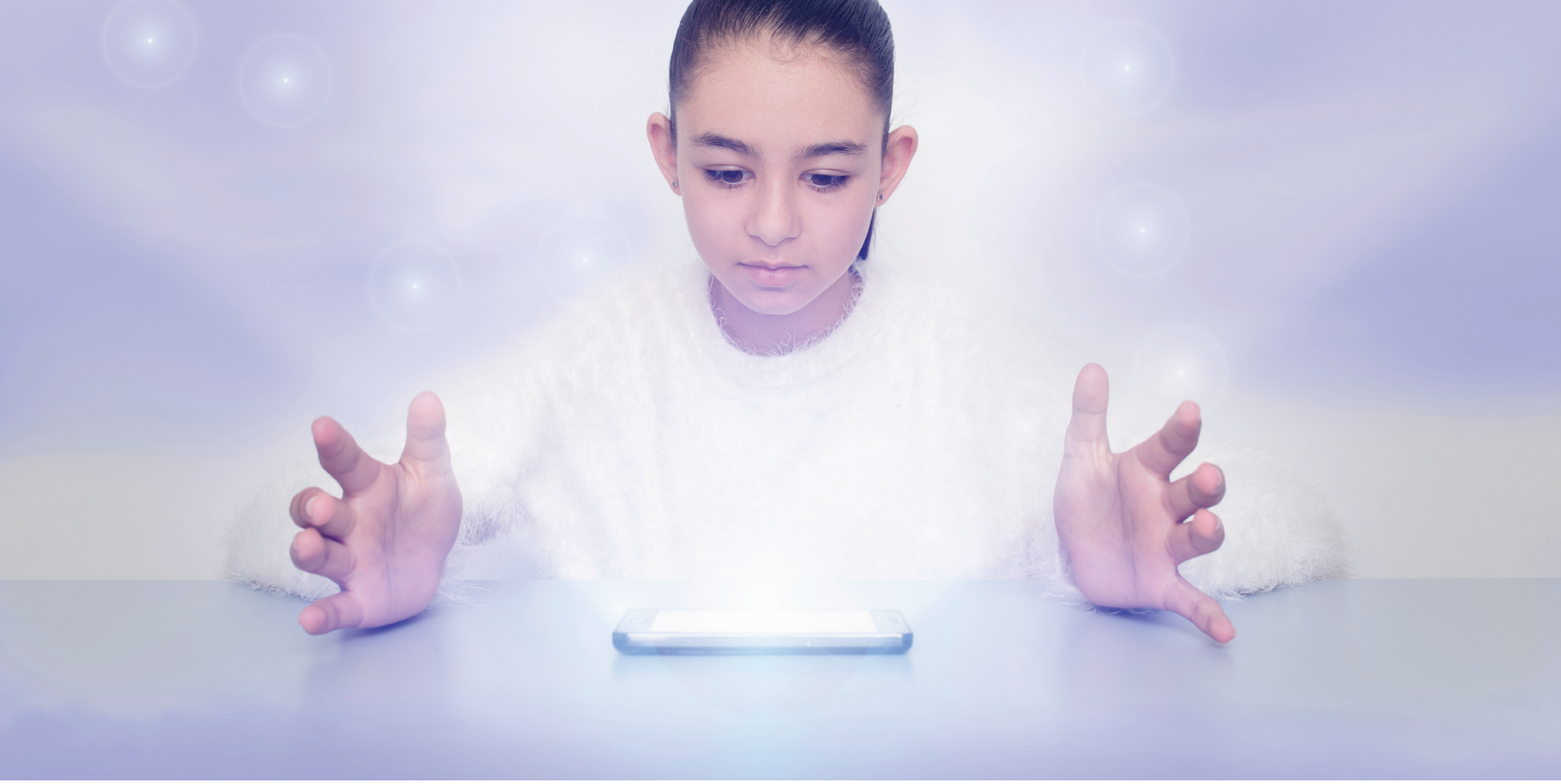


Outthinking disruption in communications

The 2020 CSP in the cognitive era

IBM Institute for Business Value

IBM communications industry solutions

More than ever, communications service providers need to rely on the latest solutions related to cognitive computing, analytics, cloud, mobility, network optimization, digital transformation and global integration. IBM has an extensive global network of telecom solution labs, research labs and innovation centers to support its industry offerings. With more than 22,000 subject matter experts working in the communications industry, we work with more than 200 major communications service providers across the globe. IBM continues to invest significantly in key acquisitions to add expertise and capabilities that enable clients in this industry. For more about IBM communications solutions, see ibm.com/communications.

Capitalizing on disruption

It's a whole new ball game for communications service providers as they navigate a shifting industry landscape. We believe the future is bright, however, for those that can outthink the disruption. By capitalizing on the very forces currently plaguing them, providers could create a world with revenue and margin growth in new addressable markets. The threats of today can be overcome through accelerated transformation to the digital services provider market and innovative partnerships, even with the digital invaders currently muddling the competitive arena.

Executive summary

The communications industry is in the throes of a digital shake up, as over the top (OTT) digital giants and new startups upset the status quo. Offering new communication options and, in some cases, alternative access technologies, these digital invaders are shifting the competitive landscape, capturing revenues and hitting margins.

At the same time, communications service providers (CSPs) are challenged to meet the increasingly high expectations of empowered – and less loyal – subscribers.[1] In addition, they are tasked with large investments in network capabilities, particularly as the explosive growth in data-intensive applications increases traffic. Add a slowdown in subscriber numbers, continued regulatory pressures and forecasts for sluggish revenue growth, and the result is an industry in flux.[2] The big question confronting providers is, "Where do we go from here?"

Seeking answers, we conducted extensive research, including a survey of 135 industry leaders in 51 countries (see *Study approach and methodology* section). Based on our investigation, as well as decades of engagements with communications clients, we assert that today's CSP can emerge in 2020 as a new and stronger business. Indeed, providers have a huge growth opportunity before them thanks to disruption stemming from technology challenges, changing customer expectations and rapid industry convergence.

The rise of business ecosystems based on Internet and "as a service" technologies is creating new market opportunities. Many established OTTs are attempting to become core platform players of scale, effectively competing in the communications and IT sectors, as well as eyeing pieces of other industry value chains, such as finance and retail.

90 percent of CSPs believe **cognitive computing** will be an **essential industry technology** in 2020.

68 percent of CSPs identify **"siloed processes and divisions"** as a key **obstacle** to implementing customer experience initiatives.

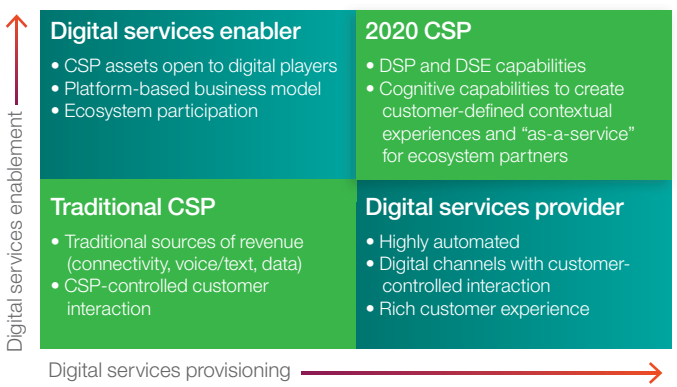
86 percent of CSPs view **OTTs** as their **greatest competitive threat**.

So, where is the growth opportunity for providers? CSPs have the size, global scale, market trust and brand reach to capture a good share of new markets created by emerging ecosystems.[3] Further, success in an ecosystem platform could translate from national to global scope and massive growth for those that find the right niches. For example, China's Tencent, which shifted from a product/service focus to a media, communications and commerce platform-based model, has become one of the largest Web companies in the world.[4]

Making this growth opportunity a reality requires simultaneous progress along two trajectories. The 2020 CSP will emerge as providers advance along two digital service axes: The digital services provider (DSP) and the digital services enabler (DSE). (See Figure 1.) To complete this evolution, CSPs must make changes at warp speed.

Figure 1

The 2020 CSP will emerge from today's provider along two primary axes: The digital service provider and the digital services enabler



Source: IBM Institute for Business Value.

Simply put, the DSP is a highly automated, low-cost provider delivering high-quality customer experiences through online channels. It values data and analytics – and will embrace cognitive capabilities to further improve both the customer experience and its operations. While a number of CSPs are moving down this path today, many are frustrated as they seek more rapid change and improvements in Net Promoter Scores (NPS) and earnings before interest, taxes, depreciation and amortization (EBITDA).

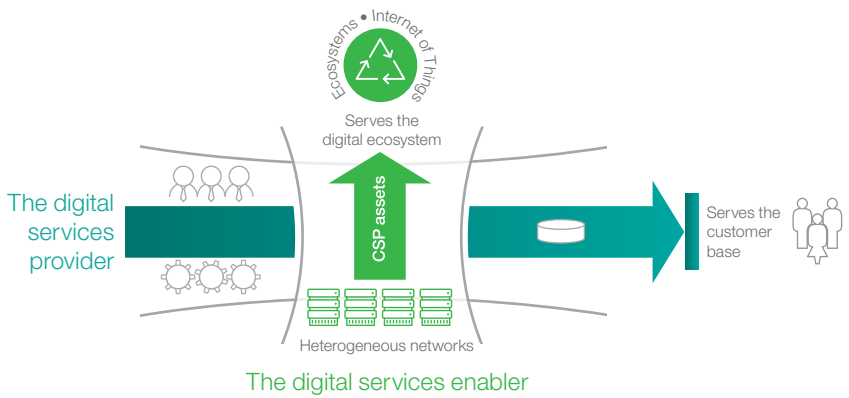
Along the other axis, the DSE recognizes the growing importance of ecosystem platforms and the associated market opportunities. By embracing industry convergence and abandoning a product-based model in favor of a platform-based one, it serves customers as well as an expanding ecosystem of partners – which includes OTTs. The DSE builds on DSP capabilities to create services and platform solutions for the emerging ecosystems, the Internet of Things (IoT), digital companies, etc. Its essential capabilities are a significant departure from those of the traditional CSP, as network virtualization, an “all-IP” infrastructure, technology integration and complex partnerships become necessities. Huge changes in workforce skills, business models and execution speed are essential.

As both a DSP and a DSE, the 2020 CSP will offer personalized communication and services to customers, while allowing ecosystem partners to combine their own and others' products and services to create new offers, services, platforms and components (see Figure 2). The 2020 CSP will be a truly open enterprise.

In this report, we share insights from our executive survey as we reveal how providers can evolve into the 2020 CSP. We discuss the capabilities required and the transformation paths for becoming both a DSP and a DSE – and demonstrate how these paths converge to create the 2020 CSP. In addition, we take a look at technology's role – both today and in the future.

Figure 2

The 2020 CSP will serve both its customer base and an expanded ecosystem of partners



Source: IBM Institute for Business Value.

Becoming a digital service provider

Customers' love of digital is growing: In 2014, Web self service surpassed voice as the most widely used communication channel for customer service.[5] By 2017, only one third of customer service interactions will require the support of a human intermediary (compared to almost 60 percent in 2014), according to Gartner.[6] And consumers increasingly opt to buy online. In fact, there were more online shoppers than in-store shoppers over the 2015 U.S. Thanksgiving weekend.[7]

As trailblazing companies embrace this digital love to fundamentally change the customer experience, they reset customer expectations for all industries. This reset is particularly daunting for the communications industry, which has struggled with its customer experience reputation.

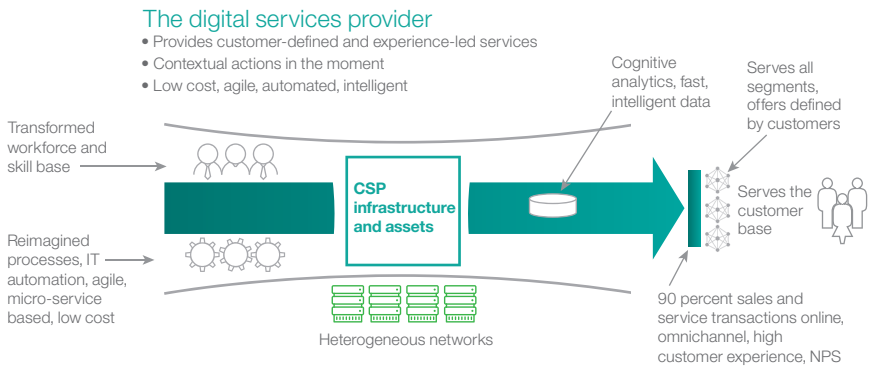
Many CSPs have yet to transform their business models to respond to these new expectations. It's time for providers to recognize the imperative by becoming DSPs. With a laser focus on driving almost all interactions online and across devices whenever and however customers choose, a DSP provides customer-defined contextual services (see Figure 3). It embraces a digitally savvy workforce, agile automated processes and cognitive analytics to provide personalized customer engagement and communication for an elevated customer experience.

"My top business priorities are to improve the client experience using analytics and technology; to lower costs with improved performance and reliability; and to integrate new acquisitions with nimble, agile common systems."

CSP CIO from Canada, IBM C-suite Study

Figure 3

DSPs offer tailored communication and customer-defined, contextual experiences



Source: IBM Institute for Business Value.

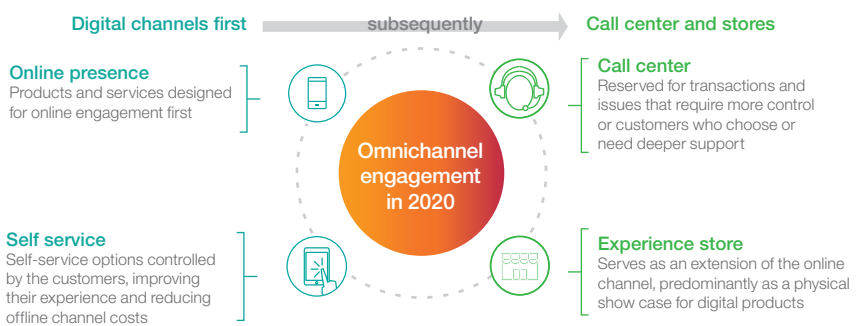
The customer is now in control

For providers to successfully become DSPs, they must elevate the customer experience. Understanding this, 87 percent of the CSPs we surveyed realize that customer experience will be the ultimate differentiator in 2020. To improve in this area, the majority of executives surveyed intend to focus on customer service (67 percent), omnichannel (66 percent), self service (66 percent) and Web presence (56 percent).

In the traditional CSP engagement model, providers determine when, where and how customers interact with them – typically starting with the call center and progressing through retail stores and dealerships to an online presence. However, a DSP thinks digital first and drives almost all interactions online and across devices, putting the customer in control (see Figure 4). The call center is reserved for issues that cannot be resolved digitally and for customers who choose that channel, while the retail store serves only as an extension of the online channel – a physical showcase for digital products. In addition, the DSP offers consistency across channels and devices for customers as they buy, consume and service products at their convenience.

Figure 4

The 2020 customer experience is consistent across channels and driven by customer control



Source: IBM Institute for Business Value.

"Ultimately, computing is about networked intelligence, and the real impact of the Internet and devices will occur once that translates into automation and machine intelligence. So cognitive computing will transform our world."

CSP COO from South Africa, IBM C-suite Study

As part of the conversion to a DSP, providers should strive for at least 90 percent digital sales and services transactions, enabled by complementary strategies for social media presence and self-service initiatives. In addition, they should aim for full-scale automation of processes, using micro services for agility, to improve market response and shorten time to market for new product and service offerings.

Cognitive computing's role

DSPs value data and the role analytics can play in elevating the customer experience and improving operational efficiency. Cognitive computing can open the door to even greater levels of value, helping drive knowledge-lead disruption in communications, greater loyalty and improved NPS.

Cognitive capabilities can lead DSPs toward superior insights and, by extension, superior decision making. Insights from cognitive solutions can help organizations put the customer at the heart of operations and offerings, as well as predict outcomes and determine next best actions. Cognitive computing can help enhance, scale and augment human expertise, thereby helping reduce spend on lower-value clerical processes and redirecting it to higher-value, differentiating services. This enables more effective capital allocation decisions and helps control operation costs – key requirements for CSPs today.

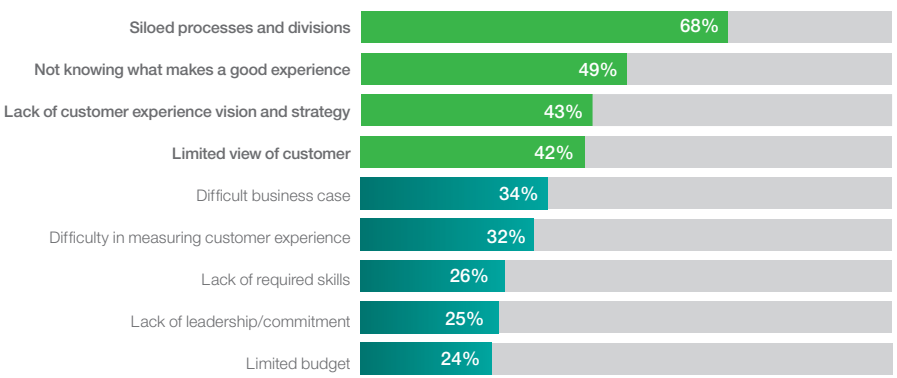
Clearing the hurdles

To become a DSP, today's provider must overcome challenges. According to our research, siloed processes and divisions are the biggest obstacles in implementing customer experience initiatives for most CSPs (see Figure 5).

These silos can contribute to a disjointed experience for the customer, as well as prohibit an end-to-end view of the customer journey. Indeed, limited view of the customer was cited by 42 percent in our survey as a customer experience obstacle.

Figure 5

CSPs face a number of obstacles when implementing customer experience initiatives



Source: IBM Institute for Business Value Communications 2020 Survey.

"The biggest challenge is the company itself; this is a very big and slow boat."

CSP CFO from Spain, IBM C-suite Study

"The biggest issue is persuading our employees to make the change. The people we employ today aren't necessarily the people who will face tomorrow's digital challenges."

CSP CFO from Chile, IBM C-suite Study

A DSP must have a "lean and mean" business model focused on reducing up to 50 percent of operations costs and promoting optimum efficiency in service delivery. This requires simplification and automation of processes likely inhibited by existing silos. Re-engineering processes to dramatically improve end-to-end automation will be critical.

Effectively automating processes for no touch flow through requires more than organizational change, process redesign and IT support; it requires fundamental rethinking of financial management, investment and business models to align projects across the company. Too often, programs that benefit the company are not implemented because they do not benefit all of the siloed business units.

Another obstacle – cited by almost half of the CSPs – is simply not understanding what constitutes a "good" experience. Rather than relying on call-handling stats and single-touch client satisfaction measurements, CSPs should look outside the industry to better understand the factors that contribute to exceptional customer experiences.

While only a quarter of CSPs identify "skills" as an obstacle, new skills are crucial in the digital era. We have heard from a number of communications executives who fear the majority of their workforce does not have the right abilities for 2020. DSPs need engaged employees who are comfortable operating in the digital world, where everything and everyone needs to be agile, action oriented and constantly reinventing themselves. Retraining existing and/or recruiting new talent will be necessary for areas like digital channels and social media, content management, user experience (UX) and user interface (UI) design, digital advertising, etc.

Recommendations for becoming a DSP

- Ensure you understand the customer experience desired and then target digitization of the customer experience. Build self-service sales and support functions and accelerate customer migration. Re-engineer processes to dramatically improve end-to-end automation, using design thinking approaches, new tooling and application programming interfaces (API) calls. Underpin processes and decisions by applying cognitive analytics pervasively across the enterprise.
- Destroy silos. Look at processes through the customer's eyes to determine necessary changes across organization and reporting structures. Use big data, analytics and cognitive computing solutions to uncover deeper customer insights and consistently engage customers across available channels.
- Accelerate the pace of change through incentives on NPS, simplification and automation. Aggressively simplify products and services, processes, networks, applications and headcount. Develop a migration strategy to assess which units, processes, systems, etc. will remain, which require triage and which should be retired.

Becoming a digital services enabler

Industry convergence and the pace of technology innovation are game-changing forces, fragmenting value chains and creating new ecosystems. For example, ride-hailing company Uber, initially a startup, has become a thorn in the taxi industry's side. After another round of funding in July 2015, Uber was valued at USD 51 billion in July 2015 – more than four times the value of rental car companies Hertz and Avis combined.[8] The evolution of Google – now Alphabet – is another example. Starting as a search engine, Google has expanded into a platform offering a variety of products and services and, as of February 2016, was one of the world's most valuable companies.[9]

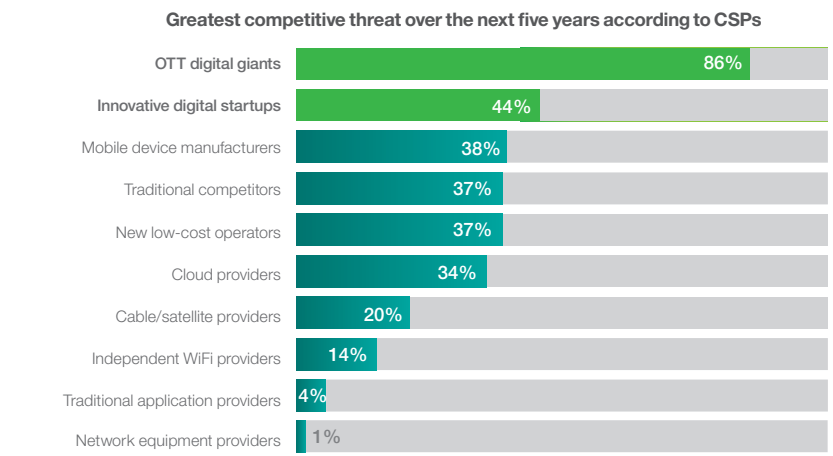
The communications industry has become a complex battlefield, as CSPs feel the squeeze of competition not only from OTT providers, but also smaller startups offering alternative communication channels, such as WhatsApp, Twitter and LINE. According to our survey, CSPs view OTT players – or digital giants – as their biggest competitive threat in the next five years, followed by innovative digital startups (see Figure 6). While the digital giants can use economies of scale to disrupt markets, the startups tend to apply digital technologies in innovative ways while using their small size and agility to their advantage. Both can result in what one CIO from the IBM Global C-suite Study called "the 'Uber' syndrome" – when a competitor with a completely different business model enters an industry and flattens traditional players.[10]

In addition to affecting CSPs' traditional revenue streams, digital giants are pursuing opportunities in alternative access technologies, such as Google's ultra-fast Internet service, Google Fiber.[11] And some are moving into industry verticals of interest to CSPs, like Apple did with the introduction of Apple Pay.[12]

In response to this competitive pressure, CSPs are exploring a range of opportunities to generate new sources of revenue. According to our survey, two thirds believe the path toward growth will involve increasing their role in the IoT, while close to half (45 percent) believe becoming a platform for partner applications will open new doors for revenue.

Figure 6

CSPs view OTTs and innovative startups as their greatest competitive threats



Source: IBM Institute for Business Value Communications 2020 Survey.

"It's really difficult to predict the advent of new entrants from other industries. These competitors – and they're not all online social apps – will destroy the conventional way of thinking."

CSP CIO from Japan, IBM C-suite Study

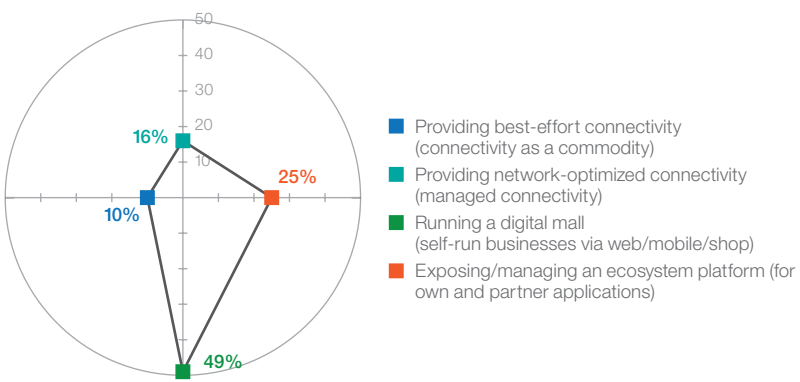
As DSEs, providers can take a central role in many ecosystems and IoT applications. They can act as service integrators in IoT and business markets, integrating their own and other companies' assets, exploiting their global reach and coverage, and providing the high levels of security and privacy that CSPs can provide.

A future snapshot?

In looking toward 2020, we asked providers to select one of four capability areas where they would place the *most* focus in five years (see Figure 7). These categories are not mutually exclusive; some providers will indeed provide services and assets in all areas.

Figure 7

CSPs identified four potential roles for themselves in 2020



Source: IBM Institute for Business Value Communications 2020 Survey.

Ten percent of survey participants predict their primary focus will be offering commoditized connectivity products. Sixteen percent plan to concentrate on networked-optimized connectivity, focusing on dynamically scaled and tailor-made network performance based on the unique needs of both end users and content providers/application developers.

Almost half plan to capitalize on the size of their customer base by running digital malls. This entails selling products – their own and those developed by other companies – to customers. However, a downside to this role is its focus on products. In the digital world, what eventually differentiates winners from losers is often not the best product – but the right business model. And the most powerful business models are based around platforms.

As such, we believe the ecosystem platform manager path offers the greatest opportunities – and positions providers as DSEs. One quarter of survey participants plan to go this route, operating as platforms that unlock significant value by investing in and opening core CSP capabilities to all digital players (see Figure 8).

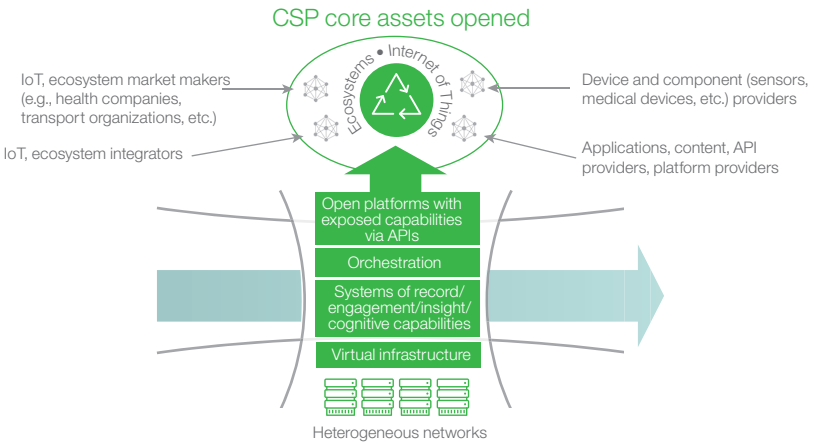
Ecosystems create new forms of value, with participants delivering more value acting together than they would acting alone by opening up their capabilities and enabling the market at large to partner and create new services, offerings and disruptive businesses. With their customer access, network assets, data management capabilities, client billing relationships and third-party relationship management experience, CSPs are ideally suited to become ecosystem development and management partners. As a DSE, the CSP also becomes an important partner for application developers and third-party providers, as well as enhances its role in the business-to-business-to-consumer space.

"There will be more partnerships and consortia and more of a 'gray' area between buyers and sellers. Rather than controlling the value chain completely, companies will share it."

CSP CEO from Portugal, IBM C-suite Study

Figure 8

As ecosystem managers operating as platforms, DSEs open core CSP capabilities to all digital players



Source: IBM Institute for Business Value.

For this to become reality, CSPs must foster ecosystem development. In the new economy, no organization is an island – success increasingly depends less on closed systems and more on partnerships within ecosystems. Innovation has become more open and collaborative. In this spirit, as DSEs, providers must be willing to make their assets available to partners to promote ecosystem growth and IoT enablement.

Using open application programming interfaces (APIs) and orchestration, providers can offer soft platforms and products to managed environments within the ecosystem via software-defined networking (SDN), network function virtualization (NFV), middleware virtualization, etc. Powered by big data and real-time automated intelligent systems, the 2020 CSP could connect industries to their customers and suppliers – and connect industries with one another.

A January 2014 *Economist* article focusing on the importance of platforms proclaimed: "…proliferating digital platforms will be at the heart of tomorrow's economy..."[13] Because platforms facilitate collaboration with third parties, application developers and Internet users, they are particularly useful for young startups seeking market access. By providing the APIs for these new firms, CSPs can capitalize on the network effects between the different ecosystem partners.

Key recommendations for becoming a DSE

- Develop strategies that enable speed and agility to create new partnerships and solutions. Partner extensively, including a few major partners and many niche partners, to realize revenue growth from the market at large. Break down traditional barriers, seeking nontraditional partners and disruptive business models for untapped opportunities. Expose assets such as customer data, vertical applications, IoT platforms, field force capabilities, billing services, video services and more.
- Rather than a generic (horizontal) platform capability, build solutions with specific business needs and use cases, then replicate to similar use cases. Vertical solutions should be built with horizontal capability in mind to scale quickly and efficiently across new opportunity areas.
- Realize one size does not fit all and implement multiple business models catering to the needs of different partners and markets. Develop business case and funding models that account for uncertainty; consider option valuation methods over hard business cases.
- Offer cognitive and analytics insights "as a service" to be used in ecosystems and the IoT. Build intellectual property and solutions, selectively invest where differentiation and premium value is possible, and purchase commodity services (e.g., cloud).

The 2020 CSP

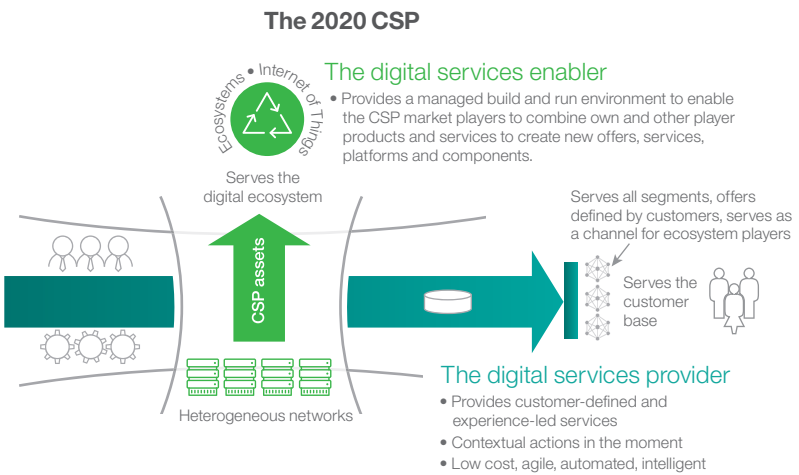
New ecosystems are redefining industries around the world, spurring new partnerships and alliances. For example, 55 percent of Indian executives surveyed last year believe ecosystems will define the future global economy, while 52 percent plan to increase their collaboration with other industries as part of their ecosystem journey. And many believe engagement in new global economic ecosystems provides an avenue to leapfrog traditional growth.[14]

There is extensive opportunity for CSPs to benefit from ecosystem engagement. Combining the DSE capabilities with those of a DSP, the 2020 CSP emerges as an entity that serves not only customers, but also a digital ecosystem (see Figure 9). In this scenario, major corporations, OTTs and innovative startups evolve from competitive threats into ecosystem partners.

As a DSP, the 2020 CSP efficiently and agilely provides customer-defined services and initiates contextual actions. And as a DSE, it allows ecosystem partners to combine their own and other market players' products and services to create new offers, services, platforms and components. In addition, it provides these ecosystem partners a channel to the market.

Figure 9

A digital service provider and enabler, the 2020 CSP benefits both its customers and an extended ecosystem



Source: IBM Institute for Business Value.

"I'd like to create a two-way approach to strategy planning. We always focus on the short term. We need to strike a better balance between our short- and long-term horizons."

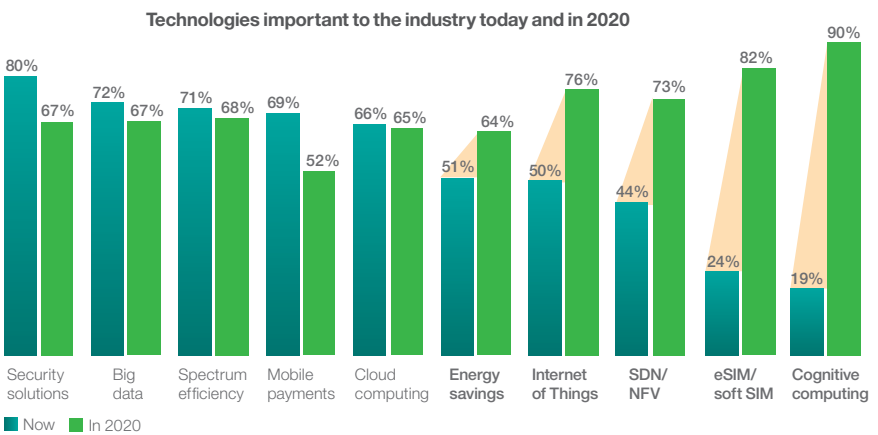
CSP CIO from the Netherlands, IBM C-suite Study

Exploiting technology

Historically, the communications industry has embraced technology to its benefit and continues to rely on it for innovation and growth. Indeed, technology plays a starring role in the 2020 CSP transformation. As part of our research, we asked CSPs which technologies they view as most important today and which they believe will be most important to the industry in 2020 (see Figure 10).

Figure 10

While CSPs rank security-related technologies as most important today, they believe cognitive computing will be essential in 2020



Source: IBM Institute for Business Value Communications 2020 Survey.

Technology today

Security solutions top the list of today's most important technologies, which is understandable. As custodians of the networks, CSPs play a pivotal role in fighting continued threats and security breaches. Coming in second are big data solutions, which can reveal insights that help improve the customer experience, drive operational efficiency and identify revenue streams. Following at a close third are spectrum efficiency technologies – including 4G/5G networks, small cells and WiFi offload – which are particularly relevant as the immense popularity of video affects data traffic (see sidebar: Growth in mobile traffic). Other key technologies today include cloud computing (which enables business and operating model transformations) and network-enabled monetary services (as consumers increasingly turn to mobile payment options).

Technology tomorrow

By 2020, CSPs predict cognitive computing will move from least important to the number-one spot. They understand that insights from cognitive solutions can help increase customer engagement by driving innovations in product/service development and delivery, as well as improvements in operations management. CSPs also believe embedded SIM (eSIM) and soft SIM technology will grow in importance, likely due to its potential to modernize the way connectivity is delivered both to consumers and IoT devices. Next in line is IoT technology, which could help providers monetize additional connections and network traffic, as well as develop new services. Virtualization of the network will continue to grow in importance as well, with the appearance of SDN and NFV suggesting a move toward virtualized cloud-based networking.

Growth in mobile traffic

The popularity of data-intensive applications has led to an explosive growth in mobile traffic, requiring huge investments to increase network capacity. Mobile video is of particular concern: Today, more than half of YouTube and Facebook video views are from mobile devices.[15] And the use of mobile video for various industry applications continues, such as telemedicine in healthcare and surveillance and police body cameras in law enforcement. One report estimates that mobile video will account for nearly three-fourths of the world's mobile data traffic by 2019.[16]

A cognitive future

According to a 2015 IBM industry study on cognitive computing, 85 percent of CSP executives familiar with the technology believe it will play a disruptive role in the industry, 89 percent believe it will play a critical role in their business, and 94 percent intend to invest in cognitive capabilities.[17]

Cognitive solutions can help CSPs extract meaningful patterns from their wealth of data – and derive insights for competitive advantage. And because they are able to engage in dialogue with humans, cognitive systems can help improve customer service by providing accurate automated responses to questions and bringing context- and evidence-based reasoning to the interaction.

Cognitive systems are already helping CSPs further enhance the customer experience and uncover new insights. For the 2020 CSP, future systems could power transformative operational and customer service initiatives, enable more effective and timely matching of customers to offerings, and help troubleshoot networks.

eSIM

New eSIM technology could have an enormous impact on the communications industry. Rather than a removable card, the eSIM is an embedded chip within the device hardware that can hold multiple operator profiles and be provisioned remotely.[18] While eSIM technology makes it easier to switch carriers, it also allows more devices to connect to CSP networks, which could lead to new revenue streams relating to the IoT, OTT services or device sales. But eSIMs will change the nature of the relationship between the customer and the CSP. Customers will have multiple relationships with CSPs and with multiple CSPs – perhaps even for each transaction.

The IoT

As interest in the IoT grows, CSPs seek to capture a sizable chunk of the market. They are increasing investments in IoT technologies, such as machine-to-machine (M2M) solutions and Low Power Wide Area (LPWA) technology. Seeking to move beyond merely selling access to their pipes, many CSPs are looking at technologies that enable development of new revenue-generating IoT services – likely through partnerships with or acquisitions of other companies. As discussed, IoT enablement will be a key part of the 2020 CSP's DSE role – and could lead to their becoming suppliers of choice in selected vertical markets, such as connected homes and smart cities.

Virtualization

As do almost three-fourths of the CSPs surveyed, we believe virtualization of the network will be extremely important to the 2020 CSP. It can facilitate more rapid delivery of new services over an open, agile and cost-effective infrastructure.

The emergence of SDN, NFV and cloud radio access network (C-RAN) signals the onset of transition to cloud-based networking (see Figure 11). In this environment, functions previously delivered as appliances are delivered as software components running on a cloud. We believe today's transition will be a matured trend by 2020. While this matches the 5G timeline, cloud-based networking applies equally well to fixed networks and previous mobile technologies.

"The market for handheld devices is saturated, but the Internet of Things, wearable devices, and care and home devices will generate new opportunities for revenue growth."

CSP CFO from the United Kingdom, IBM C-suite Study

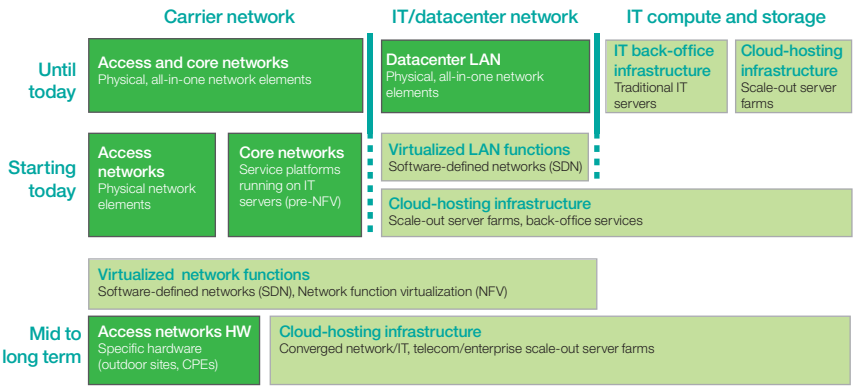
AT&T launches network virtualization initiative[19]

To better meet users' growing data and video demands, AT&T intends to virtualize and control more than 75 percent of its network by 2020 using software-defined architecture. This next-generation network will be powered by technologies including SDN and NFV.

Through this virtualization process, AT&T plans to increase network capacity and efficiency while reducing capital expenditures. The infrastructure will enable rapid creation of flexible new applications and services for customers, as well as facilitate services on demand designed to meet specific needs.

Figure 11

Network virtualization and cloud technologies can help CSPs implement new business models



Source: IBM Institute for Business Value.

A move to cloud-based networking is fundamental for the 2020 CSP to implement a new "all-IP" network and will spark innovation as vendors implement new virtual network functions. This requires that CSPs take end-to-end responsibility for network architecture, going beyond vendor selection to long-term management of well-defined network elements.

This "cloudification" of the network can help improve agility, scalability and network performance and can reduce capital and operating costs. And above all, it can help reduce time-to-market for new services that reflect changing customer demands.

The impact of video

While CSPs believe new areas such as cognitive will grow in importance, they also understand spectrum efficiency will continue to be important in 2020. As consumers' love for data-intensive apps and video endures, so, too, will the resulting network traffic issues (see sidebar: *Video and the customer experience*).

To meet high demands – in terms of capacity, speed, efficiency and performance/cost ratio – CSPs have invested in new technologies and capabilities with improved spectrum utilization. As providers roll out 4G networks, they also explore 5G technologies and look toward further paradigm shifts.

For example, Japan's NTT DoCoMo has joined forces with other vendors to conduct 10Gbps wireless tests with 5G.[22] Some early 5G deployment is expected around 2020. For example, South Korea aims to roll out core 5G wireless technologies by 2018 for the Winter Olympics and introduce the world's first 5G network services by 2020.[23] In addition, there is increasing interest in LPWA technology and the role it will play in the IoT space.[24]

According to our survey, CSPs view new network technology as the most viable solution to network capacity issues, followed by WiFi offload (see Figure 12). More than half view innovative pricing and data plans, such as tiered pricing based on peak times and speed and "a la carte" plans, as practical options to keep the growing data traffic within bounds.

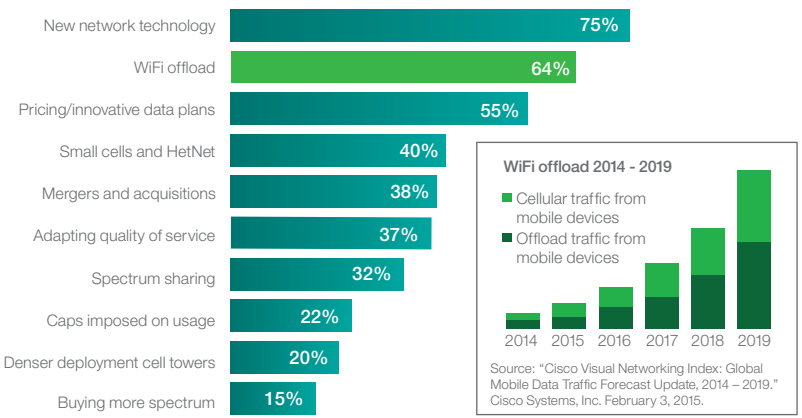
We believe the most likely scenario for the 2020 CSP will involve heterogeneous networks that deploy a mix of technologies, cell types and network infrastructures. In addition to avoiding excessive investment in new network technology, this approach offers flexibility and could help CSPs respond to rapid changes in customer demand.

Video and the customer experience

In terms of customer experience, video has specific key performance indicators (KPIs), such as initial buffering time, download rate, frame freeze frequency and video resolution. According to a 2015 survey, good quality video streaming is very important to 70 percent of mobile subscribers – but 90 percent experience video quality problems every day.[20] A survey of U.S. and U.K. iPhone users revealed that 59 percent will abandon streaming a mobile video if they have to wait longer than 15 seconds, and 19 percent will do so after only 5 seconds. Almost 40 percent said they would pay extra dollars if their provider offered some assurance on video delivery quality.[21]

Figure 12

CSPs consider new network technology the most feasible solution to network capacity issues



Source: IBM Institute for Business Value Communications 2020 Survey.

Recommendations for exploiting technology

- Determine the potential to transform the business using cognitive computing; provide a vision and cognitive journey roadmap.
- Accelerate virtualization technologies to provide open platforms that help optimize value from partner solutions and services.
- Accelerate investments and plans to handle the explosive growth of video, and consider the importance of video in the context of customer experience.

Ready or not? Ask yourself these questions

It can be tough to articulate and prioritize the actions necessary to prepare for 2020. We offer the following questions to help as you prepare to profit from the blurring industry borders.

- How will your organization learn to interact with consumers in the ways they prefer?
- What benefit would you gain in being able to detect hidden patterns locked away in your data? How would this accelerate business model innovation, product development, cost reduction and the like?
- What actions have you taken to transform the workforce to help ensure you have the skills crucial in the digital era?
- How will your organization exercise its distinctive assets to its advantage in digital ecosystems?
- In what ways can your enterprise plan for growth, given the greater opportunities that partnering in digital ecosystems makes possible?
- How can you form relationships with newer, nontraditional industry participants to provide the digital relationship and customer experience that today's digital customers demand?
- How can you recognize – and prepare for – new technologies relevant to the industry?

For more information

To learn more about this IBM Institute for Business Value study, please contact us at iibv@us.ibm.com. Follow @IBMIBV on Twitter, and for a full catalog of our research or to subscribe to our monthly newsletter, visit: **ibm.com**/iibv.

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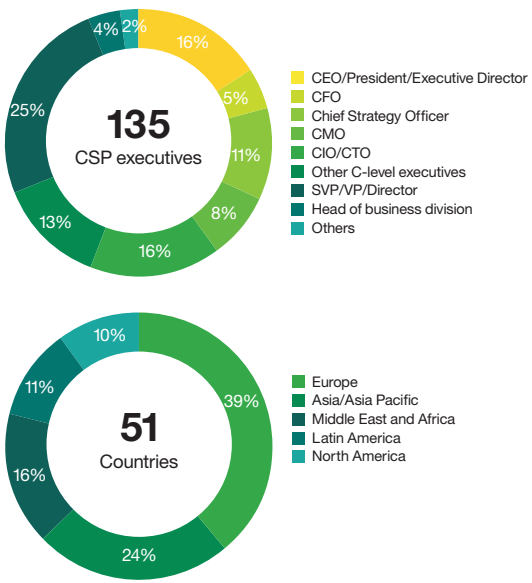
Figure 13
Methodology



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Study approach and methodology

For this study, we surveyed 135 senior communications industry executives from more than 50 companies across the globe, representing more than USD 1 trillion in total revenue and USD 1.5 trillion in total market capital. The report is based on the survey results; extensive supplementary research; and the experience, expertise and knowledge obtained through IBM's decades of work with hundreds of communications industry leaders.

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