strategy&
Part of the PwC network

Making 5G pay

Monetizing the impending revolution in communications infrastructure

Contacts

Australia
Chris Bartlett
Partner, PwC Australia
+61-414-835-935
chris.bartlett@pwc.com

China
Stephen Wong
Partner, PwC China
+86-10-6533-2255
stephen.h.wong@cn.pwc.com

France
Pierre Péladeau
Partner, PwC France
+33-1-44-34-3074
pierre.peladeau@pwc.com

Germany
Thomas Tandetzki
Global Telecommunications Assurance Leader
Partner, PwC Germany
+49-211-981-1105
thomas.tandetzki@pwc.com

Hungary
Balint Vegh
Manager, PwC Hungary
+36-30-790-1965
balint.vegh@pwc.com

India
Ashish Sharma
Partner, PwC India
+91-124-626-671
sharma.ashish@pwc.com

Japan
Naohide Nomura
Partner, PwC Japan
+88-4179-0328
naohide.nomura@pwc.com

Korea
Hosung Han
Partner, PwC Korea
+82-2-709-8956
hosung.han@kr.pwc.com

Middle East
Bahjat El-Darwiche
Partner, PwC Lebanon
+961-1-985-655
bahjat.eldarwiche@pwc.com

Hani Zein
Principal, PwC Lebanon
+966-555-136-417
hani.zein@pwc.com

The Netherlands
Mark Kuijper
Partner, PwC Netherlands
+31-88-792-5438
mark.kuijper@pwc.com

Spain
Miguel Nardiz Arrarte
Partner, PwC Spain
+34-91-568-4698
miguel.nardiz@es.pwc.com

UK
Rolf Meakin
Global Telecommunications Advisory Leader
Partner, PwC UK
+44-78-01-247677
rolf.e.meakin@pwc.com

Alastair Macpherson
Partner, PwC UK
+44-77-03546-424
alastair.macpherson@pwc.com

Kirolous Zikry
Senior Manager, PwC UK
+44-77-2563-3388
kirolous.s.zikry@pwc.com

United States
Mike Lawley
Partner, PwC US
+1-678-642-3655
Michael.lawley@pwc.com

Darren Shea
Director, PwC US
+1-469-236-3332
darren.shea@pwc.com

About the authors

Rolf Meakin advises clients in the telecom, media, and technology industries on strategy, transformation, capital allocation, and operating model change for Strategy&, PwC's strategy consulting business. He leads PwC's telecom industry global consulting practice. Based in London, he is a partner with PwC UK.

Kirolous Zikry advises clients in the telecommunications and technology industries on strategy for Strategy&. He has worked with operators in several countries on commercial strategy and business models, network strategy, and front office transformation. Based in London, he is a senior manager with PwC UK.

Stephen Wong advises clients in the telecom and technology industries for PwC. He leads the firm's telecommunications sector practice in China, specializing in business and finance transformation, mergers and acquisitions, and capital markets transactions. Based in Beijing and Hong Kong, he is a partner with PwC China.

Darren Shea is an advisor to executives in the telecommunications industry for PwC. He helps network operators develop network technology strategies and business models in order to achieve successful network deployments and transform underlying operating, technology, and cost structures. Based in Dallas, he is a director with PwC US.

EXECUTIVE SUMMARY

Scoping the 5G opportunity

The next generation of cellular mobile communications technology has arrived. 5G, which is set to succeed the 4G standard over the next few years, offers an exponential improvement in functionality over 4G — it is 100 times faster and has 1,000 times more capacity. The results will be mobile networks that offer far higher capacity and reliability, much lower latency, reduced energy usage, and massive connectivity for devices.

Over the coming four years, companies will invest heavily — up to US$57 billion — to build higher network density, add spectrum, and upgrade active equipment. As they do so, they will seek to avoid a repeat of the 4G rollout experience. Although 4G, launched in 2012, catalyzed a revolution in the adoption of data services, operators struggled to generate additional revenues from end-users to cover the investments. Consumers continually expect to have more — more data, more connectivity, more functionality — while paying the same or less. This is one of the reasons that the total shareholder returns of the top 39 telecom companies have lagged that of wider stock indices over the past three years. And since telecom companies compete strongly on having the best networks, they face competitive pressure to make 5G investments, even if they try to do so in the most cost-effective way.

To ensure they reap a fair return for their enormous investments in 5G, operators must think holistically about the monetization opportunities, going beyond simply charging consumers more for faster data. While 5G may present fixed wireless access (FWA) broadband opportunities in certain circumstances, it will be difficult to realize attractive returns on overall 5G investment. In fact, 5G offers not just higher speed but also other valuable — and monetizable — attributes. Upcoming releases will deliver a number of 5G attributes, such as higher reliability, segmented network performance, and much lower latency. As a result, 5G creates the potential for entirely new service offerings, use cases, business models, and revenue opportunities. Instead of relying mainly on end-users paying telecom companies directly for connectivity, operators in a 5G world could generate substantial revenues by charging the companies that are providing 5G-reliant services to their customers. Variants of this model, which is widely termed business-to-business-to-X (B2B2X), where X can be a consumer, a business, or a public agency, will be suited to a vast array of widely differing use cases. By identifying and tapping into these opportunities, operators have the chance to ensure that the returns on their 5G investments exceed those from 4G. But to achieve this, operators will need to develop or acquire several vital capabilities.

Leveling up to 5G

The era of 5G is upon us. The first 5G standards — defining communications networks that promise to be far better and faster than the current system — were finalized in June 2018, and standards for critical and massive machine-type communication are expected by 2020 or 2021. For this reason, the full technological potential of 5G will be realized over a five- to 10-year horizon due to the timing of the relevant standards and the required scale of investment.

Today, many operators around the world are pressing ahead with technical trials and commercial deployments. South Korean telecom carrier KT Corporation collaborated with Intel to offer 5G services at the PyeongChang Winter Olympic Games in February 2018.[1] In late 2018, Verizon launched a 5G-based FWA service in four locations.[2] The majority of operators are aiming for commercial launches of 5G at some point in 2019. This timing reflects the likely introduction of 5G-enabled smartphones, the first of which were expected to be available in markets such as the U.S. early this year.[3]

Telecom companies around the world are poised to invest tens of billions of dollars in 5G. A report by research house IDC projects that mobile service providers will collectively spend nearly US$57 billion on the rollout of 5G through 2022.[4] Although anticipated benefits will drive this investment, there are also challenges that must be overcome if companies are to realize a sufficient return on investment (ROI). To help develop and inform our point of view on the future 5G business models, we conducted a series of interviews with participants in the global 5G ecosystem.

Anticipated benefits

Operators are generally pursuing three main ways to obtain a return on their 5G investments. They want to unlock new revenue streams, reduce costs, and improve the customer experience.

1. Unlock new revenue streams

There are several ways in which 5G will enable telecom companies to tap into new sources of revenue. One is through the ability to compete in new markets. For example, 5G opens the door for mobile operators to compete head-to-head — in certain markets — against fixed-line incumbents by using 5G FWA to provide fast mobile broadband services comparable to many current wired broadband offerings. At the same time, 5G offers fixed broadband providers the potential to reduce their costs. For example, deploying 5G FWA instead of the more expensive FTTP (fiber to the premises) and FTTH (fiber to the home) alternatives can be more commercially viable, subject to spectrum availability, premise density, and the extent to which FWA customer premises equipment (CPE) is affordable.

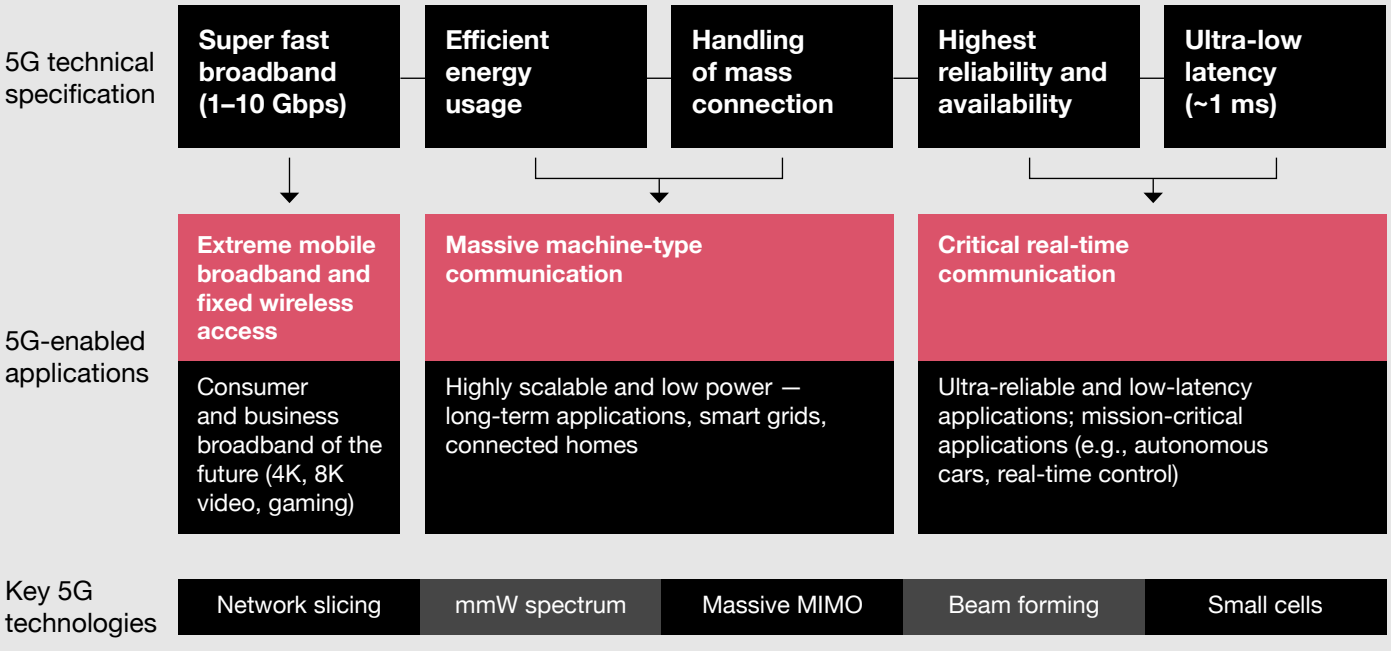
[1] Source: https://mashable.com/article/att-5g-launch/#rEFcxpcVcaqc
[2] Source: https://www.multichannel.com/news/verizon-launches-first-5g-service-in-four-cities
[3] Source: https://www.scientificamerican.com/article/5g-devices-are-about-to-change-your-life/
[4] IDC, "Market Analysis Perspective: Worldwide Carrier Network Infrastructure, 2018," Sept. 2018.

5G also carries the potential to offer new and enhanced services to both consumers and verticals. Overall, 5G's disruptive impacts spring from its unique and unprecedented blend of five technological capabilities (see Exhibit 1). In combination, these capabilities should enable three "families" of use cases:

- **Extreme mobile broadband and fixed wireless access:** delivering the fast, high-bandwidth consumer and business broadband service required by the future. Use cases in this family might include applications such as faster video streaming, interactive multiplayer gaming, virtual reality (VR) and augmented reality (AR) games and experiences, and connecting patients with remote healthcare services. AT&T, for example, is partnering with a number of healthcare OEMs to incorporate 5G into its equipment.

- **Critical real-time communication:** For business customers, 5G is even more of a game changer, capitalizing on 5G's high reliability and ultra-low latency, which enable consistent responses in real or near real time. Use cases in this category might include the operation of precision production lines, automated mining, enhanced responsiveness in autonomous cars, and medical applications such as remote surgery. Development is already underway. For example, Sprint has built more than 110 points of presence for its distributed networks on autonomous driving campuses.

EXHIBIT 1
The five 5G capabilities, enabling three "families" of use cases



Source: ITU, 3GPP, Ericsson, Nokia

- **Massive machine-type communication:** leveraging 5G's high scalability and low power consumption to connect machines with one another via the Internet of Things (IoT). Use cases might include industrial applications such as predictive remote maintenance, management of smart grids, city applications such as real-time traffic management, drones, and integrated services and devices in connected homes.

In addition, the capability for network slicing is one of the key developments of 5G. It will enable operators to offer differentiated services to users and lead to greater efficiency and cost optimization, as it is neither necessary nor sensible to offer a particular class of services to all customers if they don't want or need them. Operators in different markets are initially focusing on different use cases from all three families owing to variations in 4G network saturation, fixed broadband penetration and performance, and focuses on innovation. For example, the focus in the U.S. has primarily been on fixed wireless and mobile broadband. By contrast, operators in Japan and the Nordic countries are targeting industry verticals, robotics, and AR, and in South Korea the emphasis has been on drones and smart factories. Over time, the differences between geographies in terms of the use cases being targeted are likely to narrow.

2. Reduce costs

The high costs of investing in the spectrum, network densification, and device upgrades necessary to build 5G will be offset by the fact that 5G will provide 1,000 times more capacity and speeds that are 100 times faster. The result will be a massive reduction in unit cost per gigabyte of data traffic, yielding economics that will help operators maintain — and potentially increase — their margins on selling mobile broadband services.

Further cost-saving opportunities from 5G include the potential to introduce increased automation in network planning and operations. With the 5G rollout comes the opportunity for the telecom industry to put into practice cost-saving concepts such as operational simplification, automation, and SONs (self-organizing/operating networks) on a wide scale. Although these benefits should drive down network operating expenditures, they will come at the cost of capital expenditures on spectrum, networks, and IT. Therefore, ROI cannot rely on cost savings alone.

3. Improve the customer experience

Combined with 5G's ultra-low latency and near-real-time response, the advances in speed and capacity also open the way to a far superior experience for customers using 5G networks across all application types — video calling, video streaming, gaming, interactions with devices in the connected home, and more. Again, developments are underway. For example, Samsung is working with Qualcomm to develop indoor 5G with small cells.

Within the 5G domain, these services and quality of customer experience will be managed and tailored by means of network slicing, which allows operators to horizontally slice their network resources and provide different characteristics (speed, latency, reliability, etc.) for different applications and services.

The challenges to monetizing 5G

Although the benefits offered by 5G services are substantial, operators' efforts to monetize the technology face some fundamental challenges. Traditionally, operators' revenues have been primarily consumer-driven. But generally speaking, the consumer pull that encouraged the rollout of 4G mobile services is likely to be much weaker with 5G. When 4G launched, many customers actively wanted the service, and the devices to deliver the services were already available from major players such as Samsung and Apple. With 5G, by contrast, consumer awareness is lower and most of the biggest players have yet to introduce upgraded handsets — all of which may result in a slower uptake.

There's a second obstacle: Customers will likely be reluctant to pay a premium for better service. Recent PwC research[5] shows that just one-third of Internet users would pay more for 5G technology — 33 percent would do so for 5G in the home, while 31 percent would do so on mobile. In terms of cost, consumers on average would be willing to pay an extra $5.06/month for 5G Internet service in the home and an extra $4.40/month for 5G Internet on mobile (see Exhibit 2). It's notable that more consumers say they're willing to pay a premium for 5G in the home than on mobile.

EXHIBIT 2
Average increase that U.S. consumers are willing to pay for 5G services

Home Internet	Mobile Internet
$5.06/month	**$4.40/month**

Source: PwC Strategy& analysis

There may be some segments, such as gaming, in which consumers will be willing to pay incrementally more for a better experience. But the path to this higher monetization has yet to be worked out. The main incentive for operators to move to 5G is generally to create more capacity and reduce their costs. But to achieve returns sufficient to justify their 5G investments, operators will need to look beyond selling broadband connectivity and target new types of use cases that are specifically enabled by 5G's unprecedented capabilities.

[5] Source: PwC, "The promise of 5G: Consumers are intrigued, but will they pay?" October 2018: https://www.pwc.com/us/en/advisory-services/publications/consumer-intelligence-series/promise-5g.pdf

To capitalize fully on these new use cases, operators must understand the nature of demand and the willingness of end-users and business partners to pay, and work out how the returns will be generated. They'll also need to harness powerful processing capabilities, such as edge computing and cloud computing, that will reduce the cost and enhance performance in applications such as VR and gaming.

For operators that can bring these elements together, a diverse set of 5G-specific use cases present themselves across both the consumer and business customer spaces. To name just two examples, on the consumer side there's great potential to deliver enhanced AR/VR experiences — and, more generally, as the range of wearables continues to explode, operators should help drive the growth and promotion of these devices. This is a particular focus for U.K.-based BT/EE, which foresees a long list of wearables becoming an integral part of the 5G experience. On the business side, 5G has huge potential in industries such as manufacturing, which is being targeted by AT&T and Samsung, working together.

Creating a road map

We believe there is a clear road map to success in the world of 5G. To navigate that world, companies must first gain clarity on the 5G-enabled services and experiences that consumers, businesses, and public agencies will want in the future. Then they must formulate their strategies for monetizing 5G; develop monetization models and required partnerships and platforms; decide on the use cases and service offerings that will fit that model; and, most important, ensure their capabilities are aligned with their chosen 5G "ways to play." Players who take all these steps successfully will be well placed to win in a 5G world.

> "The main capability gaps with 5G are around the availability and wide spread of devices and the availability of verticalized applications. We haven't yet been approached with any use cases or applications."
>
> **Senior executive for strategic initiatives at a major e-commerce site**

> Picking winners and losers among the vertical third-party 5G app providers is not going to be AT&T's goal. But we do have the connections and bandwidth that will enable us to bring any of those third parties to the table and into the discussion."
>
> **Robert Boyanovsky, Vice President, Enterprise Mobility, AT&T Business**

Ways to play: Emerging strategies for monetization

Operators' opinions are divided on ways to play and the underlying role they should aim to fulfill with 5G. Some want to be primarily providers of connectivity, acting as an enabler rather than focusing on creating vertically integrated solutions themselves. By contrast, others want to play a wider role across the ecosystem, becoming more involved in delivering vertical solutions to their customers.

But there is a consensus that telecom companies will not be creating the vertical 5G applications themselves — and that partnerships are the way forward if they are to win a share of the value generated from them. Carriers are also unanimous in their belief that operators should extract insights from their 5G networks and not just let 5G traffic pass across them. The resulting intelligence will be very useful for developing and optimizing many use cases. One of the key parameters to negotiate in forming partnerships is which parties have access to which data.

Focusing on capabilities

The reality is that the transition to 5G requires a significant departure from the way telecom companies have thought and operated in the past. To negotiate the transition successfully, operators need to define three elements: first, the services and use cases that consumers, businesses, and public agencies will value; second, the optimal way to play to monetize and create value; and third, the capabilities needed to succeed. This interrelationship is illustrated in PwC Strategy&'s Capabilities-Driven Strategy (CDS) framework (see Exhibit 3, next page).

A way to play that appears increasingly viable for generating value is selling 5G services to other businesses, which will then sell them as part of their offering to their own customers. This means expanding away from the traditional business-to-business (B2B) and business-to-consumer (B2C) business models by adding B2B2X — business-to-business-to-third-party. Under B2B2X, which encompasses both B2B2B and B2B2C, operators collaborate and share the rewards with B2B partners.

EXHIBIT 3
The Capabilities-Driven Strategy (CDS) framework

Source: PwC Strategy& analysis — see https://www.strategyand.pwc.com/cds/approach

> Telcos need to have a strong strategy that leads and drives the wider ecosystem, and they must be able to forge partnerships that are fast, innovative, and that enable them to implement real products on the ground. Vertical knowledge is a key challenge. It is hard to build in-house capability spanning all the verticals, so creating strong partnerships is the way forward."
>
> **Fotis Karonis, 5G Executive Advisor, BT Group**

Why focus on B2B2X?

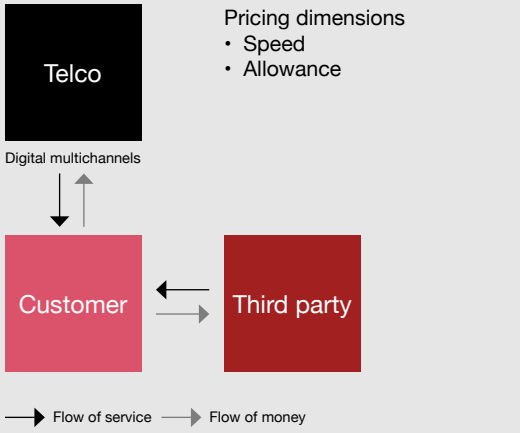
B2B2X represents a significant break with the recent past for operators. Consumers' response when presented with a plethora of over-the-top (OTT) services has dictated that telecom companies focus mainly on the type of business model illustrated in Exhibit 4. Under this model, commonly used for 4G services, the operator sells voice and data connectivity directly to end-users, who simultaneously contract separately with their chosen third parties to access services over that connection. For example, a user might buy a 10 GB data plan from the operator and a separate subscription to a video-streaming service such as Netflix or Amazon Prime.

But this pattern is now evolving: Some operators have started to partner with OTT service providers to bundle their service with connectivity subscriptions, sometimes with an explicit charge and sometimes without (for example, by making certain streams unmetered against the customer's data bundle). "With the improvements in network capabilities in the 5G era, customers can expect to enjoy more network services bundled with content provider services — including accelerated gaming — and the operator could offer its network service to the customer as part of that bundle," said a senior executive at an Asian Internet player. "So, as a content provider that is closer to the requirements of the customers, we could be the sales channel for the operator's network service."

In the 5G world, where the network technology allows a far greater range of functionality that can be monetized, telecom companies have many more opportunities to develop these types of collaborations with a variety of businesses and public agencies. We see three main options for how operators could monetize this greater functionality.

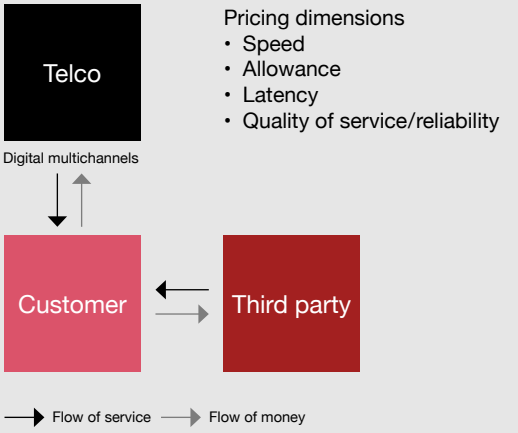
- **Connectivity provider — operator-led B2B or B2C:** The telecom company extrapolates the typical 4G pricing and bundling model by applying additional elements and innovation. This may involve adopting an "airline-type" approach, delivering a multitiered connectivity service to both B2C and B2B customers based on the level of package selected by the customer (see Exhibit 5).

EXHIBIT 4
Typical 4G business model



Source: PwC Strategy& analysis

EXHIBIT 5
5G "connectivity provider" model



Source: PwC Strategy& analysis

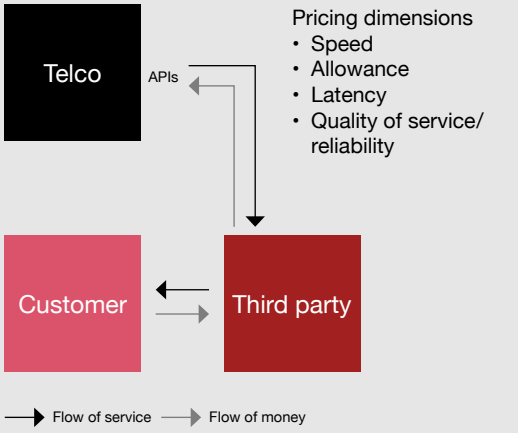
To implement such a model, an operator could offer different speeds, quality-of-service levels, and pricing levels to match each customer's needs and budget. A variation on operators' traditional approach, this tactic runs a risk of becoming overly complex for end-users, who may struggle to understand the value of a plan whose pricing is defined on the basis of technical functionality (such as latency and reliability) rather than simply speed and data allowance.

- **Solution enabler — third party–led B2B2X:** A third party such as a cloud provider or video-streaming service incorporates 5G connectivity sourced from the operator as part of its own offering. The third party markets the bundled offering to its customers, receiving revenue through either direct payment or some other monetization model, while paying the telecom company for the network usage and variable functionality in the form of either a network charge or a revenue share. The third party effectively buys a "slice" of the operator's 5G network capacity for its own use, and the interface between them is managed and enabled through application programming interfaces (APIs) (see Exhibit 6). "We don't need to develop every capability in-house, especially if they are core to other sectors," notes Vishal Dixit, director of strategy and wholesale, Vodafone U.K. "We recently announced a global strategic partnership with IBM focused on cloud and hosting. We will jointly go to market, with Vodafone leading on connectivity and IBM leading on verticalized solutions."

- **Solution creator — operator-led B2B2X:** An operator creates new digital propositions by bundling third-party products and services with its core connectivity and markets the bundled solution directly to its own customers (see Exhibit 7). Telecom companies might use this approach to create vertically integrated solutions that bundle third-party offerings, such as AR/VR services and equipment, with access to their 5G networks.

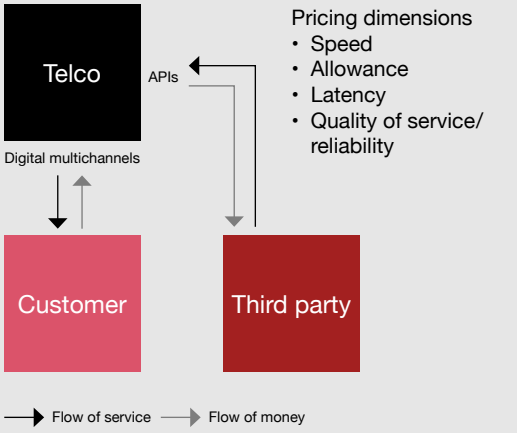
  Under this model, a telecom company could offer its customers a data plan that comes complete with VR gaming, including a VR content subscription and a headset, at no extra cost. A number of operators, including Vodafone, already make commercial agreements with OTTs to buy their services wholesale and resell them to consumers — and they are looking at how this

EXHIBIT 6
5G "solution enabler" model



Source: PwC Strategy& analysis

EXHIBIT 7
5G "solution creator" model



Source: PwC Strategy& analysis

type of model could be enhanced to build in 5G functionality, allowing customers to pick and choose from a menu of OTT products and receive a discount depending on their selection. New collaborative monetization models will undoubtedly be invented as the possibilities of 5G become clearer to the market. Operators have the opportunity to be proactive in scaling up and industrializing their partnership-based businesses.

The availability of these widely varying business and monetization models will enable operators to benefit from greater choice and flexibility in terms of their services and pricing, and will spread value around more evenly into different areas of the ecosystem. Across all the models, operators and their partners will tailor their service offerings to capitalize on emerging technology trends such as the IoT, AI, drones, robotics, smart cities, and Industry 4.0.

> Telcos are keen to offer our branded devices — they've been investing and focusing on acquiring and developing content for them. So a B2B2C VR model will be a good mechanism to distribute and package VR content more attractively. We want 5G to unlock the uptake of high-quality but cheaper all-in VR solutions."
>
> **CEO of a virtual reality hardware company**

Selecting the optimal business model

To help operators and other participants in the quickly expanding 5G ecosystem identify the most suitable business model — connectivity provider, solution enabler, or solution creator — for each specific use case, PwC Strategy& has developed a matrix of five criteria for scoring potential use cases.

Third-party brand strength	When the operator's third-party partner in a potential business model has a very strong brand in relation to the target use case, the third party has an advantage in owning the customer relationship. For example, game-streaming service Twitch would have stronger brand strength among the serious gamer customer segment for an enhanced 4K gaming service than a telecom operator.
Third-party market penetration	If the prospective third-party collaborator already has a high market penetration in the sector where the use case is located, the situation also points to that third party owning the customer relationship. For example, a specialist engineering solutions provider with strong penetration among transit authorities would be better placed than an operator to roll out a dynamic traffic control system.
Alignment with the operator's internal capabilities	If the use case is closely aligned with its existing capabilities, the telecom company has a greater ability to own the customer relationship and secure a higher proportion of revenue share. For instance, an operator's existing strengths in distribution, service delivery, billing capabilities, and physical presence may mean it's well placed to sell AR/VR experiences over 5G to consumers and businesses. This points to the solution creator option for the business model.
Operator brand relevance	The higher the relevance of the telecom operator's brand to the use case, the greater the operator's ability to own the customer relationship and claim a bigger share of revenues. For example, an industrial OEM may have a stronger brand than a telecom operator for selling an automated, real-time controlled production solution to manufacturers. In this case, the telecom company should probably aim to partner with and support the OEM as a solution enabler, rather than expecting to take the lead itself.
Associated usage intensity or dependence on 5G	When a use case has a high intensity of 5G usage or is critically enabled by 5G, it may give the operator a greater ability to own the business model and take a bigger slice of the resulting revenue. For example, for VR headset distribution business models, operators are well placed to act as solution creators because of not just their physical retail presence and device financing but also their ability to optimize network slices for graphics-heavy gaming requiring ultra-high 5G speeds and cloud-based edge computing for low latency rendering.

By scoring a use case against each of these criteria, an operator can determine which 5G B2B2X business model is most suitable. In some instances, it's possible that multiple business models might work for a given use case. In that situation, operators' capabilities and brand perception are likely to be the deciding factors. This means individual operators in a similar market may have different levels of success with the new 5G business models, depending on how well they establish and execute their way-to-play strategy.

Indicative use cases

Here are three potential use case studies within the three families identified earlier.

Family

1

Extreme mobile broadband and fixed wireless access

Example use case: Consumer and business "VR/AR to anywhere" via 5G mobile

- The fast connectivity and high capacity provided by the 5G network allow customers to access content and communicate in real time using VR and AR.
- Data-hungry applications are highly reliant on the 5G technology that can drive the uptake of these services, even if the provider offering them does not have an established brand in the VR/AR market.
- The operator has the right marketing reach and brand perception to include VR/AR wearables as part of its portfolio, using brick-and-mortar stores as experience centers to promote and bundle the VR/AR offerings with smartphones and tablets.
- The business model criteria matrix points to the solution creator business model, with the telecom company taking the lead.

> We've set up America's first 5G manufacturing-focused innovation zone jointly with AT&T. There are a wide variety of use cases in manufacturing, with safety and security high on the list."
>
> **Alok Shah, Vice President, Networks Strategy, Samsung Electronics America**

Family

2

Critical real-time communication

Example use case:
Smart manufacturing

- A joint proposition between a machinery manufacturer and telecom operator enables owners of manufacturing facilities to use 5G to connect sensors, machinery, and robotics via the IoT.
- The solution enables greater automation, together with remote control and monitoring of processes and product quality.
- The machinery manufacturer's large installed base among the target customers points to the solution enabler role for the operator.

Family

3

Massive machine-type communication

Example use case:
Predictive maintenance on a remote oil and gas pipeline

- Drones equipped with cameras and 5G connectivity constantly scan the pipeline for leaks, damage, or attacks, and transmit the data collected to the company's central control system.
- The drone data is supplemented by 5G-connected sensors on the pipeline, continuously sending real-time condition data on topics such as stress, temperature, and pressure.
- Most of the routine maintenance in inhospitable areas can be handled remotely by drones, with human teams sent in only when necessary.
- The strength of industry-specialist field service providers' brands in the oil and gas maintenance market means the business model matrix points to the solution enabler role for the telecom company.

Capabilities for success in a 5G world

In combination with the right monetization models and customer-relevant use cases, telecom operators will need a number of commercial, operational, and technical capabilities to ensure they generate an appropriate return on their 5G investments. Four capabilities will be especially critical.

The right 5G network

As the 5G network is built, it will be vital to ensure sufficient spectrum across various bands, introduce automation and simplification to optimize operation, and identify how to deploy the network efficiently at a specific level of densification (i.e., with enough small cells to provide a high-quality service). Will network sharing reduce the cost to deploy 5G? And if so, which elements should be shared? Network sharing is one way for operators to reduce costs and fast-track deployment, as Vodafone and O2 are doing in the U.K.

Commercial innovation

Operators will need the ability to create or enable new services, pricing models, and commercial partnership agreements in days or hours rather than weeks or months, while also leveraging data analytics and AI to ensure that their services add value for customers and ecosystem partners. They must ensure that their customer service solutions can handle the increased sophistication needed for customers using 5G applications.

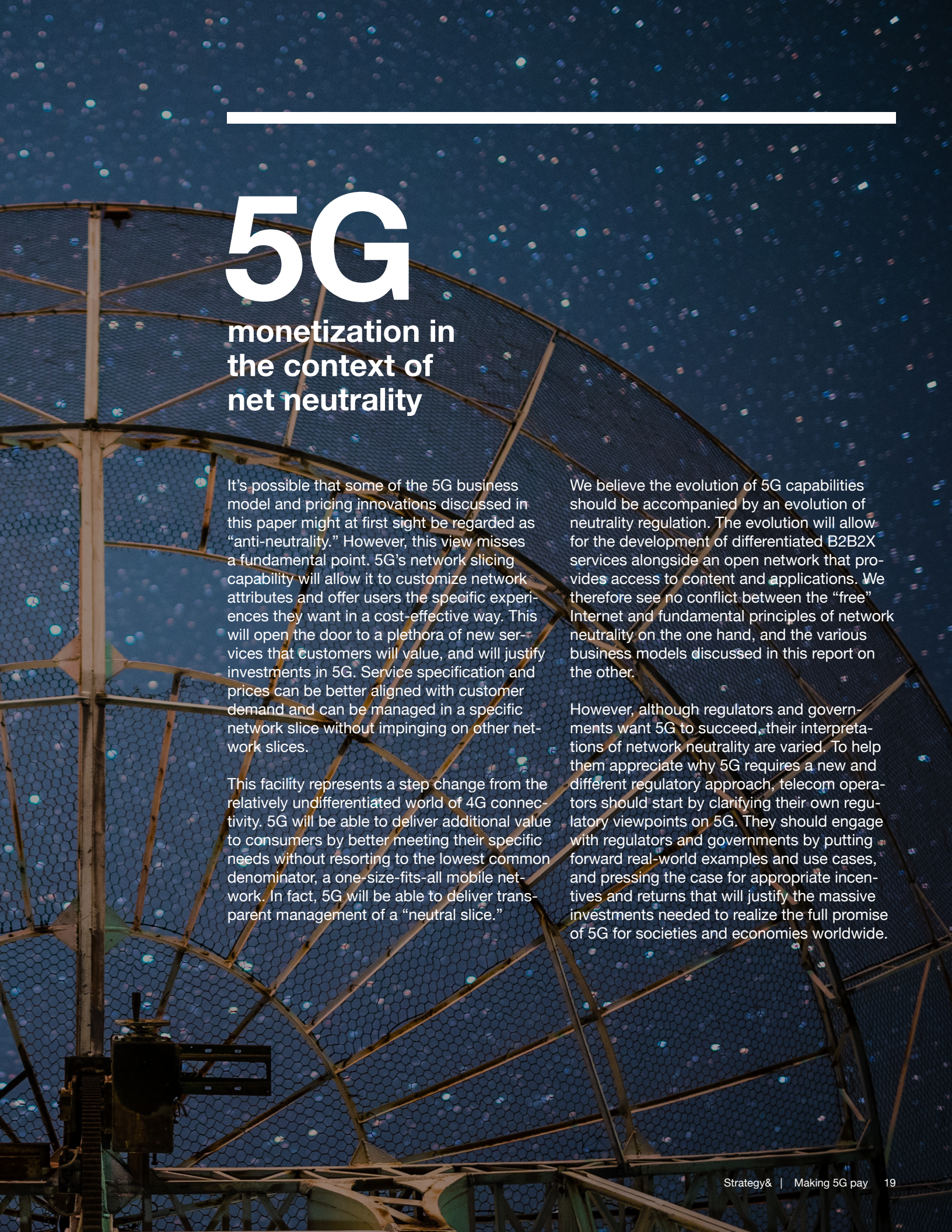
Vertical industry engagement

Operators must develop advanced capabilities in prototyping vertical 5G use cases and demonstrating the benefits. Other important steps will include establishing vertically focused product management, sales, and marketing functions, as well as optimizing the CRM, solution sales platforms, order-to-fulfillment, and post-activation support capabilities.

A culture of mass collaboration

An ability to forge close and trusted partnerships with OEMs, OTT players, and content providers will be vital to additional monetization of 5G. This will require a collaborative culture put into effect through a well-developed partner engagement and relationship-building capability, coupled with the ability to link into third-party solution catalogs, jointly create bundled products, and articulate each value proposition to partners, customers, and the wider market.

The relative importance of each of these capabilities will depend on the way to play that an operator chooses and on the business models used to execute that strategy. Telecom companies that adopt a solution enabler or solution creator way to play will require vertical industry engagement and a culture of mass collaboration.



5G monetization in the context of net neutrality

It's possible that some of the 5G business model and pricing innovations discussed in this paper might at first sight be regarded as "anti-neutrality." However, this view misses a fundamental point. 5G's network slicing capability will allow it to customize network attributes and offer users the specific experiences they want in a cost-effective way. This will open the door to a plethora of new services that customers will value, and will justify investments in 5G. Service specification and prices can be better aligned with customer demand and can be managed in a specific network slice without impinging on other network slices.

This facility represents a step change from the relatively undifferentiated world of 4G connectivity. 5G will be able to deliver additional value to consumers by better meeting their specific needs without resorting to the lowest common denominator, a one-size-fits-all mobile network. In fact, 5G will be able to deliver transparent management of a "neutral slice."

We believe the evolution of 5G capabilities should be accompanied by an evolution of neutrality regulation. The evolution will allow for the development of differentiated B2B2X services alongside an open network that provides access to content and applications. We therefore see no conflict between the "free" Internet and fundamental principles of network neutrality on the one hand, and the various business models discussed in this report on the other.

However, although regulators and governments want 5G to succeed, their interpretations of network neutrality are varied. To help them appreciate why 5G requires a new and different regulatory approach, telecom operators should start by clarifying their own regulatory viewpoints on 5G. They should engage with regulators and governments by putting forward real-world examples and use cases, and pressing the case for appropriate incentives and returns that will justify the massive investments needed to realize the full promise of 5G for societies and economies worldwide.

Act now

As 5G services are launched, the most immediate use cases in the short to medium term will likely be in fixed wireless access broadband, extreme mobile broadband, manufacturing, and support of emergency services. But these will just be the start, as new experiences and applications enabled by 5G emerge. “5G will give rise to new business models, which will become more clear after a period of commercial and technological innovation,” said VIshal Dixit, director of strategy and wholesale at Vodafone U.K. “To take a leading role in this evolution, operators need to gain experience in platforms and platform business models, add non-telco sector knowledge to their DNA, and hire people from diverse backgrounds to build a more diverse, future-focused talent base.”

For operators, it will be imperative to define the way to play, looking holistically at the potential business models and use cases in the 5G services market. This in turn will dictate the capabilities they’ll require. To monetize 5G efficiently and effectively, we believe operators will need to ramp up and excel in the use of B2B2X business models applied to the right use cases. Having defined their way to play, operators should build or strengthen the four key capabilities set out above: the right 5G network, commercial innovation, vertical industry engagement, and a culture of mass collaboration. They should appreciate that 5G is not the answer on its own. For full monetization, 5G needs to be coupled with other technological capabilities such as edge computing, cloud computing, AI, and automation — and it will demand real insight generation, rather than just data collection and transmission from A to B.

Whatever way to play they choose for a 5G world, few operators looking to take these steps will have all the required capabilities readily available to them internally. So they likely will need partners, including entrepreneurs with the ambition to invent new commercial models using 5G. It is from this mutual dependency that the possibility for operators to fully monetize 5G will arise.

Strategy&

Strategy& is a global strategy consulting business uniquely positioned to help deliver your best future: one that is built on differentiation from the inside out and tailored exactly to you. As part of PwC, every day we're building the winning systems that are at the heart of growth. We combine our powerful foresight with this tangible know-how, technology, and scale to help you create a better, more transformative strategy from day one.

As the only at-scale strategy business that's part of a global professional services network, we embed our strategy capabilities with frontline teams across PwC to show you where you need to go, the choices you'll need to make to get there, and how to get it right.

The result is an authentic strategy process powerful enough to capture possibility, while pragmatic enough to ensure effective delivery. It's the strategy that gets an organization through the changes of today and drives results that redefine tomorrow. It's the strategy that turns vision into reality. It's strategy, made real.

strategy&

Part of the PwC network

www.strategyand.pwc.com