Changing Engines in Midflight
How Technology, Media, and Telecom Companies Can Transform and Prosper in the Digital Economy

The Boston Consulting Group
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THE 2012 TMT VALUE CREATORS REPORT

CHANGING ENGINES IN MIDFLIGHT

HOW TECHNOLOGY, MEDIA, AND TELECOM COMPANIES CAN TRANSFORM AND PROSPER IN THE DIGITAL ECONOMY

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EXECUTIVE SUMMARY

THIS REPORT BUILDS ON the fourteenth annual report in the Value Creators series published by The Boston Consulting Group. We look at some of the broader trends shaping the success of technology, media, and telecom (TMT) companies at a time of unprecedented turbulence. Using the lens of total shareholder return (TSR), we identify the world’s top TMT companies over the five-year period from 2007 through 2011 and then explore the secrets of their success.

TMT industries are experiencing their most disruptive shift yet, driven in particular by the globalization of the Internet, the explosion in data, and the emergence of what is increasingly termed the post-PC era.

- The trends are boosting some companies while hurting others. So despite stellar performances from some, TMT players as a group only achieved an average annual TSR of 3.1 percent—slightly above average among all industries.

- TMT industry growth is far from over, despite the challenges of a slowing global economy and major shifts in spending patterns. Digital services, for example, a fast growing market, is expected to reach $1 trillion by 2015.

- Powered by the global nature of the Internet, developing markets are spawning TMT global challengers—ambitious, fast-moving companies that bring an accelerator mindset to the global fray. These companies focus on growth rather than immediate returns and learn as they go rather than relying on preprogrammed business plans.

Adapting to the realities of the digital economy requires companies to undertake a blunt assessment of their starting position and digital capabilities. With that understanding, they will be ready to embark on a four-part transformation agenda.
• Setting an Overarching Strategy. Build a portfolio of businesses that ensure profitable growth.

• Funding the Journey. Manage legacy businesses to generate the cash needed to invest in future opportunities and satisfy investors.

• Winning in the Medium Term. Get the most out of the current business model while successfully exploiting adjacencies and executing digital strategies.

• Focusing on Adaptive Advantage. Flatten the organization, change the talent mix, and foster a culture of iterative experimentation throughout the company.

In technology, a sea change is under way, driven by such trends as the rising importance of ecosystems and integrated offerings, the emergence of software as a product differentiator, and the “arms races” in areas like cloud computing and intellectual property.

• The semiconductor sector is facing a seminal inflection point, creating a need for higher R&D productivity and collaboration within ecosystems, with consolidation perhaps ahead.

• Mobility and the rise of new ecosystems—exemplified by low-power chip leader ARM Holdings (which surpassed Apple as the leading technology value creator from 2007 through 2011)—are the main drivers of change in semiconductors.

• The IT services and software sector is experiencing maturation and convergence, as cloud offerings change the game for both IT services and software companies.

• IT services companies must block and tackle better and actively manage their portfolios, as shown by the TSR performances of Cerner and IBM in the technology top ten.

In media, the digital age has already created big winners such as Baidu and Tencent, but most established companies are still midway through a difficult journey.

• Newspapers and magazines, hit hardest by the shift to digital advertising, are in the most urgent need of a makeover, which is difficult but doable by embracing an adaptive strategy and using a transformation agenda.

• Companies can win in the medium term by focusing their legacy portfolios, scoring some quick digital wins, and expanding into adjacent areas, even at the risk of cannibalizing existing businesses. Most need an infusion of digital talent to drive cultural change.

In telecommunications, companies around the world have been driving TSR with dividends and buybacks. But slowing growth in developing markets, costly fixed and mobile rollouts in developed ones, and revenue erosion from over-the-top (OTT)
services—the delivery of online services such as Skype that are not managed by the Internet service provider—are challenging the traditional telco model.

- Telcos face a fundamental reordering of the industry into specialized segments, pushing them away from the vertical integration of the past. To vie with specialized competitors, telcos need to move to a new, modular business model.

- OTT services are dramatically eroding the telcos’ revenue sources, pushing them to move into digital services themselves. They shouldn’t underestimate the difficulty of this move, or let it distract them from needed changes in their traditional businesses.
RAPID, DISRUPTIVE CHANGE HAS long been the norm in the technology, media, and telecom (TMT) world. But the fast pace of the past was merely prelude to the head-snapping acceleration over the past few years.

The digital economy—powered by TMT players—is changing the way in which businesses and consumers behave globally. The Internet economy accounted for 4.1 percent of the GDP of G-20 economies in 2010, with leading countries achieving double that share. There are now more than 2 billion Internet users, with a billion more expected to be online by 2016. There are over 5 billion mobile phones—and remarkably, already more smartphones than fixed connections—and social networks reach about 80 percent of Internet users throughout the world. Together, these developments are shaping commerce, culture, and communications and will permanently redefine sectors as disparate as health, education, banking, and government. The “new” Internet is different in many ways from the old Internet. (See Exhibit 1.)

**EXHIBIT 1 | The “New” Internet Is Different in Many Ways from the Old Internet**

| From developed to developing G-20 Internet users (millions) |
| 2005 | 2015 |
| 238 | 508 | 1,390 |

| From fixed to mobile G-20 consumer broadband connections (millions) |
| 167 |

| From basic content to a data explosion Global Internet traffic (exabytes per year) |
| 30 |

Sources: Economist Intelligence Unit; Ovum; trefis.com; Cisco; BCG analysis.

Note: In Europe, the G-20 includes only the independent European members: France, Germany, Italy, and the United Kingdom. The developing nations included are: Argentina, Brazil, China, India, Indonesia, Mexico, Russia, Saudi Arabia, South Africa, and Turkey. The developed nations included are: Australia, Canada, France, Germany, Italy, Japan, South Korea, the United Kingdom, and the United States.
As machines such as cars and medical-imaging devices go online, an explosion of data is occurring. Cisco estimates that annual global Internet traffic will exceed one zettabyte—that is a billion terabytes—by 2015, a 35-fold increase over the volume in 2005. Video traffic is the primary driver: the online video traffic generated by the London Olympics, for example, was 20 times what it was for the Beijing Olympics.

While TMT players are central to the digital economy they are also buffeted by its turbulence. Over the five-year period from 2007 through 2011, TMT players, as a group, only achieved average total shareholder return (TSR) of roughly 3 percent annually. For every high-performing company there are laggards, late starters, or fallen heroes.

TSR is the product of a company’s strategic direction, execution, and overall market conditions. In past years, we have conducted our analysis of TMT companies primarily through a TSR lens. For an explanation of our methodology, see the sidebar “The Basics of Value Creators and Value Creation.” In this report, we continue that tradition but also look at some of the broader trends shaping the success of TMT companies.

Waves of Change

In technology, media, and telecommunications, companies are vying for position in what has rapidly become known as the post-PC era—an age when portability and connectivity trump power and speed, and ecosystems of content and services drive value.

A transformation that began in the consumer market is shaking the foundations of enterprise IT and spilling over into other industries.

THE BASICS OF VALUE CREATORS AND VALUE CREATION

This report builds on the fourteenth annual report in the Value Creators series published by The Boston Consulting Group. It ranks the stock market performance of the world’s top TMT companies over a five-year period—from 2007 through 2011—and explores both the secrets of their success and the challenges ahead for their sectors.

Of the 133 TMT companies analyzed, 51 are from the technology industry, 38 from the media industry, and 44 from the telecom industry. To be ranked, companies needed to have been publicly listed for all five years of our study period, with at least 25 percent of their shares being publicly traded. We also imposed a minimum market capitalization of $9 billion for technology companies, $8.5 billion for telecom companies, and $3 billion for media companies.

The overall rankings track performance in local currency from 2007 through 2011; returns for the first nine months of 2012 are also listed in the exhibits. For companies that are listed in exchanges outside their home country, returns are calculated in the currency of the exchange.

In addition, we show the contributions of the six components of TSR in order to assess how each company creates value. The first two elements—sales growth and change in profit margin—represent a company’s fundamental value. The third element—the change in valuation multiple—conveys investor perception of the company. We calculate the multiple as the ratio of enterprise value (the combined market value of equity and debt) to EBITDA. All three elements contribute to establishing the change in a company’s market capitalization. The last three elements—cash dividends, share repurchases, and debt repayments—determine the contribution of cash payouts to a company’s TSR.

NOTE

Consider the following trends: PC sales in 2012 will show their first annual decline in eleven years, according to IHS iSuppli, as consumers and businesses shift their spending to smartphones and tablets. In the United States, people now spend more time using apps in smartphones and tablets than browsing the Web, according to Flurry Analytics. Consumer cloud services, notably Apple’s iCloud and Amazon’s Kindle Fire ecosystem, have already changed the way consumers and media companies interact.

Furthermore, enterprise cloud services like Amazon Web Services (AWS) and salesforce.com are changing the game for enterprise software companies like SAP and Oracle. Media companies, especially those in print, are generally struggling to respond to the digital revolution. The shuttering of the print version of Newsweek magazine is only the latest example.

Digital technologies and services will soon be embedded into nearly everything we do.

As these winds whip through the TMT world, companies are changing tack. Microsoft, the biggest beneficiary of the old paradigm, is integrating Windows 8, the Windows Phone 8, and Surface (a tablet) into a tight collection of software, services, and hardware. The world’s largest software company is also expanding its retail footprint in order to improve the customer experience.

The Surface tablet changes Microsoft’s relationship with original-equipment manufacturers (OEMs) and also with Intel. The first version of Surface runs on a chip design from ARM Holdings, an Intel competitor.

Google and Apple, meanwhile, have gone from being partners to fierce rivals. Google’s new handset business, based on its 2012 acquisition of Motorola Mobility, also changes its relationship with Android-reliant OEMs like Samsung and HTC.

As the Internet becomes increasingly global, developing countries are spawning their own global challengers—ambitious, fast-moving companies that bring an accelerator mindset to the global fray, focus on growth rather than immediate returns, and learn as they go rather than rely on preprogrammed business plans. Two Chinese Internet companies, Baidu and Tencent, top the list when large-cap companies in all industries are ranked by TSR from 2007 through 2011. (See the sidebar “TSR in TMT: A Tale of Leaders and Laggards.”)

China’s ZTE and Huawei have become leading smartphone players. ZTE is now the fourth largest global player, after Samsung, Apple, and HTC, according to newly released data from International Data Corporation. India’s Bharti Airtel and Infosys help set the global pace in telecom and IT services, respectively. Other developing-world telecom powerhouses include Mexico’s America Movil, Russia’s Vimpelcom, and Abu Dhabi’s Etisalat. In media, South Africa’s Naspers has a strong presence in many emerging markets in e-commerce, pay TV, and print.

In the post-PC era, just keeping score is a challenge. Step back a bit, however, and it is possible to view all this activity not in terms of what is ending, but in terms of what lies ahead: An era in which digital technology and services are embedded in nearly everything we do.

Digital Services and Big Data

Digital services are radically changing entire industries ranging from retail to banking, from games to music, and from health care to transportation. The market for digital services shown in Exhibit 2 will reach $1 trillion by 2015 and is growing at 13 percent annually. Soon it will be larger than the global telecom services market. This represents a huge opportunity for TMT companies.

Venture capital is flooding into digital services—and mobile services, in particular. Venture capital firms invested $5.5 billion in mobile technologies from November 2011 to July 2012. (See Exhibit 3.) In 2011, mobile investment represented 42 percent of technology investment in the TMT sector.
Most companies had a hard time creating shareholder value in the five-year period from 2007 through 2011, according to the fourteenth annual Value Creators report, a multi-industry study of company stock-market performance. The master study showed five-year average annual TSR across 1,003 companies in 21 industries of 2.4 percent. Nine industries had negative returns. Against this backdrop, the overall performance of TMT industries was middling. The average annual TSR for technology companies was a little better than average, at 4 percent. Telecom TSR averaged 3 percent, and media TSR averaged only 2 percent. (See the exhibit “TMT Industries Eke Out Small Gains for Investors.”) These returns are all lower than the five-year averages in the period ending in 2010.

### TMT Industries Eke Out Small Gains for Investors

<table>
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<tr>
<th>TMT Industries</th>
<th>Value creation (%)</th>
<th>Fundamental value (%)</th>
<th>Valuation multiple (%)</th>
<th>Cash flow contribution (%)</th>
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<td>Construction and building materials</td>
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<td>Metals</td>
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</tbody>
</table>

Sources: Thomson Reuters Datastream; Thomson Reuters Worldscope; Bloomberg; company disclosures; BCG analysis.

Note: The contribution of each factor is shown in percentage points of five-year average annual TSR; any apparent discrepancies in TSR totals are due to rounding.

Weighted average of the five-year average annual TSR (2007–2011) for each respective sample.
But averages can be deceptive, masking an unusually wide range of value creation—and destruction. In technology, the big winners were companies taking advantage of mobile and ubiquitous computing, such as chipmaker ARM, Apple, and salesforce.com. In media, Baidu and Tencent, the Chinese Internet companies, led the field by a wide margin. In telecommunications, a trio of Asian mobile providers stood apart. The big TSR losers in all three TMT industries were companies that have failed to transform their business models.

Across the TMT industries, large-cap companies outperformed the field, posting an average annual 5.2 percent TSR. A handful of them did exceptionally well: Baidu, Tencent, and Apple hold the top three spots on the broader Value Creators list, with average annual TSR of 59.5 percent, 41.8 percent, and 36.7 percent, respectively. Amazon.com is fourth at 34.4 percent, with growing businesses in tablets, media, and cloud computing. Vodafone, the best-performing large-cap telco, with an 11.1 percent TSR, ranks twenty-ninth among all large-cap companies.

Sales growth powered the TSR performance of the technology and media companies, while price-to-earnings multiples sharply declined, removing 11 and 7 percentage points, respectively, from their average annual TSR performance. The telecom industry, meanwhile, benefited from growth in sales and dividends and suffered slightly less from declining multiples. (See the exhibit, “Companies Find Many Ways to Create Value.”)

We take a closer look at sector-specific TSR issues in the sidebars accompanying each chapter of this report.

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**Companies Find Many Ways to Create Value**

<table>
<thead>
<tr>
<th>TSR contribution (%)</th>
<th>Technology</th>
<th>Media</th>
<th>Telecommunications</th>
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</thead>
<tbody>
<tr>
<td>Sales growth</td>
<td>Margin change</td>
<td>Dividend change</td>
<td>Sales growth</td>
</tr>
<tr>
<td>Margin change</td>
<td>80</td>
<td>60</td>
<td>40</td>
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<tr>
<td>Dividend change</td>
<td>20</td>
<td>0</td>
<td>-20</td>
</tr>
<tr>
<td>Range</td>
<td>60</td>
<td>40</td>
<td>-40</td>
</tr>
<tr>
<td>Top ten company</td>
<td>80</td>
<td>60</td>
<td>40</td>
</tr>
</tbody>
</table>

**Sources:** Thomson Reuters Datastream; Thomson Reuters Worldscope; Bloomberg; annual reports; BCG analysis.

**Note:** The contribution of each factor is shown in percentage points of five-year average annual TSR.
EXHIBIT 2 | The Digital-Services Ecosystem Will Reach $1 Trillion by 2015

Source: Euromonitor; Gartner; IDC; Magna Global; Ovum; Telecommunications Industry Association; BCG analysis.

This assumes a 2.5 percent average fee on transaction volume.

EXHIBIT 3 | Venture Capital Is Flocking to the Mobility Market

Between November 2011 and July 2012, venture capital firms invested $5.5 billion in 700 investments

Source: Rutberg & Company; BCG analysis.
venture capital (up from 30 percent in 2010 and only 17 percent in 2009).

Many of these digital services are built on various forms of data—for example, personal data volunteered knowingly or unknowingly by consumers, open data released by governments, or geospatial data gathered by satellites and other methods.

Data are becoming the new oil of the economy. When used appropriately, personal data can create new economic value by helping to achieve new efficiencies in business; tailor and personalize products; respond quickly to global challenges; and empower individuals to engage in social, commercial, and political activities more effectively. Personal data help drive the Internet economy and boost the recent valuations of many companies.

There is real risk, however, that this value will not be realized. High-profile security-data breaches are commonplace. Individuals are increasingly concerned about intrusions into their privacy and the possibility of data being used for unauthorized purposes. Many companies are unclear about what they can and cannot do and are either standing on the sidelines or forging ahead with an unclear understanding of liabilities and risks to their reputation. Governments are proposing various laws and regulations to protect privacy while also aiming to encourage innovation and growth.

In this turbulent and unpredictable environment, traditional notions of competitive advantage become fragile, and setting strategy based on long-term forecasts is perilous. A new way of thinking is required.

NOTES
PILOTING A TMT COMPANY through the current turbulence is a white-knuckle challenge—the more so if the pilot must rely on sputtering propeller engines in an age when turbojets and state-of-the-art avionics are needed. And while it would be nice to taxi the company into a hangar for an upgrade, that is not an option—the work must be done in real time and in midair.

The extent of the overhaul and the path forward will differ, of course, for technology, media, and telecom businesses, and will depend as well on the specific challenges a company faces.

In today’s volatile world, all transformations require adaptability. (See the sidebar “Adaptive Advantage in TMT.”) Most transformations require companies to conduct a blunt and honest assessment of their starting position, followed by implementing a four-part transformation agenda—setting an overarching strategy, funding the journey, winning in the medium term, and focusing on adaptive advantage—to deal with the realities of the digital economy. (See Exhibit 4.)

Setting an Overarching Strategy. After the blunt assessment come the questions that shape a company’s strategy for adaptive advantage: Where should the company compete? Where should it bow out? Have the risks of disruption—as well as the opportunities to disrupt—been understood and quantified? With industry boundaries shifting, these questions become tougher and also more urgent. Capital plans, operating models, technology platform, and talent and culture all need to be evaluated.

Transformation is not a “one-off” exercise or one repeated perhaps every few years.

Some specific questions need clear responses: Is the company adequately leveraging data on customers, suppliers, and ecosystem partners to develop new sources of competitive advantage? Does the technology platform provide analytic insights, and can it be adapted to a fast-changing business environment at reasonable cost? Do employees have the skills to address the new business environment, and is the organization open to experiment? How does the leadership model need to change to promote a culture of “test and learn”—of “perpetual beta,” as software developers would say?

Above all, the company must recognize that this is not a “one off” exercise, or one that is repeated perhaps every few years. The digital
Increased turbulence has altered the basis of competitive advantage. Positional advantage—best exemplified by such metrics as market share and industry leadership—is giving way to adaptive advantage, which emphasizes learning, experimentation, and action that matches the clock speed of the market.

Adaptability is clearly linked to value creation. In The Most Adaptive Companies 2012, we found that technology companies that increased their adaptability generated higher TSR than their peers. Specifically, companies that improved their adaptability ranking by 1 decile relative to peers—from the fiftieth to the sixtieth percentile, for example—generated an increase in equity value of 4 percent annually over six years over companies that stayed in place. (See the exhibit “More Adaptive Companies Produce Greater Value.”)

We have found five sources of adaptive advantage:

- **Signal Advantage.** The ability to read and act on change signals, as Amazon has done with its recommendation engine. It aggregates large amounts of customer purchase, click stream, and wish list data to tailor onsite and e-mail recommendations that drive new purchases.

- **Experimentation Advantage.** The ability to experiment rapidly and economically in order to learn new and better ways of coping with change. Intuit uses Intuit Labs, for example, to lower the cost of failure on new software with rapid consumer feedback.

- **Organizational Advantage.** The ability to organize in ways that promote adaptation, including enhancing knowledge flow, diversity, risk taking, and flexibility. Netflix’s carefully designed culture prioritizes flexibility, seeks to minimize formal rules, and encourages leaders to lead through context rather than control.

- **Systems Advantage.** The ability to harness the diversity and adaptive potential of multicompany ecosystems. The primary example would be Apple’s cultivation of...
an ecosystem of hardware manufacturers, app developers, content providers, and networks.

- **Ecosocial Advantage.** The ability to continuously adapt the business model to changes in the ecological, social, and economic spheres. Huawei, for example, has introduced a range of innovations in billing, distribution, and design that have reduced costs and increased penetration in the developing world. It is also working with nongovernmental organizations to support broadband access in developing nations.

**Funding the Journey.** As the epicenter of change in the digital age, the TMT world is home to a growing array of once-lucrative businesses that are maturing or in decline. The trick is to manage these legacy businesses to generate the cash needed to fund more promising opportunities, while also satisfying investors. Revenue growth may be limited, or out of reach, but improving margins, paying down or refinancing debt, or funding share buybacks or dividends can buy management time to launch new businesses.

As private-equity owners have shown, businesses frequently benefit from a fresh look in discovering cost efficiencies and improving sales-force effectiveness.

**EXHIBIT 4 | Adapting to the Digital Economy Requires a Transformation Agenda**

- Find new sources of competitive advantage
- Reduce potential for disruption
- Seek adaptive approach to defining and executing strategy
- Focus on cash generation
- Satisfy investors in the short term
- Adopt a private-equity lens for cost efficiencies
- Acquire new talent
- Collaborate across functions
- Gain flexibility to explore, test, and learn
- Adopt an accelerator mindset to growth
- Win in the core; grow in adjacent businesses

**NOTE**

Source: BCG analysis.
Winning in the Medium Term. In a world in which the boundaries are constantly being redrawn, success for TMT companies means much more than stretching current business models. These companies also must continuously seek new opportunities, experiment with ways to exploit them, and incorporate the successful experiments into the business. In contrast to classical strategies, adaptive strategies are characterized by an iterative learning process.

Success requires more than stretching business models.

Apple is a case in point. When Steve Jobs returned to Apple in 1997, he sharply refocused the struggling company—eliminating multiple products and quickly launching the iMac, a new, consumer-friendly version of the company’s signature offering. At the same time, he began laying the groundwork for the iPod, iPhone, and iPad ecosystems.

The top ranks of the 2012 TMT value creators contain several companies that are also ambidextrous. Pearson, for example, is still best known to many for publishing the Financial Times, a 124-year-old brand that Pearson brought into the digital age—augmenting it with premium services and replacing lost advertising revenues with new digital-subscription sales.

Marjorie Scardino, who will soon complete a 16-year run as Pearson’s CEO, began selling off a grab bag of unrelated businesses (such as Madame Tussauds) in the 1990s. She moved decisively into the U.S. education market, eventually developing markets. Education—including a growing presence in digital learning—is now Pearson’s biggest business. The digitally driven repositioning is ongoing: Pearson recently announced plans to merge its Penguin book-publishing unit with Bertelsmann’s Random House in order to better deal with the challenges posed by the increased importance of e-books.

Amazon also has this dual focus. The company remains a tough retail competitor. At the same time, Amazon’s adjacent expansion into devices and consumer cloud services (via Kindle) and enterprise cloud services (via AWS) holds promise for the future. Analysts estimate that AWS will bring in $1.5 billion in revenues this year.

Focusing on Adaptive Advantage. For mature companies, people, organization, and culture are challenging parts of the transformation equation. To thrive in the digital world, they require flat organizations, a new talent mix, and a culture of iterative experimentation.

A flatter organization structure can help improve margins and agility. With less bureaucracy, managers will be more likely to come up with counterintuitive tactics—for example, raising prices instead of cutting them when the users of a legacy service are reduced to the core group that values it most highly.

Some long-established companies, such as IBM, have succeeded in turning culture and organization into a competitive advantage. IBM’s alphaWorks web community enables developers and early adopters to evaluate and influence the company’s R&D. IBM is also a prolific acquirer of small and medium-sized companies in areas such as cloud computing, data analytics, and social networking.

Other TMT companies concentrate their digital efforts in a standalone unit. This approach is not a panacea—and may be counterproductive. The imperatives of the digital age must permeate the entire organization, not just a subset of it. Culture, working styles, and performance evaluation all need to change in order to attract and retain the talent that is needed to succeed.

Rakuten, Japan’s largest Internet company, has been in a steady state of transformation since its founding in 1997. It has expanded from e-commerce into finance, travel, content, and ownership of professional sports teams—and from its home country to China, the United States, and Europe. Its chairman and CEO, Hiroshi Mikitani, gives his executives free reign to manage their businesses so long as they follow Rakuten’s culture, brand concepts, and management practices.
Nowhere in TMT is the pace of change faster than in the technology industry, where the law of the land is Moore’s law. The doubling of processing power every two years drives a constant stream of innovation in everything from semiconductors to mobile phones and IT services.

Success in the technology industry comes fast but is often fleeting. Of our top-ten value creators, only five were on the list last year and only one—Apple—made it to the top ten in each of the past five years. (See the sidebar “TSR in Technology: Muted by Multiple Contractions.”) Many companies that were star performers in the middle of the past decade now languish at the bottom. Traditional consumer-electronics companies have gone from world-beaters to massive losses in a time frame only slightly longer than that.

But just as the industry’s volatility pulls some companies down, it thrusts others into the limelight. Some leading technology players were barely known until quite recently. Huawei, an employee-owned enterprise in China with $32 billion in global revenues, is now second only to Ericsson in the telecom equipment business.

New Rules of the Game
A sea change in the industry dynamics is under way. Once dismissed by some industry participants, the emergence of the post-PC era and the rise of cloud computing are changing the rules of the game for a wide range of companies across the TMT landscape.

There are many manifestations of these shifts in industry structure.

**New Ecosystems.** Innovation is not just about creating new products and services but also increasingly about creating new ecosystems and business models. Apple defined this model; Microsoft’s Windows 8, Windows Phone 8, and Surface tablet are the response from the company that defined the PC era.

**Integrated Offerings.** The traditional “hardware,” “software,” or “services” company is disappearing. Hardware companies are generating an ever-larger share of their revenues from services and greater product differentiation through software. Software companies are using the cloud to enter services businesses.

**The Importance of Software.** Software is an increasingly important component of product differentiation in the technology industry. More broadly, it has helped upend the book and music retailing industries and will go on to disrupt many more. As the venture capitalist Marc Andreessen has said, “Software is eating the world.”
Average annual TSR for our sample of 51 technology companies was 3.6 percent for the period 2007–2011, sixth among 21 industries. The biggest contributors to technology industry TSR were sales growth (8 percentage points), margin improvement (2 percentage points), and share repurchases (2 percentage points). Shrinking multiples were a major detractor, subtracting 11 percentage points from industry returns.

The ranks of the top ten technology performers were dominated by companies helping to lead the march into an age of consumerized IT, mobile Internet access, and cloud computing. (See the exhibit “The Technology Top Ten, 2007–2011.”) Low-power mobile chip designer ARM tops the list with a 38.0 percent return, closely followed by Apple at 36.7 percent, and salesforce.com at 22.7 percent.

Several members of the top ten had to overcome especially severe multiple contractions to deliver their strong returns. Apple would have achieved a TSR of 67.7

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**TSR IN TECHNOLOGY**

Muted by Multiple Contractions

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**The Technology Top Ten, 2007–2011**

<table>
<thead>
<tr>
<th>#</th>
<th>Company</th>
<th>Location</th>
<th>Industry segment</th>
<th>Average annual TSR (%)</th>
<th>Market value ($ billions)</th>
<th>Sales growth (%)</th>
<th>Margin change (%)</th>
<th>Multiple change (%)</th>
<th>Dividend yield (%)</th>
<th>Change in shares (%)</th>
<th>Net debt change (%)</th>
<th>2012 TSR (%)</th>
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<tr>
<td>1</td>
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<td>6</td>
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<td>–2</td>
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<td>2</td>
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<td><strong>2</strong></td>
<td><strong>40</strong></td>
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<tr>
<td></td>
<td><strong>Total sample</strong></td>
<td></td>
<td></td>
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<td><strong>2,167.2</strong></td>
<td><strong>8</strong></td>
<td><strong>2</strong></td>
<td><strong>–11</strong></td>
<td><strong>1</strong></td>
<td><strong>2</strong></td>
<td><strong>1</strong></td>
<td><strong>19</strong></td>
</tr>
</tbody>
</table>

**Sources:** Thomson Reuters Datastream; Thomson Reuters Worldscope; Bloomberg; annual reports; BCG analysis.

**Note:** The sample includes 51 global companies with a market valuation of at least $9 billion. The contribution of each factor is shown in percentage points of five-year average annual TSR; any apparent discrepancies in TSR totals are due to rounding.

1As of December 31, 2011.
2As of September 30, 2012.
Global Technology Challengers. The globalization of the Internet is allowing ambitious developing-world companies to crank up the competition. China’s Lenovo, Huawei, and Foxconn, and India’s Infosys, HCL, and Wipro are the best-known examples, but there are dozens of others: Brazil’s Totvs, the largest software company in Latin America, Israel’s Check Point Software Technologies, Kuwait’s ITS, and Russia’s Kaspersky Labs, to name just four.

Entrepreneurialism Versus the Arms Races. The technology industry has always been driven by startups. Many industry giants owe their existence to venture capital’s eagerness to fund ideas and growth. At the same time, the industry is increasingly characterized by enormous R&D and investment needs—which are driving three parallel arms races.

• **The Moore’s Law Arms Race.** As Moore’s law drives the cost of processing power relentlessly downward, the stakes for semiconductor players rise. Intel’s recently opened fabrication facilities involved capital outlays of between $3 billion and $5 billion each, while Taiwan’s TSMC is investing over $9 billion to build its third 12-inch wafer fabrication facility and plans to move to 18-inch facilities within a few years.

• **The Cloud Arms Race.** Since the beginning of 2007, Google has invested more than $14 billion on its data centers, and Apple, Microsoft, and others have been investing heavily too.

• **The Intellectual Property Arms Race.** Owning the right intellectual property is more important than ever, a point driven home recently when a California jury concluded that Samsung had infringed several of Apple’s iPhone patents and assessed $1 billion in damages. Many smaller companies are concerned that the intellectual property arms race could throttle innovation.

What kinds of developments lie ahead, and how can companies prepare for them? Semiconductors and IT services and software reside at opposite ends of the technology value chain, but they are neighbors in terms of their exposure to the upheaval.

Shifting Sands in Semiconductors

The semiconductor industry is in the early stages of what we believe will be a seminal inflection point. Most notable is the rise of ARM Holdings, the U.K.-based specialist in designing the low-power chips now used in more than 90 percent of the world’s smartphones and tablets. ARM and companies such as Qualcomm, Broadcom, Xilinx, and Marvell design but do not actually manufacture chips—a move that has made sense in a time of accelerating product cycles and the need for specialized chips.

ARM was the technology industry’s leading value creator from 2007 through 2011, delivering an average annual TSR of 18.5 percent and 6.3 percent, respectively, followed closely by the IT services and software sector, at 6.2 percent. All three sectors, however, have their fair share of companies that are struggling to generate value for their shareholders.
now forging ahead into technologies that facilitate mobile payments and the “Internet of things.”

Industry leader Intel has lagged far behind in terms of both TSR and presence in the fast-growing mobile market. Indeed, the vertically integrated giant did not introduce its first smartphone chip until 2012. But Intel is now playing catch up. It plans to launch a new line of low-power microprocessors in 2013. While the new Microsoft Surface tablet has debuted with an ARM chip, an Intel version will follow.

In the past, the largest players have generally produced the best returns for shareholders. Historically, only the top three companies in each product segment have created shareholder value; the rest have underperformed. (See Exhibit 6.) ARM is one of the few exceptions that prove the rule.

The increasing economic difficulty in delivering on Moore’s law has created a crossroads. Fabrication facilities are becoming prohibitively expensive. Meanwhile, the consumerization of IT—that is, the blending of personal and business technologies—is fueling the phenomenon of “good enough” computing. Maybe the semiconductor companies can forgo some of the massive investments that have been their legacy.

There are several things that all semiconductor companies must get right. They will need to realize higher R&D productivity while exploring new forms and models of collaboration (especially with customers) in order to drive product innovation.

Companies also need to get better at pricing, more efficient at manufacturing, and more adept at securing and managing intellectual property. Finally, they need to build global or-
ganizations that can attract and retain the talent necessary to meet strategic objectives and align operations with customer needs—especially in Asia, where the center of gravity of the industry has shifted.

Big structural shifts often lead to shakeouts, and with scale so important, the semiconductor sector may be in for consolidation. But size alone will not determine the winners. Speed to market and the willingness to engage in alliances and joint ventures will also matter.

**IT Services and Software Reshaped**

Like the semiconductor sector, the global market for IT services and software is growing faster than global GDP, which is remarkable for a $1.4 trillion sector. It generated a 6.2 percent average annual TSR over the past five years, well ahead of the technology industry as a whole, but still modest. The five IT services and software companies in the technology top ten—salesforce.com, Cerner, Check Point Software Technologies, Citrix Systems, and IBM—did much better, with average annual TSR performances ranging from 22.7 to 15.6 percent.

As the IT services and software sector matures and new competition arises, companies must develop a winning playbook. There are at least four chapters in the book: active portfolio management, automation, standardization, and process excellence.

**Active Portfolio Management.** Leaders have shown an uncanny ability to pick sweet spots for growth. IBM, recognized for its timely pivot into services and software in the 1990s, has lately been a leader in deploying cloud services and business analytics. IBM does not
break out revenues for these offerings but did report that its cloud revenue grew 380 percent in 2011 and could reach $7 billion in 2015.

Cerner has benefited from the growth in health care spending and the need to make providers more productive. It provides integrated IT services, centered on the electronic health care records of patients, to more than 9,300 hospitals and providers. Cerner’s CareAware, an Internet of things offering, gathers data from medical devices to form a full diagnostic picture of patients.

**Automation.** All of the leaders have made significant investments in automation. For example, Cognizant (whose 10.8 percent average annual TSR puts it just outside the top ten) has built a technology platform that affordably delivers deep and broad expertise to customers in industries such as financial services, health care, manufacturing, retail, and logistics. Infosys has created Finacle, a scalable core-banking platform capable of handling more than 100 million transactions an hour.

**Standardization.** IBM and Cognizant have leveraged global delivery centers to meet the needs of their customers. The CernerWorks suite of solutions, for example, provides remote hosting, application management services, operational management services, and disaster recovery.

**Process Excellence.** The success of leading IT service providers has been hard earned. They have achieved it by, among other things, diligently perfecting their business processes.

IBM has implemented a consistent set of processes and standards worldwide to reduce inefficiencies and improve collaboration. Both IBM and Cognizant have built delivery capabilities in low-cost countries and managed to meet the needs for industry-specific services across a global network.

There is more for these companies to do. Increasingly, services companies are bumping up against competitors from the cloud such as AWS and salesforce.com. IT service providers need to align their own deliverables with the business drivers of their customers.

Of course, the IT services companies aren’t the only ones that must work on building a better model. The enterprise software companies that the service providers have long worked with are also vying against cloud competitors, especially in hot new categories. In the past year, Oracle, SAP, and IBM all acquired cloud-based human-capital management companies.
IN THE LARGE AND disparate media world, the digital revolution has carried some companies to commanding new heights while damaging or destroying many others.

Yet the revolution is still in its early stages. Even digital natives are not immune to the turbulence coursing through the industry—Netflix and Yahoo! are proof of that. Conversely, several companies that grew up in a world of ink and celluloid have managed to arrive in the new one with both their brands and their audiences intact or improved.

Most established media companies are only midway through a long, perilous passage. They have cut costs and experimented, but the world is changing faster than they are, and their core business models are increasingly out of sync with the market. They are prisoners of a prosperous past, when abundant cash flows masked the need to change.

The music business was the first to be fully digitized—a painful process that radically changed the industry’s structure. Now the focus is on print media, mainly newspapers and magazines As shown in Exhibit 7, the media...
industry more than any other has borne the brunt of the huge, digitally driven shift in advertising—its most important revenue source. Newspapers and magazines received 46 percent of the total spent on global advertising in 2001 but just 27 percent of that total in 2011. By 2015, their share is projected to fall to 21 percent.

TV advertising has maintained its share, despite the arrival of Netflix, YouTube, Hulu, and other OTT video providers in the United States. Digital advertising, meanwhile, has been growing 20 percent annually in the United States, with Google, Facebook, and a handful of new entrants gaining share at the expense of the portals.

**Finding a Digital Future**

These trends have led many to conclude that newspaper and magazine publishing is a dying business. We believe the conventional wisdom is wrong. These companies still have significant assets, and they also have a digital future. (See the sidebar “TSR in Media: A Digital Boost to a Lackluster Industry.”)

In most countries, print media companies still have commanding brands and strong consumer relationships. In developing economies, they are actually growing as incomes and educational levels rise. In developed countries, some still generate enviable cash flows. Even as technology and demographics erode their prior positions, they have the time and resources needed to transform. But how do they balance the twin goals of maintaining short-term performance while executing a long-term vision?

Earlier, we laid out a four-part transformation agenda. Let’s apply that agenda to the media—the TMT industry that arguably needs it most urgently.

**Setting an Overarching Strategy**

Transformation requires a clear strategy. What is the company’s core purpose? Where will it play, and how will it win?

In a world of digital-driven change, the strategy will likely involve a shift away from the company’s historical mission of print. But in the digital age, strategy cannot just be set once and reviewed annually. Instead, it must be adaptive—able to respond to whatever may happen. Experimentation needs to be an explicit part of the company’s objectives. (See the sidebar “Baidu Searches and Finds Value Creation.”)

**TSR IN MEDIA**

A Digital Boost to a Lackluster Industry

Thanks to the strong performance of a fortunate few companies, the media sector eked out a 2.3 percent average annual TSR from 2007 through 2011—ninth best among the 21 industries in the overall Value Creators study. The high TSR of the top performers was driven mainly by developing-market growth and pure-play digital business models. Indeed, the top ten value creators averaged a 20.1 percent average annual TSR. The contrast with more traditional media companies is stark: nearly half of the 38 companies examined lost value in the five-year period.

The top ten list is dominated by a quartet of Asian Internet companies, led by China’s Baidu (with a 59.5 percent average annual TSR) and Tencent (41.8 percent average annual TSR). (See the exhibit “The Media Top Ten, 2007–2011.”) Sales growth overcame multiple contraction at both companies. Margins also improved at Baidu.

Nasdaq-listed Sina, one of two newcomers to the top ten this year, operates Sina Weibo, the most influential platform for microblogging in China, as well as a maturing portal business. The Weibo platform has more than 300 million users and is still growing. Sina’s expanding multiple contributed 12 percentage points to its 12.6 percent average annual TSR.
NHN, which operates South Korea’s biggest search engine and biggest game-playing portal, experienced strong sales growth tempered by multiple contraction, producing a 13.1 percent average annual TSR. NHN’s game company, Hangame, recently expanded into the Japanese market. The advertising revenues of NHN’s search business, however, may come under pressure, as increased smartphone adoption builds the share of mobile traffic.

The other newcomer to the top ten is satellite service provider SES, which joins two satellite broadcasting companies—Directv of the United States and British Sky Broadcasting, which is partially owned by News Corporation. Directv benefited from its 2009 spinoff from Liberty Media, which unlocked value, strong sales growth, and margin improvement. British Sky Broadcasting also showed a strong sales performance, confirming the resilience of the television sector for viewers, advertisers, and shareholders.

A few traditional media companies are now reaping the fruits of their diversification and digital transformation efforts. Naspers, Pearson, and IHS have all demonstrated the value of a well-managed media portfolio.

### The Media Top Ten, 2007–2011

<table>
<thead>
<tr>
<th>#</th>
<th>Company</th>
<th>Location</th>
<th>Industry segment</th>
<th>Average annual TSR (%)</th>
<th>Market value ($bilions)</th>
<th>Sales growth (%)</th>
<th>Margin change (%)</th>
<th>Multiple change (%)</th>
<th>Dividend yield (%)</th>
<th>Change in shares (%)</th>
<th>Net debt change (%)</th>
<th>2012 TSR %</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>Baidu</td>
<td>China</td>
<td>Internet</td>
<td>59.5</td>
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**TSR Disaggregation**

- **Market value**: $bilions
- **Sales growth**: %
- **Margin change**: %
- **Multiple change**: %
- **Dividend yield**: %
- **Change in shares**: %
- **Net debt change**: %
- **2012 TSR**: %

**Sources:** Thomson Reuters Datastream; Thomson Reuters Worldscope; Bloomberg; annual reports; BCG analysis.

**Note:** The sample includes 38 global companies with a market valuation of at least $3 billion. The contribution of each factor is shown in percentage points of five-year average annual TSR; any apparent discrepancies in TSR totals are due to rounding.

1As of December 31, 2011.
2As of September 30, 2012.
Baidu, a Chinese Internet company known primarily for its search engine, also knows how to engineer value creation. (See the exhibit “Baidu Is at the Heart of China’s Internet Ecosystem.”) With a five-year average annual TSR of 59.5 percent from 2007 through 2011, Baidu is the leading TMT value creator. The company is also the top-ranking large-cap company, and fourth in the overall rankings of the 1,003 companies covered in BCG’s 2012 Value Creator report.

It is tempting but mistaken to attribute Baidu’s success solely to being in the right place at the right time—China’s Internet population swelled from 210 million in 2007 to 513 million in 2011. Baidu has tailored its search engine around music and entertainment that local users enjoy and created consumer loyalty by offering a host of free online and social-networking services. It has also built local sales teams in order to meet the needs of advertisers, its primary source of revenue.

Baidu benefited sharply when Google moved its search business from the mainland to Hong Kong in 2010, citing...
One Asian publisher laid out a particularly bold transformational map in 2002 and has successfully followed it into an era of digital growth. (See Exhibit 8.) What made its move so bold was its willingness to cannibalize print advertising revenues while building a digital presence—something its rivals were afraid to do. The company’s key insight was that if it could sustain market share and influence during the transition, it would succeed.

Funding the Journey

As one client likes to say, vision without execution is hallucination. To unlock cash and buy time, print media companies need to take a fresh look at their organizations. They should examine the company through the eyes of a private-equity buyer. Action steps will fall into three areas.

Reducing Costs. Many companies have already reduced management layers. More ambitious companies are reassessing vendor relationships; streamlining editorial (by merging print and digital staffs as well as sharing more content across formats, as the Wall Street Journal has just announced); revamping advertising pricing and production processes; and pooling advertising sales across publications. A restructuring at a major U.K. newspaper publisher generated savings of nearly 20 percent and created a more agile organization.

In order to regain its groove, Baidu is looking to expand into adjacent businesses. To date, the results of those moves have been mixed. It shut down an e-commerce joint venture in April 2012, and sales of a Dell smartphone powered by Baidu’s Yi mobile platform were modest. Earlier this year, Baidu teamed up with Foxconn to launch a lower-priced phone meant to appeal to China’s masses. With China’s Internet population expected to exceed 700 million by 2015, the mass market in China is still fertile ground.

The biggest potential savings may involve moving cost centers to lower-cost locations, potentially offshore; achieving the most efficient balance of freelance and on-staff reporting; and outsourcing corporate and nonstrategic functions to third parties. Outsourcing back-office operations at one newspaper company yielded a 10 percent cost reduction. Magazine publishers in multiple countries have successfully sent print production offshore, achieving savings of 5 to 9 percent in printing costs.

Increasing Revenues. Publishers may have more opportunity than they realize to raise additional revenue from newsstand sales and subscription rates as well as from advertiser relationships. Research shows that consumers often overestimate what they pay for print publications, suggesting that publishers have more pricing freedom than they thought. By raising subscription rates by up to 40 percent and developing market-specific content, multiple U.S. newspaper chains believe they can generate substantial gains in subscription revenues.

Global print advertising still generates more than $100 billion a year. Publishers can stem near-term declines in revenues by demonstrating the value the medium still delivers through consumer research on advertising reach and effectiveness and leveraging their relationships with advertisers.
Maintaining Near-Term Shareholder Value. Many companies train their attention almost entirely on operations and strategy, losing sight of how they can generate returns for their shareholders in the near term. They often have the ability to use free cash to pay down debt, buy back shares, and increase dividends. Research shows that as companies raise their earnings payout ratios, investors award them with higher price-to-earnings ratios. Two U.S. publishers recently outperformed both their peer index and the S&P 500 by almost 20 percent for the 180 trading days following the unveiling of their new capital policies. The right changes to financial polices—particularly to debt levels and ratios, dividends, and buybacks—can create a clear and compelling case for long-term health, lift stock prices, and, in the process, attract more patient investors.

Winning in the Medium Term
Because stakeholders need assurance, management teams need to set out clear goals for their experiments and initiatives—and show progress toward them. Action in three areas is paramount.

Focusing the Portfolio for Success. Many publishers, especially magazine publishers in the United States and Europe, have large portfolios—from a dozen to more than 60 brands and properties, with varying prospects. They should establish priorities so that brands with the most potential get the capital and management attention they need. Too often, publishers apply a uniform approach to all titles.

One U.K. publisher with more than 20 newspapers, including low-growth, low-margin titles, created a smaller, refocused portfolio and immediately freed up cash for investing in the winning titles. Some of its titles were shuttered, while others moved some content online and reduced publishing frequency. Innovative products were designed for those with loyal readerships, specialized content, or both.

Scoring Digital Wins in the Core Business. It is difficult to transition from daily, weekly, or monthly print deadlines to an online, multiple-platform approach. The organization often needs to adjust to the new realities.
Publishers often have different models for different sets of titles—one for hard news, for example, and another for general interest topics. One publisher moved from a standalone digital division for each of its local newspapers to an integrated national print and digital model, with a special unit to drive new product and platform development. The company also created category divisions (with combined print and digital capabilities) for verticals such as cars, careers, real estate, food, parenting, and sports.

It is not easy overcoming the ethos of everything free online, but consumers are showing some willingness to pay for content they value. Publishers with highly engaged and loyal audiences have been able to shift the focus from charging for delivery to charging for content. The key, however, is providing unique and differentiated content, which is easier in specific categories or niches and harder for commoditized news.

Growing in Adjacent Lines of Business. Creating relevant content and reframing the consumer’s experience for digital formats are both essential steps, but they are unlikely to boost revenue or profits significantly in the medium term. Growth will come from new sectors and lines of business. Our research into value creation among 1,600 companies with more than $1 billion in annual revenues shows that just over a third of leading companies grew by expanding into adjacent businesses and another third by expanding into new sectors.1 Magazines, for example, can seek to leverage strong brand names, access to consumer data, and national advertiser relationships in order to build retail- and consumer-oriented businesses.

Focusing on Adaptive Advantage

Few companies already have the needed capabilities—people, organization, and culture—to embark on a successful transformation and to deliver on adaptive advantage.

For most companies, managing the transformation requires a change in the makeup of the executive team and an infusion of digital talent in line and staff positions. New key roles may include a chief digital officer, a chief marketing officer, and a chief information officer to focus on data analytics and provide support for digital and growth initiatives.

### Few companies have the needed capabilities to deliver on adaptive advantage.

Many companies will also need to invest in new organizational capabilities. These may include expertise in consumer insight, digital-product development, design and user experience, digital marketing and selling, data mining and analytics, and mergers and acquisitions. One publisher created a digital boot camp to increase skills and ensure that executives are abreast of the latest developments and debate the implications for their business. A U.S. publisher established a central research and consumer insights function in order to ensure that the voice of the consumer is integrated into all strategy development.

Companies should not underestimate how difficult the transition will be for employees—both those who must be laid off and those who remain. Media companies should treat the first group fairly and give a meaningful role to those who will lead the company forward. Quick and visible decisions, frequent communications, and celebrations of early wins are essential.

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**NOTE**

The digital economy would not exist without the networks and the connectivity provided by the world’s telecom companies. Their services have contributed significantly to economic growth and social development—most recently through the provision of mobile services in the developing world.

Yet like an action hero near the end of the movie, telcos now face several converging threats—and the audience is wondering whether they will survive to fight yet another day.

Financial Strains
The most immediate threat is financial. Many telcos have generated TSR through financial policies, driving returns through high dividends or low capital spending. From 2007 through 2011, dividend payments alone contributed 5 percentage points to the telecom industry’s meager average annual TSR of 3 percent. Developed-market telcos have been even more reliant on dividends to drive TSR. Without the contribution of dividends, European telcos would have experienced a ~4.3 percent average annual TSR. (See the sidebar “TSR in Telecommunications: Propped Up by Dividends.”)

In 2011, more than a third of telcos in our sample earned a return on their invested capital of 8 percent or less, which was less than their assumed cost of capital in many cases. (See Exhibit 9.) Nearly one quarter of the telcos paid out more than 100 percent of their net income in dividends. These types of financial policies are not sustainable and cannot be a source of ongoing competitive advantage.

Telcos face converging threats; the most immediate is financial.

Even in developing markets—which have for many years been a source of growth—the “race to the bottom” is in full gear. The TSR of most leading telcos in these markets has sequentially declined year over year. Over the five-year period, returns on invested capital of one in five developing-market telcos in our sample failed to exceed their estimated 8 percent cost of capital.

Most of these markets are now saturated, or soon will be. In seeking to build their customer bases, developing-market carriers increasingly relied upon price- or volume-oriented offers, delivering voice and data at decreasing yields. Rapidly falling hardware prices seduced them into adding ever greater capaci-
The telecom sector’s five-year average annual TSR (2007–2011) was a paltry 2.9 percent, the eighth best performance among the 21 industries ranked in the overall 2012 Value Creators report. Companies focused on developing markets occupy three of the top five slots, including the top two. (See the exhibit “The Telecommunications Top Ten, 2007–2011.”)

In recent years, the telcos that posted top-ranking TSR got there by dint of sales growth. As growth has slowed, this year’s top players have turned to dividends to achieve their high levels of return. Dividend payments contributed, for example, 10 percentage points to a five year (2007–2011) average annual TSR of 30.5 percent in the case of Malaysia’s DiGi.Com—with the company paying out dividends in excess of its net profit. For Thailand’s Advanced Info Service, it is a similar story, with dividend payments running at around 100 percent of net profit over the past five years.

In past years, dividend-driven TSR has been more typical of developed-market telcos than those in the developing world. For our entire 44-company sample, the

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**TSR IN TELECOMMUNICATIONS**

Propped Up by Dividends

The telecom sector’s five-year average annual TSR (2007–2011) was a paltry 2.9 percent, the eighth best performance among the 21 industries ranked in the overall 2012 Value Creators report. Companies focused on developing markets occupy three of the top five slots, including the top two. (See the exhibit “The Telecommunications Top Ten, 2007–2011.”)

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**The Telecommunications Top Ten, 2007–2011**

<table>
<thead>
<tr>
<th>#</th>
<th>Company</th>
<th>Location</th>
<th>Industry segment</th>
<th>Average annual TSR (%)</th>
<th>Market value ($bilions)</th>
<th>Sales growth (%)</th>
<th>Margin change (%)</th>
<th>Multiple change (%)</th>
<th>Dividend yield (%)</th>
<th>Change in shares (%)</th>
<th>Net debt change (%)</th>
<th>2012 TSR (%)</th>
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**Top ten**

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<tr>
<th>#</th>
<th>Company</th>
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<th>Average annual TSR (%)</th>
<th>Market value ($bilions)</th>
<th>Sales growth (%)</th>
<th>Margin change (%)</th>
<th>Multiple change (%)</th>
<th>Dividend yield (%)</th>
<th>Change in shares (%)</th>
<th>Net debt change (%)</th>
<th>2012 TSR (%)</th>
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<td>-1</td>
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**Sources:** Thomson Reuters Datastream; Thomson Reuters Worldscope; Bloomberg; annual reports; BCG analysis.

**Note:** The sample includes 44 global companies with a market valuation of at least $8.5 billion. The contribution of each factor is shown in percentage points of five-year average annual TSR; any apparent discrepancies in TSR totals are due to rounding.

1As of December 31, 2011.
2As of September 30, 2012.
ties, but operating costs have not fallen sufficiently fast. Margins and ROIC predictably declined. Regulators seeking infrastructure competition and customer demands for better service quality hold the cycle in place.

Telcos in developed markets are even more severely squeezed. They face massive investments in 4G networks and fiber rollouts in order to satisfy the explosive demand for broadband capacity. SoftBank’s recent agreement to buy Sprint, for example, was driven largely by Sprint’s need for capital to fund its $7 billion 4G network upgrade. In addition, regulators are crimping margins by pushing for more market competition and reducing roaming and call-termination prices.

In both developed and developing markets, it is clear that the telcos need a change of course. There are some challenges unique to each, but many others that the two have in common. Since the telcos in some more mature markets are feeling all these challenges most acutely, it makes sense to focus on them first.

Yet some telcos are bucking the trend, and pulling other levers to reward shareholders. Millicom International Cellular (active in Africa and South and Central America) and MTN Group of South Africa made the top ten mainly by virtue of sales growth. Vodafone, which has a strong developing market presence but still gets more than two-thirds of its revenues in the developed world, rewards its shareholders partly through dividends. But its 11.1 percent average annual TSR was driven more by margin improvements (9 percentage points) and sales growth (8 percentage points).

average annual TSR of 2.9 percent would have been negative without a 4.8 percentage point contribution from dividends. For companies focused on developing markets, the average annual TSR of 5.5 percent is shored up by a contribution of 4.8 percentage points from dividends.

Yet some telcos are bucking the trend, and pulling other levers to reward shareholders. Millicom International Cellular (active in Africa and South and Central America) and MTN Group of South Africa made the top ten mainly by virtue of sales growth. Vodafone, which has a strong developing market presence but still gets more than two-thirds of its revenues in the developed world, rewards its shareholders partly through dividends. But its 11.1 percent average annual TSR was driven more by margin improvements (9 percentage points) and sales growth (8 percentage points).

EXHIBIT 9 | Fewer Than Half of Telcos Earned Their Cost of Capital in 2011

Sources: Thomson Reuters Datastream; BCG analysis.
OTT Challenges
In some developed markets, as much as 70 percent of a typical telco’s revenues could be under threat from voice substitutes such as mobile VoIP, mobile instant messaging, and digital services more broadly. So far, telcos have not been able to find replacement revenue in mobile data services or other sources.

A crude comparison illustrates the point: During 2011, Apple and Google increased their combined market capitalization by about $100 billion—approximately the same as the year-end market value of Deutsche Telekom and France Telecom combined. Since the end of 2011, they have increased their combined market capitalization by nearly $200 billion, or about the total value of AT&T.

To remain viable, developed-market telcos must overhaul their business models.

The financial markets are delivering a powerful message. To remain viable, developed-market telcos must completely overhaul their business models—in our view, within the next three to five years. A fundamental reordering of the industry is under way, as the industry breaks into specialized segments, each one addressing a single layer of the stack, from networks and infrastructure at the bottom to content and communities at the top. Because each layer has its own economics and required capabilities, vertical integration—and the management mindset that comes with it—may become dangerously anachronistic.

Market forces and regulatory pressure are already catalyzing change in developed markets. The unbundling of SingTel and Telstra into more specialized units was propelled by regulation but may serve as a model for other telcos to follow. Major players such as Vodafone have shown other ways to adapt. (See the sidebar “Vodafone’s Path to Value.”)

A crucial migration is under way, as telcos seek efficiencies in the lower layers of the stack and growth in the upper layers. Both objectives require them to get a lot better at something that has not traditionally been a strong suit: understanding different customer segments and tailoring offerings accordingly.

Capital-Efficient Rollouts
At the bottom of the stack, developed-market telcos are faced with seemingly limitless demand for broadband connectivity. They must learn how to meet it in a capital-efficient way—something they cannot hope to do with blanket rollouts rooted in the old universal service paradigm.

There is a better way. Network planners and the marketing team need to work more closely in order to be selective about which regions and segments to serve. Together they can target rollouts geographically, scale investments to match local business opportunities, and plan fixed and mobile networks in tandem to realize offloading and backhaul synergies.

This new, market-attuned network paradigm is already finding application around the world. Telcos such as Swisscom, for example, are offering customers a choice of network speeds, with lower speeds that are priced more affordably.

Viewing network rollouts from a local business-case perspective also leads quickly to insights into the best ownership structure for those networks. For example, a fiber-to-the-home rollout may only be attractive for 20 percent of households in a competitive market, but 40 to 50 percent in a shared-access market.

These economics are already pushing telcos toward new models. In the United Kingdom, for example, Vodafone and rival Telefónica recently received regulatory approval to combine their mobile-network infrastructures in a joint venture.

Aspirations in Digital Services
In both developed and developing markets, telcos are pushing hard to participate more
Vodafone Group, the world’s largest mobile provider by revenue, was long known for its appetite for acquisitions and far-flung portfolio of assets. It was early to see the value in developing markets, and it made major acquisitions in Turkey, South Africa, and India in 2006 and 2007. But the company’s subsequent success—an average annual TSR of 11.1 percent in the 2007–2011 period, eighth best in the telecom industry—was more than a matter of being in the right place at the right time. (See the exhibit “Vodafone is Refocusing Its Portfolio on Growth Markets.”)

During the buildup in developing markets, Vodafone was also rebalancing its portfolio by selling assets in mature markets—including majority interests in companies in Sweden and Japan. Its revenues from emerging markets more than doubled between 2005 and 2007, contributing 21 percent of group revenue and 39 percent of group profit.

With the start of the financial crisis, the year 2008 was a tough one for Vodafone, as it was for the rest of the industry. The company’s TSR turned sharply negative, declining 22 percent.

**Vodafone Is Refocusing Its Portfolio on Growth Markets**

<table>
<thead>
<tr>
<th>Total return index</th>
<th>Revenue growth and multiple appreciation</th>
<th>Multiple depreciation due to crisis</th>
<th>Dividend increase drives TSR</th>
<th>Margin increase offsets multiple compression</th>
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</thead>
<tbody>
<tr>
<td>250</td>
<td>Major reorganization into three business units: Europe, developing markets, and new businesses</td>
<td>Profits decline 35 percent during industry-wide crisis</td>
<td>Further reorganization and revenue growth of 25 percent driven by developing markets and Verizon Wireless</td>
<td>Cost-cutting program in Europe</td>
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<tr>
<td>200</td>
<td>Strong growth in developing markets</td>
<td></td>
<td>Major divestments in minority stakes in China, Japan, and France, while increasing strategic stakes in developing markets such as India and South Africa</td>
<td>Significant dividends from Verizon Wireless</td>
</tr>
<tr>
<td>150</td>
<td>Major acquisitions in Turkey, South Africa, and India; divestments in Japan, Belgium, and Switzerland</td>
<td></td>
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<td>100</td>
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Five-year average annual TSR

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<th>2006</th>
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<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
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<td>−22</td>
<td>16</td>
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</tbody>
</table>

**Average annual TSR (%)** 28 −22 16 17 11

**TSR Disaggregation**

<table>
<thead>
<tr>
<th>Year</th>
<th>Revenue growth (%)</th>
<th>Margin change (%)</th>
<th>Multiple change (%)</th>
<th>Cash payout change (%)</th>
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<tbody>
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<td>2006</td>
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<td>2007</td>
<td>16</td>
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<td>2008</td>
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<td>8</td>
<td>9</td>
<td>−11</td>
<td>5</td>
</tr>
</tbody>
</table>

**Sources:** Thomson Reuters Datastream; Thomson Reuters Worldscope; Bloomberg; annual reports; BCG analysis.

**Note:** The index was set to 100 on January 3, 2006.
Vodafone continued to concentrate in its most promising markets—increasing its investments in India and South Africa while selling off minority stakes in China, France, and elsewhere. It turned around a struggling operation in Turkey and grew the customer base there by 20 percent from 2007 through 2011. It also worked through problems in India and ultimately achieved 100 million subscribers in that country.

Vodafone’s position was further strengthened in 2011, when it received its first dividend payment since 2005 on its 45 percent stake in Verizon Wireless, its most valuable asset.

But there are plenty of challenges ahead, as growth slows in the developing world and competition gets ever-tougher in Europe, where Vodafone still generates 70 percent of its revenue. Like its rivals, Vodafone is figuring out how to grow data revenue fast enough to make up for the falloff in voice revenue, while facing challenging market and competitive conditions in several European countries. Vodafone may have to rely on its knack for reinvention once again.

fully in digital services such as cloud computing, mobile advertising, and other drivers of new revenue streams. Acquisitions and joint ventures are favored tools. From 2007 through the first half of 2012, the proportion of acquisition targets involved in applications, content, and other activities above the basic network level of the stack rose from 54 percent to 69 percent. (See Exhibit 10.)

Verizon, for example, expanded its footprint in cloud computing with a pair of acquisitions in 2011: Terremark and Cloudswitch. SingTel earlier this year bought mobile advertising

---

**EXHIBIT 10 | An Increasing Percentage of Telco Targets Are Above the Network Stack**

<table>
<thead>
<tr>
<th>Year</th>
<th>Network</th>
<th>Infrastructure</th>
<th>Platforms</th>
<th>Applications</th>
<th>Devices</th>
<th>Content</th>
<th>Communities</th>
<th>Cross-stack consulting</th>
<th>Other deals</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>60</td>
<td>20</td>
<td>0</td>
<td>20</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2008</td>
<td>70</td>
<td>10</td>
<td>0</td>
<td>20</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2009</td>
<td>80</td>
<td>10</td>
<td>0</td>
<td>10</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2010</td>
<td>90</td>
<td>5</td>
<td>0</td>
<td>5</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2011</td>
<td>95</td>
<td>5</td>
<td>0</td>
<td>5</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2012</td>
<td>100</td>
<td>5</td>
<td>0</td>
<td>5</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Sources:** Thompson Financial Mergers and Acquisitions; Datamonitor; public press search; annual reports; BCG analysis.

**Note:** The total number of deals evaluated between 2007 and July 31, 2012, was 479. The companies assessed were AT&T, Axiata, Bharti, BT, Chunghwa, Deutsche Telekom, France Telecom, KPN, MTN, NTT, PCCW, SingTel, SK Telecom, Telecom New Zealand, Telefónica, Telenor, TeliaSonera, Verizon, and Vodafone.
company Amobee. Isis, the mobile-payment joint venture formed in 2010 by AT&T, T-Mobile USA, and Verizon Wireless, is expected to launch soon.

Given the gulf between the telcos of today and the organizations they need to become, they are especially vulnerable to the cultural and organizational problems that often undermine such deals. Significantly, Verizon opted for a reverse integration in cloud services, retaining the Terremark name and folding its existing enterprise business into the new subsidiary. SingTel will keep Amobee in Silicon Valley, while integrating it into its new Digital Life unit, one of three divisions formed during a reorganization earlier this year. Way back in 2005, Deutsche Telekom created its T-Labs unit for leading-edge innovation.

If the telcos can become proficient at providing digital services—and this is no small “if”—some new growth could perhaps be theirs. But even then, the size of the prize will very often be small compared with their overall businesses. Investors are likely to be skeptical until tangible results emerge and will also be asking whether these new activities are distracting from the challenges facing their traditional businesses.

A New Relationship with High-Value Customers

For developing-market telcos, these challenges are less imminent, but no less real. Like their developed-market cousins, they face the task of defining a new course in a world in which the days of easy growth are over. As they look for business models in which costs are commensurate with average revenue per user, they need to identify a group of targeted customers who are eligible for cost-advantaged service and a differentiated customer experience.

High-value customers make up about 35 percent of the market and generate more than 65 percent of revenue. Yet, technology deployment practices lump all customers into a single bucket. Further, the needs of these customers are not reflected in the customer experience that telcos provide. Telcos need to anticipate what devices customers will use in the future and map out how customers will use these devices to engage in mobile commerce and social networking, download videos, and the like.

Developing-market telcos also need to learn to think, plan, and execute differently. Incremental technology and capacity deployments should give way to more focused planning. Fiber back haul infrastructure should be built out to handle anticipated needs over the next several years. In some cases, telcos should skip certain technology deployments in order to benefit from declining costs. They should also open their application programming interfaces in order to encourage innovations created by third parties.

The list goes on, but the key point is that developing-market telcos have the resources to create strong relationships with high-value customers. The first ones that drop out of the “race to the bottom” will be the first to recreate sustainable competitive advantage—and their customers, employees, and shareholders will be grateful.
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**Shifting Sands: New Challenges in Semiconductors**
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BCG Perspectives, June 2012

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**Running Forward; Walking Backward**
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