geopolitical risk, as US semiconductor manufacturers are discovering. As our colleagues at the BCG Henderson Institute describe it, a global zeitgeist of risk and insecurity has emerged.

The definition of what constitutes a good company and a good investment in the 2020s is still emerging. The public expects good companies to produce good products, practice sustainability, generate value, and help society meet its biggest challenges, such as climate action and social and economic inclusion.

The stakes are even higher for tech companies in light of even a partial list of the public debates in which they appear at center stage: privacy, corporate power, security, truth, AI bias, and automation.

In this hothouse environment, tech companies should aim to rediscover their fundamental

EXHIBIT 10 | Software Is the Strongest Tech Segment by Median TSR Performance



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

purpose—what makes them uniquely able to fulfill specific human needs. Shareholder returns are a vital part of a company’s raison d’être, but not the only part. A more expansive view of purpose recognizes that societal impact matters, too. Some tech companies are moving in the right direction; others have their work cut out for them. Their right to operate may depend on meeting this challenge.

THE five-year records of success posted by many established tech companies suggest that others can strengthen their businesses, renew their social license, and start the 2020s on the right foot.

IN MEDIA, SUBSCRIPTIONS MATTER MOST

FOR MEDIA COMPANIES, THE story of the moment and possibly of the 2020s as a whole is the pursuit of subscriptions and other forms of recurring revenue. Whether they are in news, entertainment, or gaming, media companies are building or expanding these annuity businesses.

Consumers themselves want to manage their media consumption more actively, leading to the drip-by-drip demise of the cable bundle and to the growth of select services. Media

companies' desire for an ongoing, paying relationship with their audience is the dominant force now shaping the industry. In terms of value creation, media finished fourth out of 33 industries, with a median annual TSR of 16% over the past five years (2015 to 2019). Most of the top ten value creators in media derive a significant share of revenue from subscriptions and other recurring sources. (See Exhibit 11.) Notably, subscriptions are nearly the sole source of revenue for Netflix, the number-two overall media value creator

EXHIBIT 11 | Gaming Companies Continue to Lead Media in TSR

Rank	Company	Headquarters	Segment	Average five-year annual TSR (%) ¹	Market value (\$billions) ²
1	CD Projekt	Poland	Video games	76.4	7.1
2	Netflix	US	Digital media	46.0	141.8
3	WWE	US	Entertainment	41.9	5.1
4	Take-Two	US	Video games	34.3	13.1
5	IAC	US	Digital media	33.1	21.1
6	Ubisoft	France	Video games	32.3	8.3
7	Tencent	China	Digital media	30.5	457.9
8	Nintendo	Japan	Video games	30.4	48.2
9	NetEase	China	Video games	30.0	39.2
10	Weibo	China	Digital media	26.6	10.4

Sources: S&P Global Market Intelligence; annual reports; BCG analysis.

Note: Sample includes 75 companies.

¹From January 1, 2015, to December 31, 2019.

²As of December 31, 2019.

and the number-one large-cap media value creator, with a five-year average annual TSR of 46%.

Why Subscriptions Matter

Alphabet, Facebook, and, increasingly, Amazon are by far the leading players in the digital ad market. Other media companies often find that it's easier to double down on subscriptions than compete against the digital giants for advertising dollars. In absolute value creation, Alphabet and Facebook continue to be the industry's workhorses. Together they generated nearly \$900 billion in value during the period from 2015 to 2019, one-half of the industry's total. (See Exhibit 12.)

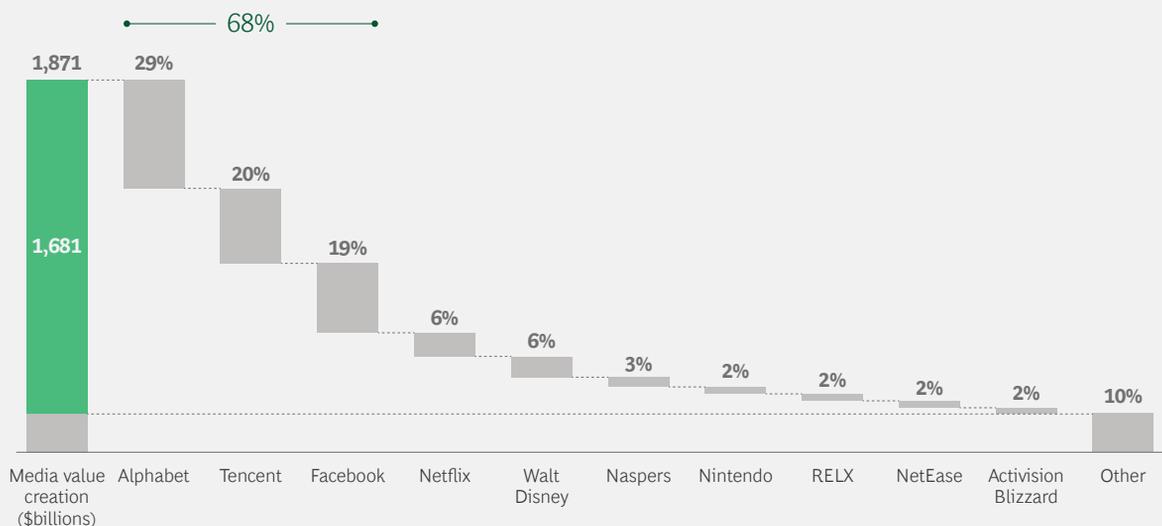
As 2019 came to a close, Walt Disney, the number-five value creator in absolute terms, launched its long-awaited subscription and streaming service. Disney+ generated 10 million subscribers on its first day and nearly 29 million by early February 2020. At \$7 a month, Disney+ costs less than Netflix's basic service and offers a library of must-see family entertainment. Although it has a long way to go to catch Netflix, which has nearly 170 million subscribers, Disney+ has a good chance to become one of a handful of core entertainment packages that consumers purchase.

Another company of interest is the New York Times, which generated an annualized TSR exceeding 20%, comparable to the figures for Alphabet and Facebook. By the end of 2019, the publisher, which is more than 150 years old, had attracted 5.2 million subscriptions and had increased its total number of digital-only subscriptions by 1 million in just a year. Although the New York Times did not earn a spot in the top ten among media value creators, it offers strong evidence that print media transformation is possible in the digital age. Wolters Kluwer, a global professional information provider, is another old-line media company that generated in excess of 20% annualized TSR, largely on the strength of recurring revenue.

The Growth of Gaming Companies

Although large companies are generating the most absolute value, smaller companies dominate the top-ten list on the strength of their high performance against relatively small revenue bases. Many of these small companies are fireflies that come into the media sphere only to quickly vanish. But a few endure, and their endurance suggests that these companies may be worthy of attention. For example, the number-one media value creator a decade ago (during the

EXHIBIT 12 | Alphabet, Tencent, and Facebook Are Generating the Most Absolute Value



Sources: S&P Global Market Intelligence; annual reports; BCG analysis.

Note: The sample consists of 75 companies. Value creation is computed by multiplying a company's market capitalization on December 31, 2014, by its five-year CAGR. Figures are rounded to whole numbers.

period from 2005 to 2009) was Tencent, then one-tenth the size it is today, with a 106% annualized return. While its annual TSR has since moderated to a still strong 30.5%, making it number seven among media companies, Tencent remains the number-two value creator in media in absolute terms. Its performance foreshadowed the arrival of the internet in China, one of the biggest business—and media—stories of the 2010s.

Tencent is the largest media company that has a strong presence in the fast-growing gaming media segment. It owns a 40% stake in Epic Games, the publisher of Fortnite, and has positions in many other makers of popular games. Five gaming companies, including the number-one media value creator CD Projekt of Poland, rank in the top ten, and the results mark the third year in a row for Take-Two Interactive, NetEase, and Ubisoft on the list. Important as it is now, mobile gaming will become even more critical for these companies in the next decade. (See Exhibit 13.)

Intriguingly, gamers are reluctant subscribers but habitual users. Many gaming companies have built or are building a subscription business. More fundamentally, they trade on the habitual use and ongoing purchases of their core customers. For example, gamers often make in-game purchases that don't technically count as subscriptions but are effectively cousins to subscriptions. Collectively, sub-

scriptions and in-game purchases already make up 14% of gaming revenue. These companies' continued relevance depends on moving beyond hits to recurrence.

WWE, the sponsor of televised and live pro wrestling, climbed two spots to become the number-three media value creator with a 42% annualized TSR, an achievement strongly supported by its transition to a subscription business.

What It Takes to Win

The subscription business—or any repeat business for a nonessential product or service—requires companies to offer consistent value in order to convert visitors into paying customers. It is costly to find and make offers to potential subscribers, and turning promotional offers into profitable revenue is a high-stakes effort. Even the best in the business struggle in an increasingly crowded market. (See Exhibit 14.) In the second quarter of 2019, for example, Netflix lost US subscribers for the first time.

In media, a subscription business is also a content business. News, entertainment, and gaming companies alike need to continually create, refresh, and buy content that will keep their audiences coming back for more. Netflix has increased its programming budget, which hit \$15 billion in 2019, by 34% annually since

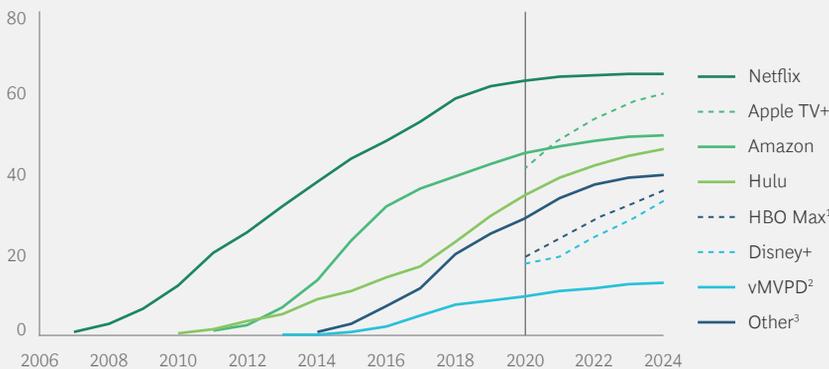
EXHIBIT 13 | In Gaming, All Segments Are Rising—Mobile Most of All



Sources: Newzoo April 2018 Quarterly Update; Global Games Market Report.

EXHIBIT 14 | For Established Players, Growth of the US Streaming Market Is Slowing as the Market Gets Crowded

US subscriptions (millions)



Sources: Ampere Analysis Consumer survey, measured from the third quarter of each year; BCG analysis.

¹Service to be launched in early 2020, combining content from HBO and TimeWarner.

²vMVPD = virtual multichannel video programming distributor, such as Hulu TV, YouTube TV, Sling TV, Fubo.TV, PlayStation Vue, and DirecTV Now.

³Subscription-based streaming service of own content, such as HBO, CBS All Access, Showtime, Starz, BritBox, WWE, and ESPN+.

2015. Demand for content also contributes to some of the industry’s dealmaking, such as AT&T’s acquisition of Time Warner and Walt Disney Co.’s purchase of 20th Century Fox.

As the cable bundle disappears, consumers will be able to choose from among an expanding galaxy of video services. About 80% of US households already pay for a streaming service. The great unknown is how many subscriptions households will be willing to pay for. In the US, a recent BCG survey showed that the average number of subscriptions in streaming households is currently 3.2.

Even when they offer strong content, companies need to craft the right offer at the right price to the right consumer. Contrary to conventional wisdom, younger generations of consumers are willing to pay for content and even print subscriptions—but they do not

seek them out. Rather, our research suggests that media companies must reach out to them with a deal. In contrast, older consumers are more likely to seek subscription offers based on convenience.

FOR traditional media companies, the industry may not feel as if it were the number-four industry among top value creators. The past five years have wrenched operating models and tested management resolve. The next five years will do more of the same. Nevertheless, levels of media consumption, fascination with media, and media creation have never been higher or more intense. It’s a dynamic industry that punishes or rewards based on performance. The goal of achieving top-quartile TSR performance must drive any media company that seeks to remain relevant.

UNLOCKING AND BUILDING VALUE IN TELECOM

WHAT DOES IT MEAN that three of the highest-return telecom companies over the past five years are not real telecom companies? Could there be any clearer signal that the industry is under the sway of fundamental transformation than the fact that three tower companies—companies that own passive telecom infrastructure—generated higher shareholder returns from 2015 to 2019 than almost all operators? (See Exhibit 15.)

The apparent moral here is that it's more profitable to own passive telecom assets than

to operate wireless services. Investors view American Tower, SBA Communications, and Crown Castle International as relatively clean plays on mobile data growth next to traditional operators. (See Exhibit 16.)

The real moral, however, is that operators need to break free from the familiar constraints of regulation, legacy, and often-unfavorable competitive dynamics. Rather than bleed outdated business models dry, they need to be bolder in strategy and execution.

EXHIBIT 15 | The Telecommunications Top Ten Includes Four US Operators and Three Tower Companies

Rank	Company	Headquarters	Segment	Average five-year annual TSR (%) ¹	Market value (\$billions) ²
1	Safaricom	Kenya	Wireless operator	24.0	12.5
2	T-Mobile US	US	Wireless operator	23.8	67.1
3	Elisa	Finland	Integrated operator	22.3	8.8
4	Charter Communications	US	Cable operator	21.4	104.2
5	American Tower	US	Tower operator	20.7	101.8
6	Crown Castle International	US	Tower operator	17.0	59.1
7	SBA Communications	US	Tower operator	16.9	27.1
8	Tele2	Sweden	Wireless operator	16.8	10.0
9	Mobile TeleSystems	Russia	Wireless operator	16.1	9.0
10	Emirates Telecommunications	UAE	Integrated operator	15.8	38.7

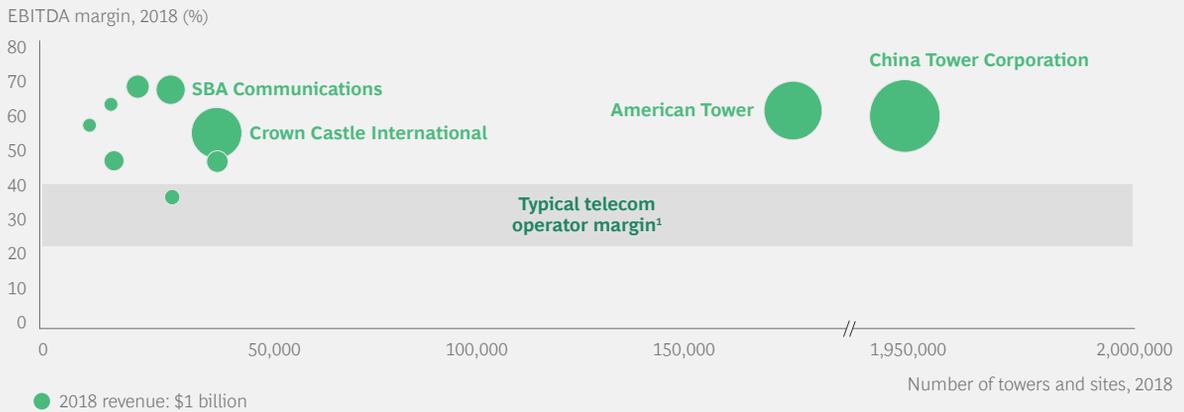
Sources: S&P Global Market Intelligence; annual reports; BCG analysis.

Note: Sample includes 61 companies.

¹From January 1, 2015, to December 31, 2019.

²As of December 31, 2019.

EXHIBIT 16 | Tower Companies in the Telecommunications Top 10 Have Margins of 40% to 70%



Sources: Company reports and press releases; S&P Global; TowerXchange; BCG analysis.
¹Sample of 20 telecom operators.

The industry’s challenges are well known. Telecom companies lack the global scale of the digital giants in rolling out new services, an area where operators have lost revenue over the past two decades. They face daunting network investments and a lack of financial flexibility due to a debt-laden capital structure and sky-high dividend commitments. And although they are making progress, operators still have room to improve their culture and ways of working.

What would it take to flip the switch? What would cause investors to bet on the transformational potential of the telecom industry, which finished 28th out of 33 analyzed industries in value creation, with a five-year average annual TSR of 6.3%?

To win in the next decade, operators must take advantage of four prime opportunities, as illustrated in Exhibit 17:

- Optimize the balance sheet by unlocking the value of infrastructure assets, exploring new ownership models such as network or tower sharing, or taking advantage of activities such as debt restructuring and M&A.
- Create network supremacy by smartly rolling out 5G and fiber to the premises, integrating precision analytics and marketing, embedding intelligence, and eliminating legacy systems. (See the sidebar, “Elisa’s Smart Play.”)

- Find growth in select B2B plays, and truly leverage data and digital to build new businesses and shape ecosystems.
- Transform the operating model with drastic simplification, digitization, and modern, streamlined ways of working.

These are not necessarily new lessons. But they are urgent. In addition to having bottom-quartile TSR, telecommunications had the lowest spread between top and bottom performers among the 33 analyzed industries, an indication that investors do not detect much difference among operators in their pursuit of risk-averse, in-country fiber and 5G strategies. (See Exhibit 18.) At this point, relying on a business-as-usual approach will not cut it. Operators need to be willing to take risks.

Balance Sheet Optimization

The success and high valuations of tower companies and private-equity-funded fiber companies such as Inexio, Deutsche Glasfaser, and Hyperoptic suggest a way for operators to unlock latent value in their towers and fiber networks. They can capture this value through sharing, joint ownership, and spin-offs. The cash infusion to be gained by selling off assets entails a tradeoff in the form of a subsequent decrease in operating and strategic flexibility and the loss of a key control point—so a careful analysis is worth doing. Most operators will benefit from a nuanced

EXHIBIT 17 | Four Keys Can Unlock Performance



Source: BCG analysis.

rather than binary approach toward both scope and operating model.

Investors are aware of the subtleties involved. With regard to M&A, they favor domestic consolidation but not necessarily diversification into new businesses. Even in an era of cord cutting, for example, Charter Communications jumped five spots to become the number-four

telecom value creator by buying other US cable operators. Meanwhile, the number-eight telecom value creator, Tele2, has been successfully consolidating assets in Sweden and divesting them elsewhere.

The low-interest-rate environment challenges assumptions about debt ratios that have served the industry for a decade or longer.

ELISA'S SMART PLAY

Elisa, the largest Finland-based telecom operator, became the number-three telecom value creator globally, with a 22% average annual TSR from 2015 to 2019, despite operating in a highly competitive environment marked by unlimited mobile data subscriptions. Elisa's performance is built on a strong customer focus, attractive yet straightforward offers, operational excellence, and selective risk taking in areas that offer a clear competitive advantage. The company has followed a judicious, focused, and strategic approach to M&A and has demonstrated financial discipline.

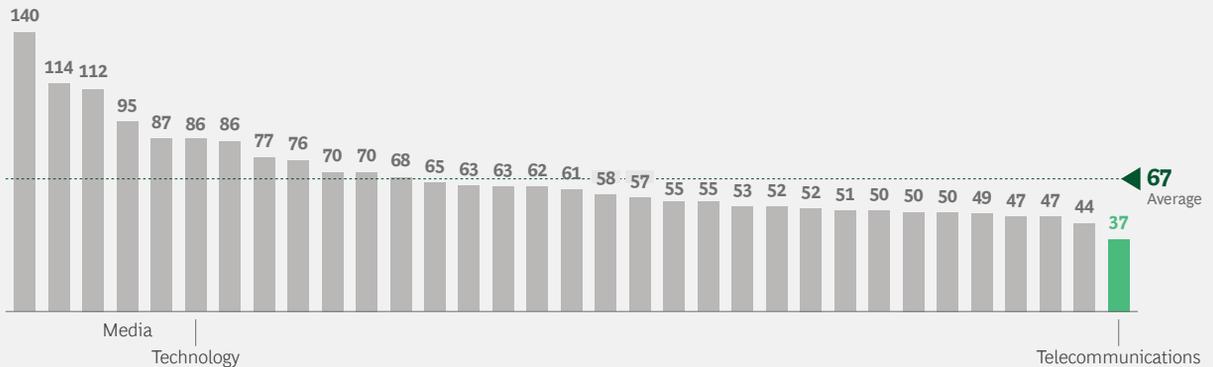
Elisa has also been early leader in introducing new digital services and in undertaking

a digital transformation of its operations. For example, the company put significant effort into building leading capabilities in network management automation more than a decade ago. Consequently, Elisa recorded higher-than-average mobile service revenues while maintaining flat spending and managing a 16x increase in data traffic from 2012 to 2018.

Automation enables Elisa to prevent and resolve nine out of ten network faults before they become visible to customers. Its network automation has been so successful that Elisa has started to offer these services to other telecom operators, such as Orange Spain and LG Uplus.

EXHIBIT 18 | Telecommunications Showed the Lowest TSR Spread Across All Industries

TSR spread across 33 industries (ppt)¹



Sources: S&P Capital IQ; company disclosures; BCG analysis.

¹TSR spread is the difference between the top and bottom performers; ppt = percentage points.

Does it make sense to finance 5G and fiber-to-the-home (FTTH) rollouts with higher debt levels than operators would traditionally carry? This is a question worth pondering.

If telecom companies do not make these moves, an activist investor might do it for them, as investor Elliott Management’s recent pursuit of changes at AT&T foreshadows.

Network Leadership

The long-awaited rollout of 5G, with its promise of innovative services and revenue growth, has begun. Operators will not participate equally in this opportunity, however.

Not all new 5G uses—telemetry, remote surgery, and real-time traffic management, for example—will be ready at the same time, or applicable, or profitable in all markets. The rollout challenge for 5G is more complex: do you build on anticipation of future growth, or do you roll out selectively while offering a thin coverage layer? The second approach is less costly and risky in the short run but may cap long-term opportunities.

This is more than an engineering challenge. In deciding on a cadence, operators must juggle strategic, financial, and operational issues. Their technical, business, and finance staffs need to cooperate to pursue the best approach, market by market, often in partnership with both telecom and non-telecom companies.

5G is just one network challenge facing operators. Their ongoing FTTH rollouts are equally costly and necessary. At the same time, operators should build intelligence into their networks to balance traffic, manage devices, and heal failures—all while decommissioning copper and legacy networks. Cable operators and telecom operators that offer TV must also seek to slow cord cutting through pricing, packaging, and other adjustments.

Smart Growth and Focused Execution

Despite their mixed record when they step outside the core, operators should seek fresh growth spots. Growth continues to be the key driver of value for the best-performing companies, such as operators Safaricom, T-Mobile, and Charter. It’s the best option for replacing core revenues lost to the digital giants. We consider three opportunities to be the most promising:

- **Next-Generation B2B.** Small and medium-size businesses increasingly need help upgrading their infrastructure and managing cloud and software-defined services. Although operators may need to change their business model, talent, and commercial offers to handle such services, they are in a good position to win this business.
- **Data-Driven Customer Centricity.** Operators can help commercial and retail

customers navigate, bundle, and integrate digital and entertainment services. They can provide a personalized segment-of-one customer experience with the goal of becoming customers' lifetime partners.

- **Adjacent and Up-Stack Opportunities.** Taking risks is not a bad thing. Operators should be willing to consider pursuing a focused set of plays, either organic or through M&A, that meaningfully take advantage of their core strengths to create value-added services. Number-one telecom value creator Safaricom demonstrates this potential with its M-Pesa mobile money service, which has contributed nearly one-third of Safaricom's annual revenues while growing at a 22% annual clip for three years running. The fact that other operators have not replicated this success demonstrates both the challenge and the potential of value creation.

Radical Simplification and New Capabilities

Operators have spent the recent past lowering cost. It's now time to build organizational and operational muscle in three interrelated areas:

- Dramatically simplifying products, customer journeys, processes, and systems
- Making foundational improvements in data and analytics and artificial intelligence capabilities
- Focusing on people, talent, and ways of working, especially in developing new capabilities and fast learning

T-Mobile US has shown what this type of transformation can accomplish. The number-two telecom value creator disrupted the market with a simple offer that did away with everything consumers hated about their plan, especially lengthy contracts, monthly data limits, and add-on prices. The carrier has also focused on team and employee engagement.

It's hard to overemphasize the importance of people. In stark terms, without talent transformation, operators will not be able to master business transformation. And without business transformation, operators will not break away from old strategies that are unsuitable for the new decade.

The opportunities are clear. CEOs who create a bold vision and execute ruthlessly against that vision can break away from the pack.

FOR FURTHER READING

Boston Consulting Group has published other reports and articles that may be of interest to senior TMT executives. Recent examples include those listed here.

Investors Want Companies to Be Resilient and Bold

An article by Boston Consulting Group, February 2020

The Superincumbent's Dilemma

An article by Boston Consulting Group, December 2019

5G Will Take a Different Type of Launch

An article by Boston Consulting Group, October 2019

Flipping the Script on Climate Action

An article by Boston Consulting Group, September 2019

Winning the Media Subscription Battle

An article by Boston Consulting Group, September 2019

As Global M&A Slows, Investor Activism Is on the Move

An article by Boston Consulting Group, June 2019

The Business Imperative of Diversity

An article by Boston Consulting Group, June 2019

Optimize for Both Social and Business Value

An article by Boston Consulting Group, June 2019

Solving the Tech Industry's Purpose Problem

A Focus by Boston Consulting Group, June 2019

What Does a Successful Digital Ecosystem Look Like?

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The 2019 TMT Value Creators Report: Value Creation Amid Turbulence

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The 2019 TMT Value Creators Report: Despite a Volatile 2018, Tech Is Still Performing Strongly

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The 2019 TMT Value Creators Report: Winning in Media in the Digital Age

An article by Boston Consulting Group, February 2019

The TMT Value Creators Report: Unlocking Value in Telecom

An article by Boston Consulting Group, February 2019

The Global Landscape of Corporate Vitality

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An article by Boston Consulting Group, August 2018

Taking Agile Transformations Beyond the Tipping Point

An article by Boston Consulting Group, August 2018

To Fuel Growth, Telcos Need a Digital Makeover

An article by Boston Consulting Group, April 2018

Total Societal Impact: A New Lens for Strategy

A report by Boston Consulting Group, October 2017

The Art of Capital Allocation

An article by Boston Consulting Group, March 2017

NOTE TO THE READER

This is BCG's ninth report in the Technology, Media & Telecommunications Value Creators series. Our main purpose is to help clients understand the dynamics of shareholder growth in these dynamic industries. More than ever before, your success will be defined by your ability to achieve digital transformation, as outlined in this report.

About the Authors

Simon Bamberger is a managing director and partner in the Los Angeles office of Boston Consulting Group and a core member of its TMT practice. **Wolfgang Bock** is a managing director and senior partner in the firm's Munich office. He is the former global leader of its telecommunications work and is active in its Global Advantage and People & Organization practices.

Hady Farag is a partner and associate director in BCG's New York office. He is a topic expert in shareholder value strategy and a core member of the firm's Corporate Finances and Strategy practice. **Anna Green** is a managing director and senior partner in the firm's Sydney office. In addition to leading that office, she oversees BCG's Technology, Media & Telecommunications practice in Australia and New Zealand and is a global leader of its media work. **Derek Kennedy** is a managing director and senior partner in BCG's San Francisco office. He is the global leader of the firm's work in technology and works with senior executives in B2B and B2C software, cloud services, and device business. **Fredrik Lind** is a managing director and senior partner in the firm's Stockholm office. He leads the Technology, Media & Telecommunications and Social Impact practices in the Nordics and is the global leader of Technology, Media

& Telecommunications marketing. **Rocío Lorenzo** is a managing director and partner in BCG's Munich office. She is the global leader of the firm's telecommunications work and is active in its Marketing, Sales & Pricing and People & Organization practices. **Vaishali Rastogi** is a managing director and senior partner in the firm's Singapore office. She is the global leader of the Technology, Media & Telecommunications practice, BCG's former head of Southeast Asia, and a former member of the firm's executive committee. **Steffen Stern** is a principal in BCG's Cologne office. He is a core member of its Technology, Media & Telecommunications practice, experienced in telecommunications and corporate finance. **Maikel Wilms** is a partner and director in the firm's Amsterdam office. He focuses on network strategy and roll-out and on B2B commercial strategies for telecom operators. **Neal Zucker** is a managing director and senior partner in BCG's New York office. He is the global co-leader of the firm's media work. He is experienced in building digital businesses for existing brands and large-scale transformation.

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For Further Contact

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

Simon Bamberger

Managing Director & Partner
BCG Los Angeles
+1 213 625 4489
bamberger.simon@bcg.com

Wolfgang Bock

Managing Director & Senior Partner
BCG Munich
+49 2317 4409
bock.wolfgang@bcg.com

Hady Farag

Partner & Associate Director
BCG New York
+1 917 678 5846
farag.hady@bcg.com

Anna Green

Managing Director & Senior Partner
BCG Sydney
+61 2 9323 5607
green.anna@bcg.com

Derek Kennedy

Managing Director & Senior Partner
San Francisco
+1 415 732 8124
kennedy.derek@bcg.com

Fredrik Lind

Managing Director & Senior Partner
BCG Stockholm
+46 8 402 4480
lind.fredrik@bcg.com

Rocío Lorenzo

Managing Director & Partner
Munich
+49 89 2317 4174
lorenzo.rocio@bcg.com

Vaishali Rastogi

Managing Director & Senior Partner
BCG Singapore
+65 6429 2527
rastogi.vaishali@bcg.com

Steffen Stern

Principal
BCG Cologne
+49 221 5500 5187
stern.steffen@bcg.com

Maikel Wilms

Partner & Director
BCG Amsterdam
+31 20 548 5782
wilms.maikel@bcg.com

Neal Zuckerman

Managing Director & Senior Partner
BCG New York
+1 212 446 2992
zuckerman.neal@bcg.com

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