



Optimizing the 5G opportunity in Europe



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Executive summary

Telecommunications infrastructure and services will play a pivotal role in the digital economy for decades to come. In Europe, mobile technologies and services accounted for 3.3% of regional gross domestic product (GDP) in 2017; this contribution is expected to surpass 4% by 2022.¹

5G will play a critical role in this new era of “intelligent connectivity,” offering the chance to recast customer value propositions, accelerate industrial transformation and reinvigorate the digital society.

However, a positive outlook for the European mobile industry is by no means certain. Fragmented market structures, uncertain demand scenarios and ongoing regulatory complexities present substantial obstacles. Meanwhile, internet of things (IoT) services currently account for a low single-digit proportion of telco revenues.

The following insights present a new perspective on how operators should prepare themselves to take advantage of 5G. Vision should translate into action and new competencies must come to the fore, if telcos are to maximize their return on investment (ROI). More robust digital transformation road maps, improved dialogue with stakeholders and more meaningful customer interactions will all have a vital role to play.

01

5G: the European opportunity

1.1. Mobile at the heart of a digital continent

The European telecoms industry stands on the edge of an exciting change. The region boasts the world’s highest rate of mobile penetration and this is set to increase further, from 85% of the population in 2017 to 88% by 2025.²

European governments and policymakers recognize 5G’s ability to create positive externalities that can drive productivity growth across traditional industries. This is recognized in regional 5G targets. For instance, the European Union (EU), in its 5G action plan, calls for major roads and railways to have uninterrupted 5G coverage by 2025.³

At a national level, 5G trials are well underway in a number of countries, many with a focus on leveraging its potential to create new economic centers. Policymakers also recognize the need for greater levels of regulatory certainty. The EU’s 5G action plan, for example, emphasizes the importance of coordinated spectrum release, testing and trials alongside a pro-investment regulatory environment at large.

1.2. 5G for operators: the reassertion of control

5G’s credentials as a transformational technology are strong. Beyond improved data rates, ultra-low latency will bring new levels of network responsiveness. 5G can support a hundredfold increase in connected devices per unit area, redefining what’s possible in IoT, while network slicing enables highly differentiated services at specific locations.

Other emerging technologies are set to complement 5G. Mobile edge computing can unlock more efficient data transfer and perimeter security, helping operators to relieve network congestion, and realize low latency. Network function virtualization (NFV) will support more dynamic management of network resources, aiding operating expense (OPEX) and capital expense (CAPEX) reductions in the process.

In this light, 5G paves the way for new paradigms of network operation and service creation. By leveraging analytics, artificial intelligence (AI) and machine learning in conjunction with 5G, operators can offer a range of location- and context-aware services across millions of end-points, backed by a significant change in network control, service quality, and personalization.

1. “5G to power economic growth in Europe, finds GSMA study,” GSMA, 18 September 2018, ©2019 GSM Association.

2. “5G to power economic growth in Europe, finds GSMA study,” GSMA, 18 September 2018, ©2019 GSM Association.

3. “5G for Europe: An Action Plan,” European Commission, 14 September 2016.

As a result, operators can play a more assertive role in the industry value chain. No longer relegated to the role of a dumb pipe provider, operators' more intimate relationship with their networks will help them pave the way for new forms of customer experience and service monetization.

1.3. A chance to reignite the sector growth story

Despite mobile's role as a productivity driver, operators financial performance in Europe has underwhelmed in recent years. Regulatory burdens remain pronounced, competitive intensity is increasing and new growth stories in IoT have, thus far, been slow to emerge.

Looking ahead, market conditions are set to remain challenging, intensified by macroeconomic pressure as Eurozone GDP growth slows, from 2.6% in 2017 to 1.9% in 2018 and 1.0% in 2019.⁵

Other regions are already ahead of Europe in terms of 5G commercialization, reflecting the earlier development of 5G strategies predicated on technology leadership. Industry forecasts suggest that 5G adoption rates in Europe will lag other developed regions over the next five years.

Figure 1: European telcos' share performance (2008-18)⁴

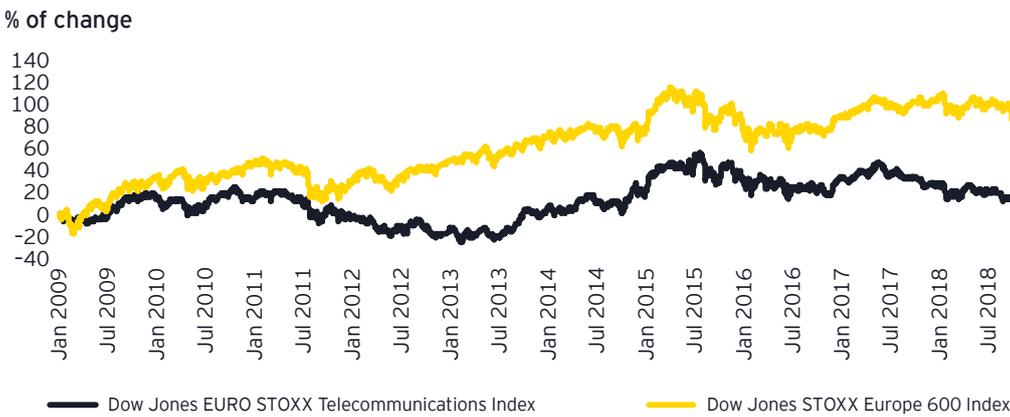
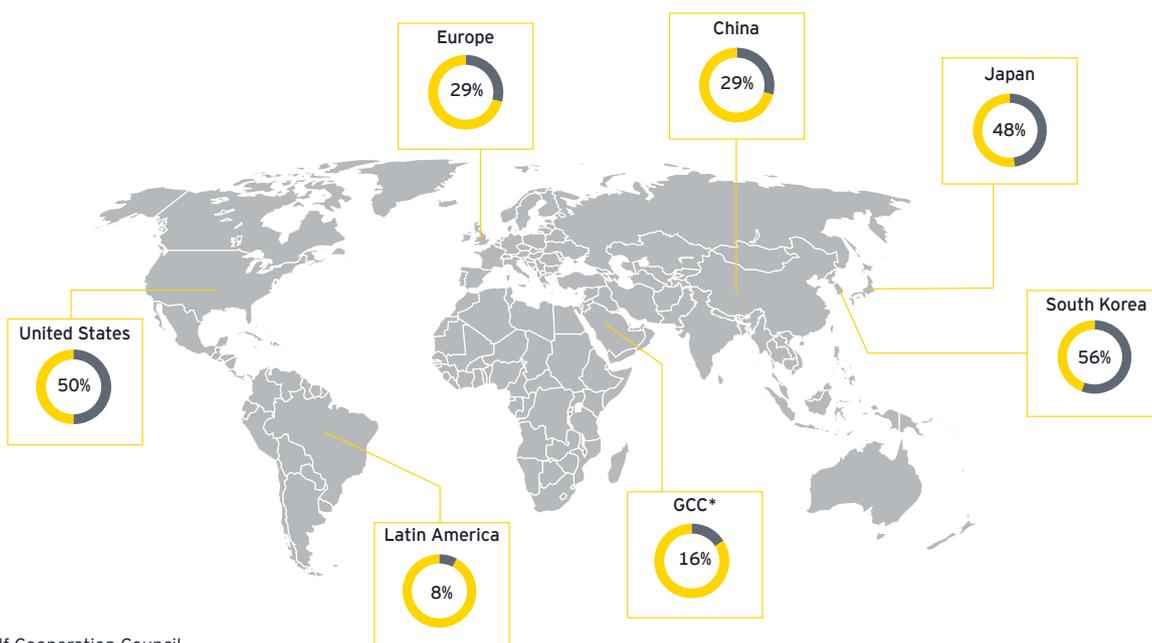


Figure 2: 5G as a proportion of total mobile subscriptions in 2025⁶



*Gulf Cooperation Council

4. CapitalIQ; EY research.

5. "OECD sees global growth slowing, as Europe weakens and risks persist," OECD, 6 March 2019, ©2019 OECD.

6. "The Mobile Economy 2019," GSMA, February 2019, ©2019 GSM Association.

02

Five key objectives for operators

2.1. Place 5G at the heart of your transformation agenda

While much is made of the global race to 5G launches, the rollout of new networks is not an end in itself. 5G upgrades are not a “big bang” moment; they will deliver new capabilities on an incremental basis. While 5G’s scope to transform service propositions is clear enough, its ability to transform the operator business from within is just as important.

- ▶ **Prepare for a new network paradigm, but don’t forget 4G:** New 5G capabilities, such as network slicing, in tandem with small cell-led network densification, will alter traditional notions of coverage expansion, service innovation and customer experience. Nevertheless, 5G radio access network (RAN) investment is only likely to overtake 4G RAN spend in the early 2020s, with phased 5G upgrades allowing telcos to absorb capital expense requirements.

Enhanced 4G infrastructure for wide area coverage will still be critical in the medium term, while ongoing deployments of low-power wide-area networks will fuel IoT service propositions before 5G-based IoT capabilities take center stage. The decommissioning of legacy standards will also figure prominently in network strategies over the next decade.

- ▶ **Align 5G migration with related digitization activities:** 5G represents a route to more efficient and agile service provision beyond gains in low latency and capacity per se. Complementary investment in NFV and software-defined networks (SDN) can bring long-term CAPEX and OPEX savings, while aiding greater network automation, and operators should consider how best to harness this as part of their migration to 5G. A holistic perspective is paramount, since the shift toward virtualized platforms is expected to take place gradually and at varying rates across the mobile network estate.

The role AI and analytics can play at the network level will also gain further prominence as 5G takes hold. This requires a holistic approach to emerging technology deployments that prize their mutually reinforcing benefits.

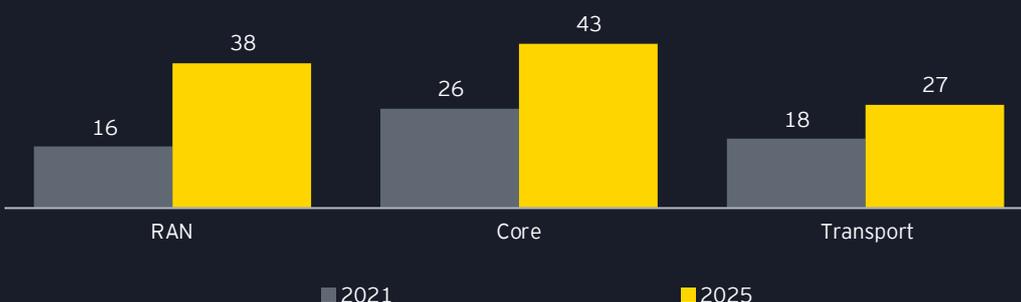
- ▶ **Embrace a new era of organizational design and effectiveness:** 5G’s impact on the operating model also merits attention. The increasingly blurred relationship between hardware and software is prompting more demand for software skills alongside a closer alignment of network and IT departments.

The move to 5G has profound implications for workforce design. Deeper collaboration between network operations, IT and data center staff will enable better visibility of applications, services and networks across the business, while closer alignment of network and product development teams will help telcos fashion new 5G use cases.

Reskilling is also essential as operators migrate to 5G. Sales teams must interact with enterprise customers in new ways, focusing on the business outcomes enabled by 5G-based IoT. This is vital if telcos are to move beyond their legacy role as connectivity-only providers.

Ultimately, 5G network investment is about much more than differentiation through network quality. It will play a pivotal role in the long-term transformation of the telecoms business. Service providers that recognize 5G’s potential to revitalize their organization will be best placed to maximize their ROI over the next decade.

Figure 3: Virtualization as a proportion of global mobile CAPEX by equipment category
Virtualization as % of mobile CAPEX



2.2. Engage with policymakers and regulators early and often

Policymakers and regulators will have a crucial say in building a healthy investment environment for 5G. This is no easy task: the telecoms sector has historically been heavily regulated, while mobile technology is now coming into sharper focus as part of national industrial strategies.

- ▶ **A new landscape of mobile industry oversight is coming:** 5G is spurring a closer relationship between the mobile industry and governments who are keen to leverage the productivity benefits of new digital infrastructure. State funding for 5G test beds and support for 5G-centric public-private partnerships reflect this growing intimacy between the public sector and the mobile industry.

Yet, the supply-side landscape is not without its complexities. Spectrum release is an increasingly intricate exercise. The phased release of multiple bands to support various use cases will take many years. Disputes over spectrum auction design may stretch spectrum release timeframes still further. Accepted notions of spectrum caps may also give way to new concepts of spectrum pooling as network sharing regulations evolve in new ways.

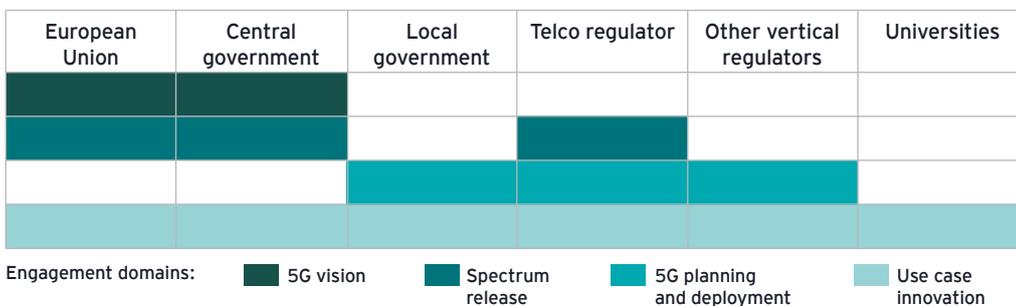
- ▶ **Fixed and mobile infrastructures will become more interdependent:** Policymakers recognize the convergence opportunities between fiber and 5G in terms of greater choice of connectivity options for consumers and fiber’s critical role in mobile backhaul. Looking ahead, this could pave the way for unified market reviews designed to stimulate complementary investments in both fixed and mobile infrastructure.

Yet, achieving more holistic regulatory frameworks is by no means straightforward. Both telcos and regulators will be keen that regulatory stability and clarity do not suffer as digital infrastructure policies become more holistic. More granular challenges, such as ensuring that dark fiber regulation supports 5G backhaul, also deserve focus.

- ▶ **Engage with a wider range of stakeholders:** The range of public sector actors with an interest, and role, in 5G deployments will widen. Local governments will have a greater say in network planning and site access, while regulators across different industries are already engaging with each other in order to maximize the industrial transformation heralded by 5G. Meanwhile, 5G’s impact on wireless radiation is attracting growing attention. This, in turn, poses new challenges to national and regional regulators to mitigate health and environmental concerns. Finally, universities are playing an increasingly important role in trials of new 5G use cases across a range of industries.

With all this potential change, operators must take their destiny into their own hands. Engaging early and often with a wider range of public sector stakeholders can only aid the development of more workable policies and regulatory stipulations. As such, proactive communications and ongoing dialogue are essential.

Figure 4: Public sector engagement domains for operators⁸



8. Source: EY analysis.

2.3. Adopt new positions in a fluid and fast-changing value chain

New business models and value chains are key to the 5G opportunity. As operators consider new industrial use cases for mobile, there is much more scope to go beyond the role of a mere connectivity provider. Yet, the potential for disruption is also real. For instance, various industry actors, such as technology specialists and industry vertical leaders, may look to act as 5G mobile virtual network operators (MVNOs), taking advantage of new capabilities in network slicing. The advent of private 5G networks could even see operators fully disintermediated from the connectivity layer.

- ▶ **Take advantage of new retail and wholesale opportunities:** Various go-to-market strategies are available to telcos. Incumbents will sensitize their existing retail and wholesale businesses to 5G, with fiber alternative network providers or tower operators looking to broaden their addressable markets. Mobile-centric operators and cable companies will focus on enhancing their consumer retail propositions. New 5G offerings, such as fixed wireless access, can be co-opted in various ways, as an extension of broadband capabilities in remote regions or as a tool to disrupt the fixed broadband market in urban areas. Critically, 5G can recast IoT offerings in multiple ways.
- ▶ **Adapt to changing market structures:** Efforts to reduce network duplication will evolve further. 5G could signal a more localized approach to “neutral host” networks in order to support smart city services. Meanwhile, the rise of nationwide 5G wholesale networks cannot be discounted. 5G also provides scope for more nuanced infrastructure sharing

arrangements depending on the network layer or geographic area. With all this potential for change, telcos should take care to revisit legacy infrastructure sharing arrangements to ensure that they are fit for purpose.

- ▶ **Pre-empt new disruptive scenarios:** 5G capabilities also drive new disruption risks. Network slicing, for example, allows service providers to provide localized network capability supported by differentiated service level agreements. New business models to support localized networks could prove fundamentally disruptive, especially if private 5G networks provide an alternative to operator-controlled network slicing. Technology vendors and industry vertical leaders may potentially seek more control of 5G connectivity, undermining operators’ growth ambitions in the process.

Mitigating the disruptive potential of new 5G market structures will be essential. Operators should consider how best they can protect and extend their value chain positions – vertical industry needs, the scope for horizontal partnerships and regulatory frameworks will all inform the decisions they make. The prospect of rising capital expenditure will demand extra consideration of asset-light strategies, where infrastructure sharing and co-investment take on a new prominence as routes to greater CAPEX efficiency.

Figure 5: Indicative 5G service provider strategies⁹

Asset-heavy	Integrated and tower operators	<ul style="list-style-type: none"> ▶ Consumer and enterprise ▶ Heavy investment in mobile RAN, fiber and virtualized platforms ▶ Localized enterprise capabilities via network slicing 	Increasing disruptive potential for telcos 
5G MNO*	Mobile-centric operators and cable companies	<ul style="list-style-type: none"> ▶ Consumer ▶ High-quality network for consumers ▶ Fixed wireless access (FWA), pay-TV and augmented reality propositions in focus 	
5G MVNO**	Operators, technology specialists and industries	<ul style="list-style-type: none"> ▶ Enterprise ▶ Customized applications and analytics-as-a-service ▶ Integration with industrial use cases 	
Private 5G provider	Operators, technology vendors and industries	<ul style="list-style-type: none"> ▶ Enterprise ▶ Highly-secure and localized industrial use cases ▶ Licensed or unlicensed spectrum ▶ Alternative to network slicing 	

*Mobile Network Operator
 **Mobile Virtual Network Operator

9. Source: EY analysis.

2.4. Take a selective and phased approach to monetizing new use cases

5G’s ability to enable new use cases is not in question. Beyond the consumer connectivity market, 5G can catalyze various industry-specific use cases, from autonomous transport to smart buildings and remote surgery. Yet, circumspection is important: while the field of innovation is wide, operators should take a phased and selective approach to service innovation, and revenue diversification.

- ▶ **Sophisticated 5G use cases will take time to mature:** Game-changing 5G use cases will not appear overnight. Fully autonomous vehicles will not become commercially available for many years; remote surgery delivered using robots is also in a very nascent phase. A number of factors, from data protection regulation to the burden of legacy IT within specific industries, will mean that the road map to game-changing innovation is necessarily incremental.
- ▶ **Enhanced mobile broadband offers initial upside:** Operators should bring realistic expectations to bear on their timelines for proposition development. Enhanced mobile broadband will act as the first large-scale 5G use case – with improved capacity in densely-populated areas, and fixed wireless access in suburban and rural areas coming to the fore – ahead of innovations in augmented reality content. While 5G-based IoT unlocks limitless potential for industrial transformation, direct-to-consumer services will still be vital in the near term.

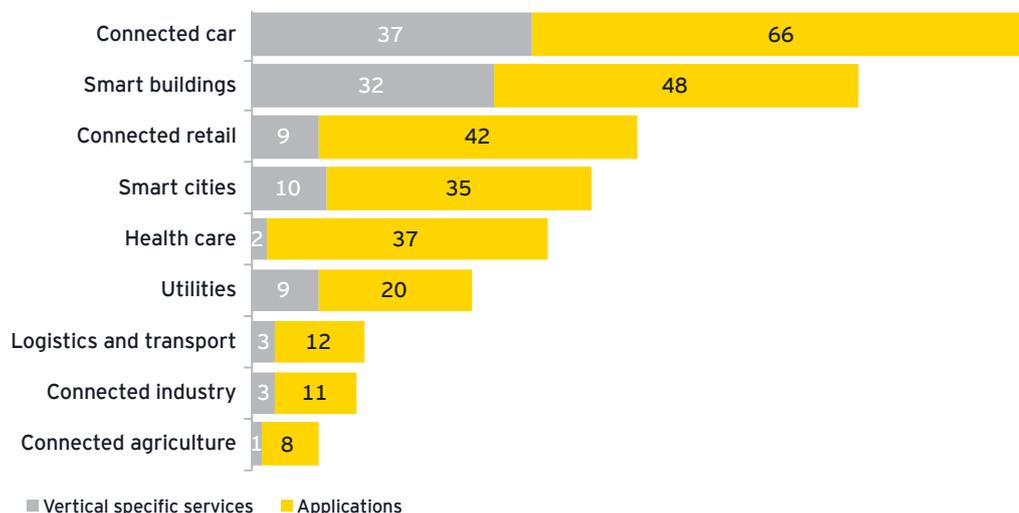
- ▶ **Build a balanced view of 5G-enabled IoT:** As operators leverage 5G in the IoT, careful value chain positioning is essential. Devices, platforms and applications account for the majority of IoT revenues, well ahead of straightforward connectivity. Yet, the efforts of telcos to move beyond a basic bandwidth play should be cautious. The demand for higher-value connectivity via network slicing, ecosystem complexity and willingness to partner will vary from industry to industry.

By focusing on use case clusters, operators may be able to unveil hidden adjacencies that cut across different industry domains. The ability to exploit these can strengthen the business case for both network investment and service customization, ultimately enabling them to scale their propositions more rapidly.

While considering 5G’s role as a catalyst for their IoT strategies, operators should not overlook its role in serving existing use cases. The successful introduction of 5G – with a focus on consumer connectivity and content – will hinge on effective refinements to existing 4G-based value propositions.

Figure 6: IoT market size by use case category¹⁰

Value in €b



10. Machina Research; EY analysis.

2.5. Reboot your relationships with enterprises and industry verticals

Previous mobile upgrade cycles have been consumer-driven. The arrival of 4G coincided with the advent of touch screen smartphones. However, 5G’s promise is predicated on its ability to transform entire industries. For this to happen, telcos should overhaul their enterprise relationships. Customized solutions for industry verticals provided in conjunction with partners will come to the fore, and sales teams must focus on more consultative dialogue if they are to unlock new forms of enterprise demand.

- ▶ **Demystify 5G use cases and benefits for businesses:**
5G is much more than a new wave of mobile infrastructure that enables faster connectivity delivered to more end points – it is fundamentally transformational and disruptive. Cloud computing and storage are now entering the very fabric of business processes, and 5G can build on this, helping organizations unlock new horizons in digital transformation. Explaining the true business value of 5G, and the role that telcos and their partners can play will allow enterprises to invest with confidence and ensure that 5G becomes a core part of overarching business strategy in years to come.

- ▶ **Understand your customer – and your customer’s customer:**
Operator-led dialogues that focus on the legacy attributes of corporate mobility, such as the total cost of ownership or workforce productivity, are likely to understate the potential of 5G – and limit its potential to deliver top- and bottom-line benefits. Providers that can develop more granular 5G propositions sensitized to vertical needs will be best placed to win the hearts and minds of their corporate customers in the future.
- ▶ **Come closer to the enterprise transformation agenda:**
Organizations investing in 5G are looking for better business outcomes for the next decade and beyond. This requires telcos to move beyond their historic role as mere connectivity suppliers. Engaging in consultative dialogue that positions 5G within the broader context of enterprise transformation is vital. Telcos should articulate 5G’s relationship to other emerging technologies while alleviating concerns regarding cybersecurity and integration with existing technologies.

With 5G, operators can take on new roles as both technology distributors and information-centric service providers. Yet, this can only happen if they engage more productively with their enterprise customers. The technology push of the past should give way to the business outcome of the future.

Figure 7: UK enterprise attitudes to 5G¹¹

Question: What are the most critical concerns informing your organization’s view of 5G? (Please select three.)



11. “Energizing the enterprise journey to 5G and IoT,” EY UK LLP, February 2019, ©2019 EYGM Limited.

03

How EY can help

We have a range of capabilities that can help operators maximize the vast potential of 5G. From digital transformation professionals that can support the internal digitization agenda, to deep functional knowledge in regulation, cybersecurity, business modeling and transactions, EY can act as a trusted partner to the telecoms industry as the 5G revolution comes of age.

5G strategy planning and execution

- Use case selection and development
- Network deployment and decommissioning
- Partner selection and go-to-market strategies

Create new services, new infrastructure and new partnerships.

Value creation through strategic portfolio management

- Strategic portfolio review
- Deal origination, valuation and diligence
- Merger integration
- Infrastructure sharing, spin-off and outsourcing

Optimize your service portfolio and infrastructure position.

Technology, people and process excellence

- Value-adding AI, analytics and automation
- Organizational redesign and change management
- Enhanced data protection and cybersecurity

Ensure organizational outperformance lies at the heart of your 5G journey.

Trust-driven stakeholder engagement

- Regulatory scenario planning
- Spectrum auction management
- Risk and compliance guidance
- Public sector engagement

Negotiate an increasingly complex regulatory environment.

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