The NextWave Journal

The latest opportunities and challenges in your industry: now, next and beyond

Issue Three: Connected Impact MWC Barcelona 2021 Edition





Welcome to The NextWave Journal

The NextWave Journal is an insightful look at the telecommunications industry today, created to inform and inspire your short- and long-term decisions, with actionable insights.

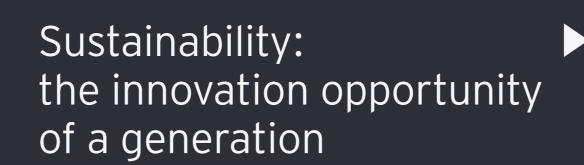
Designed as a response to the rapidly changing world we're living in, this regular series of publications discusses the changing priorities in your industry, highlights the latest challenges businesses such as yours are facing, and shows how we're working with our customers to help them adapt.

We hope you find the information within these pages useful. Please let us know if you have any comments or queries about anything you've read.

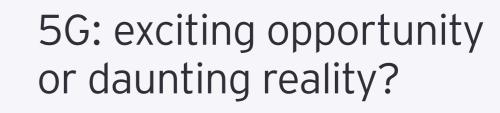


In a world more connected than ever, why work alone?

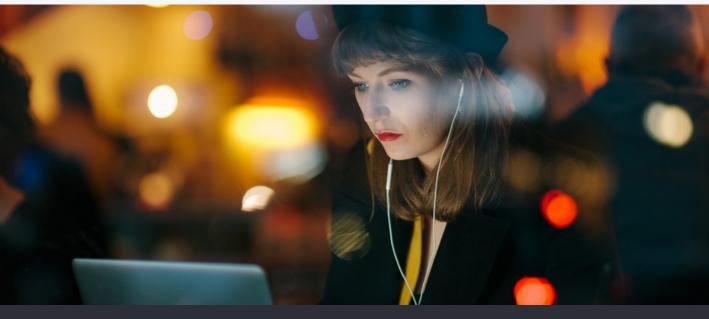
In an increasingly dramatic and fast-moving context, the ability for organizations to be connected and make an impact is key.



Technology has always helped humanity solve the largest issues of the world and it can help us here again.



Exciting new connectivity is transforming industry futures, and it's a source of competitive advantage for the companies that use it effectively.



Do the upside risks of 5G outweigh the downside security risks?

The smart devices that connect to the 5G network to create exciting new possibilities can themselves act as a cyber threat.



The importance of connected citizens in a connected world

Governments have to put people at the center of everything they do in order to keep focused on delivering value.



Contact Us

Find out more about the topics we've discussed in this Edition



What does the idea of "connected impact" mean to you? Is it optimized communication for greater efficiency? Improved collaboration for better outcomes? Or simply the idea of linking everyone together seamlessly to get more done?

At EY, we believe that connected impact means all of the above and more. It's a key topic for organizations across the globe and it is consequently the theme of this year's MWC Barcelona 2021.

Therefore, we're dedicating this edition of the NextWave Journal to discuss and expand on some of the most pertinent points of conversation. Over the following pages, you'll see contributions from some of the main speakers at EY virtual booth for MWC Barcelona - and hear why we believe that being connected is essential for business success.

Connecting industry ecosystems in a post-pandemic world

When considering connected impact, a vital aspect that springs to mind is business ecosystems. The way we all work together within today's interconnected world is critical to creating long-term value, and this will only intensify as 5G connectivity is embedded into everything from hospitals to transport systems and public services to power plants.

Indeed, the combined power of 5G and the internet of things (IoT) will connect and define the ecosystems of the future, enabling organizations to transform the way they operate. The question is, how can they move away from where they are today and bring together data from multiple sources simultaneously to inform their business decision-making?

I've seen first-hand how technology and innovation is making a difference across a wide variety of sectors. And at EY, we've consequently been turning up the dial in terms of helping our clients understand where they need to get to next - and where that involves using new technology, optimizing existing systems and introducing more sustainable ways of operating, we've been able to help.





MENU

THE NEXTWAVE JOURNAL

Next-level considerations for next-level networking

When considering the potential of 5G and increased connectivity, we must also of course think about the challenges it presents - and one of the biggest areas of concern is unsurprisingly cybersecurity. As legacy systems merge with the latest technologies and systems, we need to consider how to bring it all together securely. Cybersecurity should be fundamental from the outset in order to prevent deeper issues down the line, which is why we've explored the topic in greater depth within this publication.

Equally, sustainability needs to be front of mind. No longer merely an after-thought, or boxticking exercise, sustainability presents a unique innovation opportunity if approached in the right way. With consumers, employees and investors alike actively looking for its benefits, sustainable initiatives now make good business sense - which is why we also need to consider the use of data in building out sustainability models to act as frameworks for future success.

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Keeping everyone moving forward

It's not only businesses that need to focus on being connected. Governments also need to connect more citizens without leaving the disconnected behind - ensuring everyone can benefit from the great digital opportunity. Citizens have seen how businesses have been increasingly using data and technology to improve their services, and governments need to do the same. The rewards for doing so include improved agility and better public engagement.

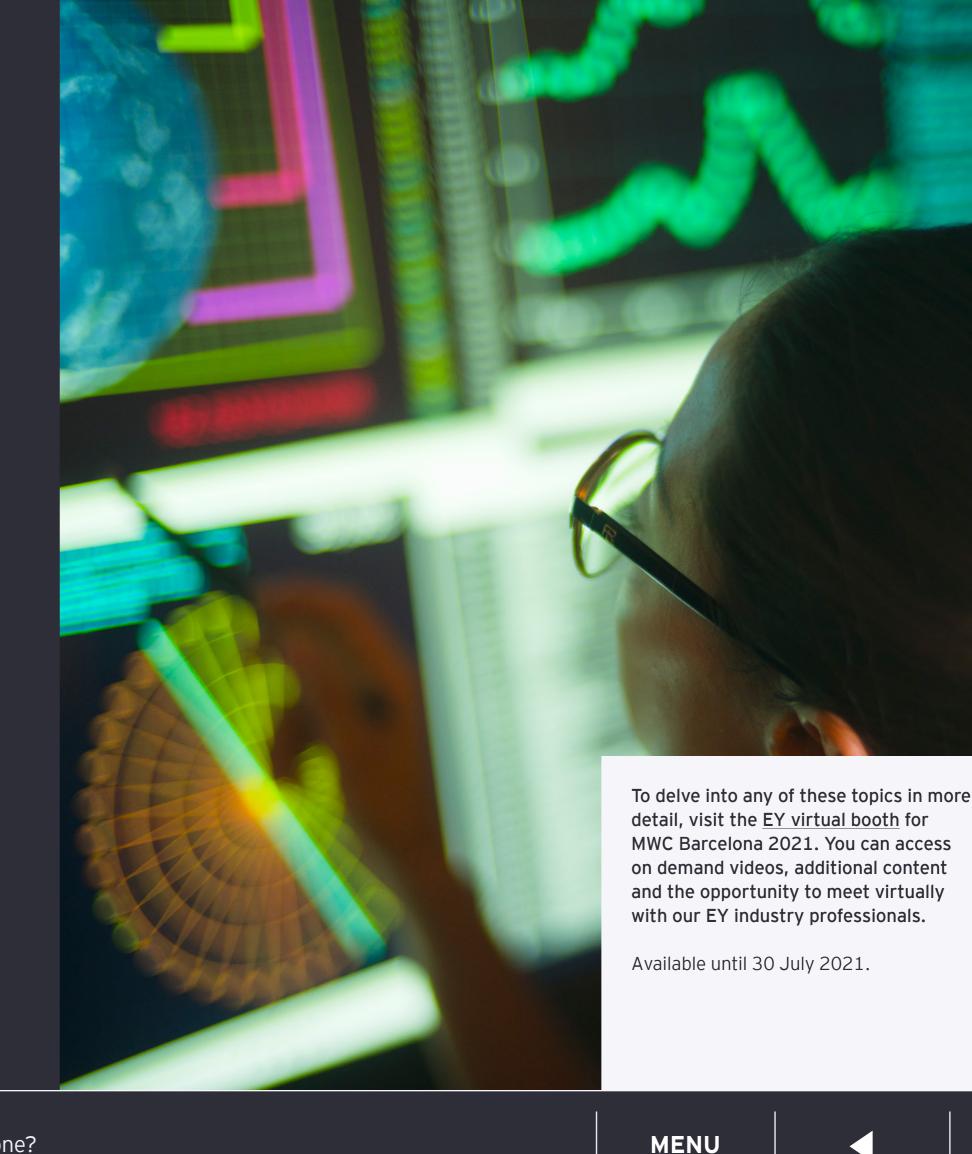
I'm proud to say that EY is doing a great job of helping clients, across both private and public sectors, to identify and realize the opportunities that can arise through leveraging new technologies - enabling them to reimagine their operations and leverage innovation to get ahead. An intelligent digital infrastructure is critical for societies everywhere and we want to ensure more businesses can create a connected impact. After all, in a world more connected than ever, why work alone?

Tom Loozen

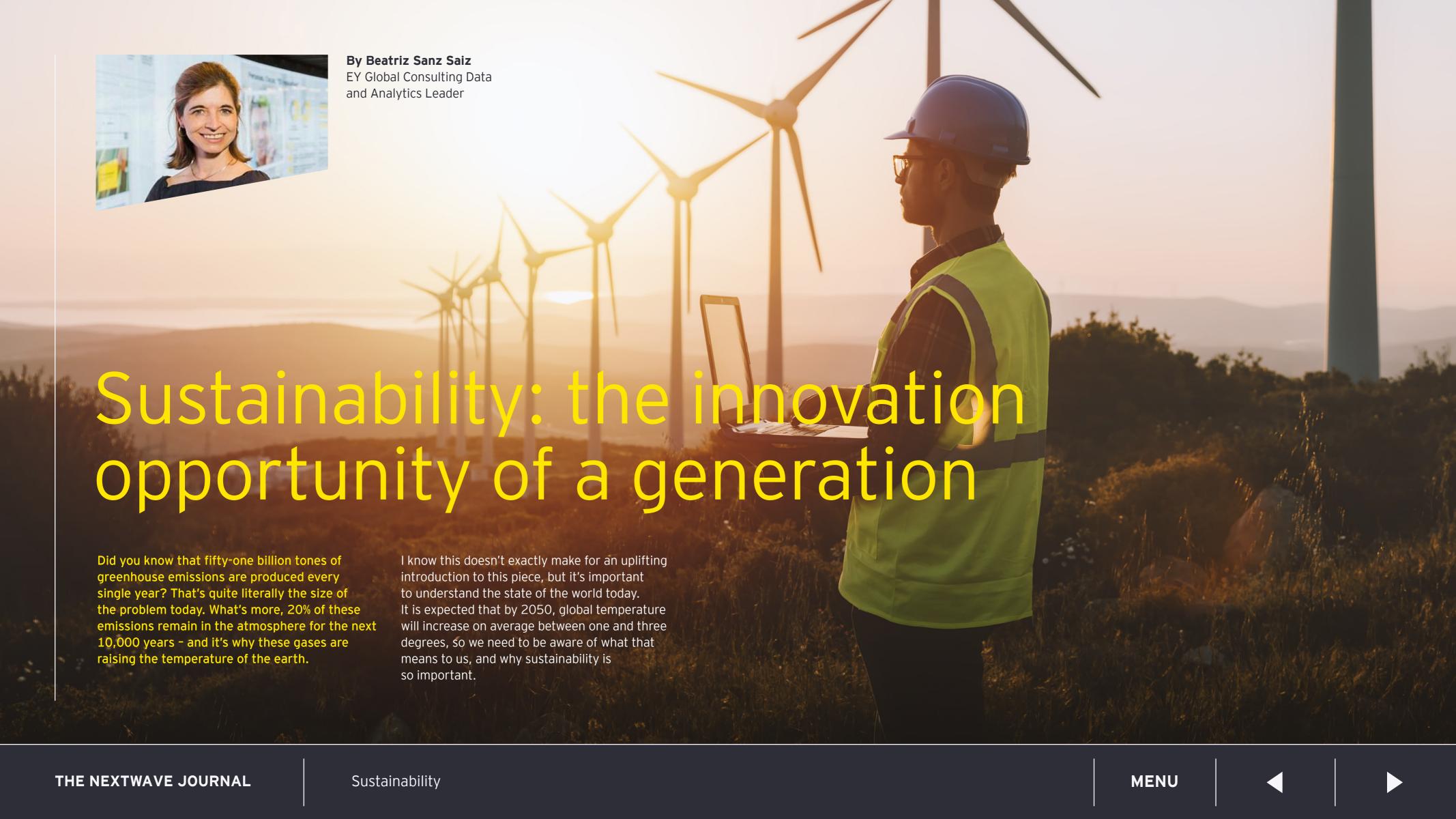
EY Global Telecommunications Leader

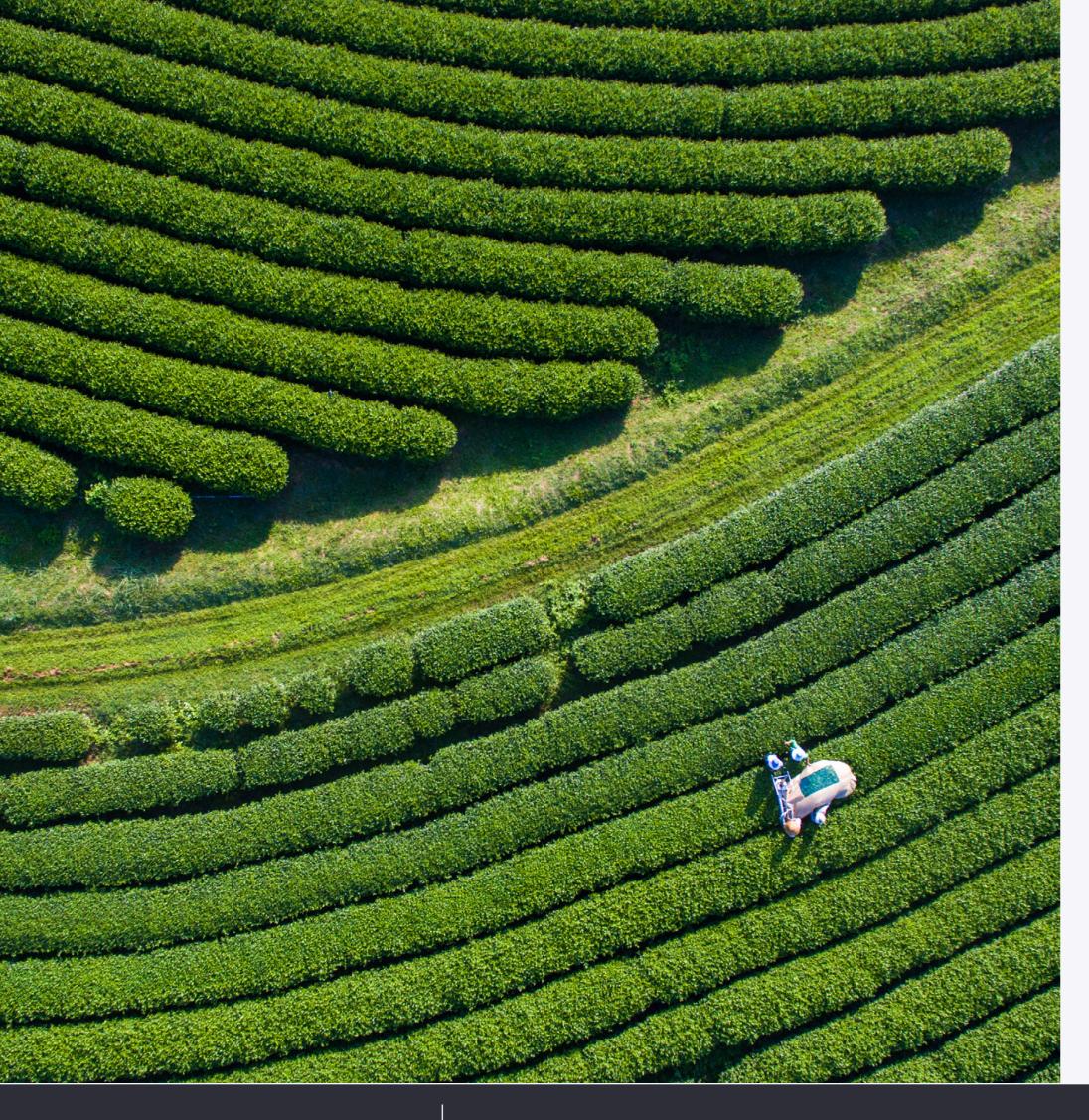


An intelligent digital infrastructure is critical for societies everywhere and we want to ensure more businesses can create a connected impact.









Why we simply can't ignore climate change

The effects of climate change are no longer mere predictions or hypothetical scenarios. If global temperature continues to increase at the current rate, we can expect a completely different distribution of animals, plants, insects, viruses and bacteria within the next 30 years. We can also expect an increasing number of floods, with a subsequent loss in crops and an increase in bushfires.

By the end of the century, climate change will cause five times more deaths than the current pandemic we're struggling to control. In fact, the issue of pollution alone will lead to more than seven million deaths per year. It's the economical equivalent of having a COVID-19 crisis every 10 years.

But here's the good news. We're increasingly seeing technology, global policies and markets coming together to solve the challenges we face. The Paris Agreement, which was drawn up at the recent United Nations Framework Convention on Climate Change (UNFCCC), was a notable milestone where 196 countries signed to reduce emissions by 12%. It may not be enough to solve all of our problems in one hit, but it's a strong start.

The crucial role of technology

Beyond just politics, there are many other reasons to be positive. Technology has always helped humanity solve the largest issues of the world and it can help us here again. We are in the midst of a revolution where technology is becoming cheaper, faster, smarter and smaller - and problems that look big today can be overcome with technology's exponential improvements.

Data is the new footprint, and it is the raw material of sustainability in the modern age. More data means better data and therefore better artificial intelligence (AI), which is at the core of any environmental technology science. Al is already being used to mimic and replace animal proteins with vegetable proteins; build better and longer batteries; capture emissions directly from the air; and produce green electricity.

Any climate change solution also needs to be delivered at scale. This is where smart platforms for distributions and new networks come in. And reassuringly, the biggest area of R&D, globally, outside of the COVID-19, vaccines is on environmental technology and science. There's a lot to be excited about.

THE NEXTWAVE JOURNAL Sustainability **MENU**





Linking technology with sustainability

In many ways, sustainability makes good business sense. Almost every report today talks about consumers' preference for sustainably produced products. Employees are choosing employers with sustainability at the core of their culture. Investors are investing in companies that are committed to making meaningful progress. And if all of that isn't enough to convince you, there's a growing market opportunity for sustainable products and services, which is expected to reach US \$516 billion by 2030.

Microsoft has recently published an executive playbook that talks about why sustainability is good for business and we've been lucky enough to talk to Cindy Rose, President at Microsoft Western Europe. Cindy commented:

"Technology plays a critical role in driving sustainability improvements. For example, we're currently working with companies such as IKEA and Equinor, who are migrating to cloud and utilizing collaboration technology to reduce their carbon footprint. We're collaborating with companies such as Shell and Maersk to decarbonize their supply chain. We're exploring circular economy approaches in retail with companies such as H&M."

She summarized: "What the experience of the last year has taught us is that to make meaningful progress on sustainability, you need a combination of accurate standards, real economic incentives and effective technology-based measurement systems. We think that's what will help us, our customers and partners to accelerate progress around the world."

Tackling sustainability with data

Sustainability data is a whole new class of data, which brings with it a number of challenges. Firstly, there's capturing the data itself. It's becoming increasingly clear that there's a need for new data standards and a new taxonomy so that data can be shared more efficiently - with everyone speaking the same language. But then how do we aggregate that data in real-time and follow it with AI? What about the security and privacy challenges that come from third-party supply chains? In many ways, sustainability data challenges represent a microcosm of the overarching digital data challenge that most organizations are facing today.

Encouragingly, we're already taking action. In the area of supply chain analytics, innovators are starting to use blockchain and they're looking to track the provenance of their raw materials. When it comes to aggregating data, there's a new generation of datacenter architecture. Rather than trying to bring vast quantities of data together in one place, innovative organizations are leaving that data where it is: they're instead bringing analytics to the data using edge computing principles.

An area that we're passionate about at EY is trust and embedding that trust into our business processes. Innovators in this field are recognizing that the technology they leverage for sustainability can be used to drive other parts of the business as well. They're realizing that it's all about how you can use data as part of your everyday business decisions.

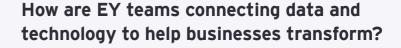




THE NEXTWAVE JOURNAL Sustainability MENU







At EY, we're excited about mobilizing the largest pools of talent in the world. The 2021 Better Working World Data Challenge is an initiative where the EY organization, along with collaborates such as Microsoft, NASA, the bushfire authority of Australia and others, have come together to solve a challenge - this year, to tackle the issue of bushfires.

Within only a few weeks, we have mobilized almost 9,000 students and young professionals from 115 countries and more than 1,000 universities around the world to come up with a solution to bushfires - predicting, classifying and managing in the threat in real-time within key areas such as Australia and California. These solutions will be given, free of charge, to every government and non-commercial institution - a clear example of Tech for Good, which I am particularly proud of.

Aside from this challenge, we're also moving toward being carbon negative at EY. We're even looking at using own data to build out sustainability models and frameworks for ourselves. We're working with EY clients and regulators to start building the common data standards that are going to be the engine that powers everything we do.

Finally, I do hope that this article has inspired you to reflect on your own carbon footprint and, more importantly, on what the impact of that carbon footprint is. Now it's time to think: what could you achieve by 2025? And what could your transformation journey look like by then?

By Beatriz Sanz Saiz

EY Global Consulting Data and Analytics Leader





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Becoming a trusted 5G partner

In February 2021, we surveyed 1,000 enterprises in 11 countries worldwide to explore their attitudes toward 5G and the IoT. We also wanted to gain their opinions on the technology and telecoms companies providing these services. What we found is that the pandemic has brought 5G and IoT into sharp focus.

Therefore 52% of respondents say COVID-19 has triggered greater interest in what 5G and IoT can do for their organization. And this comes at a time when more than two thirds of businesses say the pandemic is forcing them to accelerate their digital transformation plans. Although interest levels are higher than ever, 64% of organizations don't know the right kind of supplier to turn to – a significant stumbling block that undermines positive enterprise spending intentions.

What's more, the pressure is on for telcos and technology vendors to demonstrate that they are the best type of provider of 5G to enterprises. EY survey shows that while they are very trusted as IoT connectivity experts, less than one in five businesses see them as experts on digital transformation. And this is important because enterprises want 5G-based IoT to help deliver business transformation.

So, what's the bottom line here? Ultimately enterprises will prioritize those providers that can act as genuine partners and deliver concrete business outcomes - which is why we have created Future Network Now. Our comprehensive set of solutions enables executives to make informed decisions about their network asset and capital allocation; drives efficient and high-quality network build and maintenance; and allows for cost-effective, efficient, resilient and secure deployment of network services. With all of this in place, operators are in the strongest position to help enterprises to take full advantage of 5G.







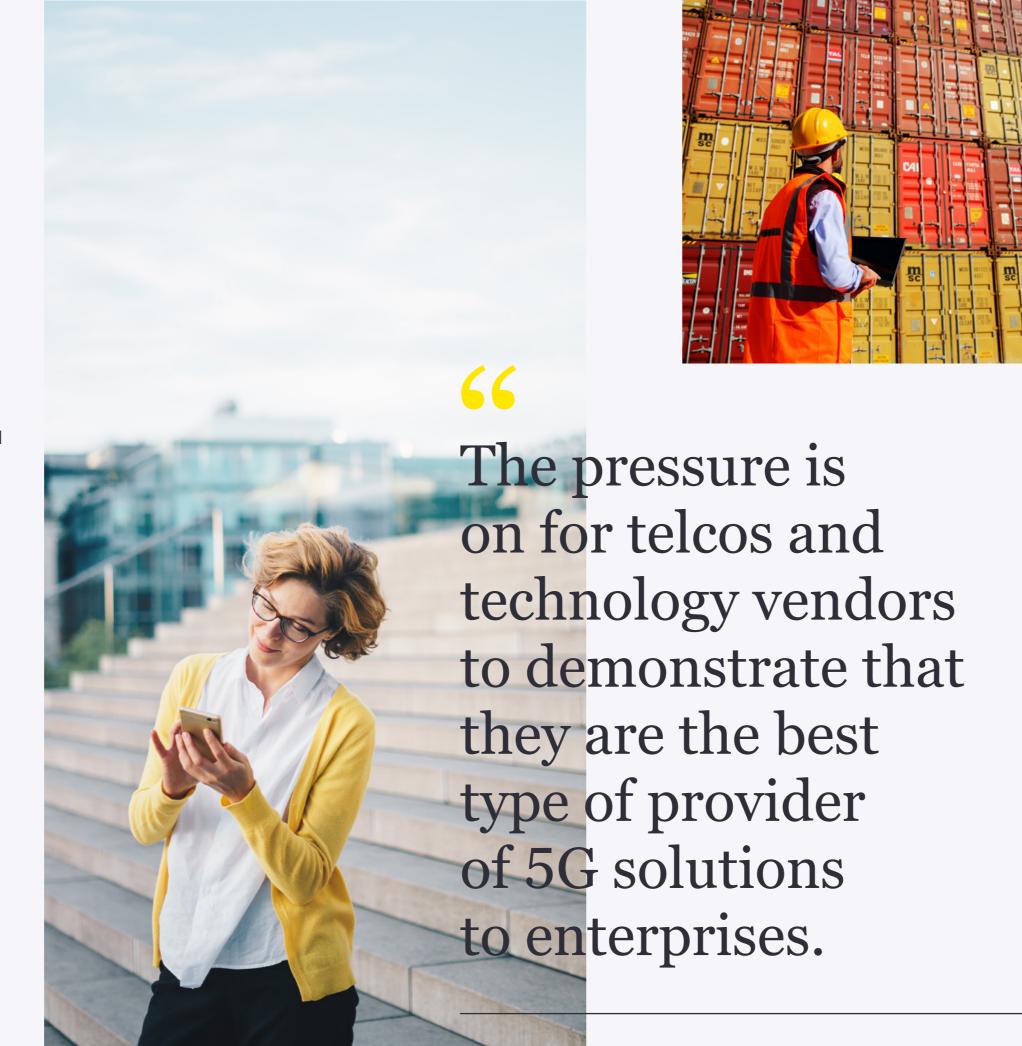
Converging technologies and related security challenges

Unlike previous iterations of network technology, the security threats associated with 5G take on a whole new level of complexity. Enterprise customers are sensitive to this: 32% of respondents to our survey cite increased vulnerability to cybersecurity risks as a perceived 5G challenge. Beyond 5G itself, there are additional cloud threats to consider, including security complexity brought about by multiple cloud levels; distributed application services and network functions; virtual infrastructure; virtual resources; and virtual management to support and orchestrate all this complexity.

Additionally, there are IoT and supply chain security threats to consider as well. And all of this is compounded by network security visibility issues and severe shortages in skilled individuals able to secure 5G.

Our Future Network Now deployment solution helps clients implement new ways of working so that deployment becomes more efficient, more structured, more predictable and ultimately far simpler. This efficiency and simplicity then translates into a greater ability to deploy a high quality network quickly while also managing costs and reducing waste.

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Helping you benefit from advances in technology

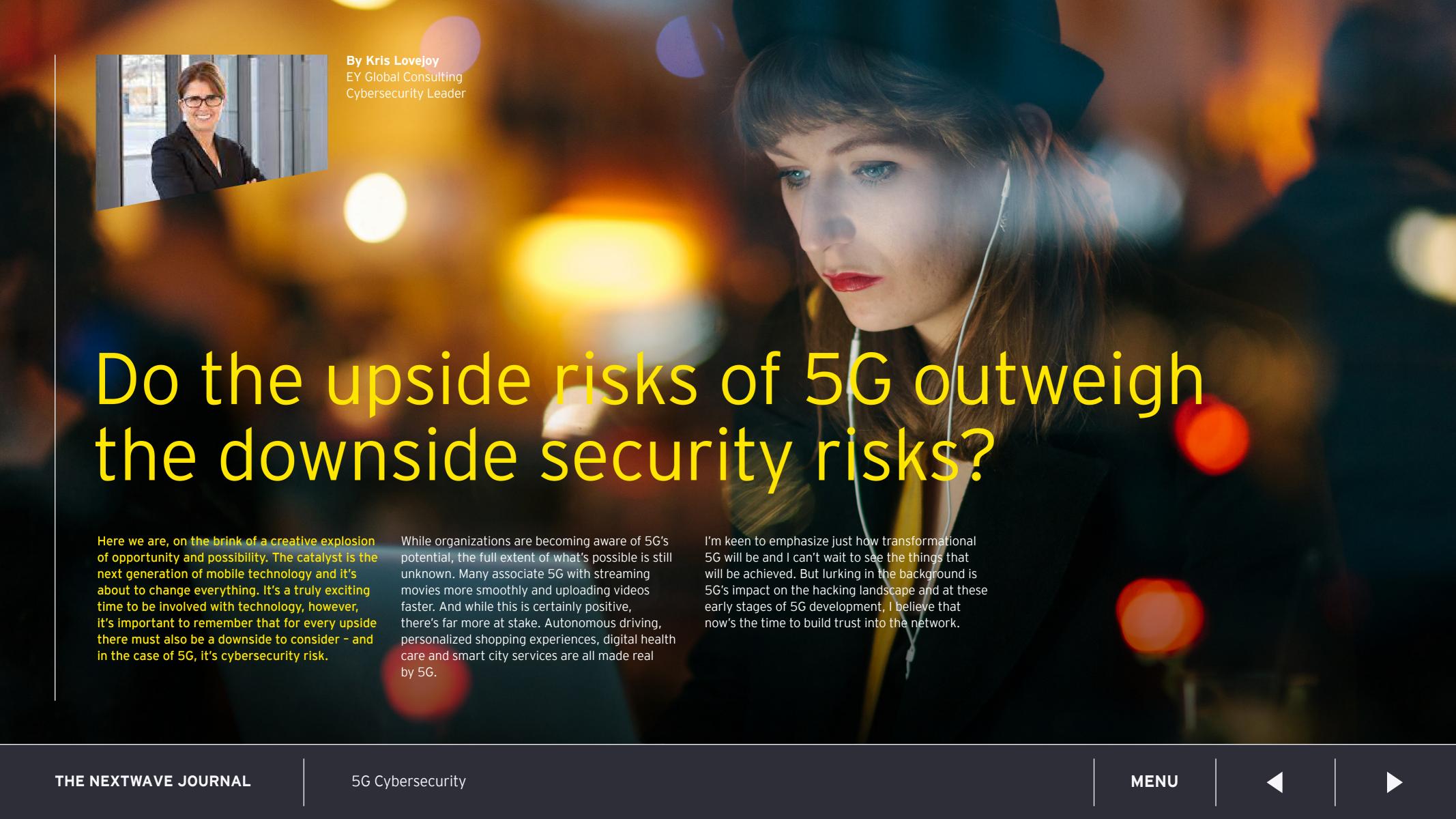
At EY, we have the experience to support communications service providers and enterprises through their 5G transformation. We help them to leverage the true power of 5G-enabled cloud and IoT to disrupt and identify the risks and put in place appropriate protection strategies, covering people, process, technology and data. And we also help our customers identify the risks and put in place appropriate protection strategies, covering people, process, technology and data.

It's clearer than ever that an intelligent digital infrastructure is critical for societies. Enhanced connectivity is transforming industry futures and it's a source of competitive advantage for the companies that use it effectively. Therefore, our Future Network Now suite of solutions comprehensively covers the critical elements of exactly what needs to be addressed. It's our way of driving the sustainable business benefits that deliver long term value.

By Tom Loozen

EY Global Telecommunications Leader

Reimagining Industry Futures MENU





Next level considerations

5G differs hugely to previous mobile technologies. Within earlier networks, the core was where critical functions such as metering, authentication and access control actually happened. But in 5G, the separation between core and edge functions is blurred - and this changes the landscape because managing security at the edge is much more complicated.

It's fascinating because on one hand 5G is more secure than previous generations - it overcomes many of the issues seen in 2G, 3G and 4G. But on the other hand, 5G introduces several new security implications.

Network slicing, for example, is an amazing feature with huge potential. It's a type of virtual networking architecture that sits within the same family as software-defined networking (SDN) and network functions virtualization (NFV) - and it offers the ability to create virtual networks with different service level agreements (SLAs) and security parameters that can enable digital transformation. However, these slices are far more vulnerable to denial-of-service (DDoS) attacks.

Another example is with edge cloud adoption. Beside generic cloud security implications, we need to think about physical security to protect the datacenters that are dispersed across the network. The applications and services at the edge will also increase the attack surface. And all this is before we even consider regulatory concerns...



The need for multilayered cybersecurity

What keeps me up at night? The smart devices that connect to the 5G network to create exciting new possibilities can themselves act as a cyber threat. These IoT devices have three layers; each one has computing technology embedded in it, and each one is built by different people.

There's the chip layer, the original design manufacturer (ODM) layer, and the provider layer - which is the brand that hooks into the device via user facing applications. Because the first two layers are built at scale with cost effectiveness in mind, security isn't always a priority. Therefore, no matter how much the technology provider considers security, the underlying layers will always be vulnerable. That's not all:



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Supply chain

The entire supply chain has to be taken into account. The technology provider should consider their obligations and what their liability is within the chain - because ultimately the consumer will hold the brand name on the package responsible for any issues.

Al and machine learning

Because of the massive amounts of data being collected to enable IoT devices, machine learning has to be applied. But maintaining data in many different locations is hard. We've recently seen a shift toward nationalism from globalism in the world and this applies to technology too. Different countries are creating different rules around data sharing and algorithms, and it's increasing complexity. Localized rules create biased data pools. And most organizations leverage third party datasets, which themselves are targets of attackers.

Identity protection

5G raises broader questions around identity itself. In some countries, an IP address is personally identifiable information, and in many cases, devices are being treated like humans. So, what really is an identity today? And how do we protect security and privacy in a 5G world where a device, just like a human being, also has a right to privacy?

Cybersecurity has to extend beyond the four walls of the company. Businesses need to build trust into the devices themselves as well as the networks they belong to. However, our latest research shows that only 19% of organizations consider security* within the context of a new business initiative. So, what's the answer?



* source: EY Global Information Security Survey 2021

What keeps me up

at night? The smart

5G Cybersecurity MENU

Cybersecurity by design

At EY, we recommend that organizations take a cybersecurity by design approach when it comes to security and privacy inside the smart device and 5G networks - right from the point at which adoption is first considered. That's why we've formed a collaboration with Nokia to support customers in this crucial area.

By combining Nokia's 5G leading professionals and security competency with the EY organizations extensive enterprise IT and OT security capabilities, we can offer managed security service solutions that are tailored for 5G environments. We've developed three pillars of capabilities that we help our customers with, which when combined form a circular, broad process:

End-to-end security assessment

We help customers assess the gap between what they want to achieve and where they really are today. It enables them to understand their current security posture and develop a maturity improvement roadmap to achieve their desired security readiness.

Security governance, risk and compliance

We merge the true capabilities of Nokia and the EY organization to address the challenges around the complex security controls required for 5G - in addition to any location-specific regulatory requirements - and help customers manage risk on a continuous basis.

Managed threat detection and response

While 5G has a number of embedded enhanced security features, we cannot rule out the likelihood of a successful attack. To detect and respond to incidents, we help customers develop contextual incident management capabilities.

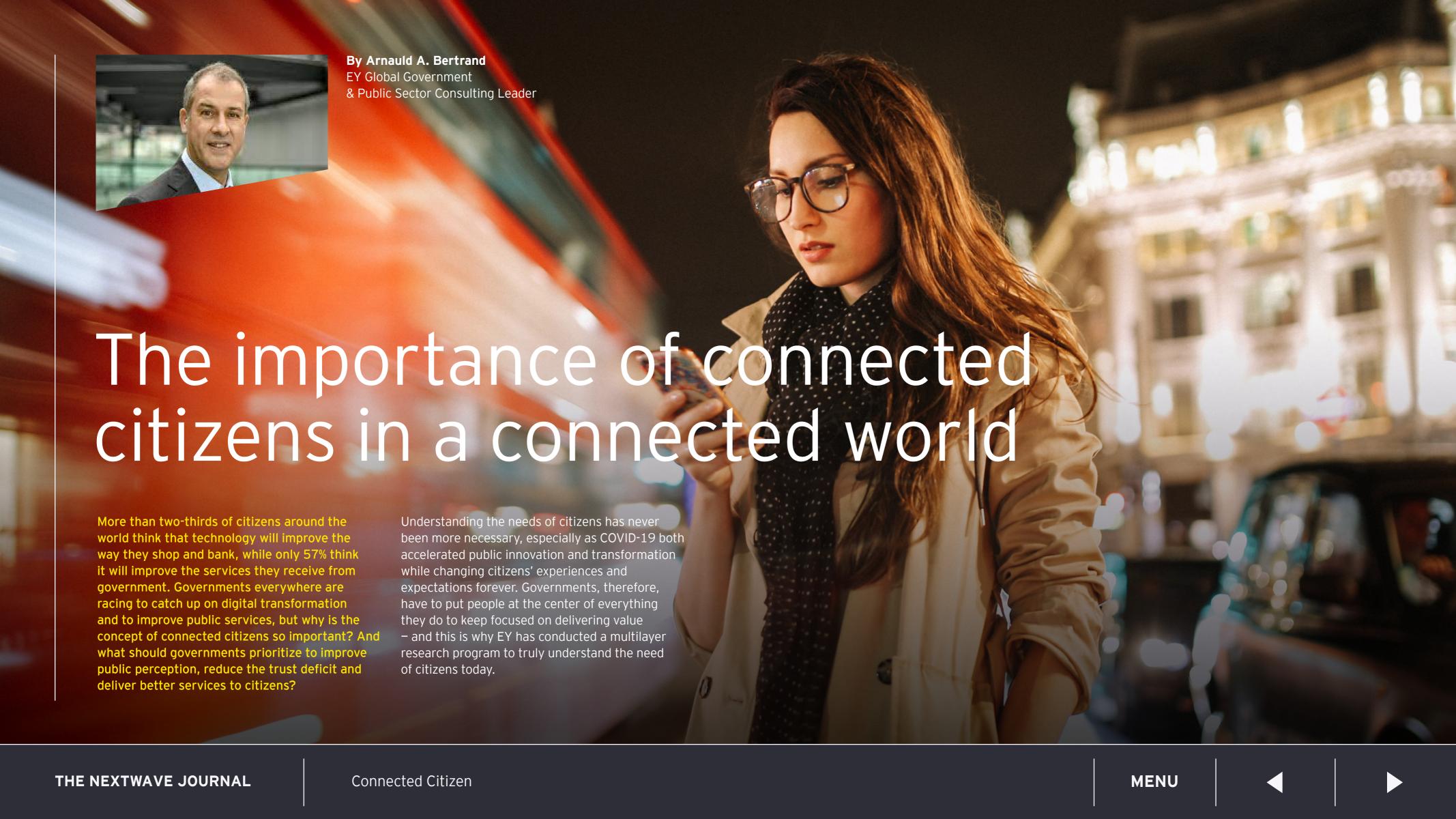
By leveraging and integrating 5G network and mobile technology from Nokia, and cybersecurity business transformation capabilities from the EY organization, you can enable innovation and enter into the future with confidence.

5G isn't a revolution. It's the inevitable evolution of networking as we connect more and more devices. Building trust into the network now is the only way to maximize the opportunities that come from the adoption of 5G.

By Kris LovejoyEY Global Consulting
Cybersecurity Leader

THE NEXTWAVE JOURNAL 5G Cybersecurity MENU





Introducing EY Connected Citizens

EY Connected Citizens is a major research program aimed to help governments anticipate and prepare for the future needs of citizens by understanding exactly what is driving disruption. As part of the program, EY conducted an initial survey of 12,000 people across 12 countries toward the end of 2020, seeking to find out exactly who a government's citizens are; what their values are; what their attitudes, needs and behaviors are; and crucially, what they expect from government.

Run in three main stages, the ultimate goal of the program is to help governments find innovative ways to meet business needs, deliver better services, and improve outcomes for citizens and communities:

Identify who connected citizens are

- outlining key citizen personas in a connected world and recognizing the main expectations they have around government transformation

Focus on what connected citizens need

 identifying what citizens expect from their government, deepening our analysis on a countryby-country basis

Study how government should respond

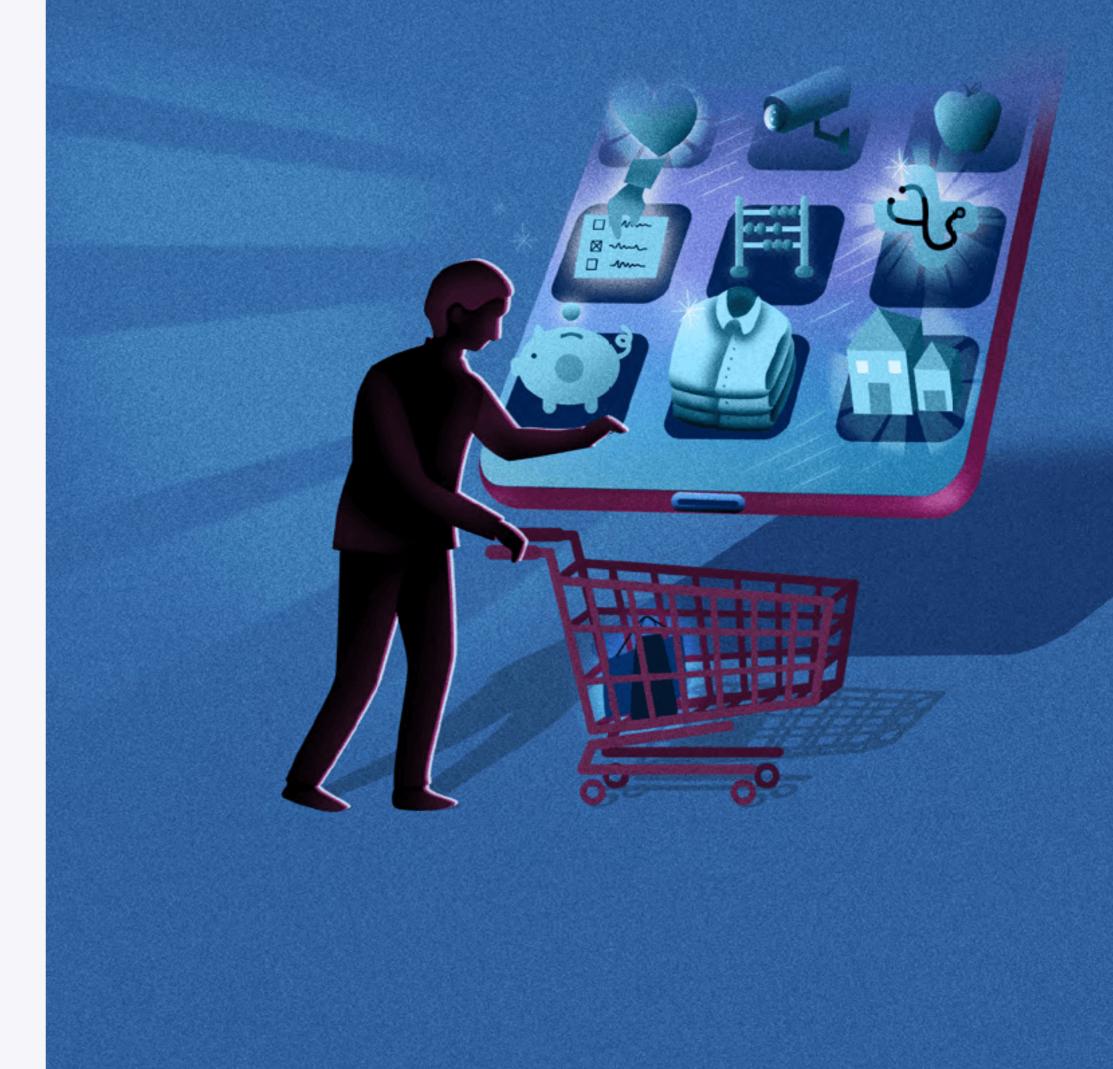
 holding focused events that bring together the public sector ecosystem, civil society and citizens themselves to explore solutions

Offering insight to governments

Our initial research has led to several key learnings, which provide governments with valuable insight. There's an overarching confidence in the power of digital technologies to change our lives; a lack of confidence in the government's ability to leverage digital technologies to improve interactions with citizens; concerns around the potential negative impact of digital technologies to society, including inequality and loss of community; and a reluctance to support data sharing across government to drive improvements.

Headline findings:

- **1.** Financial insecurity is a global challenge affecting citizens across all demographics
- **2.** Despite some anxieties about the future, most people remain optimistic
- **3.** Technology is playing a more pervasive role in people's lives, but...
- **4.** Governments lag behind in digital services compared with the private sector
- **5.** There are broader concerns about the impact of technology
- **6.** Digitization remains an imperative for governments
- **7.** Governments must seek ways to overcome a troubling trust deficit



THE NEXTWAVE JOURNAL Connected Citizen MENU



Understanding the diversity of citizens today

Working closely with leading market research company, Ipsos MORI, we also identified a total of seven citizen personas. These personas provide the best way to understand the diversity of citizen views, experiences and attitudes, so that governments can optimize their policies and services accordingly. After all, there should never be a one-size-fits-all approach to creating public services, because not all citizens use technology in the same way.

Citizen personas:

Aspirational technophiles

Well-educated digital natives excited by the power of technology

Capable achievers

Pragmatic technophiles who embrace innovation

Diligent strivers

Young self-improvers keen to get on in life

Privacy defenders

Cautious about sharing their data with government or private companies

Tech sceptics

Older, lower-income earners who struggle to see technology's benefits

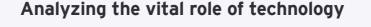
Struggling providers

Low-paid workers who lack digital skills and access

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Passive outsiders

Detached from the connected world and reluctant to embrace change



Today, technology is a huge part of citizens' lives and within governments, data is the new frontier for tackling the complexities of public policies. However, harnessing technology and data will only succeed in the public sector if governments can demonstrate that digital transformation will bring value to the whole of society without leaving anyone behind. Therefore, governments must facilitate education and continuous training to make sure that everyone can benefit from the digital opportunity.

Encouragingly, despite varied perceptions of the government response to the pandemic, digitalization remains a priority for all governments around the world, and they're broadly all working toward change. Our research points strongly toward four key areas that they should focus on:

Priorities for governments:

Agile and innovative policymaking

develop innovative policies that address the concerns of different groups

Inclusive digitization

drive more rapid digitalization of public services while ensuring no groups are left behind

Responsible use of data

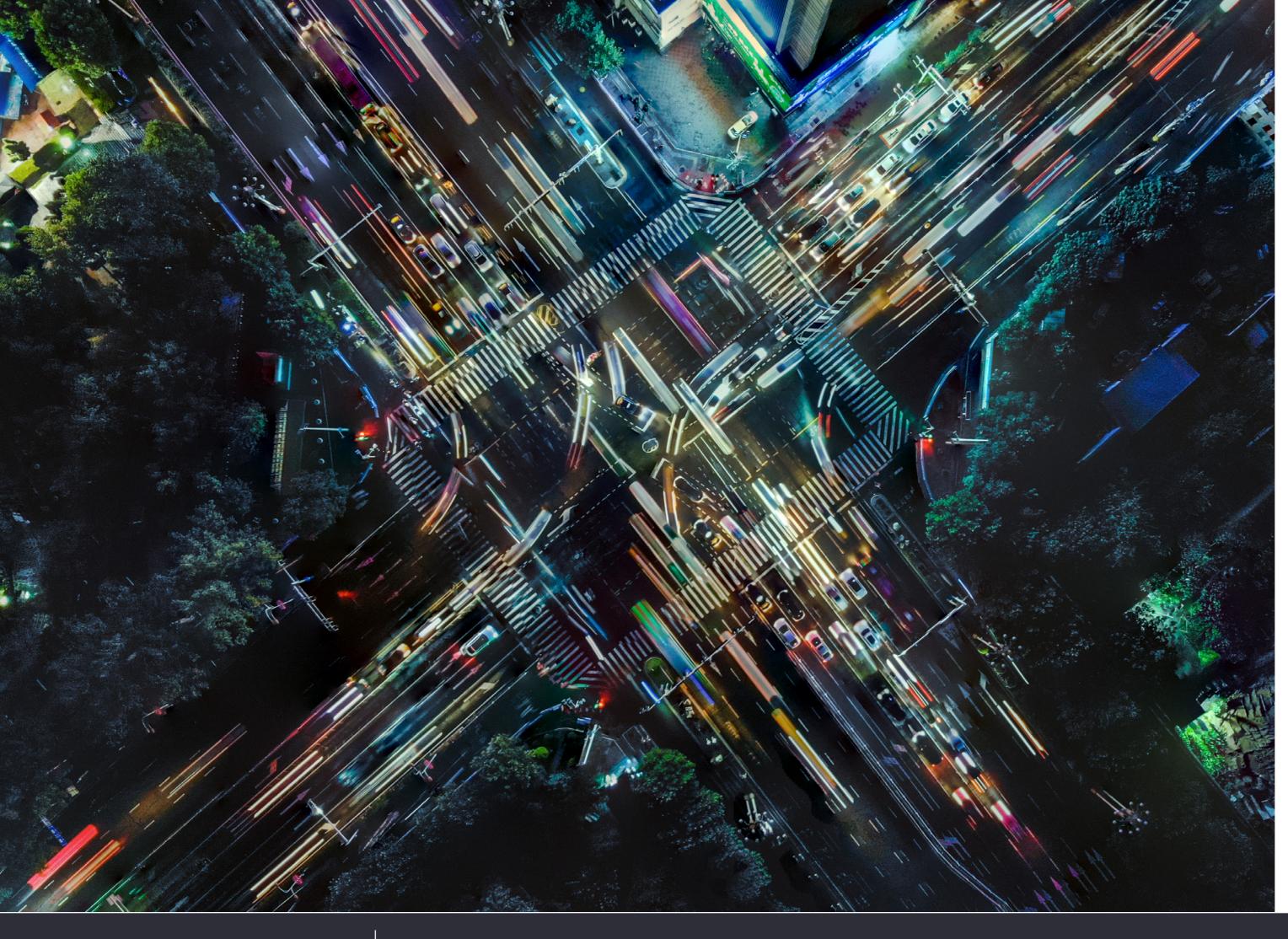
create new regulatory, legal and governance frameworks that allow countries to capitalize on the opportunities of data, while at the same time managing the potential risks for citizens

Public engagement

provide the mechanisms for more shared, open and participatory decision-making

Governments have to put people at the center of everything they do in order to keep focused on delivering value.

Connected Citizen MENU



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Making the most of the digital opportunity

For the most part, citizens have now seen how big private sector organizations can use data and technology to improve their services and improve their customers' lives. Rather than feeling daunted by this, we want to help governments see the huge opportunity that it presents.

As opposed to returning to "normal" following the impact of the pandemic, governments should instead use the experiences they've had to build better digital services for all. Because by catching up with the private sector, they can build trust with citizens, which then has a knock-on effect for overarching priorities such as re-elections.

At EY, our combination of sector insight and experience in helping governments undertake large transformation projects in different parts of the world, means that we're in a great position to help. Not only do we understand citizens and what's driving governments to transform their services, but we also have the solutions and services to make it happen.

By Arnauld A. Bertrand

EY Global Government & Public Sector Consulting Leader





Together, we can see opportunities where others don't

We hope you've found this third edition of the NextWave Journal insightful.

And we hope you've been able to see why we believe that as the world becomes ever-more unpredictable, the one constant is being connected. This will be essential for business success not only today, but also tomorrow.

If you'd like to share any opinions or ask us any questions about anything you've read so far, please don't hesitate to get in touch with us - we'll be more than happy to start a conversation.

Thank you.

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EY | Building a better working world

EY exists to build a better working world, helping create long-term value for clients, people and society and build trust in the capital markets.

Enabled by data and technology, diverse EY teams in over 150 countries provide trust through assurance and help clients grow, transform and operate.

Working across assurance, consulting, law, strategy, tax and transactions, EY teams ask better questions to find new answers for the complex issues facing our world today.

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