

Envisioning 5G-enabled futures: helping enterprises turn imagination into reality

EY Reimagining Industry
Futures Study 2021



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About this study

The Reimagining Industry Futures Study 2021 is an online survey of 5G perceptions among 1,012 enterprises worldwide, conducted in February and March 2021, updating a survey carried out in 2020. Respondents were drawn from multiple industry verticals and geographies, with only the responses from those who self-selected “moderately knowledgeable” or above about internet of things (IoT) / 5G initiatives within their organizations, included in the results.

The questions explored enterprise executives’ behaviors, attitudes and intentions toward emerging technologies, with a specific focus on IoT and 5G-based IoT. Drawing on the survey results, this report provides additional insights and recommendations on both the current and future state of enterprises’ usage of 5G-IoT and their evolving relationships with 5G-IoT providers.

Figure 1:
Survey respondents split by location and primary industry

Question:
Where are you located?

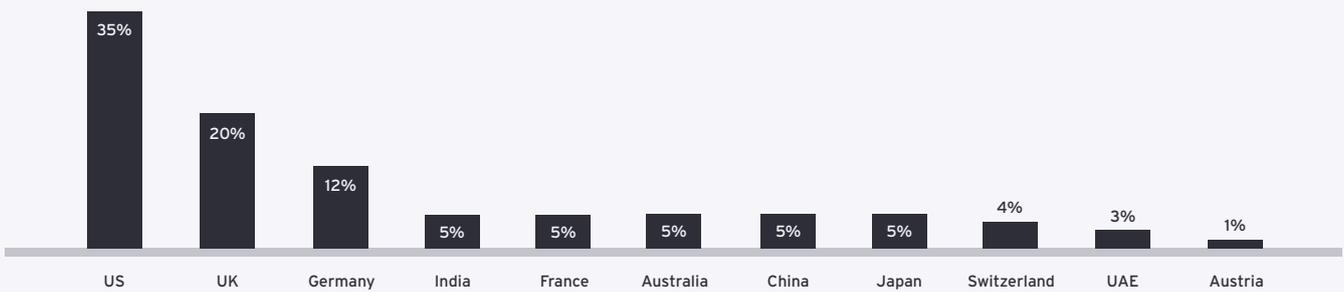
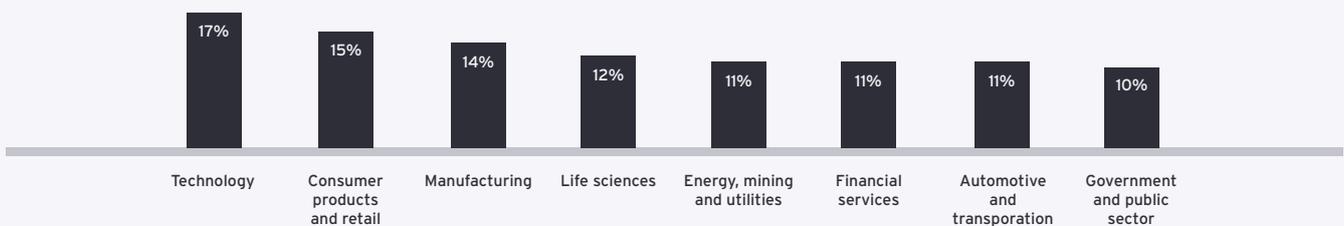


Figure 2:
Primary industry of respondents

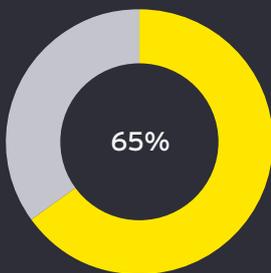
Question:
Which of the following best reflects the primary industry of your organization?



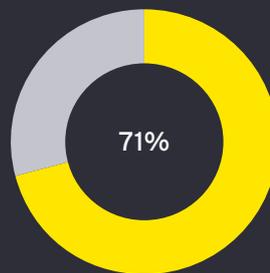
Executive summary

COVID-19 has prompted greater focus on enterprise transformation ...

Alongside its other profound impacts, COVID-19 has accelerated enterprises' digital transformation plans and spurred a demand for emerging technologies, putting these front and center as a catalyst for a post-pandemic recovery. Game-changers such as 5G and IoT are in the forefront of this new wave of enterprise technologies, with organizations' leadership becoming more attuned to the opportunities 5G presents as a tool for transformation.



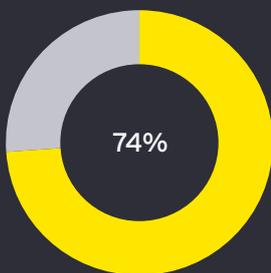
65% believe emerging technologies will play a critical role in their organization's recovery from the pandemic.



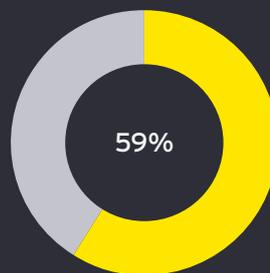
71% of respondents believe the COVID-19 pandemic has accelerated their organization's existing digital transformation plans.

... as enterprises get closer to their tech providers and consider 5G-IoT use cases

With 5G-based IoT possibilities coming into sharper focus, many enterprises are coming closer to their technology providers, as new and more collaborative types of supplier relationships come to the fore. At the same time, enterprises are reconsidering the most pressing 5G-based IoT use cases for their organization, helping give 5G the best profile of all emerging technologies in terms of widening investment exposure in the years to come.



74% believe 5G will enter the fabric of their organizations' business processes over the next five years.

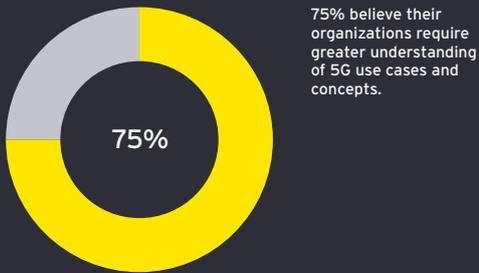


59% believe the COVID-19 pandemic has driven much closer collaboration between their organization and tech providers.

Interest in 5G application scenarios remains consistent year-on-year, and most enterprises predict it will become part of their business, moving forward. But, perceptions of the highest-potential use cases within specific sectors are evolving significantly – a process that our research shows has continued over the past year. For example, receptivity to more sophisticated use cases has risen in health care, while tracking and monitoring use cases are gaining increasing prominence in sectors, such as manufacturing.

A 5G knowledge gap must be filled ...

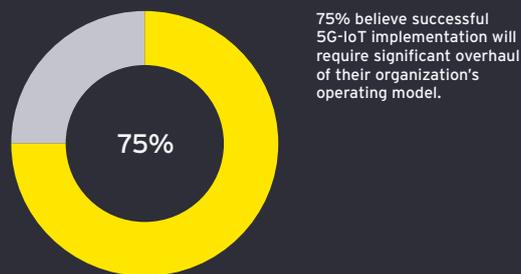
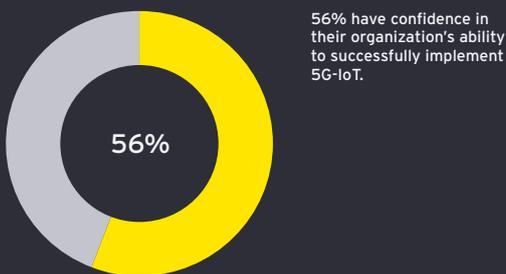
But while enterprises are fully aware of 5G's transformational potential and their ambition levels for 5G are high, so is the anxiety surrounding the "capability gap" they face – a knowledge shortfall around their understanding of 5G use cases and concepts. Many respondents fear their organizations are undersold on 5G's benefits, with more than two-thirds believing their organization sees 5G as only an incremental improvement on 4G or Wi-Fi.



... and enterprises need more support to make the most of 5G-based IoT

Such misperceptions are prompting fears that many businesses may fail to realize 5G's full potential. As enterprises look to gear up their 5G-IoT initiatives and investments, many are viewing the need to reimagine the future of their industry as a prerequisite for success, while three-quarters of respondents say organizational overhaul is critical to making the most of 5G. Without these factors, many businesses think they will miss the 5G opportunity.

Crucially, organizations want to know how 5G can be harnessed alongside other emerging technologies. At a practical level, technology integration is a concern, as are questions of technology maturity and resilience. More positively, limitations on budget support and leadership engagement are lesser challenges than in the past.



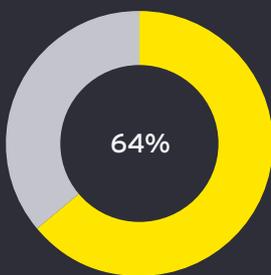
5G providers must convince customers they can deliver positive business outcomes ...

While 5G is gaining momentum across enterprises in virtually all sectors, many organizations are still struggling to identify the right 5G vendor to fulfil their aspiration for the technology. While enterprises value speed and agility in their suppliers, both now and going forward, two-thirds think their current 5G interactions are largely tactical and transactional. Also, an increasing reliance on suppliers features as a perceived 5G pain point, and enterprises are struggling to maximize the value of ecosystems. In summary, there's a mismatch between the vision and reality.

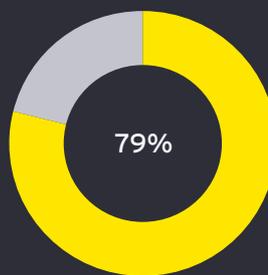
... and become ecosystem partners and collaborators offering end-to-end and vertical capabilities

To overcome these challenges, enterprises are looking for suppliers who can act as collaborators to articulate a more coherent 5G-IoT vision, provide support with use case formulation and deliver trusted business outcomes. And enterprises will increasingly prioritize vendors that can communicate a convincing role as partners and operate within ecosystems, while also offering specific skills in critical areas. Competitive pricing is set to decline as a requirement, while end-to-end capabilities will become more important.

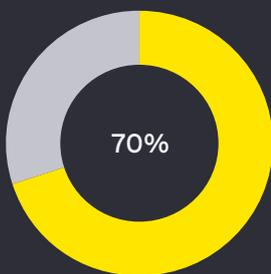
Currently, telecom and equipment vendors lack credibility as experts in digital transformation in a 5G world. To win and help their enterprise customers make the most of 5G-IoT, they will need to transform into end-to-end collaborative partners. And the time to start this transformation is today!



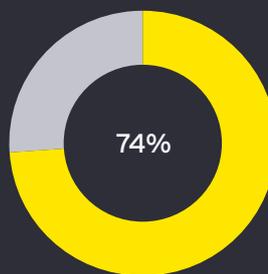
64% believe their organization is struggling to identify the right type of vendor to address its 5G strategy.



79% believe their organization will prioritize vendors that can deliver 5G business outcomes as collaborators rather than pure cost or technology benefits.



70% will prioritize vendors that offer deep industry vertical expertise as part of their 5G capabilities.



74% believe vendors need to articulate a more coherent vision of 5G for their organization to construct a robust investment case.

Enterprise 5G perceptions in detail

Adoption of emerging technologies



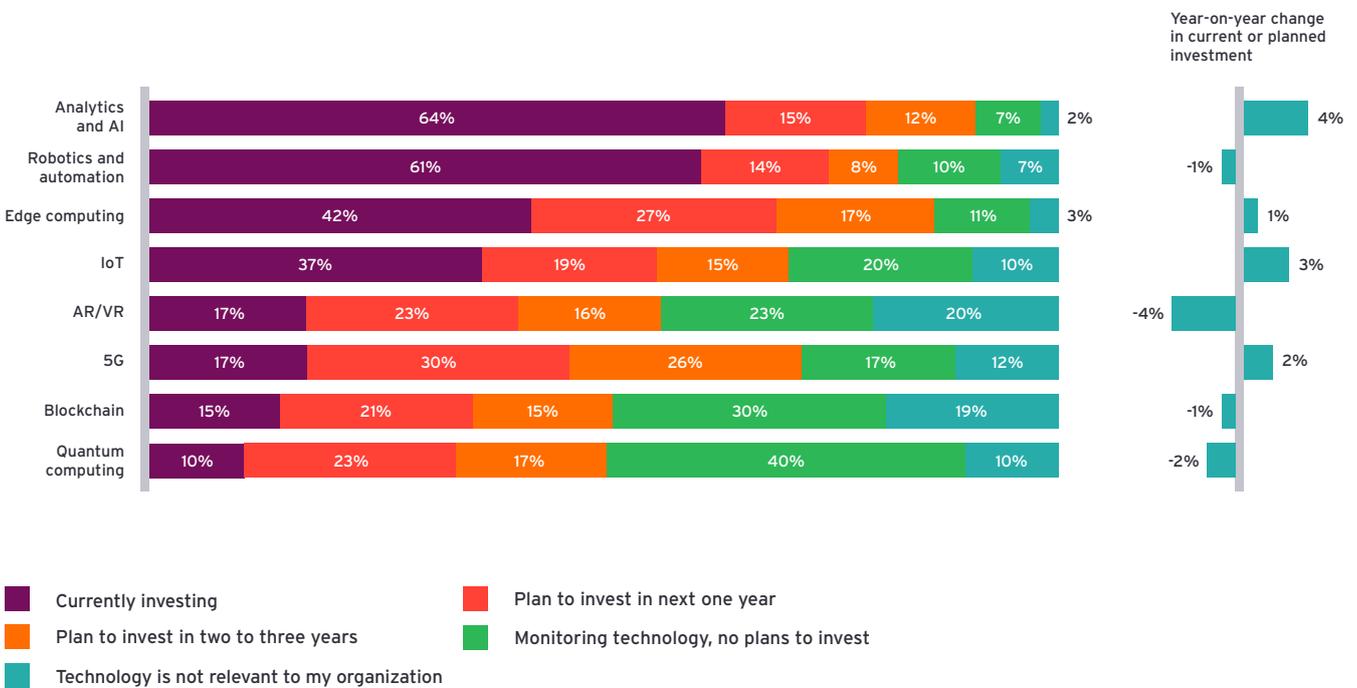
5G is moving to the forefront of enterprise adoption plans

Enterprises are accelerating their digital transformation efforts in the face of the pressures caused by COVID-19 and looking to reinvent themselves to compete in the post-pandemic world. The research confirms that several emerging technologies are gaining growing traction. As Figure 1 shows, analytics, artificial intelligence (AI) and automation are the most mature of this new wave of emerging technologies, while current investment in edge computing has jumped by six percentage points year-on-year.

Figure 1:
Investment in emerging technologies

Question:
Which of the following emerging technologies is your organization investing in?

(Percentage of all respondents)



However, the highest proportions of planned investment in emerging technologies in the next three years are being allocated to 5G as well as edge computing, indicating that 5G is rising up the ranking of corporate priorities. Conversely, overall current and planned investment intentions are dropping for some technologies, most notably augmented reality (AR) and virtual reality (VR).

The rising investment in emerging technologies means these now account for more than 10% of total information and communications technology (ICT) spend for 57% of the organizations in our study. Interestingly, enterprises in Asia-Pacific – and the technology and energy sectors globally – are far more likely to be devoting more than 30% of their ICT spend to emerging technologies.



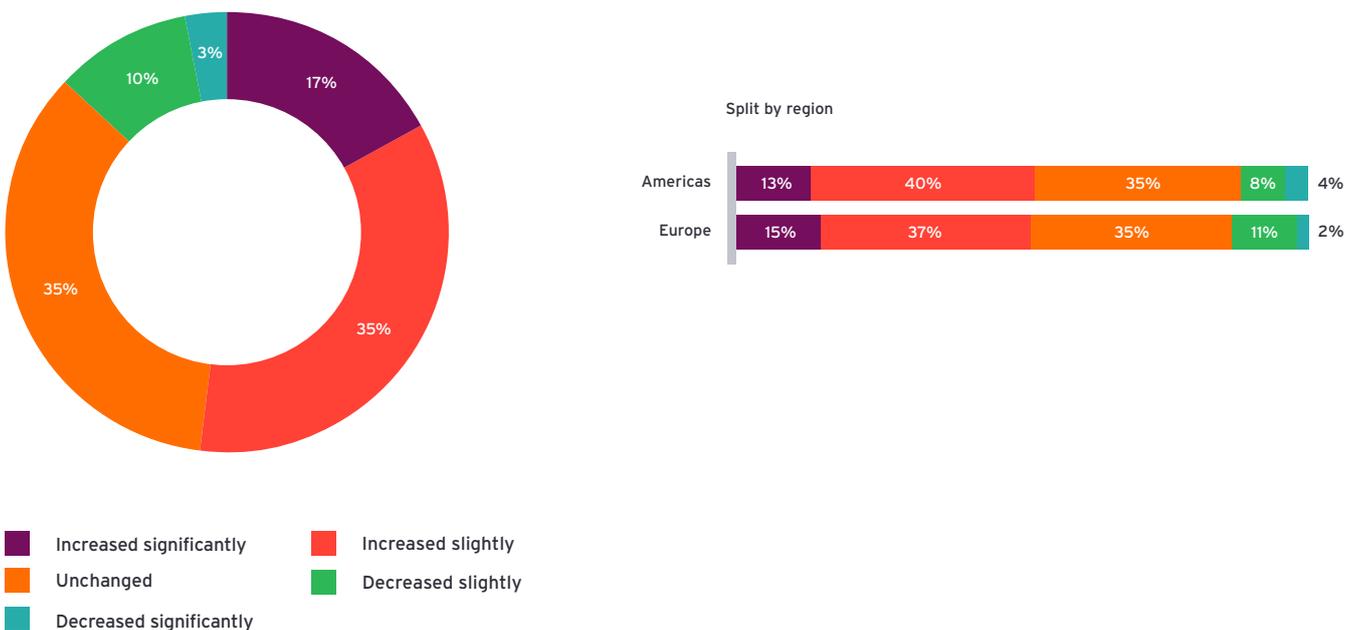
The pandemic is spurring greater enterprise interest in 5G

The role played by COVID-19 in spurring interest in 5G and IoT is underlined by our research, with the pandemic having prompted a significant increase in interest for almost one in five of our respondent organizations. Overall, more than half have seen interest in 5G and IoT rise as a result of COVID-19, with only thirteen percent signaling a reduction. The uptick in interest is most pronounced among Asia-Pacific businesses, with twenty seven percent reporting a significant increase.

Figure 2:
The pandemic's impact on enterprise interest in 5G and IoT

Question:
How has the COVID-19 pandemic affected your organization's interest in 5G and IoT?

(Percentage of respondents currently investing or planning to invest in 5G or IoT)



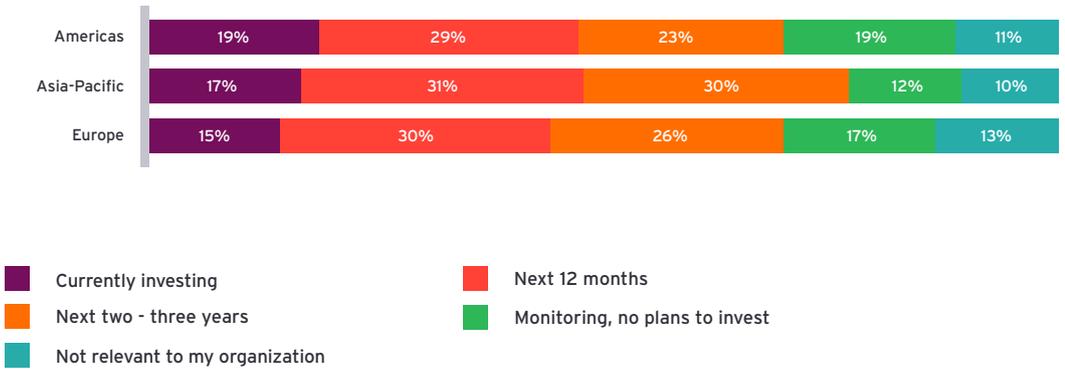
As interest in 5G rises and enterprises gain greater insight into the range of benefits the technology offers, our findings show that live 5G services and trials are also trending upward. This means 5G investments are shifting from the planning to execution phase: eight percent of businesses with investment plans now have 5G actually operational inside their organization.

European enterprises lag other regions on 5G investment intentions

A regional analysis of the findings shows that businesses in the Americas are currently leading the 5G investment wave, but that investment intentions among Asia-Pacific enterprises are the highest in the medium term. The proportion of Asia-Pacific respondents currently investing in 5G has risen from ten percent to seventeen percent in the past year, while the percentage saying they deem 5G irrelevant has halved to ten percent.

European enterprises are currently lagging behind other regions for 5G investment and their 5G ambition levels are also less pronounced: seventy percent believe they need to reimagine the future of their industry to make the most of 5G, compared with seventy seven percent of all respondents.

Figure 3:
Current and future 5G investment by region
(Percentage of respondents)



Enterprise 5G perceptions in detail

5G-based IoT: Drivers and use cases in focus



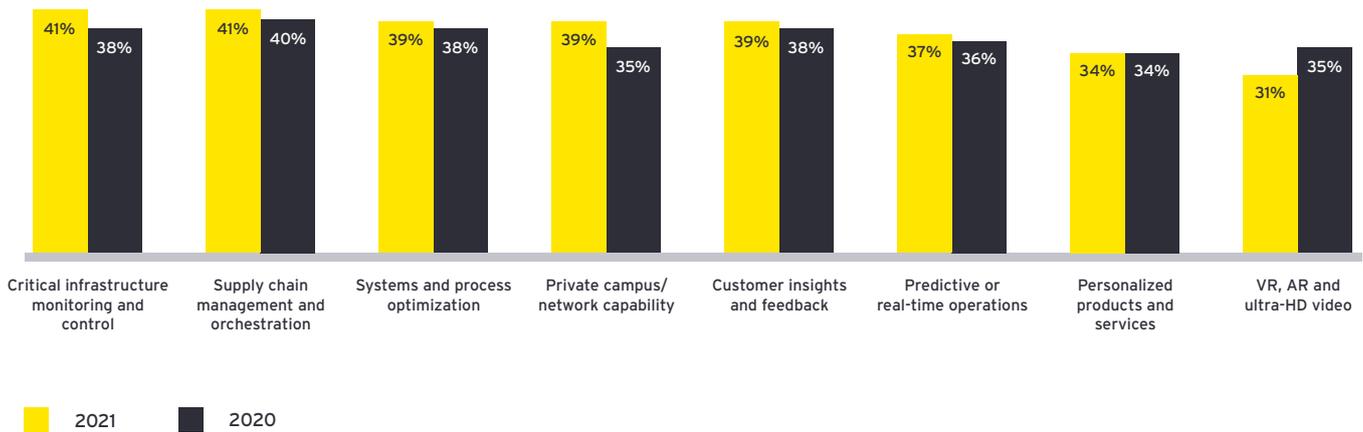
A wide array of use cases is in play as interest grows in private networks

As enterprises gear up to capitalize on the opportunities offered by 5G-IoT, they have a broad range of application scenarios in their sights. Figure 1 shows some of the key 5G-IoT use case clusters that are now “in play.” While our survey respondents’ interest in application types is broadly consistent with last year, there’s a growing focus on monitoring or control applications. Private networks are also seeing increasing deployment, as enterprises look both to enhance security and move as quickly as possible to customized 5G capabilities. Meanwhile, interest in VR and AR, and ultra-HD video 5G applications has edged downward year-on-year.

Figure 1:
Demand for 5G-based IoT by application type

Question:
Which are or will be the most significant 5G-based IoT application scenarios for your organization?

(Percentage of respondents currently investing or planning to invest in IoT)



While levels of interest are consistent, respondents are also mindful of how the pandemic is altering their use case needs. 31% of organizations believe that current use cases offered by vendors do not adequately address their business continuity and resilience needs, underlining the need for 5G providers to be more agile and responsive.

Enterprise views of sector-specific use cases are more fluid

Drilling down into specific sectors, we find that the approach to use cases is more fluid and faster-evolving than at the cross-industry level, with certain use cases showing sharp rises in interest in each industry.

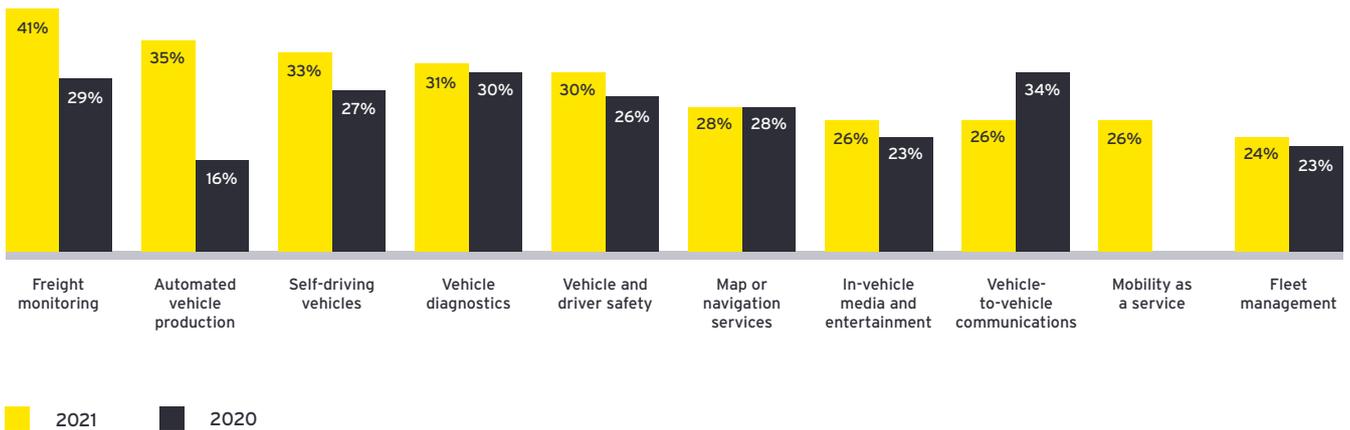
Automotive

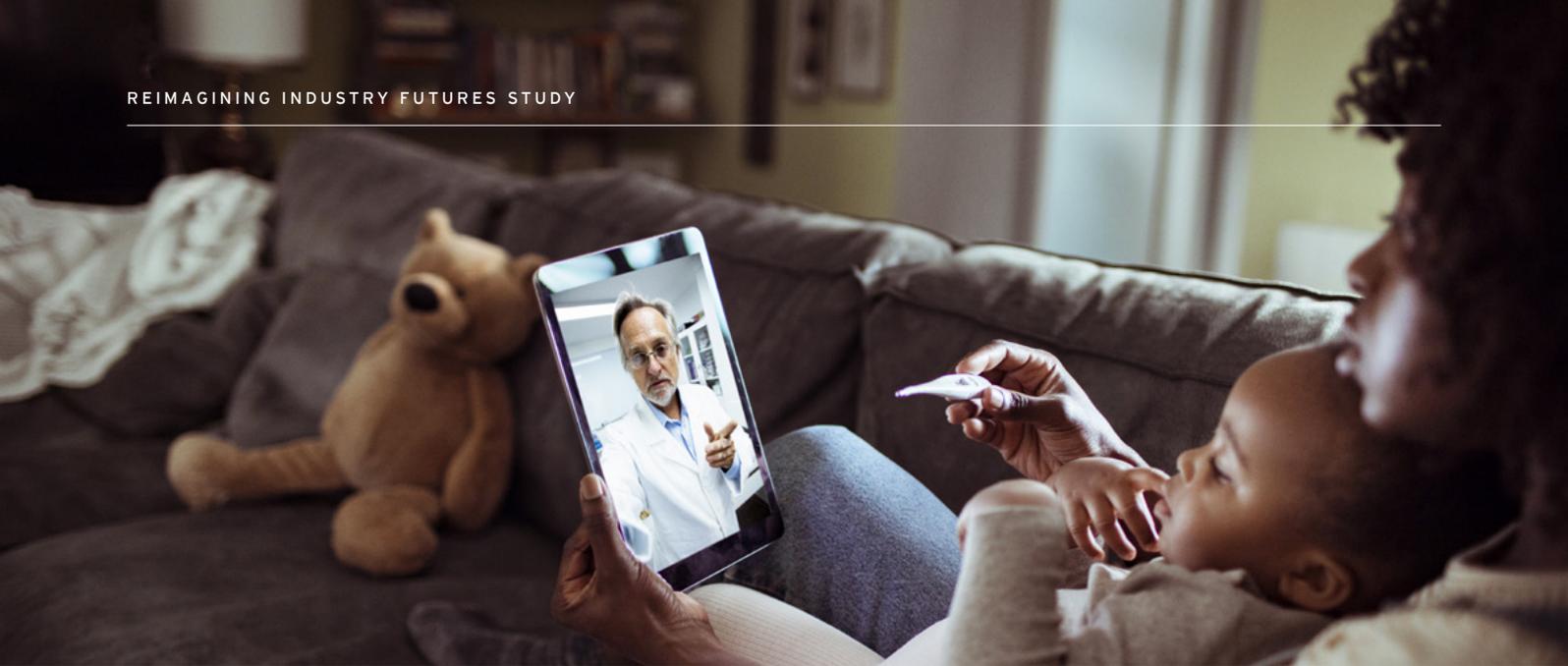
Monitoring and automation use cases enabled by 5G-IoT are finding increasing favor among automotive respondents, as their focus shifts away from some low latency-dependent applications – such as vehicle-to-vehicle communications – and toward more business-to-business (B2B) related manufacturing and remote monitoring services. However, interest in 5G-enabled self-driving vehicle applications has risen, while vehicle safety and navigation use cases have held steady.

Figure 2:
Automotive and transportation 5G-IoT use cases

Question:
Which are or will be the most significant industry-specific 5G-based IoT application scenarios for your organization?

(Percentage of automotive respondents currently investing or planning to invest in IoT)





Health care

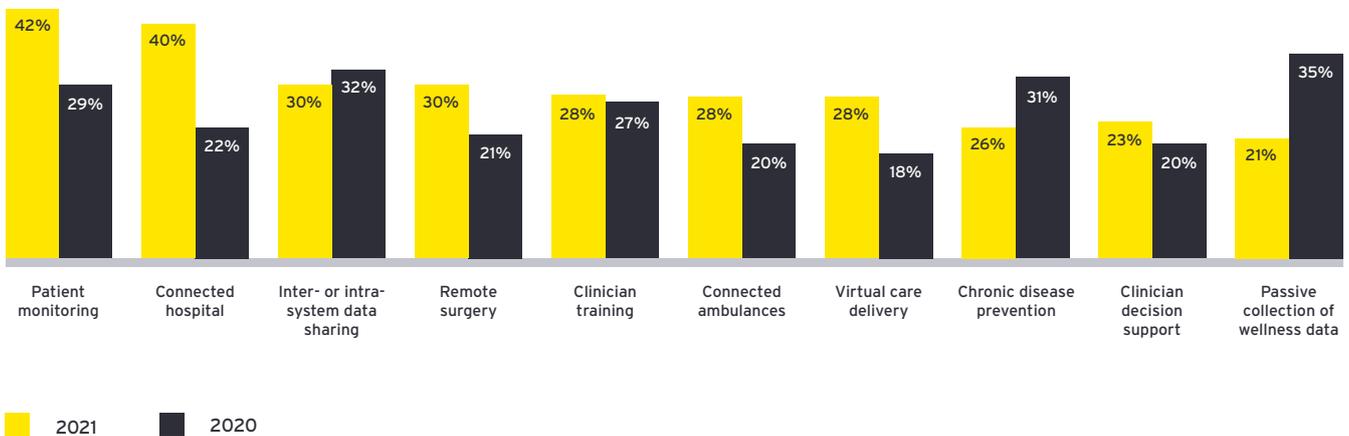
In the wake of the COVID-19 pandemic, health care enterprises are increasingly focused on 5G use cases at the more sophisticated end of the spectrum.

Applications, such as patient monitoring and virtual care delivery, have become relatively more important as compared with passive collection of wellness data. Sophisticated use cases that can capitalize fully on 5G's low latency are also on the rise: these include the likes of connected hospital, remote surgery and connected ambulances.

Figure 3:
Health care 5G-IoT use cases

Question:
Which are or will be the most significant industry-specific 5G-based IoT application scenarios for your organization?

(Percentage of health care respondents currently investing or planning to invest in IoT)



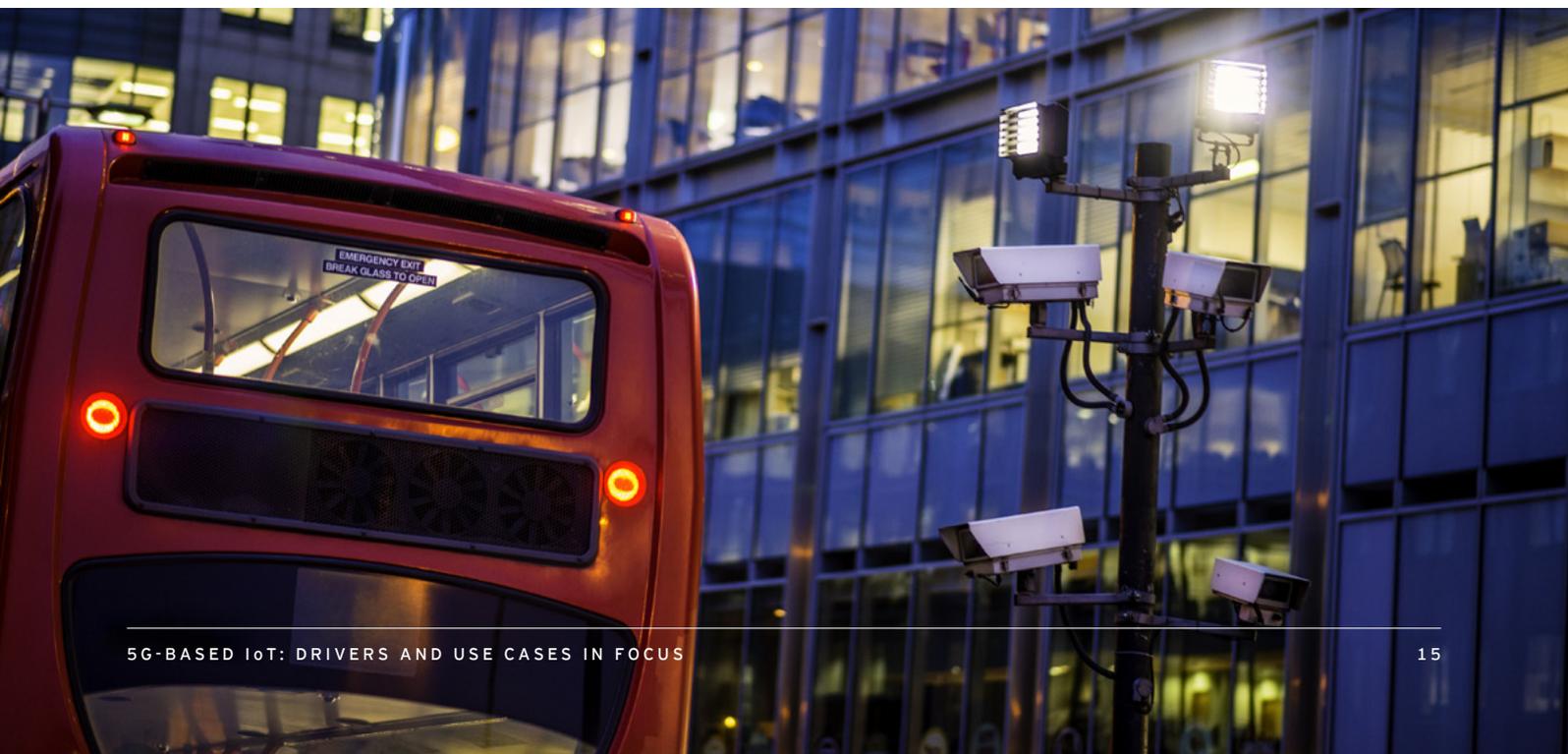
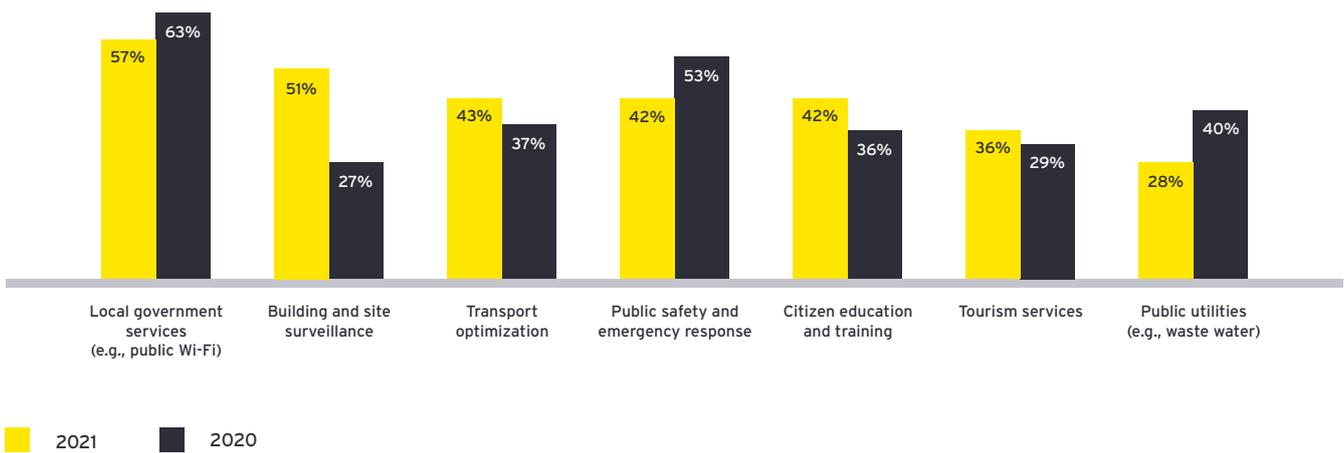
Government

Among government respondents, use cases centered around surveillance, transport, training and tourism have gained ground. While local services – including public Wi-Fi and city hall services – remain the leading 5G-IoT use cases, a number of other applications are growing in appeal year-on-year. The biggest uptick is in surveillance relating to government and military buildings and sites, indicating a security-related focus that partially mirrors the trend toward private networks in the private sector.

Figure 4:
Government and public sector 5G-IoT use cases

Question:
Which are or will be the most significant industry-specific 5G-based IoT application scenarios for your organization?

(Percentage of government and public sector respondents currently investing or planning to invest in IoT)





Consumer products and retail

Product traceability and personalized hospitality or entertainment use cases for 5G-IoT are on the increase among consumer products and retail enterprises. While most use case preferences in this sector remain largely consistent with last year, product traceability has gained growing interest, reflecting the desire to enhance supply chains and goods provenance monitoring.

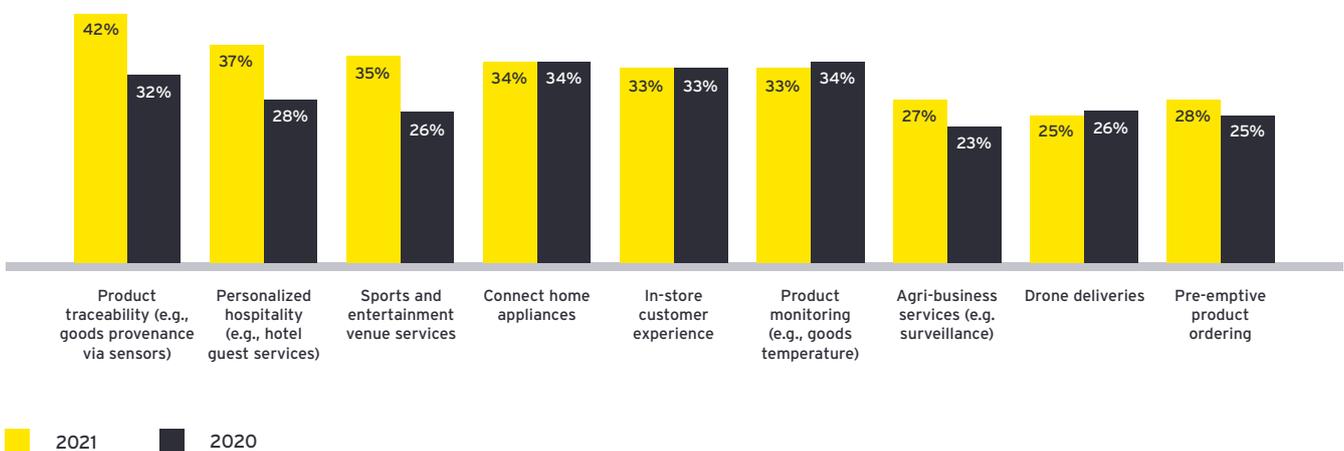
Location-specific services that can take advantage of 5G's high speed and bandwidth – such as personalized hospitality and venue services – are also gaining ground, as companies prepare for the post-pandemic recovery in consumer spending.

Figure 5:
Consumer products and retail 5G-IoT use cases

Question:

Which are or will be the most significant industry-specific 5G-based IoT application scenarios for your organization?

(Percentage of consumer products and retail respondents currently investing or planning to invest in IoT)



Manufacturing

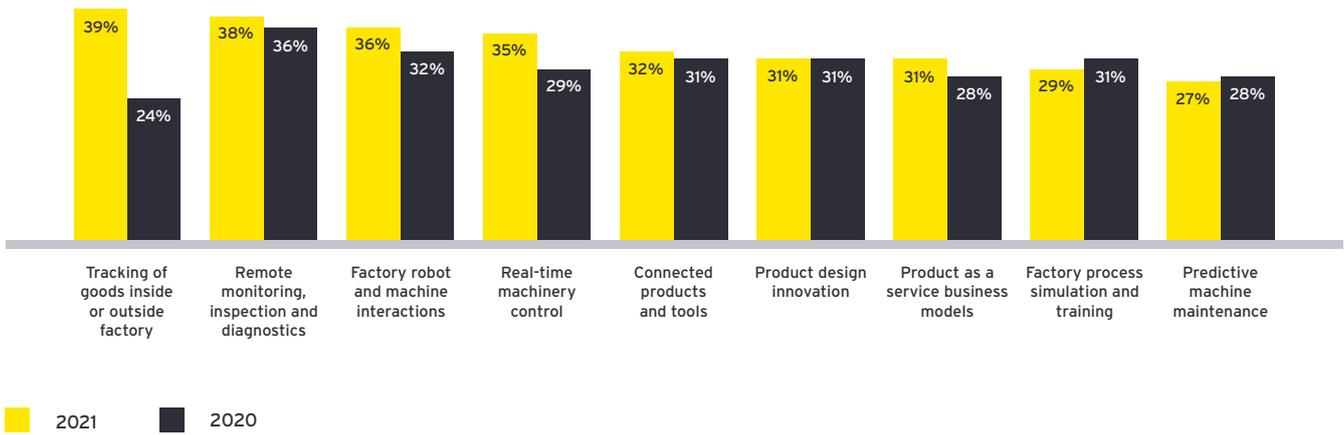
Manufacturing enterprises participating in our research tend to favor use cases where the location-specific and low latency credentials of 5G come to the fore – such as factory robot interactions and real-time machinery control. While their application preferences remain broadly consistent with the previous year, goods tracking has leapt in importance, reflecting the strong focus on enhancing efficiency and intelligence in logistics and supply chains.

Figure 6:
Manufacturing 5G-IoT use cases

Question:

Which are or will be the most significant industry-specific 5G-based IoT application scenarios for your organization?

(Percentage of manufacturing respondents currently investing or planning to invest in IoT)



An aerial, top-down view of a busy city street. The pavement is made of dark grey rectangular tiles. Numerous people are walking, but they are heavily blurred due to a long exposure, creating a sense of motion and a busy atmosphere. In the center of the frame, two people are walking towards the camera, appearing sharper than the others. One is wearing a light grey jacket and the other a white jacket. A bright yellow rectangular box is overlaid on the upper left portion of the image, containing text.

Enterprise 5G perceptions in detail

5G-based IoT: priorities and pain points

A holistic approach to 5G is essential

Taken together, the 5G and IoT priorities revealed by our research underline the importance of a holistic approach to the adoption of emerging technologies. With investments in both IoT and 5G, enterprises' plans are focused on gaining the ability to harness these technologies in combination with each other – and also with other emerging technologies. Overhauling business models is a further priority for companies' 5G investment plans, along with evaluating 5G's advantages over legacy connectivity technologies and addressing 5G cybersecurity risks. Meanwhile, IoT's ability to enhance operational efficiency is still ranked above its potential to drive revenue growth.

Figure 1:
Enterprise 5G and IoT priorities



A drill-down into the findings on 5G priorities by region shows that European enterprises allocate a lower priority to exploring 5G's relationship to other emerging technologies, while Asia-Pacific enterprises are relatively less sensitive to cybersecurity risks.

Product development teams are keen to collaborate with suppliers

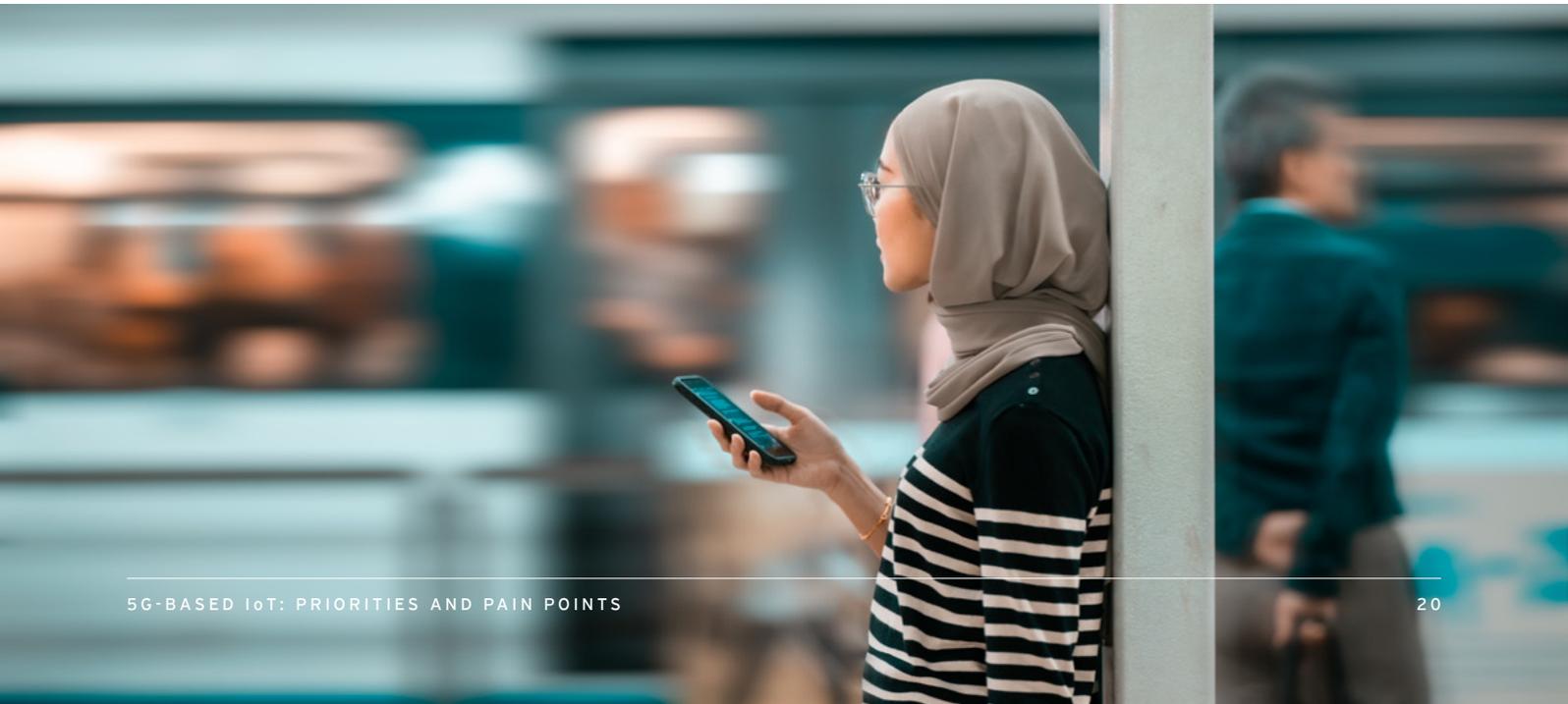
Considering enterprise priorities by job designation also generate interesting findings. Respondents in technology functions – who account for fifty percent of the survey sample – tend to be more attuned to the gains made possible by 5G.

However, respondents with product development responsibilities are in a prime position to help develop new use cases that can take advantage of 5G-based IoT. They place relatively greater emphasis on increasing collaboration with 5G providers and growing their exposure to 5G trials and testbeds.

Figure 2:
Product development respondents' 5G priorities

Question:
What are your organization's most important 5G priorities in the future?

(Percentage of respondents currently investing or planning to invest in 5G)





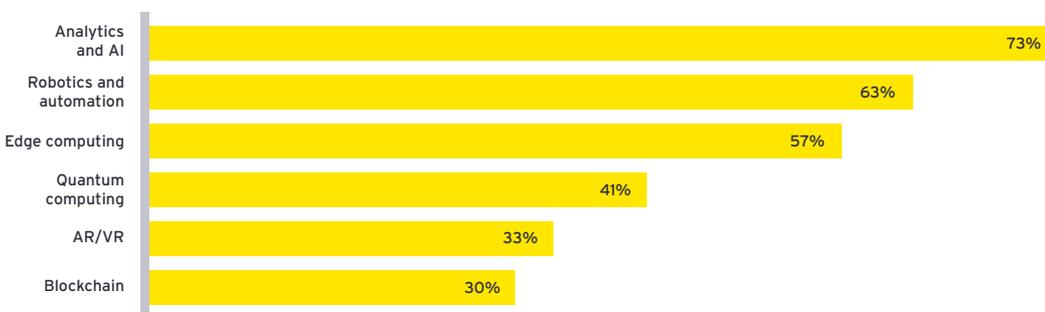
Enterprises see a range of emerging technologies complementing 5G

Looking across all sectors and regions, the front-running technologies seen to be complementing 5G and IoT are AI, automation and edge computing. Quantum computing, AR and VR, and blockchain are less likely to be on enterprises' 5G radar. The importance attached to lower-ranked technologies varies according to sector: for example, the focus on using blockchain with 5G is highest in government organizations and lowest among health care respondents.

Figure 3:
Emerging technologies that are complementary to 5G and IoT

Question:
Which of the following emerging technologies are most complementary to your organizations 5G and IoT strategy?

(Percentage of respondents currently investing or planning to invest in 5G and IoT)



Complex integration leads as a perceived 5G challenge inside organizations

Turning to the perceived barriers to capitalizing on 5G's capabilities, enterprises' ranking of internal challenges is topped by practical concerns, such as complex integration requirements and uncertainties around organizational deployment. Their external challenges are led by pain points around the maturity of 5G technology and resilience, including cybersecurity threats.

Interestingly, limited awareness of the 5G supplier universe and concerns about increased reliance on partners feature among the internal and external challenges respectively. While the COVID-19 pandemic has prompted much closer collaboration between businesses and their technology suppliers, this presents a challenge for some.

Figure 4:
Enterprise perceptions of 5G challenges



Enterprise 5G perceptions in detail

The changing view of the vendor

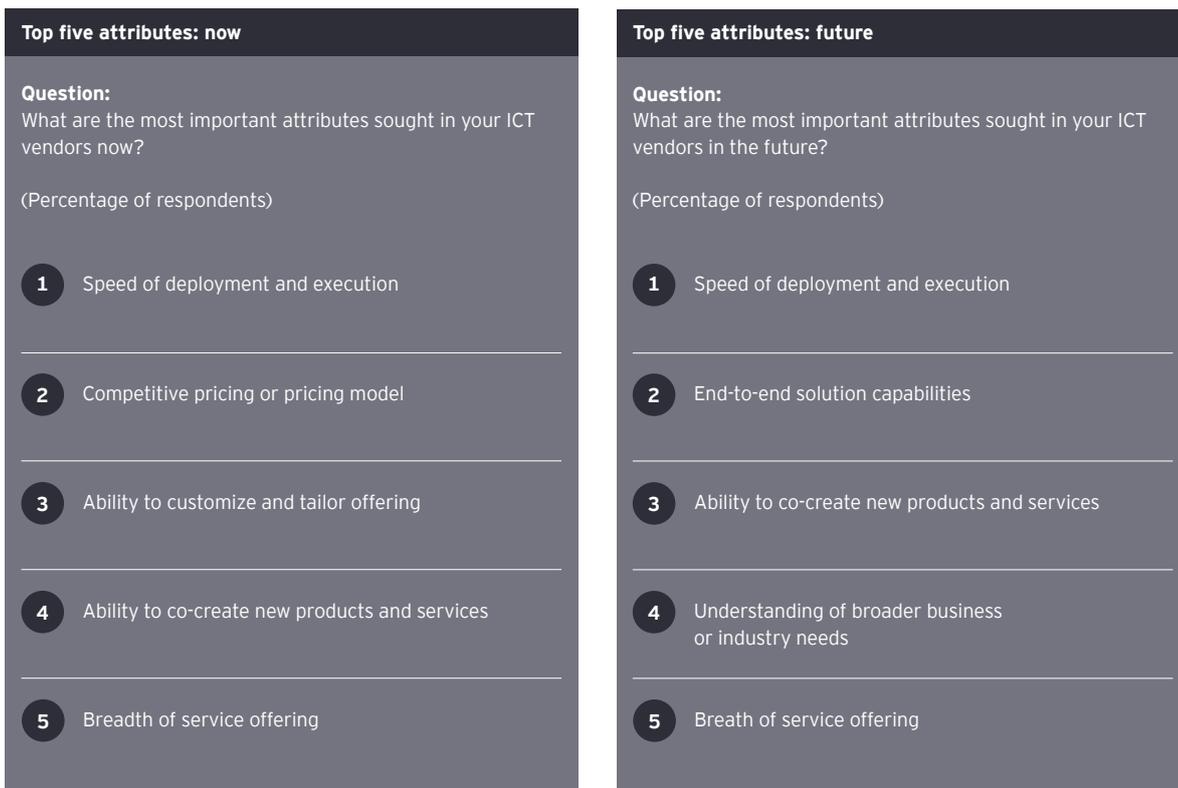


Agility and end-to-end capabilities are the attributes enterprises will prize

As enterprises seek vendors to help them achieve their 5G priorities and overcome related challenges, the characteristics they are looking for in suppliers will continue to evolve over time. As shown by the comparison of current and future vendor attributes, speed of deployment and execution remains paramount both today and tomorrow, but end-to-end solution capabilities are set to grow strongly in importance. Meanwhile, competitive pricing – currently ranked as the second most important vendor attribute – will drop out of the top five, underlining that businesses are prepared to spend more for the right kind of support.

The rising importance of suppliers having the ability to co-create is a further key shift. The growing demand for this attribute highlights the collaborative mindset that enterprises are seeking in their vendors, while the ability to understand broader business or industry needs is also becoming more important over time. The bottom line is that enterprises are seeking more than pure cost or technology benefits.

Figure 1:
Desired vendor attributes now and in the future



The attributes enterprises are seeking in their suppliers are evolving in different directions across regions. End-to-end solutions are already prominent among the attributes sought by businesses in Europe and Asia-Pacific – and the US enterprises are set to attach relatively greater importance to these over time, alongside wider business and industry understanding. Meanwhile, professional services capabilities already rank highest as a desired vendor attribute for Asia-Pacific enterprises, and their importance is also set to increase in the other regions.

Leading IoT providers are seen lacking in digital transformation expertise

Turning to enterprises' trust in suppliers to deliver against their 5G vision and strategy, we find that the degree of trust varies widely according to the area of specialization required – with telecoms and network equipment vendors lagging behind other types of providers in terms of perceived expertise in digital transformation. While enterprises do trust telecoms as IoT experts, professional services firms, application or platform vendors and IT services companies have the greatest mind share in digital transformation.

Figure 2i:
Enterprise trust in suppliers for IoT and digital transformation

Question:
Which types of ICT supplier are most trusted as experts by your organization?

(Percentage of all respondents)

IoT

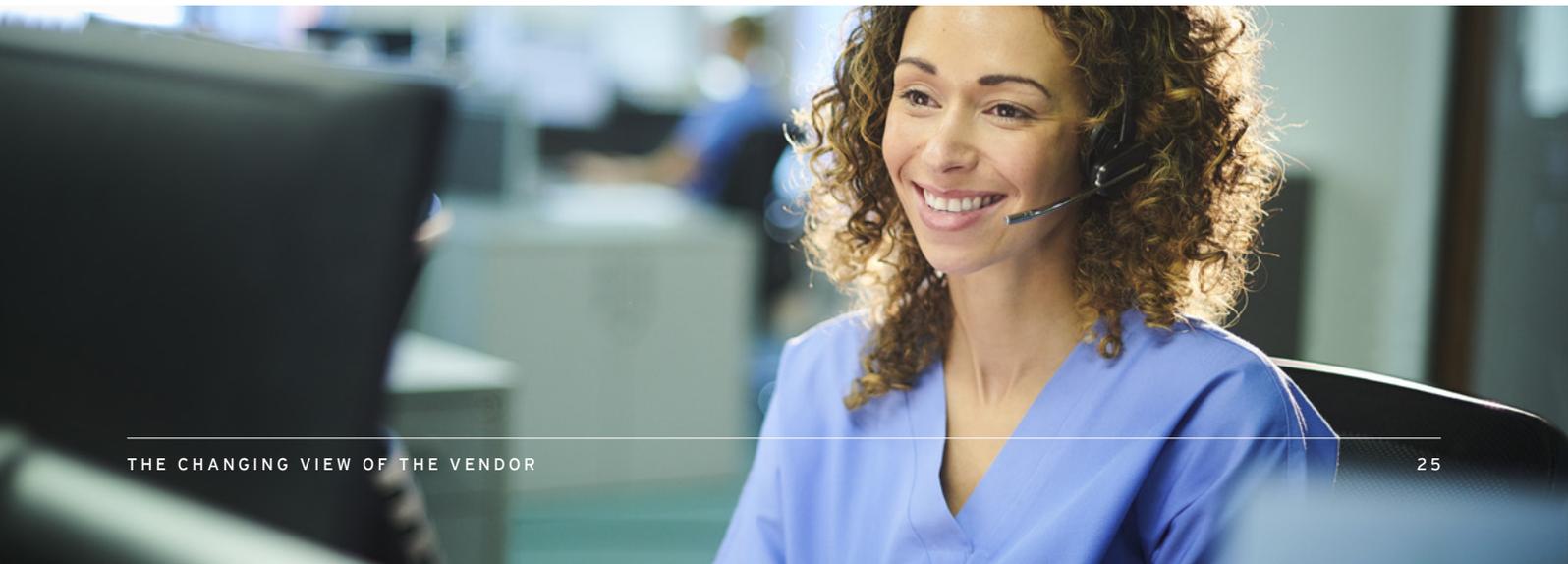
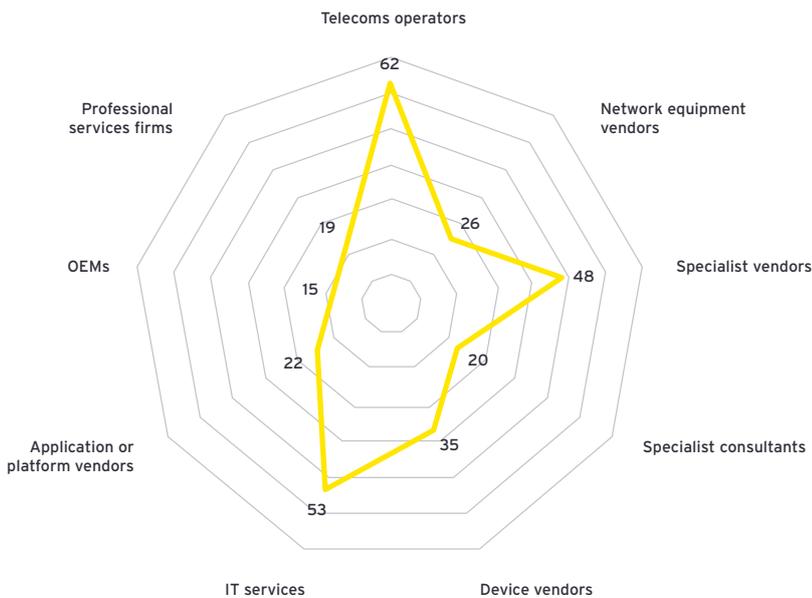
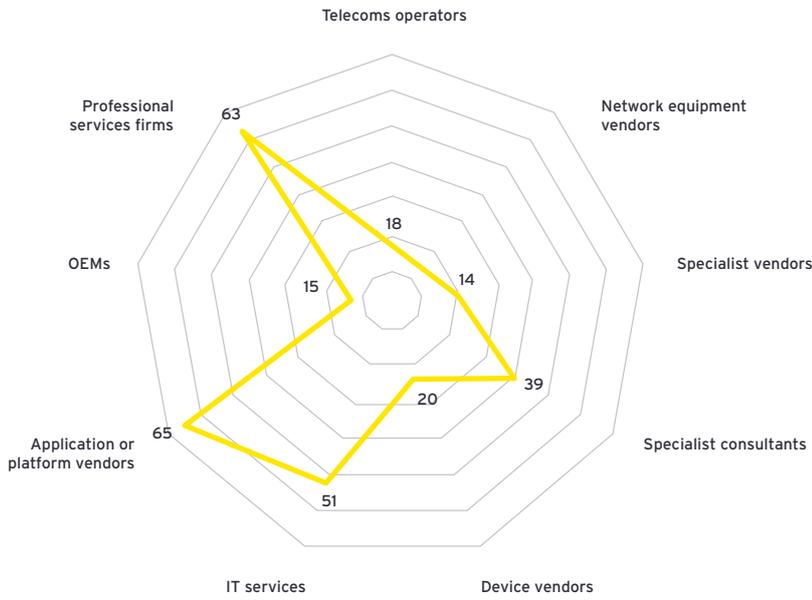


Figure 2ii:
Enterprise trust in suppliers for IoT and digital transformation

Question:
Which types of ICT supplier are most trusted as experts by your organization?

(Percentage of all respondents)

Digital transformation



This divergence in enterprise perceptions of vendor expertise represents a pain point in the buyer and supplier dynamic. 64% of respondents believe their organization is struggling to identify the right type of vendor to address their 5G strategy. Unless 5G providers address their own capability gaps, these customer uncertainties will continue.

Enterprise 5G perceptions in detail

The ecosystem conundrum

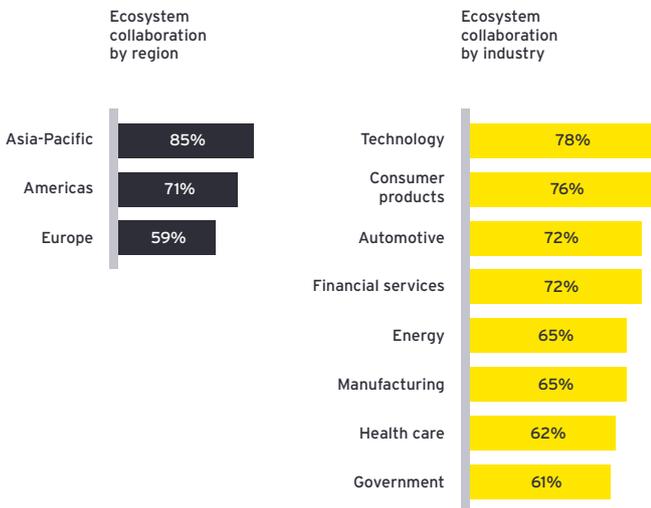


Collaborative ecosystems help enterprises accelerate innovation and access new skills

The need to bring together a wide range of competencies and expertise for enterprises to fully realize their 5G and IoT strategies means that collaboration and partner ecosystems are of crucial importance. With this in mind, over two-thirds – 69% – of enterprises in our study are active ecosystem participants, with organizations in Asia-Pacific the most receptive, and European businesses less involved. Government and health care – two sectors that stand to reap major benefits from ecosystem collaboration – are also underweight in this area.

Figure 1:
Enterprise ecosystem collaboration split by region and industry

(Percentage of respondents)





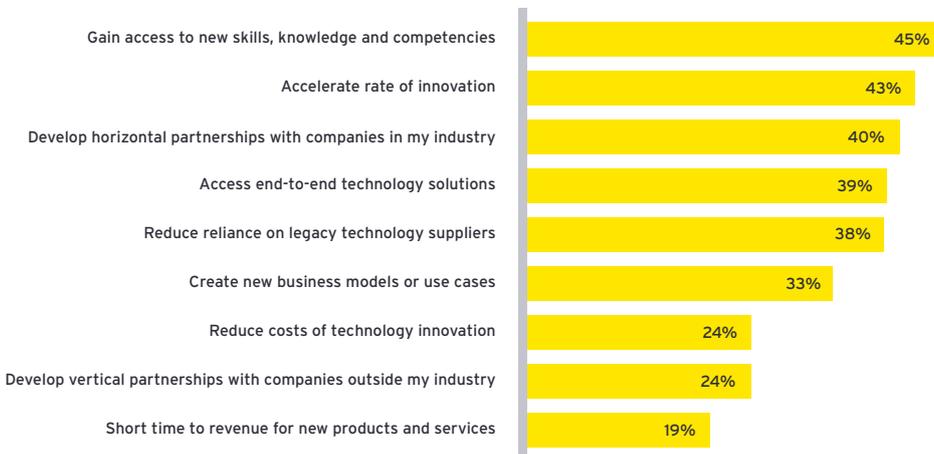
The enterprises' leading rationales for participating in collaborative ecosystems are access to new skills and faster innovation.

Yet ecosystem drivers, such as shortened time to revenue and the ability to develop vertical partnerships in other industries, rank much further down, suggesting that many companies are failing to tap the full potential benefits on offer.

Figure 2:
Drivers of ecosystem collaboration

Question:
What are the drivers of your organization's collaboration with other organizations as part of an ecosystem?

(Percentage of all respondents)



Limited prioritization and alignment inhibit ecosystem value

Regarding the factors that enterprises feel inhibit their ability to participate in ecosystem collaboration, the top barrier they identify is a lack of strategic alignment between the participants, an impediment cited by thirty nine percent of respondents globally, while low leadership prioritization is another key constraint. A closer analysis shows that limited awareness of collaboration opportunities is the leading inhibitor in Europe, while enterprises in the automotive sector find it relatively more challenging to convert ecosystem interactions into value.

Figure 3:

Ecosystem collaboration: leading inhibitors

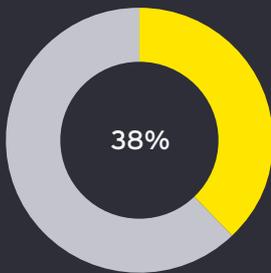


Closing the gap between the vision and reality of ecosystem engagement should be a priority

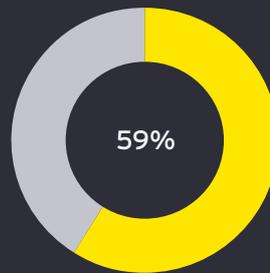
What emerges clearly from our research is that there's a gap between the vision and reality of ecosystem interaction – and that enterprises will prioritize vendors that can clearly articulate their ecosystem role.

Open innovation principles are widely accepted among enterprises – and they are more likely to increase their exposure to collaborative ecosystems as they seek 5G and IoT knowledge, and expertise beyond sector boundaries. Yet, complex partnering models are difficult to execute in practice, and the majority of organizations still do not prioritize ecosystem engagement even if they do already collaborate in this way.

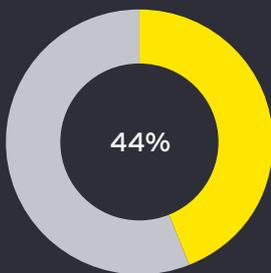
As a result, vendors that can clearly articulate their ecosystem position have much to gain – and will be well-positioned to win out as enterprises evolve and pursue their 5G-IoT strategies.



38% agree their organization's exposure to collaborative ecosystems will grow substantially over the coming years.



59% of respondents agree open innovation principles are widely accepted across their organization.



44% will prioritize vendors that can clearly articulate their role in changing industry ecosystems.

Next steps
for 5G service
providers



EY believes there are three important steps that 5G providers should take to help forge strong partnerships with their enterprise customers and help them make the most of the 5G-IoT opportunity.

Align your 5G vision to the needs of the post-pandemic enterprise

- Pay attention to enterprise needs for business continuity and resilience in the wake of the pandemic, while ensuring focus on how 5G can impact future business models
- Carefully assess changing sector use case needs as some industries are prioritizing more sophisticated 5G use cases, while monitoring and control services are a greater focus for others

Ensure your 5G dialogue is holistic and touches all parts of the organization

- Help enterprises build the right linkages between 5G and adjacent emerging technologies, so they can maximize their combined power
- Look beyond the technology function as product development teams require a targeted approach, since they are central to the creation of new use cases

Convince customers that you are the ideal partner to deliver transformation with 5G

- Transform from a supplier to a partner that delivers business outcomes through end-to-end solutions
- Build new competencies and ecosystem positions to improve your credibility as a digital transformation expert that can help enterprises make the most of 5G

How EY can help

EY IoT consulting services

Acting as the bridge between the physical and the digital world, IoT offers a huge opportunity for companies. We help clients effectively capitalize on IoT technology and solutions, linking technology, vendors and customers through a holistic business model.

Future Network Now

Intelligent networks are essential for organizations and societies to thrive. EY has developed Future Network Now to enable you to make informed business decisions through scenario planning and network investments and to deliver operational excellence across service provisioning and customer experience, supported by the right technology foundations. Through Future Network Now, you can achieve cost effective, resilient and secure networks that enable you to disrupt, innovate and differentiate.



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EYG no. 006503-21Gbl.

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