

A future for mobile operators: The keys to successful reinvention

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By transforming their networks and operations with the newest technologies, mobile operators could double their cash-flow conversion within five years.

The past several years have been tough for telecom companies. Their revenue and cash flows¹ have dropped by an average of 6 percent a year since 2010. Consumption of mobile data boomed, as masses of new wireless customers used their handsets to spend ever-increasing amounts of time online. Companies responded by investing heavily in their wireless networks, even as subscriber growth slowed. As

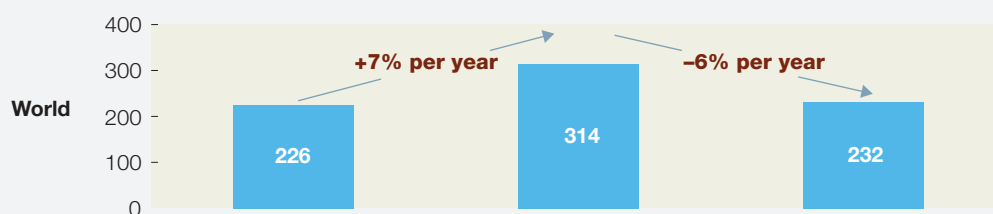
a result, the average ratio of capital spending to revenues has remained stubbornly high, at around 15 percent, for the major players (Exhibit 1).

What can companies do to alleviate the squeeze on margins and create more value? Major advances in data analytics, artificial intelligence, network equipment, and other technologies

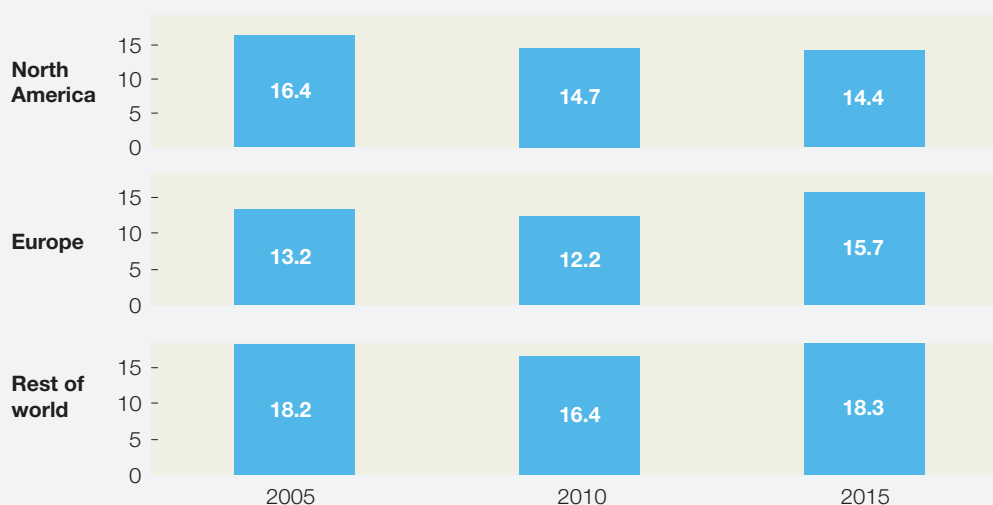
Exhibit 1

The cash flows of telecom companies dropped steadily from 2010 to 2015, and their capital expenditures hovered at around 15 percent of revenues for a decade.

Global industry cash flows (EBITDA – capital expenditures),¹ \$ billion



Capital-expenditure/revenue ratios for top telecom companies,² %



¹ Largest 250 telecommunications companies; EBITDA = earnings before interest, taxes, depreciation, and amortization.

² Largest 6–7 companies in each region.

Source: S&P Capital IQ; McKinsey analysis

have rewritten the industry's winning formula. With the newest software and hardware, along with digital-age management practices, mobile operators can achieve breakthrough cost savings and capital intensity while maintaining or even increasing their scale.

To capitalize on these opportunities, executives must take bold action to transform their businesses. Managing networks with next-generation technologies can cut the capital-spending and operating expenses of wireless operators. And digital technology can help them to streamline their business functions and please their customers, reducing costs and raising sales.

Wireless operators have little reason to wait before making these moves—the necessary technologies and management methods are available now. Moreover, operators can launch a digital transformation and begin reaping the benefits even as they move into fast-growing adjacent markets or await favorable regulatory changes. In this article, we take a closer look at the prospects of mobile operators for digital reinvention and how they can exploit those opportunities.

Managing networks with next-generation technologies

Doing more with less is seldom easy. But leading-edge technologies help mobile operators do just that to meet the burgeoning demands on their networks. Network equipment is more sophisticated than ever, and analytics allows wireless operators to make smarter decisions about how they deploy capital and adjust their networks to maintain the quality of service.

The shift to small-cell networks has been one fundamental step toward next-generation technologies. Until recently, mobile networks consisted of expansive cells with modest capacity. To fix a service problem affecting only a small area within a cell, an operator had to enhance the network's coverage and capacity over the entire cell, including places where service was already good.

Now, technological advances have made it possible for wireless operators to set up and operate dense networks of small, high-capacity cells. These networks typically cost less to upgrade than networks of large cells do. Network equipment has gotten better as well: it is less costly to buy and operate, more flexible, and more powerful. Mobile operators can also use sophisticated analytical tools to gain insights into capturing the maximum value from capital investments.

Network technology is improving all the time, and the advances will probably accelerate in several years, with the establishment of 5G wireless standards, which make it possible to serve more mobile users in a given area. Even so, mobile operators shouldn't delay making changes and await superior technology. The following applications can help these companies create more value right away.

[Analytics for smarter capital spending](#)

Advanced analytics can help mobile operators to determine which capital investments in their networks will produce the most value. Operators collect ample data about where, when, and how much subscribers use their mobile handsets. These data are precise: they can establish usage patterns within five-by-five-meter squares, roughly the size of a studio apartment, over the course of days and weeks.

By running the data through algorithms, a wireless operator can pinpoint where and when network overloads happen and which customers they affect most. With that information, it can project how much a possible upgrade might improve the satisfaction—and ultimately the retention—of its more profitable customers. An operator can also determine the highest levels of network performance that do not yield diminishing returns in customer satisfaction. Such findings let the company avoid investments that would make their networks better than necessary. With these techniques, mobile operators planning capital expenditures can prioritize value creation rather than network performance.

Machine learning for increased efficiency

Networks made up of small cells are not only less expensive to maintain than networks of large cells but also more flexible. One benefit of flexibility is that operators can save money by reducing or increasing each cell's capacity as demand for service fluctuates. (Adjusting capacity is harder with large cells. Even if some areas in such a cell are experiencing low demand, its capacity has to be kept uniformly high to maintain the quality of service in areas where demand is strong.)

Much as operators can use analytics to determine where to make upgrades, they can also use machine learning to adjust wireless networks automatically as demand changes or even to base adjustments on predictions. If a machine-learning model has records of network usage and other conditions (such as traffic or weather) and then receives new data in real time, it can predict when usage might rise or fall across a network and adjust capacity preventively.

Software for better performance

Improvements in software allow mobile companies to get significantly increased performance from hardware they already own or to use less expensive hardware. New methods for compressing and managing video, for example, let wireless

companies offer video-streaming services to ten times more households, thus creating new revenue streams. These methods can also cut data-storage costs by 60 percent.

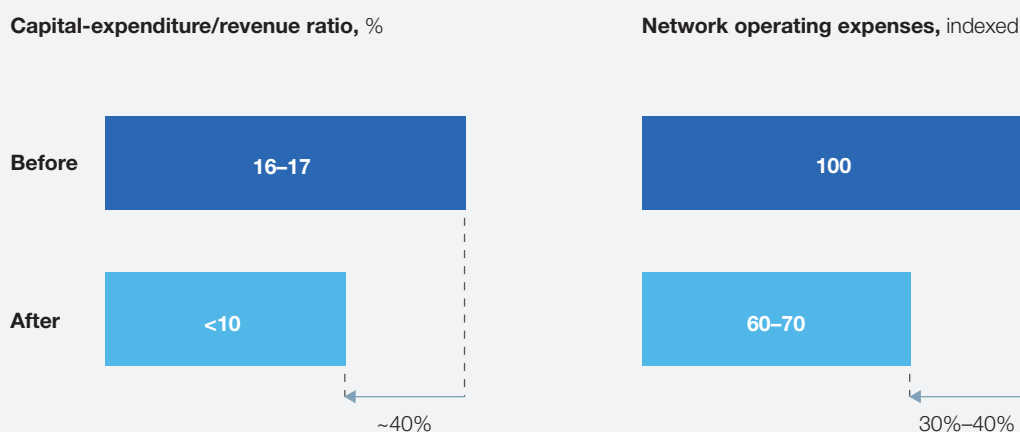
Two other key technologies are software-defined networking (SDN) and network-functions virtualization (NFV). These allow wireless operators to centralize the functions for controlling networks and to administer changes and upgrades remotely rather than in the field. Another benefit is that they let operators use generic network hardware, which tends to be more cost-effective.

All of these network technologies promise to lower costs and make it faster and easier to change networks in response to problems or new customer needs. We estimate that the newest technologies would let operators lower their capital expenditures by up to 40 percent—thus pushing these costs down to under 10 percent of revenues—and their network-operating expenses by a similar amount (Exhibit 2).

Using digital to streamline operations and please customers

Mobile operators lag behind companies in some other industries in doing business digitally. For example, they make a smaller share of their

Exhibit 2 New network technologies can increase the capital intensity of mobile operators and lower their operating expenses.



Source: McKinsey analysis

sales online than insurance and retail-banking companies do. Closing this gap isn't just a matter of pride—it can boost financial performance and create competitive advantages.

Using digital technology to automate operations makes them leaner and more productive, which leads to lower costs. McKinsey research has also found that providing customer service through digital channels improves customer satisfaction—and that in turn leads to increases in revenue.² The opportunities to digitize support for mobile customers are especially promising. Our surveys indicate that more than half of European subscribers want to deal with providers only through digital channels and that more than a third of US subscribers are open to strictly digital interactions.

Both the technology and the know-how needed to digitize wireless operators are available today. In our experience, typical companies can make nearly every aspect of their business functions and customer experiences simpler, easier, faster, and more cost-effective. Here are the major opportunities we've identified.

Automation and simplification in the back office

Many mobile operators have essential processes that are more complex and labor-intensive, and therefore more costly, than they have to be. These include dealing with business partners, budgeting, preparing compliance reports, and other essential functions. We estimate that just 20 to 30 processes generate 45 percent of the average operator's operating costs. Using advanced technologies, such as machine learning, to simplify and digitize those processes can cut costs by as much as one-third.

Excess complexity also pervades the systems and product lineups of mobile businesses. One company we know had 600 IT systems; another had 3,000 prepaid plans. Many wireless operators therefore stand to benefit from taking a fresh look at the needs of their businesses and customers and eliminating superfluous systems. To take one example, we estimate that a typical operator could trim the custom code in its customer-relationship-

management (CRM) system from 350,000 lines to 20,000—a 95 percent reduction—by removing unnecessary applications and features.

Digitization in customer support

A mobile operator we know reduced the number of support calls it fields by 90 percent after it set up sophisticated systems to track and anticipate the problems of its customers and to give them resources to solve those problems on their own. These systems typically provide three levels of support.

The first is self-care. Providing self-service guides and automatic tips about possible problems can help customers solve 75 percent of the issues themselves. Customers can solve an additional 15 percent of problems by using advice from instant-messaging chats (with employees or artificial-intelligence agents) or from online discussion groups. This leaves just 10 percent of problems to be handled at the costliest level of support: a phone call with a customer-service agent.

Predictive analytics in marketing and sales

With predictive models fed by customer information, mobile operators can develop cross-selling offers that appeal to individual customers and determine how best to reach them, down to the time of day. This approach, we believe, can add as much as two percentage points to a wireless operator's EBITDA margins. One company increased its sales from cross-selling campaigns by 25 percent once it started using analytics to plan those efforts.

Similarly, mobile operators can use analytics to increase their sales to existing customers. An analysis of customer data (in compliance with privacy-related legal and regulatory requirements) can suggest when each customer will be open to upgrading services or hardware, so that companies can make timely, appealing offers. Operators can also test and refine such offers before extending them widely.

Machine learning in customer retention

Mobile operators can use analytics to learn how to retain more of their subscribers yet spend less

doing so. By running massive sets of customer data (with as many as 300 variables) through machine-learning models, an operator can identify people who appear likely to cancel their service. Then it can woo them with offers aimed at the causes of their dissatisfaction.

Research by one mobile operator determined that 2 percent of its customers had a 48 percent likelihood of canceling their service in the next three months—a rate much higher than the 5 percent likelihood among its other customers. It divided the “likely churners” into segments based on the reasons they might cancel. The offers it extended to them, depending on their concerns, reduced cancellations by 15 percent. And because the operator targeted its outreach efforts precisely, it spent 40 percent less than it usually did to carry them out.

The use of customer data to improve retention points to other possibilities. Some telecom companies and banks have established data-sharing partnerships to gain customer insights that help them, for

example, to develop products and manage fraud.³ The subscriber data that mobile operators collect could also be valuable for other kinds of companies, such as retailers, which might use the information to predict where people will be at any given moment and give them time- and location-specific offers.

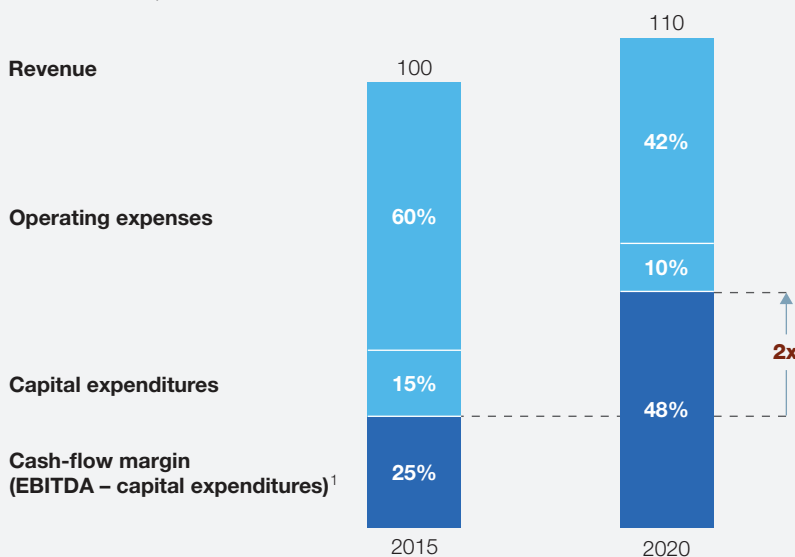
Starting a mobile transformation

Using advanced technologies to manage wireless networks and digitize mobile operations can have a powerful effect on a mobile operator’s financial performance. Although companies can implement the changes selectively, the benefits of a comprehensive, coordinated program are greater because many of these moves reinforce one another. We estimate that a full digital-transformation effort would help a mobile operator to nearly double its cash-flow conversion within just five years (Exhibit 3).

Although each wireless operator will have to devise its own approach, a few general principles can benefit all operators as they embark on digital-transformation programs.

Exhibit 3 A comprehensive digital transformation can dramatically increase a mobile operator’s cash-flow margin.

Profit and loss, indexed



¹ EBITDA = earnings before interest, taxes, depreciation, and amortization.

Source: McKinsey analysis

Aim high—then raise your sights

Many operators have responded to the steady pressure on margins by reducing costs incrementally—for instance, cutting capital expenditures or call-center costs by 3 to 5 percent a year. Such modest cuts can help sustain margins but seldom produce big, lasting improvements. To make performance breakthroughs, the leaders of mobile operators must change their organizations in a fundamental way, starting with goals that might seem absurdly ambitious.

Reducing customer-service calls by 90 percent?
Cutting lines of custom computer code by 95 percent?
Doubling cash-flow margins in five years? These improvements would be unprecedented—yet they are realistic given the economics and structure of the mobile business today. And they can be attained only if executives of wireless operators challenge their companies to achieve them.

Reshape mind-sets and reorganize

The telecom industry's historical legacy as a utility-like sector still informs its competitive outlook. But the future of the mobile business will be defined in part by how well it develops capabilities essential in the digital economy, from designing products and user experiences to implementing analytics and artificial intelligence. Few wireless operators possess these capabilities today. To develop them, they will have to hire and train people in new ways, from the C-suite down through the ranks.

Mobile operators must also transform their organizations. If different departments handle activities related to the same part of the customer experience, those might need to be unified. Product managers might have to be reshuffled as operators consolidate portfolios. Companies should find a balance between the benefits and costs of reorganizing. One company we know chose to set up a new, all-digital mobile division rather than overhaul its legacy business.

Focus on execution

Setting ambitious goals and developing plans to achieve them are the first steps in transforming

a mobile company. For those plans to succeed, managers must monitor them and take corrective action when they fall behind schedule or veer off course. This focus on execution has to remain steady over the period needed to complete a wireless transformation. In most cases, the transformation will have to be directed by a team focusing on it alone. Any successful transformation also requires a commitment from the CEO and the rest of the leadership team, who must stay involved for the duration.



Large, capital-intensive businesses can resist major change. But technological advances in the mobile business have brought operators to a critical juncture. Now as never before, they have access to sophisticated network equipment, rich data on customers and operations, analytical power, and organizational prowess. As a result, mobile operators have an unprecedented opportunity to improve many measures of performance, from cash-flow conversion to customer satisfaction. Those that move boldly to transform themselves with these new capabilities stand to cut their costs and increase their revenues significantly, while building decisive advantages over their less ambitious competitors. ■

¹ Cash flow is measured here in terms of earnings before interest, taxes, depreciation, and amortization (EBITDA) minus capital expenditures.

² Joao Dias, Oana Ionutiu, Xavier Lhuer, and Jasper van Ouwerkerk, "The four pillars of distinctive customer journeys," McKinsey & Company, September 2016, McKinsey.com.

³ Nicolaus Henke, Jacques Bughin, Michael Chui, James Manyika, Tamim Saleh, Bill Wiseman, and Guru Sethupathy, *The age of analytics: Competing in a data-driven world*, McKinsey Global Institute, December 2016, McKinsey.com.

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