

# THE MOBILE CENTURY

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## DIGITAL METAMORPHOSIS

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# FOREWORD

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The theme of the 2023 edition of The Mobile Century is **digital metamorphosis**. This reflects the profound changes that are happening in the digital tech sector in all of its forms – in networking, mobile, media, space and the internet. To the GTWN, digital transformation is an essential prerequisite for this fundamental change in the economy and society, but it is not sufficient to ensure that all of the potential benefits of these technologies can be achieved. A cultural transformation is also needed to ensure that all peoples of the world can participate meaningfully in the digital world.

Digital metamorphosis can take many forms. This edition explores a number of these: from ESG based investments in new networks and services; to developing an open, safe and creative metaverse; to the future of digital media platforms and services; reforming space law to keep pace with the reality of new space industries; transforming the mobile tower industry with VR; and importantly how artificial intelligence will drive many of the profound changes we expect to see over the coming years.

But with these positive changes will also come many challenges. For example: how to ensure that your company is metaverse ready; how to build cyber resilience in your organisation and protect critical infrastructure; how users can take back control of their own data, and what this means for data based business models. We also include global perspectives on digital metamorphosis in different regions of the world.

Thank you to all of our contributors, who are leaders in their respective fields and who have given so generously of their time and expertise to make this edition such a success. We are very grateful for the ongoing support of our major partner, the global law firm CMS. We are pleased to be able to feature several articles by leading CMS experts in areas as diverse as digital media platforms and streaming video services; AI and creativity; and protecting yourself from cyber threats. We are also incredibly proud to include articles by many of our Board Members, who are change makers in their particular fields in the digital tech industry, making our magazine unique in its depth and breadth of coverage of the issues.

And finally, thank you to our readers who continue to support the work of the GTWN as we ‘Change the culture of communications – from generation to generation’.



*Vicki MacLeod*  
TMC Editor-in-Chief  
GTWN Secretary-General

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## Cultivating the highest value digital transformation

More and more companies view digital transformation as an opportunity to reinvent themselves. Smart data, the Internet of Things and Industry 4.0 all demonstrate how digital transformation has brought far-reaching changes to the global economy. CMS is helping our clients navigate this new reality by moving their focus from the value a company creates on its own, to the value it creates in the wider world, resulting in the highest value digital transformation.

## Interdisciplinary collaboration is vital

Digital transformation impacts data protection, IT security, contract design, liability and regulation – it is all closely intertwined. New regulations such as the Digital Markets Act (DMA), the Digital Services Act (DSA), and the EU Data Package (European Data Governance Act and Data Act) are fundamentally changing the regulatory framework governing digital services. Innovative business models and the use of new technologies confront companies with completely novel legal challenges and many unresolved issues remain around the legally defensible implementation of digitisation strategies. We believe that interdisciplinary collaboration of our specialists is key to successfully managing these challenges.

## Helping our clients orchestrate value

There are over 600 Technology, Media and Communications (TMC) sector specialist lawyers at CMS in over 40 countries. Here we highlight some of our partners' incredible work to help our clients gain the most value from digital transformation.

Data security and the threat to critical infrastructure is a high stakes current issue. Since the outbreak of war in Ukraine, Co-Head of TMC in Central Eastern Europe, **Olga Belyakova**, has supported a global technology company in negotiations with the Ukrainian government concerning the urgent migration of data to the client's cloud. She also helped shape cloud legislation to ensure increased efficiency in data transfers, while promoting communications between the Ministry of Energy of Ukraine and software developers in creating a nation-wide IT platform to secure energy infrastructure.

CMS partner and Global Co-Head of the TMC Sector Group, **Dóra Petrányi** believes that a strong ethical framework is key to establishing responsible AI governance, while maintaining a competitive approach across corporations and jurisdictions. As co-chair of the Hungarian AI Coalition's Regulatory & Ethics Committee, she has played an active role in preparing Hungary's official standpoint regarding draft AI regulations and contributes to the initiatives of the Coalition on a pro bono basis. The Coalition benefits from a truly global approach and comprises over 2,000 members from state agencies, leading IT businesses and universities. They are tasked balancing the development of AI in an ethical manner while maintaining a competitive market. To further promote inclusivity and knowledge sharing around the impacts and utility of AI, Dóra has also been instrumental in establishing the Women in AI Initiative, which provides a regular forum, hosted by CMS, for women and men to discuss topics around AI, and raise awareness about its potential on a global scale.

UK-based patents partner **Rachel Free** advises clients on intellectual property (IP), and especially patents, which provide a safe haven for innovators from which new advances can be explored, and inspiration garnered. IP and patents provide a commercial incentive for knowledge sharing, and they also lead to improvements in the lives of individuals due to advances in fields such as life sciences and healthcare. Through the research, development and ultimately the protection of new technologies, it is possible to address critical issues such as global warming. Rachel's work is focussed on helping to democratise awareness and ensure that new technologies are used in human-centric ways. In the life sciences sector, she has been advising, among others: Skin Analytics, an early-stage tech business which uses AI technology to help more people to survive skin cancer; and Microsoft on a huge

range of computer related and AI technologies that improve people's lives, in fields such as information retrieval, computer security and others.

**Victoria Gaskell**, our Global Co-Head of Media, leads a team focussed on the complex digital media landscape. Content producers and distributors are having to pivot to a streaming-first model, creating content that cuts through in an incredibly demanding consumer landscape. Victoria's team has been advising on the launch of Paramount+, including a ground-breaking deal with Sky to bundle Paramount+ with Sky Cinema in the UK, Germany, Austria and Italy. Foresight provided by some of the most prominent content producers in the market, coupled with the expertise and creativity of passionate media lawyers, ensure the team can deliver results across social, cultural, economic and geographic boundaries.

Swiss-based **Tina Balzli**, Global Co-Head of Fintech, Crypto & Digital Assets, works at the forefront of financial services innovation for a number of international clients. There is a new, more consumer-centric and cost-efficient focus developing in fintech in start-ups and scale-ups as well as established financial services providers. Fintech solutions are revolutionising our understanding of banking and asset management while also furthering financial inclusion in the broadest possible sense. Tina's work focusses on ensuring accessibility and transparency of new regulation while remaining aware of the potential broader impacts of over regulation.

**Carolina Veas**, Head of Competition, Crypto and Blockchain at CMS Chile, works with both regulatory bodies and early-stage crypto businesses. She emphasises the importance of transparency in banking processes, and relevant public policies when determining factors around the closure or refusal to open bank accounts. This practice, known as de-banking or de-risking can seriously limit the economic opportunities for certain sectors of the community. This issue came to the fore in recent advice to Latin American crypto exchange platform Buda.com. Particularly in scenarios where there are low levels of regulatory certainty, agencies can tend to take the most conservative approach possible. This is not always the most reasonable solution within the scope of their faculties and could ultimately force financial services businesses to operate outside the formal economy. This has serious consequences for innovation, financial inclusion, and sustainability which are key for digital transformation globally.

## Helping the GTWN create value

At CMS, it excites us to ask ourselves not only "How do we create value?" but also "How do we help others create value?" We continue to be honoured to support the GTWN and its flagship magazine The Mobile Century, which, once again, is dense with thought-provoking articles from inspiring leaders. We hope the articles motivate you, as they do us, to think about our responsibilities and the wider impact of our companies on the world around us.

For more information about CMS, visit [www.cms.law](http://www.cms.law) or contact [dora.petranyi@cms-cmno.com](mailto:dora.petranyi@cms-cmno.com).



Dóra Petranyi is a partner and CEE Managing Director at CMS and Global Co-Head of the Technology, Media and Communications Group (TMC). She also heads the TMC, Data Protection and Intellectual property (IP) practices, and is a partner in the Competition practice in the Budapest office.

She is expert in all three sectors of TMC (Technology, Media and Communications), with a special focus on communications, media and all types of regulatory matters, having been general counsel for the largest telecommunications provider in the region.

Her major clients are TMT and pharma companies, foreign-owned commercial banks, and major joint ventures. Her areas of specialisation include AI, digital infrastructure, cybersecurity, data protection, GDPR, competition law, IP law, general commercial contracts, corporate restructuring and M&A.

She has established and leads a managed services delivery centre from Budapest. As part of this project, a team including UK, German, US, and PRC lawyers provided support to a company, undertaking and managing its procurement support on a global scale. In addition, she has in-depth experience managing and coordinating multi-jurisdictional projects in over 20 countries.

Dóra is the Co-Chairman of the Regulatory & Ethics Committee of the Hungarian AI Coalition. She is also a member of the Digital Civil Code Review Working Group, being the only outside counsel in the team. She is the first and only lawyer to be a member of the co-regulatory committee between the local telecommunications' regulatory authority and the Association of Hungarian Content Providers. Dóra is a member of the International Board at Global Telecom Women's Network (GTWN). She is also a member of the Board of Directors of UNICEF Hungary.

Dóra is the co-author of several sector-specific publications and is a regular speaker at key international conferences, including the World Economic Forum (Davos), the Mobile World Congress and ECTA.



**Olga Belyakova**



**Rachel Free**



**Victoria Gaskell**



**Tina Balzli**



**Carolina Veas**

ENVIRONMENTAL

E



SOCIAL

S



GOVERNANCE

G



# ESG INVESTING

## BUILDING GREEN FIBRE

### AN INTERVIEW WITH JANICE HUGHES, CBE, CO-FOUNDER OF GRAPHITE STRATEGY AND CO-FOUNDER OF SPRING FIBRE.

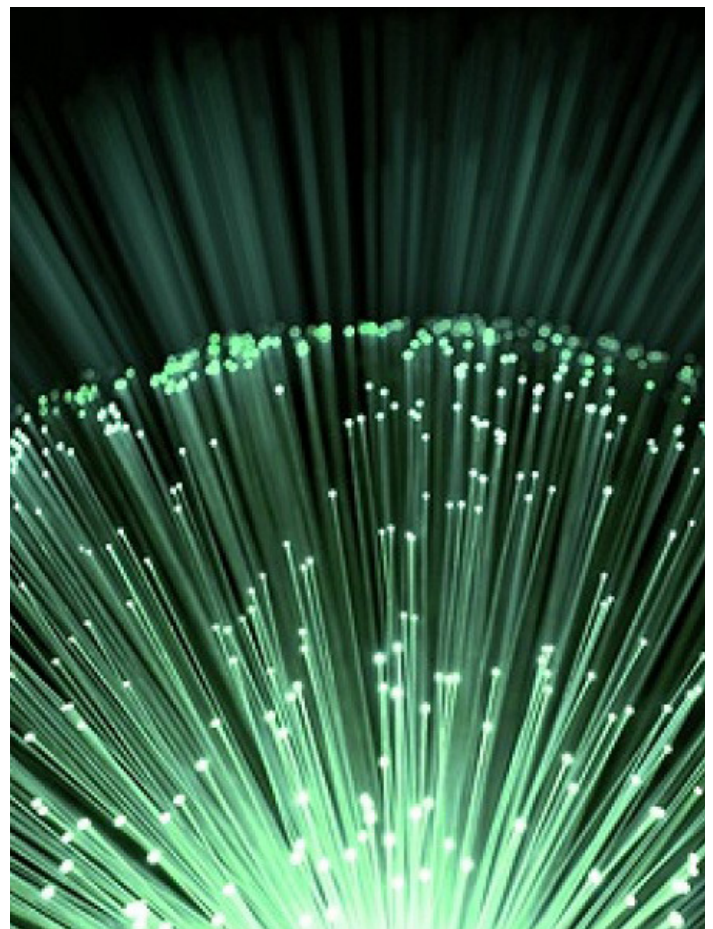
**TMC:** Investment specialist River and Mercantile (R&M) announced in September 2022 that they would invest up to £155 million to support the rollout of Spring Fibre’s ultrafast full fibre broadband network across England. Can you explain some of the background to this fantastic investment, how you became involved, and the story so far?

**Janice:** I have a long-standing interest in achieving social benefit through entrepreneurial activity and digital technology. All of my more than 30-year career has been based on growing new communications and strategic businesses to achieve positive social outcomes. As the UK broadband market started to grow with the rising demand for home working and for film and TV series streaming from Netflix, Disney, Amazon, Apple and Paramount, I realised there was a huge opportunity to offer gigabit fibre. During the covid pandemic UK film and TV subscriptions grew to 15m households. With so many people without adequate broadband coverage, I became increasingly convinced that the answer was to apply entrepreneurial skills to solving this problem. At the same time, it was important to me that any new broadband network should be as ‘green’ as possible – that is with the smallest carbon footprint and as sustainable as possible.

In 2019, just before the start of the pandemic, we decided to establish Spring Fibre, with the support of a very experienced mobile and telecoms investment team at Kingsley Capital Partners. Spring Fibre aims to deliver multi-gigabit capable full fibre-optic infrastructure across the UK, giving residential and commercial customers next generation access to the internet. We are lucky to have a fantastic CEO to lead Spring Fibre, Rosalind Singleton. She is also highly attuned, as am I, to the vision of creating the greenest fibre network in the UK. Together we will deploy the company’s network on a wholesale basis, empowering a range of Internet Service Providers to offer connectivity solutions which will cater for all users’ needs. We aim to create a network rising to more than 1 million premises passed over the next few years.

**TMC:** You have always aimed to ensure that technology is used to achieve good social outcomes – purpose with profit, so to speak, rather than profit with purpose. This aligns with the goals of the GTWN, of which you are Co-Founder. How will this be achieved through Spring Fibre?

**Janice:** Spring Fibre targets areas with poor internet provision and will deliver a major boost to many under-served communities and businesses. As in many countries, there is growing demand for better and faster access to data across the UK, but the provision of infrastructure has often been skewed to the larger population areas, meaning that many



Green fibre in narrow trenching



Wind turbines generating 50% of UK energy

smaller communities are left without adequate broadband coverage, restricting their lives, their working opportunities, their local businesses and even their children's school outcomes. Data infrastructure is now a critical asset, as was clearly shown during the pandemic. That is why we are partnering with R&M to deliver a network that will make a significant positive impact on society. Their infrastructure investment fund invests in assets with outstanding ESG credentials. We want the whole mobile and telecoms industry to step up and change their operations in view of the impending climate crisis. For example, we would like all companies to face an "Environmental Panel" to provide awards to the best practices and best companies and chide those falling behind. Sadly most companies are not measuring their emissions or thinking about climate change given the downward economic pressure emerging from the Russian invasion of Ukraine and the resultant energy price increases.

**TMC:** What are the challenges facing companies wanting to deliver ESG outcomes and a good return on investment at the same time? Are these two objectives compatible, or are there potential conflicts to be managed?

**Janice:** I think one of the biggest challenges in delivering ESG based investment results, is the higher level of expectation and scrutiny from investors, shareholders and other stakeholders. However even the investors are not always aware of the detailed changes we must all make. Frankly all of our staff, our co-workers and customers are passionate about integrating ESG delivery into our greenfield gigabit business. What I have learned from this process so far is that ESG and growth are not in conflict - in fact they are intricately dependent on each other and achieving both at the same time requires a clear focus on objectives and a determination to succeed. We just need all of the big players to set a high bar alongside us with a clear set of standards to reduce our environmental footprints individually and collectively, with key institutions holding us all to account.

**TMC:** Can you give us some examples of how this has played out in Spring Fibre's case?

**Janice:** One thing that stands out for me is the expectation of much greater visibility, especially of an ever-broader range of nonfinancial metrics related to the diverse social and environmental risks. Investors are aware that these days consumers are voting with their wallets, and that if your business commits to achieving certain ESG goals, you need to ensure that you build in metrics from the beginning, to be as transparent as possible about how you plan to monitor and report on achievement of these goals. At the moment there is no uniformity in ESG reporting, which means that any



Reclaimed poles for a greener Spring Fibre

metrics you choose must be robust and transparent, to avoid any charge of potential 'green-washing'. We have some clear markers or KPIs of implementing a green strategy. For example, to reach net zero we are using reclaimed poles made of old timber and new poles made of recycled plastic. Equally we are using narrow trenching to reduce the amount of concrete taken out so less is needed to be poured back in. We also use electric cars in our operations. We have plans in the future to incorporate micro solar and micro wind partners wherever we can. During the last week 50% of our UK energy usage has come from North Sea turbines based offshore in our target build areas and we want to become an active agent in the renewables transformation needed today.



Climate change storms demand action

**TMC:** The past few years during the pandemic have been particularly challenging for businesses in terms of cost of inputs and logistics. How has this impacted on your plans for rolling out Spring Fibre?

**Janice:** The rapid rise in the cost of everything since the start of the pandemic, and then the war in Ukraine, has caused many businesses to re-evaluate their operations, and to find savings where they can. With a new ESG-based start-up such as Spring Fibre, this has created additional pressure on management, as our stakeholders rightly expect us to deliver on our commitments, notwithstanding the higher costs and other pressures that all businesses are facing. This has meant a continual updating and re-evaluation of every aspect of our business, and I believe that this has been a positive thing, in retrospect, as it has made us even more determined to deliver the best green broadband network in the UK.

**TMC:** What other lessons can you share with other companies that are looking to invest in ESG-based businesses?

**Janice:** I think that what an ESG focus teaches you is the importance of having a customer-centric approach. As our aim is to deliver both economic and social benefits to our customers, we need to understand our customers' particular context and needs very well, and to make sure that we are giving them the best value for money that we can.

**TMC:** Thank you Janice for your insights. We wish you and Spring Fibre all the best as you build out your new network.



Janice Hughes is the Co-Founder and Director of Graphite Strategy. She also founded and built-up Spectrum, a global management consultancy with 9 offices around the world. She is now focusing on ultrafast full-fibre gigabit rollout, 5G and green energy investments. She is Co-Chair of the Independent Commission on UK-EU Relations and she is launching a new carbon credits group on the London Stock Exchange with her charity in Africa, Space for Giants. She created the European TMT Practice for Booz Allen & Hamilton and prior to that she was the MD of the Economists Advisory Group. She has advised major companies across the telecoms, media, sports and technology sectors and has advised Government Ministers in Australia, Hong Kong, New Zealand, the UK and Europe. Janice was part of the Creative Industries Committee with Richard Branson and Lord Puttnam and has written several books. She graduated from Cambridge University with a degree in Economics and Statistics. She is currently Chair of Space for Giants protecting wildlife and trying to reverse the process of extensive species extinction. She was a Director of The Jockey Club and a Corporate Advisor for Tate Modern and Tate Britain. She is a member of the Director's Circle of the V & A Museum. She was formerly the UK President of Medecins du Monde a global health charity where she worked with Syrian refugees, the Ebola outbreak in Sierra Leone and on drug addiction in Dar es Salaam, amongst many other projects. She is a co-founder of Global Telecoms Women's Network (GTWN) and a Member of the Global Board Ready Women Initiative (GBRW).

# WHAT ESG MEANS TO THE TELCO INDUSTRY

GEMA ESTEBAN GARRIDO, GLOBAL HEAD OF ESG, IG4CAPITAL

First of all let's talk about the overall size of the **whole ESG market**. According to Bloomberg Intelligence (Fig 1) Assets Under Management (AUM) are going to exceed USD41 trillion in 2023 and USD50 trillion in 2025, which will represent one third of AUM in the world. This means that ESG is not just a passing fad, but is definitely here to stay.

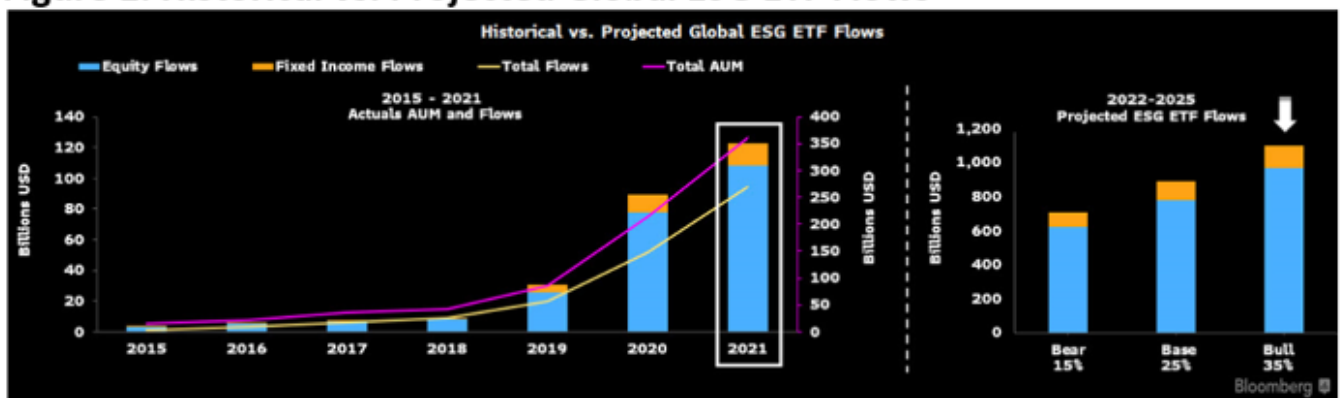
Secondly, according to a survey conducted by MSCI of 200 **Asset Owners**, **62% cited climate change or ESG measurement as a top 3 impactful trend in the next 3-5 years** and 73% planned to increase ESG investment either significantly or moderately by the end of 2021. Therefore, capital allocation whether is in **equity or fixed income** is very much growing in the telco ESG world. For example, again, a MSCI study published in April 2022 revealed that more than 1 trillion\$ of investment in communications is in ESG mutual funds and ETFs.<sup>1</sup> Also since Telefonica became the first in the telecommunications industry to issue a Green bond back in January 2019, amounting to EUR1 billion, it has become very common to see telcos issuing sustainable bonds.

## Governments are also focusing on ESG

Regulators and policy makers are equally focused on ESG. On 23 Feb 2022 the European Commission adopted a proposal for a Directive on corporate sustainability due diligence. The proposal aims to foster sustainable and responsible corporate behaviour throughout global value chains. It also aims to anchor human rights and environmental considerations in companies' operations and corporate governance<sup>2</sup>. While acknowledging that a number of EU Members States have already introduced national rules on due diligence and some companies have taken measures at their own initiative, the EU stated that there is need for a larger scale improvement that is difficult to achieve solely through voluntary action.

This is significant, because previously there was only a voluntary obligation to report on ESG criteria. This due diligence requirement could be a compliance watershed moment for identity and data markets similar to the impact felt in the financial markets as a result of the US Sarbanes Oxley (SOX) Act of 2002. This Act mandated certain practices in financial record keeping

Figure 1: Historical vs. Projected Global ESG ETF Flows



Source: Bloomberg Intelligence, DataExhibit.

1 <https://www.msci.com/documents/1296102/24720517/Top-20-Largest-ESG-Funds.pdf>

2 [https://ec.europa.eu/commission/presscorner/detail/en/ip\\_22\\_1145](https://ec.europa.eu/commission/presscorner/detail/en/ip_22_1145)

and reporting for corporations and it kicked off strong growth in the Enterprise IAM market.

## Why and how should companies and telcos focus on ESG?

Raising ESG standards and practices will drive three major outcomes for companies:

- First, it answers rising consumer demands for more sustainable and ethical products and practices. 76% of consumers say they will stop buying from companies that treat the environment, employees, or the community in which they operate poorly [PwC] and 88% of consumers will be more loyal to a company that supports social or environmental issues [Cone Communications].
- Second it may improve efficiencies or increase revenues.
- Third, companies will have access to cheaper capital and better valuations.

Then, companies need to **work out which particular ESG topics they should focus on**. It is extremely important to understand the company core business and focus on the financially material topics for that industry/company. In particular, I suggest that two areas that telcos should concentrate their efforts on are Environmental and Social issues.

### Environmental

The telecoms industry is focusing on GHG emissions and waste management. In a joint study, Telefónica and Nokia demonstrated that 5G is up to 90% more efficient than legacy 4G in terms of energy consumption per traffic unit. Also fiber is 85% more energy efficient than copper, primarily as a result of the decommissioning of the copper from homes with broadband. For example, the decision to completely dismantle the old network together and replace it with new fiber infrastructure has enabled Telefónica, in Spain, to save 208 GWh of energy between 2016-2018, which equates to 56.5 KtCO<sub>2</sub> being avoided between 2016-2018.<sup>3</sup>

In its 2022 Mobile Industry Impact Report<sup>4</sup>, the GSMA also suggest that through digitalisation, such as with smart grids, cities, buildings and transportation, we could save 7.7 billion tonnes of CO<sub>2</sub> emissions per year (more than 10% of total GHG Emissions).

The report also points out that an ESG focus is becoming business critical for all operators, and that this is why the GSMA has developed a new industry specific response with new reporting benchmarks:

<sup>3</sup> Fiber networks have 100 times more capacity than the equivalent cable, use 85% less space and have 4 times the distance capacity to premises, which allows the decommissioning of old technology resulting in huge energy savings.

<sup>4</sup> [https://www.gsma.com/betterfuture/wp-content/uploads/2020/03/GSMA\\_TheFutureofMobile-1.pdf](https://www.gsma.com/betterfuture/wp-content/uploads/2020/03/GSMA_TheFutureofMobile-1.pdf)

*“With stakeholders getting smarter and more discerning when it comes to ESG claims, an effective and consistent approach to measuring and communicating performance is more important than ever. The GSMA has recently launched ESG Metrics for Mobile, a first-of-its-kind mobile-sector ESG reporting framework featuring 10 industry specific KPIs. The sector-specific ESG data metrics will deliver a more consistent, comparable and decision-useful view of the industry’s most material impacts and drivers of value, allowing for more effective and meaningful communication between operators and their stakeholders”.*

Most operators are already reporting on the number of devices that they collect to prevent e-waste, such as the 229 million devices collected by AT&T, which were refurbished or recycled. Another example is from Orange, which reported that it collected mobile phones equivalent to 15.1% of its sales volumes in Europe in 2020.<sup>5</sup>

### Social

There are some key business aspects of ESG like digital inclusion and child protection which are focused on reducing the digital gap with rural populations or the elderly, as well as educating children in the safe use of digital services. It is estimated that more than a billion people worldwide are living with a disability. The largest group is the hearing impaired followed by the vision impaired and then also the other physically and cognitively impaired.

However, the statistics are notoriously unreliable and there is no single reliable source of data. Suffice it to say that it is a big number and represents a significant proportion of the telco industry customers in all markets. And, because of their impairments, these customers require different forms of personalisation and customisation to meet their individual needs. In fact, because of the lack of suitable access, a portion of this billion people cannot use many of the digital services that we think of being mainstream requirements today.

### Promoting digital confidence

But let’s zoom in on data privacy. Article 12 of the UN’s Declaration of Human Rights stipulates that no one shall be subjected to arbitrary interference with his privacy.



<sup>5</sup> <https://www.orange.com/en/oranges-commitment-environment>

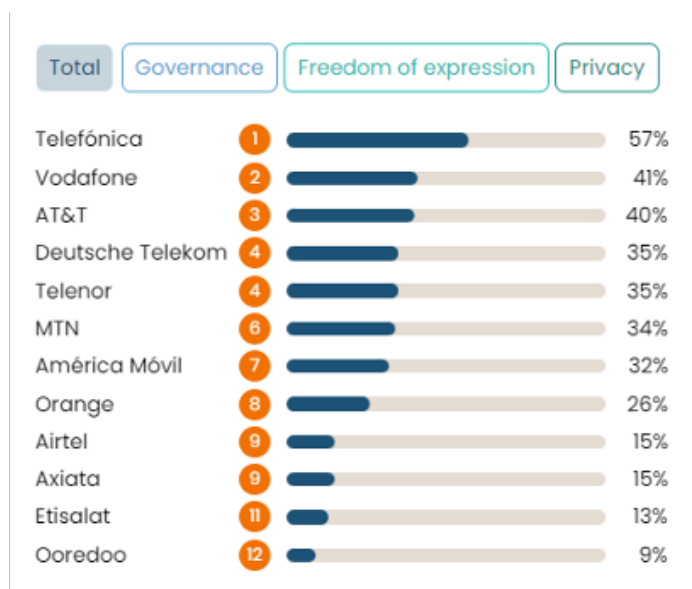
In the digital space it is paramount to promote freedom of expression and privacy on the internet through practices which respect and protect users' rights.

For investors and from a governance perspective **transparency is required** on policies, data enquiries, data deletion and data security breaches, fines etc. I like to call it **digital confidence** because, for customers, TRUST is probably the most important value when they set up a digital relationship with you.

Digital Confidence is based in three fundamental pillars that work together: privacy, transparency and security. People must have assurance that:

- **companies will not use their data** in an unexpected, obscure or abusive way;
- **customers will be informed about who handles their data** and what purpose it is used for;
- **their data will be deleted according to a predetermined policy**, and it will be retained also when they request it by exercising their cancellation or retention rights;
- **they will have the necessary tools so that they can access** and update their personal information; and
- there are **robust security measures and technical resources** in place to avoid the loss, misuse of, or unauthorized access to their data.

According to the RDR Telco Giants Scorecard<sup>6</sup>, the scorecard ranks 12 of the world's most powerful telecom companies on their commitment to protect user's freedom of expression and privacy rights. None of the



12 telecommunications companies that were evaluated earned a passing score. Though Big Tech companies have received most attention in recent years in terms of their negative assessment against these criteria, the findings of the RDR Scorecard show that, year after year, telcos are themselves failing to address the same digital rights harms while facing far less scrutiny. And yet, despite being less visible than their Big Tech counterparts, telcos wield far more power.

In summary I would say that customer relationships based on TRUST are one of the most material issues for telcos when dealing with ESG and a main challenge for the whole industry.

<sup>6</sup> <https://rankingdigitalrights.org>



Gema Esteban Garrido has an Advanced Management degree from IESE Business School, an Investment Management degree from the University of Geneva, and a bachelor's degree in Computer Science from Universidad Pontificia de Salamanca in Madrid. Gema is Global Head of ESG at IG4 Capital, a private equity firm where she is responsible for fully embedding ESG into its Investment Cycle as well as driving its portfolio companies towards the highest ESG standards. She is president of the ESG Committees of the Board in IGUÁ Saneamiento (water infrastructure), OPY Health (healthcare infrastructure), CLI (agrilogistic), AENZA (Infra) and ADELCO (B2B logistics). She serves as Board member at AENZA infrastructure. Prior to joining IG4 Capital, Gema spent several years at Telefónica, most recently as ESG Investors Director (2018-2020), where she revamped Telefónica's ESG strategy in order to attract ESG investors and positioned the company as a leader amongst the most influential ESG ratings, where Telefónica consistently achieved a top 5 ranking. Prior to joining Telefónica she worked at British Telcom and in the software industry. She is an expert in ESG investing and digital strategy. She is able to develop future strategic insights and embed ESG parameters in the company strategy focusing on company value generation. She is associate professor in the Corporate Governance Center of ESADE and IE Business School where she teaches Digital Strategy and was awarded in 2010 with a MAKE award (Most Admired Knowledge Enterprise).  
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# GREENWASHING AND ESGs FOR THE TMTS INDUSTRY

LAUREEN R. COOK, EXECUTIVE TMTS ADVISER, EXTELCON

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Greenwashing is a term used to describe a false, misleading or an unsubstantiated set of claims made by an organization related to the positive impact that a company, product, or service has on the environment, society, and/or governance (ESG) related issues. As we see in today's world of fake news, greenwashing often undermines the public's trust in the media as it becomes difficult to independently sort fact from fiction. The same can be said for the TMTS industry as currently there are no two companies, independent ESG rating agencies, or financial institutions that measure similar ESG factors with the same parameters.

In today's post-Covid world, responsible ESG behavior has become synonymous with both employees and consumers for holding corporations accountable for the way companies work with their staff, customers, and suppliers. Since 2020 the European Union (EU) has been working on an action plan for Financing Sustainable Growth and parameter setting related to the Sustainable Finance Disclosure Regulation (SFDR)<sup>1</sup>. This directive, initially including 32 mandatory metrics, has a stated purpose to "improve transparency in the market for sustainable investment products, to prevent greenwashing and to increase transparency around sustainability claims made by financial market participants."

The SFDR will re-focus capital markets towards sustainable investments and foster the transparency of economic activity. While SFDR pertains to financial institutions such as asset managers and pension funds, it will impact on the TMTS industry, which is highly capital intensive, often publicly owned and in constant need of raising capital. Asset managers globally are expected to increase their ESG-related assets under management

(AuM) to US\$33.9tn by 2026, from US\$18.4tn in 2021. With a projected compound annual growth rate (CAGR) of 12.9%, ESG assets are on pace to constitute 21.5% of total global AuM in less than 5 years, according to PWC's Oct 10, 2022 ESG Investment Report.<sup>2</sup>

For the TMTS industry, the ESG movement is gaining traction. In light of the EU SFDR initiative and growing concerns from within the Mobile industry post-pandemic, in June of 2022 the GSMA published its paper in conjunction with EY on ESG Metrics for Mobile<sup>3</sup> and have invited commentary from the industry in order to develop a consistent set of ESG Key Performance Indicators (KPI's) that would be relevant and consistent across the entire Mobile Industry. The GSMA's initial KPI's will be focused on the environment, digital inclusion, digital integrity, and supply chain. A further refinement of these topics is imperative as there is currently no uniform approach across the TMTS industry, nor among the many independent ESG ratings agencies, nor financial institutions as to which metrics should be monitored and what formula should be implemented for evaluation. While most would agree on broad topics to be measured such as carbon emissions, energy consumption, gender pay gap, excessive C level compensation, these are generic, high-level indicators, applicable across many industry sectors, not solely pertaining to the TMTS industry, which is largely reliant on private capital.

The need for consistent industry wide Key Performance Indicators (KPI's) can significantly influence the risks and rewards for the TMTS industry at large. In particular in developing markets, where a positive ESG report can

1 <https://www.eurosif.org/policies/sfdr/>

2 <https://www.pwc.com/bm/en/press-releases/asset-wealth-management-revolution-2022-report.html>

3 <https://www.gsma.com/betterfuture/esg-metrics-for-mobile>

## Examples of ESG Criteria Used by Sustainable Investors



<https://www.boreal-is.com/blog/turn-stakeholder-engagement-into-a-higher-esg-rating/>

help raise the public profile and industry awareness of a company which in turn can open doors and provide access to new sources of financing. Conversely, a negative ESG report related to sustainability impacts such as the environment, social impacts related to employees or human rights, and governance issues related to corruption and anti-bribery could significantly harm a company's reputation based on its ethical perception and restrict sources of funding to these highly capital-intensive companies.

According to the GSMA/EY June 2022 poll, 86% of managers say that the focus on ESG has been critical in building trust with their stakeholders in uncertain times. Additionally, 83% say that companies that

maintain their focus on ESG and long-term value will be more resilient in the face of increasing disruption and volatility. Investors also made it clear, with 9 out of 10 investors surveyed in the EY poll, post-pandemic, stating that they are attaching greater importance to ESG performance by companies in their investment strategies and that strong ESG performance now has a significant impact on analyst recommendations.

From the chart we see some of the key issues that most significantly impact ESG investing and impact higher ESG ratings. Environmental issues include green buildings, climate change, energy efficiency/clean technology, air & water pollution/toxins, sustainable natural resources/biodiversity and waste management. Governance issues are focused on corporate governance, executive pay, board diversity, anti-corruption, board independence & business ethics, and a fair tax strategy for the corporations. Social issues relate to human rights, community impact, workplace benefits, labor relations/workers' rights, health & safety, and supply chain advocacy. These issues need to be further refined by each of the TMTS verticals, in order to lead the ESG movement which is gaining momentum in the financial community by grass roots efforts and impending government frameworks.

As leaders in the TMTS industry we need to pro-actively define ESG KPI's that are fit for purpose, measurable, easily reportable, and understandable. Consistent ESG metrics are becoming more relevant to the public, governments and most importantly to financial markets. Industry led transparency will foster confidence and build trust across companies in the TMTS ecosystem, which will equate to greater access to funding and improved, sustainable profitability in the long term.



Lauren Cook is an Alumna of the IFC (World Bank), where she was the Principal TMT Adviser, in the Global Telecoms, Media & Technology Private Equity Sector. Currently she is the Founder & CEO of Extelcon, LLC, providing technical and commercial oversight to the Investment Banking Community, Regulators, and TMT & Satellite industry sectors as Lender's Technical Adviser for multi-billion USD telecoms & technology companies. Prior to joining the IFC, Lauren was with Alcatel-Lucent (now Nokia), as Vice President 4G Strategy & Innovation, developing revenue generating products & services. She is a founding Director of the Global Telecommunications Women's Network, and is an Investment Committee member of Innovate Cyprus, a European Union funded 6M Euro Venture Capital Fund providing financing for 4G/5G IoT Start-ups. She holds an MSc in Telecommunications Engineering from Rochester Institute of Technology, and an MBA from Long Island University in New York.

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# HOW TURNING RETAIL STORES INTO E-COMMERCE CENTRES CAN AVOID MASSIVE CARBON EMISSIONS

THIERRY GADOU, CEO SES-IMAGOTAG

- **Retail is the largest private employer and economic sector, comprising over 15% of the global GDP.**
- **Growth in e-commerce requires new infrastructure, which contributes to massive carbon emissions.**
- **Utilising existing physical stores to fulfil online sales locally could offer a sustainable solution.**

I find it surprising that retail is relatively absent from the core debate on net-zero even though it's the largest economic sector and private employer in the world, with over 15% of global GDP and jobs<sup>1</sup>.

Greenhouse gas (GHG) emissions are usually broken down into energy, transportation, building, manufacturing, agriculture and so on, but retail is absent. Yet retail is one of the largest ordering customers of many of these sectors, and retail supply chains are responsible for 25% of global GHG emissions<sup>2</sup>, according to the World Business Council for Sustainable Development. Clearly, the decarbonization of retail should be a central topic in the climate emergency discussion.

Moreover, the current evolution of retail is accelerating carbon emissions due to the unstoppable shift from physical stores to online platforms. As e-commerce continues to grow at 10-20% annually<sup>3</sup>, so far primarily based on a direct-to-consumer (DTC) logistics model, a completely new and dedicated supply chain infrastructure is gradually being built with thousands of warehouses and automated fulfilment centres.

## Growth in e-commerce and carbon emissions

E-commerce DTC logistics requires about 1 million square metres of fulfilment centres for \$6 billion of revenues. The construction of new physical infrastructure (land artificialization, concrete, steel, robotics, etc.) drives massive carbon emissions in the order of 1-1.5 tons per square metres<sup>4</sup>. Construction-related emissions are often overlooked or depreciated over 50 years (lifespan of buildings), but this is a biased way of accounting and discounting carbon impact because, from a climate perspective, 100% of carbon emissions are in the atmosphere at the time of construction.

Experts anticipate that e-commerce will continue to grow at 10-20% annually and should represent 30-40% of total retail sales in 5-7 years<sup>5</sup>. That means adding over \$2 trillion of e-commerce revenues. If this growth was primarily based on a DTC model, this would imply emissions of up to 0.5 giga tons of CO<sub>2</sub> equivalent, just for the construction of the necessary supply network, not taking into account the additional inventories required by this dedicated e-commerce supply chain nor the operational and last-mile related carbon emissions.

The development of e-commerce over the next 5-10 years could lead to a massive increase in carbon emissions, counteracting the net-zero trajectory due to a flawed model based on the shift from offline to online. And nobody talks about it.

1 <https://www. Kearney.com/global-retail-development-index/2021#:~:text=Retail%20sales%20account%20for%2012,employment%E2%80%94about%201.2%20million%20people.>

2 <https://timetotransform.biz/>

3 <https://www.mckinsey.com/~media/McKinsey/Industries/Retail/Our%20Insights/retail%20speaks%20seven%20imperatives%20for%20the%20industry/retail-speaks-full-report.pdf>

4 [https://resources.taloe.fr/resources/documents/7765\\_191210\\_poids\\_carbone\\_ACV\\_vdef.pdf](https://resources.taloe.fr/resources/documents/7765_191210_poids_carbone_ACV_vdef.pdf)

5 <https://www.mckinsey.com/~media/McKinsey/Industries/Retail/Our%20Insights/retail%20speaks%20seven%20imperatives%20for%20the%20industry/retail-speaks-full-report.pdf>

## Harnessing existing physical infrastructure

Fortunately, a more sustainable retail development model exists based on revitalising the existing physical infrastructure of commerce.

There are approximately 20 million stores worldwide – one store for 400 humans – served by an existing supply chain which every day brings all consumer goods no further than a few miles away from any consumer.

This incredible density of stores – and proximity of goods for consumers – is the obvious solution to a low-carbon e-commerce model. This will not only avoid massive carbon emissions but will dramatically increase customer satisfaction. Tomorrow, consumers will order more and more online, but they will be delivered in less than an hour from a shop around the corner. This is what I call “physical e-commerce” or “local e-commerce”.

Of course, technology is necessary for this transformation. Revitalizing the “stranded” assets of physical commerce, and stores, and enabling local e-commerce at scale requires the following:

- Turn physical stores into ultra-efficient local fulfilment centres of online orders. Enabled by IoT, cloud, big data and AI/AR technologies, enabling precise product geolocation in-store, efficient picking and replenishing processes, real-time monitoring of on-shelf inventory and stock-outs, etc.
- Virtualize the aggregated stores’ inventories to identify in real-time the nearest stores and product availability for every online order. This will allow for minimising the time of delivery and carbon emissions.



## Tech-enabled stores offer a sustainable solution

Already, several visionary retailers are pioneering sustainable and positive retail models. For example, Walmart is putting stores at the heart of its e-commerce strategy, with plans to deliver most online orders out of physical stores. Ikea is another inspiring retailer going “phygital” by including stores in their last-mile and fulfilment network so that shipping online orders from out-of-town stores means faster deliveries and lower emissions than shipping from logistics centres.

These pioneers show that it is possible, by revitalizing the existing infrastructure of physical commerce, to build a low-carbon and sustainable retail model. In the future existing stores could deliver over 50% of total e-commerce sales, thus avoiding giga tons of otherwise inevitable carbon emissions.

Beyond avoiding massive unnecessary GHG emissions, such a “phygital” (or unified) retail development model would have other positive social and environmental consequences:

**If it continues to be based primarily on a direct-to-consumer logistics model, the rapid growth in e-commerce will require hundreds of millions of sqm of new fulfilment centers and trigger massive new CO<sub>2</sub> emissions**



Up to 0.5 GT avoided CO<sub>2</sub> Emissions

Turning existing physical stores into efficient local fulfilment centers for online sales will offer a **sustainable E-commerce solution**

- Protecting local jobs and communities by stemming the tide of stores closings, thus avoiding the risk of massive employment destruction in physical retail due to online/offline substitution.
- Fostering local-for-local production and consumption models.

That's why in many respects, the technologies enabling the digitization of physical retail can be considered as climate technologies, as they can significantly contribute to the net-zero imperative.

Time is of the essence. The digitization of physical commerce is an economic, social, and environmental imperative. Each delay in this transition favours the rapid development of a highly carbon-intensive direct-to-consumer e-commerce model. Visionary retailers are showing the path towards a more sustainable and socially positive retail model. Helping this transition requires decision makers, public and tax policymakers and investors to understand the tremendous opportunity of creating positive shared value for consumers, workers, and the planet by revitalizing physical stores through technology.

It's with this profound belief and sense of purpose and responsibility that, together with Peter Brabeck-Letmathe, Vice-Chairman of the Board of Trustees of the World Economic Forum and former CEO of Nestlé, we have created the International Board for Retail Sustainability, Transparency and Consumer Protection and have launched the Positive Retail Research Program.



Graduate of the Mines de Paris engineering school, Thierry Gadou is the Chairman & CEO of SES-Imagotag since 2012. Thierry began his career as a management consultant at international consulting firm Deloitte, where he was a partner from 1997 to 2000. He then co-founded and was the CEO of Hubwoo, a high-tech company listed on the Euronext Paris stock exchange which became one of the world's leading SAP-based electronic marketplaces specializing in e-procurement solutions for large companies.

From 2007 to 2012, Thierry has been the CEO of Atos Consulting, the management consulting division of Atos. Since 2012, as the Chairman & CEO, he has transformed SES-imagotag into the largest and fastest-growing retail IoT company, serving over 350 among the largest retailers groups in more than 60 countries.

SES-imagotag is a proud supporter of the United Nations' Global Compact initiative, a member of the World Economic Forum's future of consumption platform, and has received in 2022 the Platinum Sustainability Rating from EcoVadis, the world's reference of business sustainability ratings.

# CONNECTING THE PACIFIC TO OPPORTUNITY

SHALLY JANNIF, CEO DIGICEL PACIFIC

The Mobile Century (TMC) met with CEO of Digicel Pacific, Shally Jannif, to explore how the industry can help connect the island nations of the Pacific to economic and social opportunity through digital technology.

**TMC:** What do you see as the main challenges facing the Pacific in terms of promoting meaningful connectivity and bridging the digital divide, to enable everyone in these countries to benefit equally from the global digital community and economy?

**Shally:** At Digicel Pacific, our goal is to connect the unconnected and to leave no one behind, but this is not without significant challenges. The core challenges facing the Pacific in terms of promoting meaningful connectivity and bridging the digital divide are:

a) **High infrastructure costs, accessibility and remoteness.** As a geographically large region, that is prone to natural disasters, the cost of building and maintaining appropriate infrastructure is high.

- Network infrastructure needs to be built to withstand major weather events, which are frequent in the region. ADB and the UN both agree that the Pacific Islands are among the most vulnerable when it comes to natural disasters, such as cyclones, earthquakes, tsunamis and volcanic eruptions.
- Accessibility to sites and locations is difficult and expensive. In some cases access to a site can only be gained on foot, crossing rivers and traversing incredibly rugged terrain.
- Remote island infrastructure development and maintenance create logistical challenges and increased costs. Often, in remote locations, the costs outweigh commercial gains, but connectivity means so much to the local communities in such locations.
- Furthermore, recovery after a natural disaster poses additional logistical challenges and costs for those living remotely.

b) **Poor grid power connectivity** in remote islands and locations around the Pacific severely impacts connectivity. To overcome this, our team has a solution

that includes providing power for remote greenfield sites.

c) **Education** is required to help increase digital literacy and participation. While providing infrastructure and enabling access is core to increasing connectivity, to be meaningful, education is also required to help people understand and use technology correctly, safely and responsibly.

d) **Single point of failure of internet connectivity due to submarine cables** and landing stations. In most of the Pacific Islands, there is only one submarine cable which means impacts to the cable or landing station can totally cut a nation's connectivity. In Tonga, the Hunga-Tonga-Hunga-Ha'apai volcano on 15 January 2022 cut most connectivity to the island nation, in this instance it took 5 days for us to restore voice connectivity and almost 5 weeks to restore data connectivity as this required the submarine cable to be repaired. Microwave links and satellite links are helpful but cannot fully cater for the level of capacity required to service the country.

e) **Capacity building** is challenging. With the increased migration of skilled Pacific Island workers, the ability to build capacity with human capital is becoming harder, and more costly.

**TMC:** What potential benefits in economic and social terms (such as an increase in GDP) would result from advances in digital connectivity in the region? Would the impact vary depending on the country, or would the benefits be equally important overall?

**Shally:** The potential benefits of advances in digital connectivity in the region would be substantial. During COVID lockdowns we witnessed how important connectivity was to ensuring that education continued, that businesses could operate with remote workers and that the economy could continue to trade. Looking forward, increased connectivity could open up new opportunities for education and employment.

**For education**, we want to live in a world where children in any classroom on any Pacific Island are afforded access to the same educational tools, content and opportunities as their counterparts in larger cities around the world.

**For business** and commercial opportunities, we dream of one day seeing someone on a small island in Vanuatu, remotely working for a business in New York.

**For the region**, we could become the next tech hub, imagine what economic impacts would flow from having a global tech company build a presence right here in the Pacific.

Increased connectivity could enable so much for so many people in the Pacific.

**TMC:** What technological developments are being planned or deployed in the region – cable, satellite, 4G/ 5G, cloud, and how will each of these contribute to improvements in social and economic connectivity?

**Shally:** Digicel Pacific is working on many initiatives in the markets where we operate:

- **4G/LTE:** 4 out of our 5 Pacific hub countries have networks that run 100% LTE. Furthermore, we are currently expanding our capacity and coverage of 4G/LTE across these countries.
- **5G:** No regulator has finalised a 5G strategy as yet as most of the countries are still working on connecting the unconnected before a 5G push. That said, Digicel Pacific is always planning ahead.
- **Cloud:** Internally the cloud is used to run our platforms and services, and we offer cloud services to business customers. The appetite for cloud services is rapidly increasing, particularly among corporates and those looking to improve disaster resilience and cyber security.
- **Fibre:** We have been working on domestic Fibre projects in multiple markets and also working with Telstra to see how we can improve international and regional connectivity and resiliency.

**TMC:** What do you see as the role of mobile operators in terms of promoting ESG and what can the industry do to ensure greater sustainability, both socially and environmentally?

**Shally:** Mobile operators can play an important role in promoting ESG by developing and implementing corporate sustainability plans that focus on energy efficiency, waste reduction, and other initiatives that reduce their carbon footprint.

While there are many initiatives in progress at present, a bigger ESG plan is being developed. Currently, we are working to measure outputs and develop an ESG framework that is relevant to the Pacific.

To truly be impactful though, ESG initiatives should be done in partnership and collaboration with governments and larger organisations. We would also welcome input

and collaboration from our colleagues in other regions, so we can learn from their experience in this field.

**TMC:** How is digital communication contributing to education and health outcomes in the region? What changes has improved communication brought about, and what are the success stories? What more needs to be done?

**Shally:** Digital communication has had a very positive impact on education and health outcomes in the region.

**Education:** A great example comes from 2020 when COVID lockdowns first occurred, Digicel was quick to provide free internet, free access to education sites and Telehealth initiatives across most countries. In most countries, Digicel Pacific also provides additional value for the student segment with tailored plans and solutions to suit their needs and budgets.

**Health:** Generally, improved communication has allowed for better access to information, resources, and services across the region, allowing for more efficient communication between healthcare professionals and educators. In Fiji, Digicel set up a new teleconference system at the main hospital in Suva. This now makes it possible for doctors to diagnose and make crucial health decisions for patients from outer areas of Suva. This has enabled better coordination of services and improved patient care. In Nauru, we have helped enable virtual consultations, so that patients and medical staff in the country can leverage specialist medical services previously not available.

While digital communication has improved education and health outcomes in the region, there is still much more that needs to be done. While it's narrowing, the digital divide still exists in many areas, meaning that not everyone has access to the same services and resources. Again, we see partnerships as key to successfully driving education and health forward for our region.

**TMC:** Cyber security and resilience are becoming very important issues in many countries, with cyber incidents growing and impacting customers, in both developed and developing economies. Do you have any proposals or thoughts for how the industry can work together, and with their customers, to reduce these risks?

**Shally:** Cybersecurity threats are increasing globally and the Pacific is no exception. Recently we've witnessed instances of both private and public sector organisations being impacted.

Digicel Pacific has been working with Telstra and its global partners to strengthen our cybersecurity position to help reduce the risk of unauthorised access to our network. Our priority is to protect our customers' data. We've invested and continue to invest in our security capability. That said, cyber security is a team sport – we are all in this together – we all have a part to play in helping to secure our personal and private data and help protect it from criminals who want to profit from it. No one can be complacent, and no organisation can ever be 100 per cent sure that it is completely protected

and safe. Working together with other organisations and educating our people on potential cyber risks is vitally important.

**TMC:** How important is gender balance and a focus on diversity and inclusion in ensuring that everyone is able to share in the benefits of digital connectivity? Does Digicel Pacific have specific targets for the company and its programs, and special initiatives to promote diversity and inclusion?

**Shally:** Gender balance and a focus on diversity and inclusion are important to ensure that everyone is able to share in the benefits of digital connectivity. Diverse teams ensure our customer base is represented in the decisions we make and lead to better business outcomes, more innovation and better engagement. Digicel Pacific has specific targets for the company and its programs to help ensure there is balance and diversity within our team.

Some core initiatives include:

- **Encouraging cultural and gender diversity when filling vacant roles.** Our recruitment process provides equal opportunity for anyone who is interested and meets our prerequisite requirements. We always look at how our recruitment process can encourage cultural and gender diversity.
- **Increasing participation of females in STEM.** We are focused on increasing female participation in typically male-dominated roles, particularly in the field of STEM. As an example, in Fiji, we participate in careers fairs to showcase opportunities within the business including technical and IT-related roles. We provide examples of females in the business

working in those fields that match student interests. Showcasing females doing well, in typically male-dominated roles, helps to inspire young females to pursue their studies in STEM.

- We have a strong representation of females across our business:
  - » 44% female employees across our Pacific hubs, with some countries having up to 80% of females in the workforce (Nauru)
  - » In leadership roles, our Pacific hubs have a 50/50 split between males and females.

We continually focus on making sure our workforce reflects the diversity of the communities we serve, and we are committed to providing an inclusive work environment for all of our employees.

**TMC:** Finally, how can the industry as a whole help you to address the challenges you face in connecting the island nations of the Pacific?

**Shally:** I think the fundamental answer is that we need to work together – supporting each other and learning from our successes, and areas where we can do better so that we can ensure we take best practices to our stakeholder partners in government and in the NGO sector and aid agencies. I am therefore pleased that the GTWN has launched a Call to Action for 2023 for all industry leaders to make overcoming the digital divide a priority for all people around the world. I look forward to working with the GTWN as this project goes forward.



Shally Jannif is the Regional Chief Executive Officer for Digicel Pacific and in her portfolio has management oversight of 5 Pacific markets - Fiji, Samoa, Tonga, Vanuatu and Nauru. She leads a team of approximately 900 staff focused on providing the best telecommunications experience to all customers in the Pacific. Her key pillars are customer-centricity, simplicity in everything Digicel does and digital transformation. An accredited CPA by profession, Shally has spent the better part of her career in the Telecommunications industry in Finance in roles as a Chief Financial Officer, Pacific Hub and Finance Controller in the Fiji business. Recognised by Capacity Magazine in its March 2022 edition in its 20 Women to Watch segment, celebrating notable women across wholesale telecoms and the tech sector. Shally is passionate about staff empowerment, and customer centricity and is deeply committed to helping communities thrive. When not marshalling the team at work, Shally enjoys travelling with her son.

# ESG AND SUSTAINABLE INVESTMENT

**CARLA CICO, VICE- CHAIRMAN OF THE BOARD, OLYMPIA GROUP (GREECE)**

Only a little more than 20 years have passed since the Enron and WorldCom bankruptcy scandals that, among other ramifications, forced the wholesale revision and reinforcement of Corporate Governance and Risk Management. New legislation and financial reporting requirements were enacted to expand the accuracy of financial reporting for public companies. It is now hard to believe how much the business environment has changed in such a short period. If you look at the growth in both quantity and intensity of Corporate Governance (and now ESG) requirements, it might as well have been a lifetime.

## **Corporate governance becomes ESG**

At the beginning, Corporate Governance was mainly focused on the financial aspects of businesses, aiming to ensure the transparent disclosure of data in order to avoid fraud. Over the years, however, Corporate Governance began to encompass social and environmental issues, with a notable acceleration in scope within the last 10 years, resulting in the form of Environmental, Social and Governance (ESG) we know today.

In the wake of the Global Financial Crisis of 2008, perceptions of business success started to be re-evaluated by society and also governments. There was a shift to a values-based approach and the growing expectation that business can and should play a core role in solving the biggest problems facing the world.

But what is the reality behind these expectations, for businesses, investors, government regulators, and consumers? Here I will try to unravel the complexity of ESG, which is probably the most used (and abused) phrase in the global corporate environment. It features regularly in pronouncements by regulators, the investing community, and political figures, in a variety of ways, and with different meanings. Furthermore, and most importantly, ESG and/or the lack of it, has become an important factor in choices by consumers.

## **An ESG based growth strategy**

There is no doubt that Corporate Governance/ESG has brought benefits to the business world: they force organizations to adapt more disciplined governance protocols, as well as imposing more transparent processes.

These benefits have quantitative value: for example, the investor community is willing to pay a higher price for a company that has proper ESGs in place. Underlying this behavior is a generally accepted sentiment that if a company is focused on implementing ESG in full, it is a company that is likely to create more valuable returns for its stakeholders.

Today ESG considerations must be factored into almost every business decision. Increasingly, an organisation's ESG performance will affect everything from the cost and availability of capital to its ability to attract talent and the reliability of its supply chain.

Global investment management firm BlackRock, for example, now applies a method of 'sustainable investing' to define the practice of analysing a company's ESG risks, to inform the allocation of capital. Dramatic changes in the climate, society and transparency requirements in many countries have moved ESG from the periphery to the core of decision-making for organisations and stakeholders.

New knowledge and skills are required of senior management and Board members, who need to be able to understand a range of technical issues, from climate science to data and privacy protection, to inform their business strategy and priorities.

## **The risks associated with ESG**

The benefits of ESG also bring with them considerable new areas of risk and cost which need to be understood and factored into the overall business strategy. This is

not only the case for large organisations, but importantly also for Small and Medium Enterprises (SMEs) as well.

Regulators, supported by governments, are continuing to impose new rules on companies - regardless of their size - with significant penalties for companies that fail to implement them. Yet such an approach seems to ignore the fact that the implementation of ESG standards does not come free of charge. Indeed, it is exactly the opposite: implementing ESG standards is not only costly in financial terms, but also from an organizational point of view.

Beyond the dollars and cents, companies are facing a skills shortage. It is difficult to find people with the right skills and experience to ensure compliance with these new standards. Developing and retaining these competencies in-house is also difficult due to the competition for these individuals and the ever-increasing demand. As regulatory and compliance requirements increase, many companies are forced to turn to external consultants to plug the skills gap. Business schools have recognized this changed business environment and many are transforming their MBA courses to reflect the new pressures and demands on business leaders in relation to ESG. It is hoped that this will over time expand the number of available talent in the field.

While large organizations or those that operate on a multinational level can absorb such costs without sacrificing other investments, many SMEs face a difficult dilemma: do they reduce their investments or skimp on the implementation of ESG standards, and if so, what are the downside risks of both?

The penalties for the latter are clear and immediate: companies can face harsh fines, public backlash, and regulatory investigations. Yet the decision is not so simple - if a firm decides to opt for the former, the reduction in investments bring the risk of future losses in competitive advantage, hence putting at risk long-term business growth or even overall business survival. No matter the choice, there will always be a cost, and the difference in timescales associated with each approach may obscure the true magnitude of the cost.

## We need a new approach to ESG

In light of the above, it may be time to review the current overly enthusiastic and one-sided approach to ESG regulatory standards, which over time is becoming more and more difficult to justify and meet. Instead, ESGs should be tailored and refocused on what really matters: the shaping of business activity to maximize the overall benefits for all stakeholders, whether they be shareholders, employees, or consumers. With this different approach, it will be possible to consider the potential adverse impact on an SME's future sources of competitive advantage. To avoid these negative impacts, regulators should also take into consideration the financial capabilities of each company to avoid forcing these businesses into decisions which will negatively impact their future growth prospects.

Professor of Finance at the University of Colorado at Boulder, Sanjai Bhagat, in an article published in the Harvard Business Review<sup>1</sup> warns of the dangers and unintended consequences of over regulation of ESG compliance. While investing in sustainable funds that

1 <https://hbr.org/2022/03/an-inconvenient-truth-about-esg-investing>



prioritize ESG goals is supposed to help improve the environmental and social sustainability of business practices, it may actually be directing capital into poor business performers. “In competitive labor markets and products markets, corporate managers trying to maximize long-term shareholder value should of their account pay attention to employee, customer, community, and environmental interests. On this basis, setting ESG targets may actually distort the decision-making process.” In setting ever-more- onerous ESG standards, are we really maximizing Environmental, Social, and Governance value?

different types of support, such as access to talent programs, long-term loans in the form of “green bonds” (spreading the costs of implementation over time), and carbon/emissions credits. Similarly, private actors such as investors and financial institutions could, for example, use these certifications to allocate higher investment ratings and/or loans at better conditions, while the companies themselves could integrate their “tier” into marketing and branding strategies.

We need a change in perspective: by transforming ESG regulation from a cost-imposing activity to a pro-business, individually tailored scheme, businesses would receive concrete incentives to participate while also maximizing their stakeholder benefits. One way that this could be achieved is through an “opt-in” tiered system where companies, in exchange for reaching certain “tiers” of ESG implementation, would gain access to benefits. Such a system would prescribe a mandatory “baseline” level which all businesses must comply with but would also provide criteria needed to access higher “tiers”. In exchange, businesses would be provided with



Carla Cico, born in Verona, Italy, earned her MBA at London Business School. She has an extensive experience both as CEO ( she was the first South America female CEO in South America) and as a NED on Boards. She has been a pioneer in implementing Digital Transformation and ESG.

She is a speaker in many Summits, with focus mainly on Telecommunications, Management and Strategy, Digital Transformation, ESG and Developing Countries.

# THE IMPACT OF COMMUNITY NETWORKS

## WHAT'S OLD IS NEW AGAIN

HEATHER E. HUDSON, PH.D., J.D.

PROFESSOR EMERITA, UNIVERSITY OF SAN FRANCISCO, AND AFFILIATE PROFESSOR AND FORMER DIRECTOR, INSTITUTE OF SOCIAL AND ECONOMIC RESEARCH (ISER) UNIVERSITY OF ALASKA, ANCHORAGE

The importance of access to telecommunications in Indigenous communities and developing regions has been recognized since the 1970's, when voice telephony was being extended via microwave and geostationary satellites to these regions. Criteria for access ranged from a public telephone in every village (e.g. Alaska) to a telephone within an hour's walk (the ITU's Maitland Commission, for developing regions<sup>1</sup>).

With technological evolution, the definition of "basic service" also evolved from voice service to voice plus limited data, to broadband. Technologies now include smart phones with high speed mobile networks, fiber optics, and a variety of satellites including LEOs, as well as fixed wireless networks. Also, whether by necessity or choice, some communities have built and operated networks themselves, leading to a variety of community-generated innovations.

During the past several decades, a key question has remained "What difference did it make?" How did access to these various technologies and services result in changes in economic activities, access to social services, political engagement and cultural and linguistic preservation? These questions remain important today as governments and development agencies fund expansions or upgrades of broadband infrastructure in Indigenous and developing regions.

Yet with a renewed emphasis on infrastructure funding, there has been little attention to factors that could enhance or reduce the benefits of broadband for previously unserved or underserved communities.

Among these are:

- Sustainability
- Engagement
- Digital skills

### Sustainability

Challenges in remote and developing regions can include extensive distances and challenging terrain as well as small and/or low-income populations. Will the new broadband services remain viable for providers and affordable for users in terms of operational revenue or subsidies? Is the network designed with sufficient capacity for future needs?

As in earlier eras, funders, whether government administrations or development agencies, tend to provide funds only for equipment and installation (Capex). They typically do not provide ongoing operating support (Opex). The U.S. is an exception, with various funds available to subsidize service to high cost and low-income customers.<sup>2</sup>

Acceptance and adoption of new services may be influenced by participation in community selection and project planning. Were community members consulted on proposed broadband services, facilities, construction, etc.? Does the implementation and operation plan meet the community's needs and aspirations? Are community members involved in monitoring and evaluation of services?

1 Hudson, Heather E. From Rural Village to Global Village: Telecommunications and Development in the Information Age. New York: Routledge, 2006.

2 Hudson, Heather E. and Rob McMahon. "Remote and Indigenous Broadband: A Comparison of Canadian and U.S. Initiatives and Indigenous Engagement." Journal of Information Policy, forthcoming.

While engagement has been promoted for installation and evaluation of community Internet services, criteria may be vague or ignored. A community network project in the Asia/Pacific arbitrarily selected villages for satellite terminals matched with others without connectivity, sent in evaluators, and then removed facilities where the service was underutilized. It did not try to engage leaders in site selection or suggestions about where to move equipment to other villages that had expressed interest in participating in the project.<sup>3</sup>

Effective utilization of new services may require a digital literacy strategy to ensure that residents understand how to use online services and to handle issues such as fake content and threats to privacy.

Digital skills can also include ability to install, operate and maintain community networks. The Internet Society (ISOC) has hosted annual Indigenous Connectivity Summits in North America since 2017 that include workshops on how to install and maintain community networks.<sup>4</sup>

This training can result in local jobs. Indigenous participants in Canadian regulatory proceedings have urged that recipients of federal broadband funding be required to hire and train local residents to install and maintain their equipment. However, to date, no such requirements have been imposed.

## Learning from experience with Community Networks

Research should be designed to understand what economic benefits may be derived directly or indirectly from use of a community network. Is there evidence of new jobs, economic activities, markets, savings in time or money? Are there intermediate changes such as learning new skills or exploring new techniques learned online that could be inferred to result in economic impact in the future?

Internet usage that could lead to longer-term impact could include students doing research online for school, adults taking courses online to finish high school or for continuing education, community members using online services to look for jobs or information relevant to their work as farmers, trades people, entrepreneurs, and parents, etc.

What can be learned about the demographic profiles of users, including early adopters? Is adoption widespread, or are there barriers such as cost, skills, or cultural norms? Is there evidence that the network can be sustainable such as significant adoption, plans to cover operating expenses, technical training to operate and maintain facilities?

The COVID pandemic accelerated the adoption of telemedicine and telehealth services, more than 40 years after early experiments. The reasons for delay

were primarily not technology but institutional barriers. Would insurers pay for telemedicine? What about legal liability? And would health care providers be willing to “see” patients remotely? These questions are finally being answered.

## Conclusion

Since the early days of community networks, we have learned about the benefits of connectivity, but many questions remain unanswered. Today, in the era of broadband connectivity, we still need to understand more about how and under what conditions use of community networks can contribute to social, economic, and cultural development:

For example:

- Can short term outcomes contribute to long term benefits?
- What do we know about early adopters and laggards, and do profiles of adopters change over time?
- What conditions are necessary for community networks to be sustainable?
- How can community members be involved in planning and evaluation of community networks?
- How can digital skills be incorporated in network implementation – both in user skills and in installation and operation of community networks?

A better understanding of these issues is important not only for policy makers and funders in the broadband era where governments, development agencies, and private industry are investing in infrastructure to extend access to broadband to rural, remote and Indigenous communities.

<sup>3</sup> Personal communication, 2018.

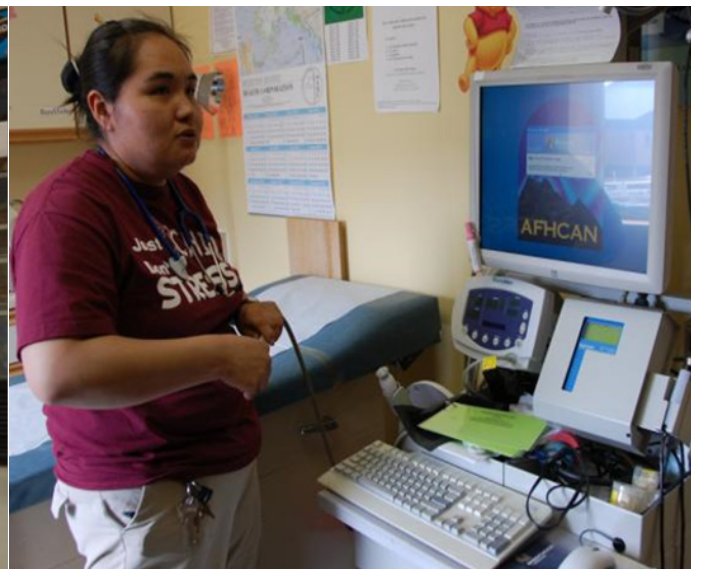
<sup>4</sup> See <https://www.internetsociety.org/events/indigenous-connectivity-summit/2022/>



African women participating in a farm radio program (Farm Radio International)



Woman in a co-op store and credit union, Canadian Arctic



Health aide with telemedicine equipment in Alaskan village clinic



Dr Heather Hudson is Professor Emerita at the University of San Francisco, and Affiliate Professor of Communications Policy and former Director of the Institute of Social and Economic Research (ISER), University of Alaska Anchorage. Her research focuses on applications of information and communication technologies for socio-economic development, regulatory issues, and policies and strategies to extend affordable access to communications, particularly in Indigenous and developing regions. She has planned and evaluated communication projects in more than 50 developing countries and emerging economies, including the Pacific islands, the Caribbean, Asia, Africa and the Arctic. She has also consulted for many international and development organizations. Professor Hudson is the author of numerous articles and several books.

# CLOSING THE DIGITAL GAP WITH BOLD AND PRACTICAL INITIATIVES

**NICOLA PALMER, CHIEF TECHNOLOGY AMBASSADOR AT VERIZON AND MEMBER OF THE BOARD OF GTWN**



As a Member of the International Board of the GTWN, I am pleased that in 2023 we are mounting a call to action to the mobile industry to work together to help close the digital divide. I hope that everyone will rise to the challenge so that we can ensure that the mobile industry continues to thrive in a fully inclusive and responsible way.

At Verizon, we recognized a number of years ago that, despite the advances we have made in providing access to mobile connectivity, too many individuals and communities are left behind by the digital transformation of the economy and society. There are a number of reasons for this, some of which are complex and longstanding. By developing bold and practical initiatives to overcome this gap, we aim to bring real, life-changing access to all. For years, we've been working to help close the digital divide - I'd like to share with you some of the strategies and programs that we have launched to reach our goals.

## How we are reaching our goals

Providing access to technology is not sufficient to ensure that no one is left behind in the digital revolution. The full benefits of mobile technology cannot be realized without appropriate education, skills, and the fundamental knowledge of how to use the technology. Through our company-wide responsible business plan, Citizen Verizon, we are building a better future by committing to provide 10 million young people with digital skills training by 2030 and providing one million small businesses with the resources to help them thrive in the digital economy by 2030, among other goals.

## Designing with, not for

A key to real digital inclusion is to identify pockets of disadvantage and exclusion that exist throughout the

economy and society and bring these sectors onboard with targeted assistance measures. One community we have identified that has been left behind is small business operators. Many of these businesses lack the background, experience or resources to fully take advantage of the benefits of digital technology... technology which can make their businesses more engaging, more efficient and more profitable. Launched in 2021, Verizon Small Business Digital Ready<sup>1</sup> is a free, comprehensive, online curriculum designed to give small businesses personalized tools - including learning modules, expert coaching, peer networking, and grant opportunities - that can help them thrive in the digital economy. The program was created with and for small business owners and the organizations that work alongside them, with a specific focus on helping diverse and under-resourced business owners have access to the tools they need.

## A focus on innovative learning

For over a decade, the Verizon Innovative Learning<sup>2</sup> education initiative has been focused on addressing barriers to digital inclusion. We are using three key touch points to direct our work in digital inclusion: delivering, inspiring, and training. Using these three guiding principles, we aim to deliver technology and access to millions of students. We are training teachers on the latest next-gen learning tools to help students explore and be inspired by STEM.

Consider the amazing story of Minu, who was 13 when she discovered her love of STEM, influenced by her involvement in Verizon Innovative Learning. Minu's story<sup>3</sup> shows the change that can be realized in young people's

1 <https://www.verizon.com/about/responsibility/digital-inclusion/small-business-training>  
2 <https://www.verizon.com/about/responsibility/digital-inclusion/verizon-innovative-learning>  
3 <https://www.youtube.com/watch?v=R6b37da3sy8>

lives and future prospects by providing opportunities to learn and discover STEM. It's stories like Minu's that continue to inspire us to fully close the digital divide.

## Reimagine education with Verizon Innovative Learning HQ

We also recognize the important role of teachers in inspiring their students to engage with STEM and visualize their future careers in a tech-related field. With our *free* online portal, Verizon Innovative Learning HQ<sup>4</sup>, teachers can access free lessons, training tools and innovative apps, like Arcadia Earth, to help bring next-gen tech into the classroom. This augmented reality experience invites students to reimagine how we address today's most pressing environmental issues by journeying through Earth's immersive landscapes and exploring how to protect the planet's future.<sup>5</sup>

## Preparing for the future

The digital divide has implications not just for society but for the wireless workforce as well. Our industry is

already facing a tech talent shortage and dire need for increased diversity. Demand for tech talent is expected to grow massively in the next decade but supply just can't keep up. According to the Bureau of Labor Statistics, 1.2M software engineering roles in the U.S. are estimated to remain unfilled by 2026.

Enacting bold and practical initiatives gets us on the path to a diverse future pipeline of students who are passionate about STEM and inspired to pursue technology careers with no student being left behind. Closing the digital divide means we can reach the full potential of the fourth industrial revolution with everyone taking part in its development.

4 <https://www.verizon.com/learning>

5 <https://www.verizon.com/about/responsibility/digital-inclusion/verizon-innovative-learning>



Nicola (Nicki) Palmer is Chief Technology Ambassador at Verizon. She works with business leaders, industry partners and consortiums, non-profits and universities to ensure Verizon is at the forefront of technology and innovation now and into the future. She served previously as Verizon's Chief Product Development Officer, overseeing the exploration of new technologies and creation of products and platforms that solve problems for individuals, enterprises, and society.

Beginning her career at Bell Atlantic in 1990, she has served as Verizon's Chief Engineering Officer and CTO of Verizon Wireless. Nicki is widely recognized as an influential leader in technology and telecommunications. Her awards include being named one of the Most Influential Women in Wireless, a Top 10 5G People to Watch, a Top 10 Mobile Influencer in DE&I, a Top 100 CIO/CTO Leader in STEM, a POWER Woman by Moves Magazine, and highlighted as a Female Disruptor by Authority Magazine.

Nicki is a passionate advocate for promoting education and careers in STEM, especially for women. She serves on the board of directors for the National Academy Foundation and chairs its STEM Advisory Committee. She also serves on the board of BreakThroughTech, an initiative of Cornell Tech that works to propel more women and underrepresented communities into technology degrees and careers. Nicki is a member of Penn State's Corporate Advisory Council as well as a board member of the GTWN. She also serves on the board of nVent Electric plc.

Nicki earned a BS in industrial engineering from The Pennsylvania State University and an MBA from the University of Pennsylvania's Wharton School. She is a proud wife, mother of three, and breast cancer survivor.



# NEW REALITY

# THE AMAZING – AND ALARMING – REALITY OF CHATGPT AI TECHNOLOGY IS GOOGLE NOW OBSOLETE ALONG WITH COLLEGE TERM PAPERS?

**MICHELE M. MERRELL, PRESIDENT MERRELL CONSULTING GROUP  
PRESIDENT, AMERICAS, GTWN**

The development of artificial intelligence (AI) technologies has led to advancements in many fields, including the technology industry. ChatGPT, a viral sensation launched in November 2022, is an AI-driven chatbot application developed by OpenAI<sup>1</sup>, a research laboratory initially founded in part by Tesla co-founder Elon Musk, Sam Altman and backed by Microsoft. The purpose of ChatGPT is to provide users with the ability to engage in natural language conversations with a computer, tablet, or phone. The application has been popularized by celebrities and companies alike as an efficient way to interact with customers and acquire data. ChatGPT has even been used to create virtual assistants and converse with users in a range of contexts. It can also be used to write papers, stories, jokes, poems, songs, and other writing applications.

Recently, the emergence of the AI-powered chatbot ChatGPT has become an increasingly alarming topic in the tech world. Unlike other chatbots that replicate pre-programmed conversations and require extensive training, ChatGPT can converse and respond in natural language with no prior training. This ability has led to warnings from the technology industry about the potential risks of an unsupervised AI agent given the

power of conversation. In this essay, I will discuss why the emergence of ChatGPT is particularly alarming to the technology industry, academia, and others.

## **Risk of Unsupervised AI Agents**

The most pressing concern regarding ChatGPT is the potential risk of unsupervised AI agents interacting with people and inadvertently influencing their decisions. As an AI agent, ChatGPT can learn from its environment by observing, interpreting, and responding to interactions with people.

This could lead to an AI-powered conversation that could be difficult for humans to differentiate from real conversations and even influence the decisions of those involved.

The threat of unsupervised AI agents is further magnified by the fact that they may be difficult to detect. ChatGPT uses natural language models to generate realistic responses to questions, eliminating the need for additional training, which can be difficult to trace.

<sup>1</sup> <https://openai.com/blog/chatgpt/>



## Potential for Misuse

In addition to the threat posed by unsupervised AI agents, the technology industry has expressed concerns about the potential for CHATGPT to be misused. ChatGPT can be used as a tool for malicious actors to create false rumors and misinformation, manipulate public opinion, and even propagate hate speech. Unregulated and unchecked AI agents could also be used to target vulnerable populations and fuel already-existing political or economic tensions.

As in all interactions online, there is always the question of the protection of sensitive and personal data. While ChatGPT does not apparently store your data as it interacts with you, it would be wise to exercise caution.

## A tool for academic cheating or IP violation?

Given its ability to search, converse and produce natural language output, some in the academic world have expressed alarm that ChatGPT could be used to help students/users cheat when asked to write papers or respond to homework assignments or take-home exams. However, OpenAI has stated that it does not condone or support cheating in any way and that the application does not support this kind of action.

The main reason why ChatGPT in its current state of development does not support cheating is because its primary purpose is not to simply answer queries but to engage in meaningful conversations. The AI-driven application is designed to learn from users and build relationships based on these interactions. As such, cheat sheets or pre-planned responses are not as effective when using ChatGPT. Furthermore, the application is only as good as the data that is provided. Bad data will lead to bad outcomes, or as we used to say “GiGo” – “Garbage in, Garbage out. So, if you try to use ChatGPT to

write an essay about a classic text, chances are that the bot will construct seemingly plausible arguments. But if others published a faulty analysis of the book on the web, that may also show up in your essay. If your essay was then posted online, you would be contributing to the spread of misinformation.

OpenAI also claims that ChatGPT does not support cheating because it is designed with safety in mind. The application is backed by several compliance teams that regularly monitor conversations to ensure that all activity is within guidelines. Should any users attempt to use ChatGPT for unlawful or inappropriate purposes, the investigation teams would detect any suspicious activity. As such, they claim, it is impossible for anyone to try to cheat using the application.

These assurances have not, however, assuaged the concerns of many in the academic and teaching professions about the development of ChatGPT and its future evolution. There has been a lot of online debate since its release about whether it has made written exams or test papers obsolete, as current tools for detecting plagiarism by students rely on identifying the source of the plagiarized material, whereas ChatGPT can mix and match phrases and sentences seemingly at random.

The experience of Associate Professor of Philosophy Darren Hudson Hick of Furman University in South Carolina, USA, posted on Facebook three weeks after ChatGPT was released, has been widely reported in the media. It details how one of his students tried to cheat using ChatGPT to write an essay<sup>2</sup>. Professor Hick’s suspicions were raised by the style of writing which, although perfectly grammatical, made no actual sense. He used the GPT Detector also developed by OpenAI

<sup>2</sup> <https://www.dailymail.co.uk/sciencetech/article-11577317/Student-caught-using-ChatGPT-write-philosophy-essay-South-Carolina-university.html>

(<https://huggingface.co/openai-detector/>) to detect the fraud and the student confessed. However, he believes: “Administrations are going to have to develop standards for dealing with these kinds of cases, and they’re going to have to do it FAST.”

This also raises the question of AI and creativity, and whether AI is breaking patent law already. The patent system assumes that inventors and creators are human. Some experts in patent law now believe that inventions devised by machines require their own intellectual property law and an international treaty.

## Is Google done?

Is Google heading for the dustbins of technology history? As ChatGPT scales and becomes more popular, it may be that Google becomes obsolete as a disrupter search engine tool going the way of Yellow Pages, which was destroyed by Google. ChatGPS already crossed the one million user threshold very early on in December 2022 in its first few weeks, and because of this rapid scale and adoption, Google may not have a monopoly on online search for much longer.

Microsoft recently announced<sup>3</sup> it has reinvented its search engine with a new AI powered Bing and Edge, which it is calling “your co-pilot for the web”. Microsoft claims that this will deliver better search, more complete answers, a new chat experience and the ability to generate content, rather than just showing a list of links. Microsoft could thus get a return on its \$1 billion investment in OpenAI, the creator of ChatGPT, and may also hope that the new features would help it outflank Google, which at present is its much bigger search rival<sup>4</sup>.

3 <https://blogs.microsoft.com/blog/2023/02/07/reinventing-search-with-a-new-ai-powered-microsoft-bing-and-edge-your-copilot-for-the-web>

4 The NY Times reported on 23 January 2023 that Microsoft is planning

## An Intellectual Property minefield?

Additionally, the use of ChatGPT technology presents both legal and ethical issues related to intellectual property rights. A critical area for consideration is who owns the content output generated by these AI chatbots? Is the AI chatbot to be considered the creator of the content? Can it be copyrighted? Or is the person making the query to the AI chatbot the actual content owner, and how are they protected by copyright laws? Convexly, are the AI chatbots the ones protected by the same IP protections as humans? If an original document written by a human is considered original authorship, then wouldn’t the same guidance apply to the AI chatbot? These are areas that the legal community must address and develop case studies and guidance frameworks in which possible new technology laws may be applied. AI technology is not going away, and the legal ramifications must be addressed quickly.

## Conclusion

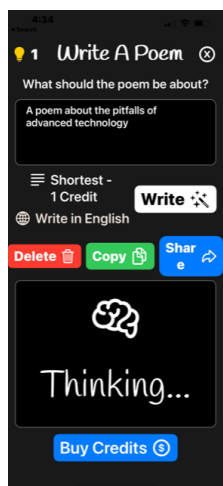
In conclusion, the emergence of ChatGPT has raised alarm in the technology industry due to the potential risks of unsupervised AI agents and the potential for misuse. To mitigate these risks, it is important to ensure proper regulation and oversight of AI technologies, such as ChatGPT, that are increasingly entering the public domain. By implementing strict regulations and oversight, the technology industry can help ensure the safe use and application of AI-powered chatbots.

to invest a further USD10 bn in OpenAI.

## Author’s Note:

I gave ChatGPT a try while writing this essay and asked it for two two examples. I asked its app first to “Write a Poem About the Pitfalls of Advanced Technology.” This is what ChatGPT came up with in less than 30 seconds, and you can draw your own conclusions.

First Example:

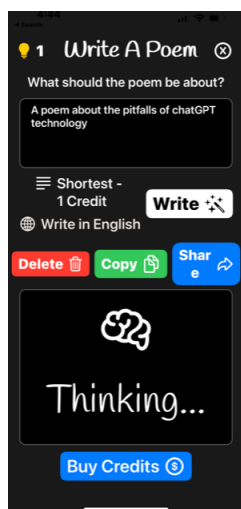


### The Pitfalls of Advanced Technology

Technology, oh so glorious,  
A new machine or fix our woes,  
It sparks new knowledge free and limitless,  
But fear its unintended woes.  
It can break down like a failing soul,  
Yet so much depends on it,  
So much of our souls, our minds, our lives,  
We hope that it will fit.  
Technology brings change, fast and deep,  
It's often hard to predict,  
That the new becomes old in a blink,  
And its impacts we should inspect.  
We buy each shiny new device,  
But with it bears unseen cost,  
From privacy to ethical minefields,  
It can easily get lost.  
Oh technology, so lovely, so sly,  
It brings us convenience and ease,  
But know its shortcuts can lead the way,  
To profound life-altering disease.

Second Example:

I asked the ChatGPT app to “Write a Poem about the Pitfalls of ChatGPT Technology.”  
This is what it came up with:



The Pitfalls of ChatGPT technology

A machine made of bits,  
An intricate collection of tech,  
To craft lines of text,  
No wonder it's so perplexing to reach.  
It seems to hold so much promise,  
So much potential to surprise,  
But when we use it as a crutch,  
It serves as a great disservice to our minds.  
It can give us answers too fast,  
And leave us devoid of thought,  
Giving away a false sense of wisdom,  
Too often it cannot be taught.  
It masquerades as our AI companion,  
But it cannot see the gut,  
It cannot account for our unique perspective,  
The way that humans just...but  
Its success is reliant on our data,  
The same as a human mind,  
But it can so easily be tainted,  
By the ignorant and the blind.  
So as technology advances,  
And the virtual world takes us in,  
Let us not forget the dangers,  
Of this digital muse we've set free to spin.



Michele M. Merrell is a senior level technology and telecommunications executive with 30 years' experience in organizations ranging from start-up to mature, private, public and pre-IPO. She is the President of Merrell Consulting Group, a global consulting consortium. She has worked on numerous mergers, acquisitions and joint venture agreements, as well as IPOs during her tenure. Her experience includes companies such as Tyco International, Brightstar, CSPI Technology Solutions, Thales eSecurity, Bellsouth, U.S. Cellular and others. She has held broad global responsibility across APAC, EMEA, LATAM and North America.

Since 2014, Michele has served on the Board of Directors for several international corporations, Cable Bahamas, Summit Broadband and Aliv Mobile Telecommunications. She is the head of the Corporate Governance & Nominating Committee, and also sits on the HR & Compensation Committee. She is a National Association of Corporate Directors accredited Board Leadership Fellow.

Michele is on the international board of directors and serves as North America President of the GTWN. Michele was also named to the Board of Directors for the LeMieux Center for Public Policy.

Michele's achievements have earned her dozens of awards and recognition over her career for her business and leadership acumen. In 2020, Michele was honored with the Women of Distinction award from the South Florida March of Dimes. In 2019, she received the "Women of Distinction Lifetime Achievement Award from Celebrating Women International. In prior years, she received the Women of the Channel Power 100 Award by CRN Magazine. Michele was the recipient of the Florida Achievement Award from the Florida Commission on the Status of Women, part of the Office of the Attorney General, State of Florida. The South Florida Business Journal also named Michele as their "Businesswoman of Influence" recipient. Michele was named by the Diversity Journal as the recipient of their "Woman Worth Watching" award. She speaks regularly both internationally and domestically on topics ranging from technology, entrepreneurship, marketing, business leadership, politics, and women's issues.

# HOW TO ADDRESS CYBERSECURITY GOVERNANCE AT BOARD LEVEL

VICTORIA HERNANDEZ, BOARD MEMBER (NED) AT CAIXABANK PAYMENTS & CONSUMER

Boards have a particularly important role in ensuring appropriate management of cyber risk as part of their fiduciary and oversight roles. But to fulfill these responsibilities, they need to fully understand the difference between cyber *security* and cyber *resilience*.

Many companies still talk about cyber security and may focus their attention on all the cyber technologies to help mitigate and avoid security risks – including firewalls and other security tools. However, they may overlook the need for an audit of the organization’s ability to recover operational control and limit downtime, reputational damage, and customer impact.

A simplified definition of the two would describe cybersecurity as a collection of technologies and actions undertaken with the goal of mitigating security risks, while cyber resilience refers to the organization’s ability to recover data, avoid service disruption, and mitigate overall damages while ensuring a successfully recover from adverse cyber events.

## Cyber risks are increasing exponentially

Digital transformation has resulted in incredible gains in innovation and efficiency in the way we live, work and play, it has also brought with it a whole new type of risk to businesses and consumers alike. Covid lockdowns resulted in a dramatic surge in demand for data at home. Video conferencing platform Zoom, for example, was used in May 2020 by 200 million daily meeting participants, compared to about 10 million in December 2019. The following month this figure had risen to 300 million. The rapid evolution of our working and leisure environment has brought with it ever more sophisticated methods of data hacks, ransom demands, phishing, spoofing, and all other types of malicious intrusions into our data. The perpetrators are no longer lonely teenagers in their bedrooms. In many cases, they are well organized and resourced by state actors or their proxies, which means that the hackers are protected from detection and prosecution.

## New regulations on data security and privacy

Countries are now being benchmarked in terms of their approach to cyber risks, which in turn influences investor confidence and trust<sup>1</sup>. Many governments are introducing ever more stringent data security and privacy regulations to try to deal with this new level of cyber threat.

- **The EU Cybersecurity Act** strengthened the EU Agency for cybersecurity (ENISA) and established a cybersecurity certification framework for products and services. ENISA will play a key role in setting up and maintaining the European cybersecurity certification framework and in informing the public on the certification schemes and the issued certificates through a dedicated website. Different assurance levels conferred by the certificates will be designed to inform users of the cybersecurity risk of using that particular product or service.
- Further measures were proposed on 15 September 2022 in a new **Cyber Resilience Act**, with rules to protect digital products that are not covered by any previous regulation. This way, it will be the first Internet of Things (IoT) legislation in the world. The aim is full transparency to enable consumers to consider key security criteria when making purchasing decisions, Industry groups expressed concerns about the implications and costs of the new regime.<sup>2</sup>
- In early 2022, the **US Securities and Exchange Commission (SEC)** published a new set of proposed cybersecurity disclosure rules for public companies. The proposed rules would significantly increase SEC scrutiny of public companies’ cybersecurity-related business activities, decision-making processes, and the Board’s new role in overseeing cybersecurity. According to the SEC, the new changes are intended

<sup>1</sup> The ITU publishes a Global Cybersecurity Index that measures the commitment to cybersecurity of countries at a global level. <https://www.itu.int/en/ITU-D/Cybersecurity/Pages/global-cybersecurity-index.aspx>

<sup>2</sup> Feedback on the proposed law was left open until 23 January 2023.



“to better inform investors about a registrant’s risk management, strategy, and governance and to provide timely notification of material cybersecurity incidents.”

- There is growing coordination between the US and EU through an ongoing Cyber Dialogue process, and both have underlined the need for enhanced transatlantic cooperation and coordination to prevent, detect and respond to malicious cyber activities. A key focus of this effort is to ensure that critical infrastructure is secure and resilient.

While it is unknown at the time of writing when these rules will come into effect, there will certainly be a much greater expectation on Boards in the future in relation to dealing with cyber security incidents.

### **We need a much broader definition of critical infrastructure**

These new regulations focus in particular on protecting critical infrastructure from cyber-attack. Utilities, banks, other financial institutions, government agencies, and defence facilities are usually defined as critical infrastructures. But as all industries and organizations are now going online and storing their data in the cloud, we need to review our definition of critical risk areas and work out how they can be protected.

For example, healthcare systems linking hospitals, private practice, and ancillary health services are areas that are very sensitive and also very vulnerable as they contain highly personal and identification information. And what about chemical plants, which produce vital medicines, not just for the pandemic, but in general, to keep many with serious health conditions alive? Control of these plants or a ransomware attack could lead to many deaths.

As agriculture is transformed through the introduction of agritech to make crop production and distribution much more efficient, it means that our food supply is also open to cyber threats. How many agribusinesses have measures in place to protect their data and their supply chains? Do the farmers at the end of the supply chain have either the skills or the funding available to put cyber resilience measures in place? And if not, whose responsibility is it to ensure that this is done, to safeguard food supplies? How do we educate everyone to think in terms of cyber safety and resilience? These examples show that the challenge of managing cyber threats and their response is now a very broad, global problem.

### **Developing a cyber resilient organization**

Resiliency is more than just protection; it’s a plan for recovery and business continuation. The ultimate goal of a cyber-resilient organization should be zero disruption.

Few Boards have the requisite experience to undertake this task effectively. And many lack the experience of complex technology-related issues, to be able to provide effective oversight of cyber risks. A board of directors must understand that cyber resilience is a dynamic discipline that requires unending monitoring and innovation. Laying the groundwork for reduced risk is essential but so is the knowledge that risk will always be there. While boards may have cyber security at the top of their priority list, the rapidly changing threat environment means that their approach needs to be constantly reviewed and updated.

A cyber incident is not the time to have difficult conversations about why and how a breach has occurred and who is responsible. Organizations need to have clear incident response plans and PR strategies in place to ensure there is strong business continuity, and to preserve reputation and consumer trust.

Here are some actionable insights to begin today so the board meets (or exceeds) the new regulatory guidelines, and provides the right level of oversight of the organization's cybersecurity plans:

- **Develop a common language** for discussing complex issues of cyber risk and resilience to shift the discussion from a highly technical one to one that businesses can understand. Focus on an economic analysis that shows how cyberattacks endanger the organization financially in the short and long term.
- Maintain a **zero-trust environment and mentality**. Any data access point is a potential threat to the integrity of the data you hold. Multiple checks and balances need to be put in place so that if something goes wrong, you have the best chance of discovering this at the earliest possible point.
- Public companies should disclose whether their boards have **members with cybersecurity expertise**. Investors will consider this to be important in considering their investment as well as in voting for the election of directors.
- Risk assessment is an ongoing process with new threats emerging daily. Keep it **on the board's agenda at least twice a year** to review strategies in line with changing threat levels. Make someone on the board (either an individual or a committee) responsible for learning the details of the organization's security needs and status. These individuals can provide ongoing updates and present larger issues for the broader board to assess and vote on.
- **Get expert advice as needed**. Rely on internal specialists, third-party consultants, vendors, and technology solutions to plan ahead and better understand the cyber security landscape.
- **Test and re-test** your plans in simulated attacks, to discover what data could still be compromised. Any weaknesses discovered should not be hidden or covered up but used to inform management where extra effort needs to be made to plug those gaps.
- **Review existing insurance policies** to see if they are adequate in the event of a data breach, or if dedicated cyber insurance may help further mitigate the risk.
- **Educate consumers** about the latest threats and scams and advise them never to divulge their personal data except for official government purposes.
- **Businesses and government should work together** to identify where security weaknesses occur and how they can be addressed to prevent customers from becoming victims of cybercrime.



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# WHEN DATA IS BEING HELD HOSTAGE RANSOMWARE ATTACKS ON THE RISE

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Critical infrastructure, businesses, and government entities are facing growing cyber threats – to the point where it has become a question of “when” rather than “if” they are attacked. The numbers are staggering. In 2021, 57% experienced an increase in the volume of cyberattacks overall, 59% saw the complexity of attacks increase, and 53% said the impact of attacks had increased<sup>1</sup>. While cyber threats can take on many forms, so-called ransomware attacks have seen a particularly steep increase. While some variations exist, ransomware is a type of malware that typically encrypts a business’ data and threatens to permanently block access to it and/or post the data publicly, in an attempt to pressure victims into paying a ransom.

According to various reports for 2022, there has been a sharp increase in ransomware attacks compared to previous years. Sophos reports that 66% of organizations were hit by ransomware in 2021, up from 37% in 2020.<sup>2</sup> Similarly, a Cybereason report shows that 73% of respondents said their organization had been the target of at least one ransomware attack over the past 24 months, an increase of 33% percent from the 2021 survey.<sup>3</sup>

## Ransomware-as-a-Service – a lucrative business model

One of the driving factors behind this significant rise in ransomware attacks lies in their resounding success. Ransomware attacks have long been established as a business model, with the growing success of the Ransomware-as-a-Service model making the use of ransomware more accessible by reducing the skill level required to deploy an attack.<sup>4</sup>

According to the latest Sophos study, average ransom payments have increased considerably over the last year. During the course of 2021, the proportion of victims paying ransoms of USD 1 million or more has almost tripled up from 4% in 2020 to 11% in 2021. During the same period, the percentage paying less than USD 10,000 dropped from 34% to 21%. Overall, in 2021 ransom payments averaged USD 812,360, almost five times the amount of the 2020 average ransom payment.<sup>5</sup> At least in part this is due to ransomware attacks becoming increasingly sophisticated. For example, attackers are becoming more successful at encrypting data in their attacks. In 2021, their success rate was 65% up from 54% encryption rate in 2020.<sup>6</sup>

1 Sophos, The State of Ransomware 2022, April 2022, available under <https://assets.sophos.com/X24WTUEQ/at/4zpw59pnkpxnhfhgj9bxgj9/sophos-state-of-ransomware-2022-wp.pdf>.

2 Sophos, The State of Ransomware 2022, April 2022, available under <https://assets.sophos.com/X24WTUEQ/at/4zpw59pnkpxnhfhgj9bxgj9/sophos-state-of-ransomware-2022-wp.pdf>.

3 Cybereason, Ransomware: The True Cost to Business 2022, available under <https://www.cybereason.com/ransomware-the-true-cost-to-business-2022>.

4 Sophos, The State of Ransomware 2022, April 2022, available under <https://assets.sophos.com/X24WTUEQ/at/4zpw59pnkpxnhfhgj9bxgj9/sophos-state-of-ransomware-2022-wp.pdf>; Microsoft, Microsoft Digital Defense Report 2022, available under <https://query.prod.cms.rt.microsoft.com/cms/api/am/binary/RE5bUv?culture=en-us&country=us>.

5 Sophos, The State of Ransomware 2022, April 2022, available under <https://assets.sophos.com/X24WTUEQ/at/4zpw59pnkpxnhfhgj9bxgj9/sophos-state-of-ransomware-2022-wp.pdf>.

6 Sophos, The State of Ransomware 2022, April 2022, available under <https://assets.sophos.com/X24WTUEQ/at/4zpw59pnkpxnhfhgj9bxgj9/sophos-state-of-ransomware-2022-wp.pdf>.

## Hitting where it hurts – increasing cyber attacks on governmental organizations and critical infrastructure

During the last couple of years, partly driven by the COVID pandemic, digital transformation has accelerated not only in businesses, but also with respect to critical infrastructure, such as water and energy supply, transportation systems and digital communications infrastructure. As physical critical infrastructure is increasingly digitalized and digital communications infrastructure becomes increasingly critical, the threat of cyber attacks, in particular ransomware attacks, has become more prevalent. In many countries, targeted ransomware attacks on governmental organizations are on the rise. Just looking at recent news gives a glimpse into how wide spread such ransomware attacks are, both in geographical terms and with respect to the affected sectors: From the University of Duisburg-Essen in Germany to the Queensland University of Technology in Australia, from a major hospital in Toronto, Canada, to a hospital in Louisiana in the USA – all of them were affected by ransomware attacks in recent days and weeks and are still struggling to resume normal operations. Other providers of critical infrastructure such as transportation provider Bay Area Rapid Transit in San Francisco, USA, have also recently fallen victim to ransomware attacks.

## Digital warfare: Russia’s attack on Ukraine does not stop at the trenches



While the some of the horrors of Russia’s attack on Ukraine’s infrastructure are very much of a physical nature (attacks on bridges, roads, railway and other transportation infrastructure; attacks on residential buildings; attacks on electricity infrastructure, water plants and even nuclear facilities; trenches reminiscent of World Wars I and II), there is also a digital dimension to Russia’s warfare. In the first few months of the war alone, Microsoft observed threat actors associated with the Russian military launched multiple waves of destructive cyberattacks against almost 50 different Ukrainian agencies and enterprises.<sup>7</sup> These attacks were aimed at paralyzing Ukrainian government agencies.

7 Microsoft, Microsoft Digital Defense Report 2022, available under <https://query.prod.cms.rt.microsoft.com/cms/api/am/binary/RE5bUvv?culture=en-us&country=us>.

Apart from governmental organizations, other priority targets included the information technology, media, communications and transportation sectors.<sup>8</sup>

However, Russia’s cyber warfare is by no means limited to Ukraine. As an example, in Australia over the last few months there have been two well publicized attacks on a major telecom provider and a major health insurer by what was reported by some media to be REvil or its affiliates, a Ransomware-as-a-Service operation with strong ties to Russia. In both instances, relatively minor ransom was demanded, and refused as a matter of policy by the Australian government. More than ten million clients were then left to their own devices to sort out the damage and the risks, and bear the cost, with their personal and sometimes sensitive data sold on the dark web. Unfortunately, this is by no means an unusual occurrence these days.

## Multidimensional financial impact

Being hit by ransomware can be very expensive for any business (or governmental organization for that matter). The majority of organizations that reported losses from a ransomware attack, had suffered combined losses between USD 1 million and 10 million.<sup>9</sup> Interestingly, the ransom itself – if paid at all – typically reflects only a fraction of the overall costs, which include:

- Disruption or even interruption of business operations
- Penalties from supervisory authorities
- Reputational damage
- Class action (e.g., by affected data subjects)
- Legal action by contractual partners (contractual penalties, claims for damages etc.)
- Costs of restoring IT infrastructure and business operations
- Loss of valuable IP/know-how
- Ransom fee.

Sophos reports that, overall, the average cost to an organization to rectify the impact of their most recent ransomware attack in 2021 was USD 1.4M.<sup>10</sup> Compared to the average cost of a ransomware attack in 2020, there was a noticeable drop which likely reflects that, as ransomware has become more prevalent, the reputational damage of an attack has lessened. Additionally, by swiftly and effectively guiding victims through the incident response process, insurance providers and internal response teams have helped to reduce the remediation cost. Even with this reported reduction in the financial impact, more than a third of organizations were forced to lay off employees following a ransomware attack.<sup>11</sup>

8 Microsoft, Microsoft Digital Defense Report 2022, available under <https://query.prod.cms.rt.microsoft.com/cms/api/am/binary/RE5bUvv?culture=en-us&country=us>.

9 Cybereason, Ransomware: The True Cost to Business 2022, available under <https://www.cybereason.com/ransomware-the-true-cost-to-business-2022>.

10 Sophos, The State of Ransomware 2022, April 2022, available under <https://assets.sophos.com/X24WTUEQ/at/4zpw59pnkpxnhfhgj9bxbgj9/sophos-state-of-ransomware-2022-wp.pdf>.

11 Cybereason, Ransomware: The True Cost to Business 2022, available under <https://www.cybereason.com/ransomware-the-true-cost-to-business-2022>.

## To pay or not to pay

In weighing its options, an organization which has fallen victim to a ransomware attack should carefully consider various aspects:

- Paying the ransom might not be legal in some jurisdictions (e.g., the Australian Government has indicated it is considering making extortion payments a criminal offence as part of its cyber strategy). Even if payment of a ransom is not illegal per se, doing so may involve payments to sanctioned individuals or parties.
- Paying the ransom might result in even more attacks: of the 28% of respondents who paid the ransom, 80% of them were hit again with a second ransomware attack and for 68% percent that second hit was within a month and for a higher ransom.<sup>12</sup>
- Paying the ransom might not lead to the desired outcome: 92% of companies who paid ransom do not get all their data restored.<sup>13</sup>
- Whether or not the ransom should be paid should be discussed with the insurance company (if there is a cyber insurance policy in place which covers ransomware attacks).

## How to minimize the risk of a cyber attack

A cyber attack is difficult to prevent but it is possible for a company to take steps to make itself a less attractive target.

- **Ensure you maintain industry-standard security.** This goes without saying and is the minimum step that must be taken.
- **Educate and train** your workforce. Most incidents occur because of employee missteps. Employees who fail to understand the rationale for processes will fail to comply or break the rules often leading to serious consequences. Training should not be a “Tick the Box” exercise but one that gives every employee a good grasp of the problem and the understanding of the part they play in cyber security.
- **Manage and audit third party vendors** as they remain one of the largest risk areas for a business as there is less control over systems they manage. Ensure that your business has a proper understanding of their systems and that they maintain the same industry-standard security as you do. Otherwise, you are inviting an attack through the vendor into your systems.
- **Minimize the data you retain and manage.** The less sensitive and confidential information you retain, the less likely that you will be targeted.
- **Prepare for attacks.** Conduct exercises to ensure everyone in the company is aware of and knows how to respond. Of the organizations that suffered

a ransomware attack in the last 24 months, 63% reported that the attackers were in their networks for up to six months before being detected.<sup>14</sup>

## How to respond

- **Take action immediately.** Immediate action is not only legally required but it is also critical to minimize the effects of a cyber attack and to minimize loss and damage.
- **Follow your cyber incident response plan.** This is not the time for creative thinking or stalling in the hope this will be over. Follow the procedures and ensure a specialized, interdisciplinary team works closely together to manage the incident.
- **Notify the relevant stakeholders.** Management must be notified immediately. Cyber insurance providers must be notified and legal notifications may be required.
- **Remediate.** Take urgent action to minimize the damage to unaffected systems and to prevent further issues. Assume that the threat actor is in your system and communicate outside of your systems to ensure they are not following your every move.

## Government response

Governments recognize that cyber attacks are a serious threat to national security and that ransomware attacks need to be monitored across industries.

- Governments have begun to require notifications for ransom payments in some countries to ensure they are informed of a cyber attack and can issue warnings to security leaders.
- Centralized cybersecurity agencies such as ENISA and CISA are trying to provide an improved national or regional response to ransomware attacks.
- Many countries have passed laws designating certain elements of a country’s infrastructure as Critical Information Infrastructure (CII). CII operators in sectors such as energy, banking, transport, defence and healthcare are legally required to meet higher security standards and notify regulators of cyber incidents.

## Takeaways for Businesses / Outlook

- Be prepared. Most businesses will suffer a cyber attack. Plan your response.
- Be effective in the event of an attack. Ensure the team is responsive.
- Consider the cost. Ransomware will cost its targets USD 265 billion by 2031.
- Download the CMS Breach Assistant from the Apple or Android app store – the ultimate guide to your immediate next steps and notification procedures in the event of a breach.

ness-2022.

12 Cybereason, Ransomware: The True Cost to Business 2022, available under <https://www.cybereason.com/ransomware-the-true-cost-to-business-2022>.

ness-2022.

13 Deloitte, Cyber Security Landscape 2022, available under <https://www.deloitte.com/globalassets/documents/chapters-and-affiliates/north-america/united-states/georgia/atlanta/cyber-threat-landscape-2022.pdf>.

14 Cybereason, Ransomware: The True Cost to Business 2022, available under <https://www.cybereason.com/ransomware-the-true-cost-to-business-2022>.



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Sheena has more than 25 years of international experience and is ranked as one of Asia's Top 50 TMT Lawyers by Asian Legal Business, Top 20 Women in Cybersecurity Singapore, a Women in Business Law Expert in Privacy and Data Protection, ranked in Who's Who Legal and Asialaw as a Leading Lawyer. She holds two certifications in privacy from the IAPP, CIPP(A) and CIPM, and is qualified to practice in New York, England & Wales and Singapore.



Dr Fiona Savary is a senior associate at CMS Germany in Munich. She specializes in all legal aspects of information technology and digitalization, assisting clients with the planning and implementation of IT projects as well as e-commerce matters. She also advises on data protection law and the legally sound structuring of internet platforms.

Fiona joined CMS in 2019. She is admitted as a lawyer in Germany and Switzerland. During her PhD studies at the University of St. Gallen she spent time researching at Harvard University's Berkman Klein Center for Internet and Society. She has written her PhD thesis on the subject of "Regulation of Dominant Internet Platforms - Characteristics, Challenges and Approaches in the Light of Economics, Innovation and Law".

# UNLOCKING THE PROMISE OF AI: BUILDING A HUMAN-MACHINE TEAM

VRINDA KAPOOR, CEO, 114AI

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There are prevalent assumptions about AI - that you need to be data scientist or engineer, a 'boffin' in order to understand what is happening 'within the black box'. And so without these prerequisite skills you should not try to get involved. But this presumption by definition excludes the vast majority of the population, crucially women and people of diverse backgrounds and perspectives, from the discussion about AI and the how and where humanity wants it to be deployed. This frightens people into thinking that AI enabled machines will take over their jobs and their lives.<sup>1</sup> From this lack of understanding comes a lack of trust, which undermines the potential of this wonderful technology to address many of the issues facing mankind today.

## Looking inside the black box

I would like to start by clarifying that the entire perception of AI is actually wrong. AI is not, or shouldn't be, a black box closed to the majority of the population, leaving them wondering if we are going to end up in some kind of a terminator movie. There are many opportunities for people of all backgrounds and abilities, in particular women or people from all ethnic and social backgrounds to become involved in driving the future of AI in a direction that does not diminish our humankind. The fact is that in the years to come, AI will become an all-pervasive technology that will be embedded in our daily lives, making it all the more important for a wide range of people to really understand the technology - what it is capable of, where it can have touch points in our lives in the future and most importantly, what risks will come along with it.

So far, an understanding of AI has been limited to an elite club of data scientists, mathematicians and coders, leaving a majority of the population out of the conversation. Thus, the question beckons, what skills and abilities does someone need to understand AI or even to build a career in AI? Taking me as an example, I am not a data scientist, or a coder. But I do have the ability to reason, to infer and to deduct, which are the key skills that people need to really identify with AI. I perceive the world around me, comprehend the complexity of the processes that make up our daily lives, and can break that down to understand how these machines can work and imagine what the impact to our society can be.

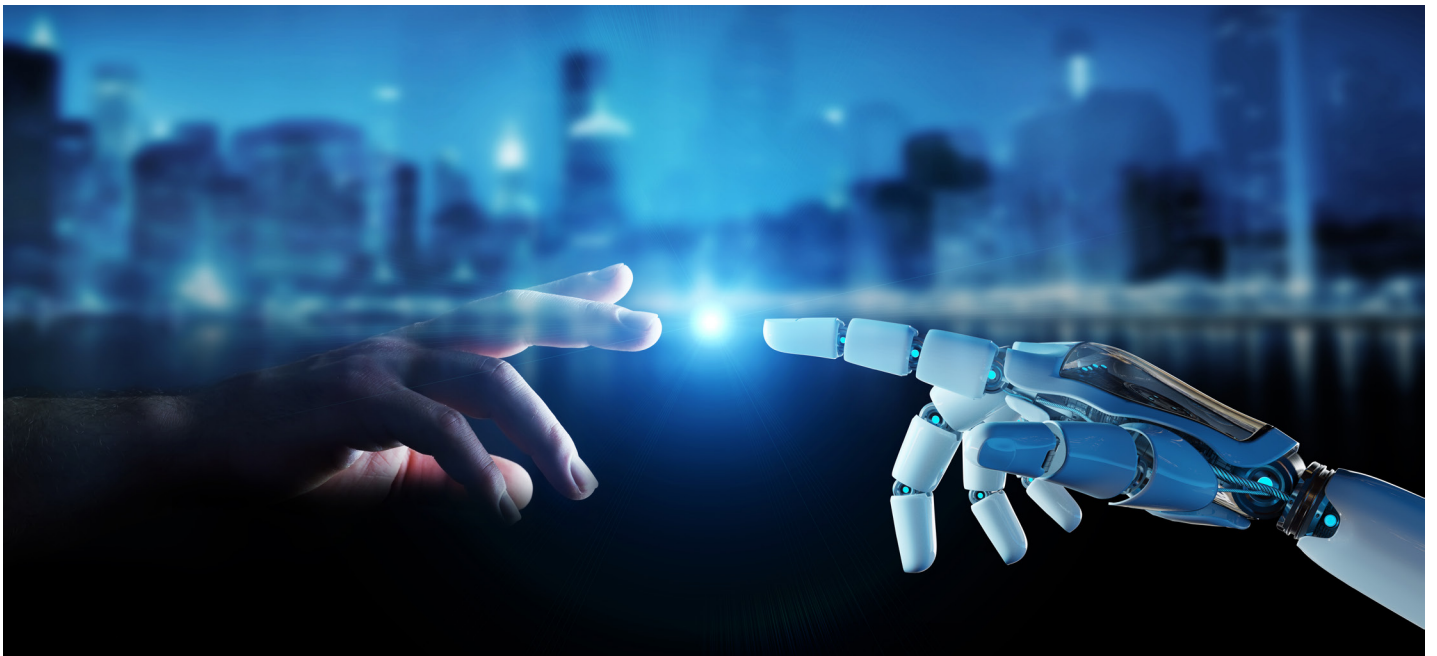
## What is machine cognition?

Machine cognition is really a process of separating background and foreground. It is no longer sufficient to think in terms of machine cognition as merely 'connecting the dots'. We need to move a step further to a paradigm where machines are able to actually 'find the dots' amongst a sea of data in a complex world. **The Dual Process Theory** is described by cognitive scientists as the bed rock of human cognition. It proposes that the brain thinks in two ways:

- Associative thinking - unconscious (not deliberate) and is believed to organize sensory inputs into similar categories popularly known as pattern recognition (similar to pattern recognition or machine learning); and
- Directed or relational thinking - conscious and directed towards a goal (similar to learning and reasoning).

Proponents of the dual process theory conjecture that the brain has different mechanisms for associative and relational thinking. They argue that critical thinking,

<sup>1</sup> This article is based on Vrinda's presentation to I'Institut Europa <https://www.youtube.com/watch?v=vfSEBve6MW4&list=PL138pGCdJ57XtKZAYiJ4-SpgYL3pCaXwz&index=8>



creative thinking, brainstorming and problem solving cannot be modelled as simple associative thinking or pattern recognition problems.

AI encompasses both - picking up patterns in high volumes of data but also being able to understand, infer and contextualise high veracity and high variability within that data, the same way a human being does. It is only by applying both associative and relational thinking that machines will be able to have a complete analysis of the whole picture and provide meaningful results.

This is the space that 114ai works in, and just for context, both I as the CEO, as well as the CTO, are women.

### Towards a human-machine team

Smart and autonomous machines of the future will require a method to mimic human intelligence in decision-making. The first step in this journey is to get to a state where **human and machine teaming** is a reality.

In the first step, machines will do what they do best, which is to sift through petabytes of data and bring to the forefront critical information. There is also a parallel need to capture and codify expert knowledge, giving the machine the “intelligence” it needs to reason through these complex pathways. Then, analytics will be built on symbolic and sub-symbolic processing, which includes things like common sense reasoning, background knowledge, episodic memory and institutional memory. The cues from the sub-symbolic process will need to be dis-ambiguated using reasoning techniques.

And finally, for true cognition to be achieved, be successful and viable, we will need to build trust with those machines and understand the factors contributing to a decision-making process.

As the technology matures, AI will be used to provide decision support to assist doctors, pharmacologists, space operators, researchers, governments, and the military. AI will provide tools to assist these and other

critical decision makers to leverage the tremendous amount of data being thrown at them constantly, to reduce their cognitive burden and make better decisions. By focussing on provenance, trackability and explainability, we can move away from the current state of ‘black box’ decision making, to a world where we can begin to trust the decisions coming from these machines. This is a necessary technological obstacle we have to overcome before we can even think about having autonomous machines in our homes and on our streets.

### Questions for next generation AI

The next generation of AI is going to require us to find answers to a few key questions:

- How can we reduce the friction of adoption? Can we stretch the boundary of what can be achieved in a low code or a no code environment, and drive even bigger value from AI?
- Can we enable machine to machine hyper automation or redirect the limited number of data scientists in the workforce away from mundane tasks towards the more complex problems at the top of the value chain?
- Can we create an operating system for human machine teaming for human beings to interact with and work seamlessly with machines?
- How can we enable augmented intelligence, or create methodologies for machines to think, reason, infer and apply logic to enhance their productivity and more complex operations?
- Can we build an AI paradigm that inspires trust, by establishing those cognitive pathways to maximise trust and to show the provenance of decisions?

### Value of a no-code platform

At 114ai we are building a platform that will enable us to leverage data analytic tools and expert knowledge in order to get to cognition or augmented intelligence. The tool we are building is a no-code environment

which acts as the 'glue' or the information architecture to fuse data, automate data transference, capture expert knowledge, set up those analytic pipelines, and use logical inference to enable the extraction of causal inferences from unstructured data.

The entire pipeline uses innovative knowledge graphs, providing explanations for each step of the inferencing process with a design that enables transparency and builds trust. Our goal is to break down the barriers that enable fear of AI; we want to reduce the friction on uptake and utilisation, enable the development and scale of analytics pipelines and use data to drive decision-making in a no-code environment.

## Unlocking the potential of AI

Our vision is to make AI ubiquitous in decision-making. This would unlock tremendous potential across the economy, but it would also allow a focus on areas of research that are not well funded, because they are not considered of commercial value. For example, an area that is close to my heart is the repurposing of existing drugs to treat debilitating conditions which may not make financial sense.

These technologies have long been touted for their promise to make new drugs cheaper and more effective.

The development of tools that can reduce the cost associated with trial and error, narrow down the list of candidate therapies and reduce failure rates between phase 1 trials and regulatory approvals, would have a substantial impact on some of the lower hanging and often neglected therapeutic areas.

This is but one example of where enhanced AI, based on a human-machine team approach, can be deployed to bring about tremendous benefits to mankind. Let us work together to make this dream a reality.



114ai is a data infrastructure company, which builds tools to make AI more accessible and usable. The company was established in 2019, after Vrinda experienced the use of AI enabled technology in the healthcare sector. With a background in life sciences and healthcare, rather than computer science, Vrinda became increasingly interested in the digital transformation of patient management systems, in both the public and private hospital systems in India. From there she became interested in addressing the challenges of AI systems, which were preventing the promise of AI from being realised. She hopes that enabling more women to work in AI related areas will normalise the involvement of women in this specialised area. "I would like to see the industry make an effort to inform young women graduates about the full range of work opportunities that are out there for them - not just those who study computer science, or even STEM, but women from all the liberal arts", adds Vrinda. Of the challenges facing us over the next ten or so years, Vrinda sees cybersecurity as a major one, especially for individuals who tend not to understand how vulnerable they may be, as smart devices are brought into the home environment, especially around children. "I would like to see senior leaders in the industry, including the GTWN members, working together on making AI more understandable and building back trust with the community.

# ENABLING GENDER EQUALITY THROUGH VR TRAINING

LETICIA LATINO-VAN SPLUNTEREN, CEO, NEPTUNO USA, CORP

I don't know how many times people have thought that I am simply joking when I say that I sell telecommunications towers for a living. "Really? And who would buy those?" they ask, and the question simply blows me away. Every. Single. Time.

Communication has really become a commodity, and the incredible technology, the infrastructure and the workforce that makes the magic happen, one could say are going unnoticed and underappreciated. Wireless Towers build outs are constantly being halted, with neighbours furious about how it ruins the beauty of the neighbourhood. I get it, they aren't pretty, and yet, without them, it would be impossible to get an emergency call through in a life-or-death situation.

Wireless networks weren't originally built to handle the amount of data that we are requiring from them today, hence, the imperative need to update the networks that allow us to satisfy this growing data appetite. As of the beginning of 2023, there are upwards of 150,000 wireless towers operating in the United States, and the estimate is that by 2030 there will be about 900,000 Telecom sites (including macro sites, rooftops, small cells).

It is estimated that the United States is short about 20,000 tower technicians to deploy 5G and broadband projects at the projected pace, which is essential to retain its global leadership in telecommunications. Because of this, and the Infrastructure, Investment and Jobs Act (IIAJ), (the largest bipartisan infrastructure bill in US history), there will be an unprecedented amount of funding, US\$65B, to be specific, geared towards broadband development. Some of that funding will be allocated to workforce development initiatives. This raises a number of questions:

- What skills are required to become a tower technician and to be able to work at height?
- How do individuals know if they are suitable for this

work and how do they learn about the career path it offers?

- How diverse and inclusive is this workforce, and is it showing signs of change?
- What can we do to ensure that women and girls view a career as a tower technician as a viable and attractive option for them?

According to Zippia<sup>1</sup>, 94% of cell phone tower workers are currently male, and only 6% are female; 64% are white, and only 17% are Hispanic or Latino. The average age of tower climbers is 45, which means we need to get more younger people joining the industry. The Federal Communications Commission (FCC) Broadband Advisory Committee Jobs and Skills Working Group identified in its 2020 report that the industry is suffering from an identity crisis. A significant lack of awareness about the career paths, job conditions, training and compensation available to its workforce is one of the main reasons for the shortage. In fact, after that recommendation, several initiatives have taken place, to help raise awareness. One of my favorite initiatives was led by the National Infrastructure Communications Association<sup>2</sup> (NATE) which released a featured length documentary called "Vertical Freedom", which can be accessed globally on many streaming platforms. It highlights the professional and personal lives of six tower climbers (including a woman) and the challenges they face on and off the job. Seeing Kelsey Olsen, who is a structural engineer, climbing those towers in the movie, can serve as a role model and inspiration to young women, not only because she chose a career in STEM, but especially because she also loves the thrill that her tower climbing job gives her. Stories such as these serve the telecom industry and prove that the jobs for tower climbers can indeed be more equitable and attractive to a broader section of the population. We are on an important mission to attract a more diverse group of workers into these jobs.

1 <https://www.zippia.com/cell-tower-climber-jobs/demographics/>  
2 Vertical Freedom Movie Trailer: <https://youtu.be/3NfAoXNAX7k>

We need to think out of the box and find better ways to outreach, train and retain candidates.

I am an innovator at heart, and as such, I've devoted almost my entire career to finding ways to improve processes and leverage existing technologies to work in a better, faster and safer way. It is no secret that tower climbing is one of the deadliest jobs out there. It requires more than not being afraid of heights, it requires the ability to work, for extended periods of time (and under extreme weather conditions), carrying a lot of weight and basically hanging around. Substantial amounts of time are currently being spent recruiting talent, to only have to let them go, a few hours after experiencing the first climb.

## The advantages of VR training

The good news is that with innovative technologies currently available to us, we can tackle this problem differently. Virtual Reality (VR) Training is slowly becoming an essential tool not only to deliver full immersive training experiences that have the ability to be more comprehensive and experiential by definition, but also to enable the employer to better screen potential candidates by providing them an opportunity to familiarize themselves with the "climbing scenario" on the virtual platform, before deciding to embark on full training.

Until now, there was no real way for someone to try out the role of tower climber without actually going up a tower with one or more trained technicians to accompany them. This is an expensive exercise, requiring trained technicians who are also skilled in instructing others to take time off their own work to train new recruits. The whole process meant that selection of potential candidates was also relatively long and careful, as it is difficult to judge whether someone is suitable for high work before they have experienced it themselves. Some people take to it immediately and love it, while others, even those who are very interested in the field, find that it is not their cup of tea.

In these VR based training modules, users move through and interact with a virtual world that looks like a real-

life location. These virtual environments marry virtual gaming elements to required training learning points and milestones. As a result, a real-world environment is created for a unique learning experience for students and industry professionals with the ultimate goal of delivering a credentialed backed training program. The user begins the training by receiving instruction from a certified tower instructor. After that, they choose their equipment and drive to a virtual representation of the tower for a tower training scenario. In addition, the application leverages gaming features to score the user on safety and training outcomes.<sup>3</sup>

Whereas some girls and young women may have been put off applying for climber jobs, as they found the selection process and training rather intimidating, in this VR environment they can experience the role and can find out if it suits them. This saves time and resources for the tower company, while also making the selection and training experience much more user friendly and less confronting for a broader range of potential applicants.

At Neptuno, we are committed to helping develop a more skilled, diverse and stronger telecommunications workforce, and we are utilizing innovative ways to achieve this goal, which is really exciting and motivating for us. We are working hard at supporting pre-apprenticeships and registered apprenticeship programs, such as TIRAP, whose mission revolves around creating solid career paths that are able to attract more talent, especially from under-represented groups. We have contributed hundreds of virtual twin datasets of telecom towers using Lidar technology to VR companies, training providers and Industry Associations to help advance the quality of the VR programs available. I hope that by using VR training and selection we will start to see the gender and equity profile of the industry change, so that this sector can benefit from a broader range of skills and experience in the future.

<sup>3</sup> For example, see <https://www.youtube.com/watch?v=47WMbCCFbqq>





Credit: Learning Alliance Corporation



With over 25 years' experience in the telecom industry Leticia Latino-van Splunteren went from working for Merrill Lynch and telecom giant Nortel Networks to accepting the challenge of extending the legacy of her family business, founded by her father in Venezuela in 1972, by establishing it in the US back in 2002. Neptuno Group has helped deploy some of the first cellular networks in the Americas where they have built over 10,000 Towers. She was appointed CEO of Neptuno USA, Corp in 2017. Under her leadership, Neptuno has patented several tower designs and has applied 3-Dimensional technologies to Site Surveys, Tower Mapping and Virtual Telecom Assets Libraries. The company also contributed to the development of NAAP, an AI fueled Telecom Asset Management Software, geared to help manage Asset Life-cycles, and is taking an active role in the Smart Cities movement through their innovative multi-host, multipurpose Smart Pole, branded as SmartTecPort.

Leticia is a recipient of the Women in IoT award by Connected Magazine, Revolutionary CEO's by Aspioneer and one of the 30 most influential Leaders in Tech by Insight Success. In early 2022 she was appointed by the United States Federal Communications Commission Chairwoman Rosenworcel to serve in the Telecommunications Interagency Working Group, which was formed as a requirement of the Infrastructure Investment Jobs Act and is tasked to present a recommendations report to US Congress on how to address the Telecommunications workforce shortage by January 2023. She is also an appointed Working Group Member to the FCC Diversity and Equity Council, and sits on several Boards including the SmartCities Expo Miami Advisory Board, The Global Telecom Women's Network and The Acceleration Project.

[www.leticialatino.com](http://www.leticialatino.com)

# AI: THE POWER TO GENERATE IDEAS SHOULD BE BALANCED BY KNOWLEDGE SHARING

RACHEL FREE, PARTNER AND PATENT ATTORNEY, CMS

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If you thought that “Cathedral with pink sky” was the text prompt used to generate the image below you could well be right. This type of photorealistic image can easily be generated by AI models such as Rombach et al.’s Latent Diffusion<sup>1</sup> today<sup>2</sup>. Michele Merrell’s article on ChatGPT, also in this edition of The Mobile Century magazine, explains the power of generative AI applied to all sectors of the world economy. Using generative AI to come up with new ideas, it is possible to dramatically accelerate the pace of technology innovation.



In this article I argue that such power to generate new ideas should be balanced by sharing knowledge; sharing knowledge about the technologies used to generate those new ideas and sharing knowledge about the new ideas themselves.<sup>3</sup>

Many of us have tried generative AI tools but not so many of us understand how generative AI algorithms work. This makes it difficult for citizens and society to “look after themselves” and ensure that AI technologies remain “human-centric”.

If a new innovation is generated by AI technology, that new innovation may easily be kept as a trade secret and exploited as “black box” technology deployed as a cloud service for example. Where innovation is protected with trade secrets only it is difficult for society to understand how that innovation is being used or may be used.

AI technology has a significant impact on our lives and it is clear that generative AI is no exception. Already AI technologies are being used in the courtroom<sup>4</sup> to advise defendants what to say. AI technologies are increasingly used in healthcare to triage<sup>5</sup> patients and for many other purposes. AI technology today has some degree of independence and uncontrollability since machine learning models are not written with explicit rules.

## AI technology is likely to advance

In recent years many authors have written about the singularity, which is a theoretical time in the future at which AI technology is on a par with human intelligence and is soon afterwards able to create AI technology

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1 <https://arxiv.org/abs/2112.10752>

2 In case you are wondering, the photograph of St Paul’s Cathedral was taken manually by myself just before snowfall in central London. The sky was naturally pink at that time.

3 Some of the material in this article first appeared in the chapter I wrote for the book “Artificial Intelligence Law and Regulation” 2022 Edward Elgar Publishing ISBN: 978 1 80037 171 2

4 <https://futurism.com/court-case-ai-defendant-earpiece>

5 <https://proxet.com/blog/artificial-intelligence-based-triage-using-ai-to-triage-patients-in-a-healthcare-facility/>



with even greater powers. It is argued that in the time after the singularity there would be an exponential increase in ability of AI algorithms until humans are left behind, potentially with little or no freedom. Whilst I am not sure I agree with the notion of the exponential increase in ability of AI algorithms at the singularity, I do think it is likely that AI technology will advance, possibly in terms of independence and “uncontrollability”. For that reason, I think it would be prudent to promote knowledge sharing of AI algorithms now.

## How to promote knowledge sharing

Mechanisms to promote knowledge sharing of AI algorithms include:

- Market pressure due to scarcity of AI experts
- Regulation and standards
- Intellectual property
- Access to data.

*Market pressure due to scarcity of AI experts leads to knowledge sharing*

Because of the scarcity of AI experts, industry is prepared at present to allow the AI experts to work in a similar way to academics and to publish their work at AI conferences, in order to attract and retain AI talent. The expanding opportunities for scientists for moving between academia and business as companies step up recruitment is explained in **Nature**<sup>6</sup>: “In the past, there were fewer research labs in industry and it was harder to publish. Now, many companies have an open-

publication policy, and that means you’re participating in peer review and embedded in a research community. It’s easy to go back to academia. It’s certainly not held against a faculty candidate if they were in industry for a few years, as long as they continued to publish. In fact, industry experience is highly valued.” Thus at present, market pressure due to scarcity of AI experts is leading to knowledge sharing.

*Regulation and standards are also mechanisms to promote, or in the case of regulation, mandate knowledge sharing of AI algorithms*

In Europe, the proposed AI Act contains a plan for regulation of high-risk AI. The implication of the proposed regulation of high-risk AI in Europe is that it may become mandatory to disclose information about AI algorithms in high-risk sectors such as health care and self-driving vehicles. Lower risk AI algorithms would be outside the mandatory disclosure system and presumably that would include AI applications such as information retrieval, recommender systems, digital assistants, crop planning and management and others.

In the case of AI standards, if an AI algorithm is to be standards compliant, it is likely to be subject to knowledge sharing or disclosure requirements such as a link to a code registry with source code of the model.

*Intellectual property system as a mechanism to promote knowledge sharing*

Patents are an incentive to knowledge sharing since a patentee is given a monopoly right in return for publishing full details of the technology. Patents

6 <https://www.nature.com/articles/d41586-019-01248-w>

are written using an internationally agreed standard document structure and so are a type of “universal language” that is understood by readers in many nations. Patents are classified according to carefully designed and maintained classification schemes and are a corpus of data which is easily searched using those classification codes as well as keywords. In contrast to many academic publications and peer reviewed academic journals, patent publications are freely available.

Generally AI patents include both high level and detailed information about AI algorithms but not source code. Typically patent documents set out problems that are to be addressed by the invention and explain how the problems are solved. This type of explanation is arguably just what is needed for transparency in terms of ethical and economic reasons for knowledge sharing.

The UK Supreme Court will consider the issue of knowledge sharing when it considers the appeal in the DABUS<sup>7</sup> test case in March 2023. DABUS is an AI algorithm listed as an inventor on two UK patent

applications. The applications were previously refused on the grounds that DABUS is not a human and so cannot, under current patent law, be recognised as an inventor. Similar test cases were mounted in other jurisdictions, including in Australia in late 2022, with similar results. Therefore, the outcome of the appeal in the UK will potentially have significant implications worldwide for knowledge sharing of technologies created by generative AI algorithms.

7 Device for the Autonomous Bootstrapping of Unified Sentience



Rachel Free is a partner in the patent team at International Law Firm CMS where she helps clients to protect their technology through patents. The patent filing and prosecution team at CMS Cameron McKenna Nabarro Olswang, LLP is band 1 ranked in Legal 500. She has an MSc in Artificial Intelligence and a DPhil in Vision Science. Rachel is a European and UK patent attorney and has worked on computer related patent drafting and prosecution through her career. Rachel is a member of the All Party Parliamentary Group on AI (APPG AI) in the UK. She is also an advisory board member of the University of Bath centre for doctoral training on AI. She is vice Chair of the Chartered Institute of Patent Attorneys (CIPA) computer technology committee and is mentioned in the legal 500 CMS entry for law firms with patent attorneys as having ‘deep technical knowledge’.

# AI IS THE ‘BRAIN’ OF 5G

LUCY LOMBARDI, DIRECTOR, HEAD OF TECHNICAL AND OPERATIONAL PARTNERSHIP AND CONTRACTS, TIM

Artificial Intelligence is not a new phenomenon. It has had a long gestation period going back to the 1950s and decades of exemplary research that followed. It wasn't until 2005, however, that the pace of research and development picked up substantially thanks to important technological developments that led to an AI rebirth, especially with respect to machine learning (ML) and, more specifically, deep learning. Chips were faster and cheaper and could support the processing speeds needed by AI and cloud-based storage and compute capacity were increasingly available on an on-demand basis.

The most common form of AI today is machine learning. Rooted in statistics and mathematical optimization, ML is the ability for computer systems to improve their performance by exposure to data without the need to follow explicitly programmed instructions. ML is the field of study that gives computers the ability to learn without being explicitly programmed, sort of like teaching a dog how to catch a ball as opposed to teaching someone to follow a cake recipe. The first method is by trying, giving feedback and letting the dog figure it out; the second approach is based on creating a step-by-step set of instructions to be followed.

We are currently in yet another AI hype triggered by the release of large language models like OpenAI's ChatGPT and Google's Bard. Telcos and OTT players are at the same time focussing on the wonderful opportunities that all the data generated by the IoE (Internet of Everything) will produce and by the increased complexities that will be needed in telco infrastructure deployments: AI is consistently listed among the major technological trends alongside 5G. Here I would like to give you an overview of how AI is playing a fundamental role in the telcos' digital transformation.<sup>1</sup>

## AI Telco challenges

Besides effectively enabling a whole new stream of IoE, 5G also presents an important opportunity for telcos to drive digital transformation within their own infrastructure. 5G in fact, introduces innovative technological features that enable a more flexible

network. The Radio Access Network (RAN) will be composed of a combination of small cells alongside macro cells, antennas will become active with the possibility of beam forming, virtualisation of the RAN will enable the separation of the antenna and the baseband unit with the possibility of centralising the latter. As a consequence, topologies will grow more complex with small cells and new antennas, usage patterns will become less predictable from humans alone, the radio propagation models will become harder to compute with new radio spectrum bands and denser topologies.

On the Core Network side, the SDN and NFV trends will develop further to mold into a new cloud native infrastructure based on micro-services and containers. Today's networks are hugely complex already, and, going forward, they will acquire a whole new level of sophistication.

With 5G, topologies will grow more complex with small cells and new antennas, usage patterns will become less predictable for humans alone, the radio propagation models will become harder to compute with new radio spectrum bands and denser topologies. Future networks will have multiple technologies coexisting side by side, e.g., licensed and unlicensed wireless technologies, fixed mobile convergence (FMC) technologies, legacy and future technologies. Telcos will have to base their investment decisions on an increased number of variables and on very granular and complex return of investment assessments.

It is therefore likely that machine intelligence will play a key role in assisting operators in engineering and operating networks. More and more policies will be machine-learned, leveraging on constant measurements from the field and best-in-class simulators, together with a constant supervision and training by the best human experts.

AI will need to be at the heart of networks and will permeate many areas. AI will:

- help manage the increased complexity in infrastructure engineering and optimizing investments;
- facilitate and improve infrastructure operations;
- enable new approaches and opportunities by

<sup>1</sup> <https://www.gruppotim.it/it/newsroom/notiziario-tecnico-tim/autori/lm/lucy-lombardi.html>

- bringing and linking together different components;
- increase knowledge of your customers and the quality of the service provided; and
- enhance security.

Last but not least, AI is not the solution to all problems. There may be some instances where ML algorithms will not offer improvements with respect to traditional algorithms and it is not always obvious to predict when this will happen. It is therefore important to approach AI with an open mind, accepting the possibility that sometimes the outcome will not be the desired one. On the other hand, the lack of control and explainability of the results obtained may be deemed not acceptable, either from an organizational, legal or customer experience point of view.

## Conclusion

For the telco industry moving towards 5G, AI adoption will be a necessity in order to drive increasingly autonomous and intelligent networks and improve customer experience through improved knowledge about customer behavior. As AI is based on data, networks will become studded with sources of data that may be very heterogeneous. Also, new ways of working will slowly spread, based on Design Thinking or its evolution. Networks will be interlaced with AI algorithms to help make sense of the increasing complexity and provide a better, more flexible infrastructure.



Lucy Lombardi is an executive with diversified professional experience in responsibilities and leadership roles in the Telco industry within technical, commercial (profit & loss) and business development/innovation departments.

She is experienced in open and ecosystem innovation, digital transformation, partnership development and scouting, industry influencing and standardization, startup acceleration processes, company-on-campus (academia) engagement, project management, technical mobile networks. Worked on 5G, big data analytic, machine learning, digital products, network sharing and roaming.

Lucy is a pragmatic and energetic leader characterized by clear critical thinking with a multicultural background and excellent skills in managing complexity, driving change, sustaining team energy and a proven track record of achieving results. She has extensive and on-going experience in international organizations (among which GSMA, 3GPP, WAC, OMTP) assuming leadership roles and developing a global network of top-level decision-makers.

# HOW TO GET METAVERSE READY: THINK BEYOND THE GOGGLES

MIRKO VOLTOLINI, VICE PRESIDENT, STRATEGY AND INNOVATION, COLT TECHNOLOGY SERVICES

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The metaverse will generate exciting new opportunities for business and society. 71% of business executives in a recent Accenture survey said the metaverse would be good for the enterprise. 42% believe it will be 'breakthrough' or 'transformational'. JP Morgan identified a market opportunity worth more than \$1 trillion in its report "Opportunities in the metaverse", while a year ago, Bloomberg Intelligence suggested it could be worth \$800 billion by 2024. Meta heralds the metaverse as 'the biggest opportunity for modern business since the creation of the Internet.'

But you would be forgiven for feeling – excuse the pun – a little 'meh' about it. Chances are we've all seen social posts from metaverse evangelists met with comments which range from sceptical sarcasm to unrepeatably criticism. What does it really mean for businesses and their customers – isn't it just for gamers? And is it time to invest in those AR goggles?

## **What's real, what's virtual – and does it matter?**

The metaverse extends human interactions into various digital worlds. It's not just about a virtual utopia, accessible only to a few people with pockets deep enough to afford the latest smart glasses. We need to think beyond VR goggles and quirky avatars, to a place where digital and physical worlds interact and generate extraordinary, meaningful connections.

The metaverse (or multiverse as some prefer to call it) represents a multitude of potential applications and guises. It's less Second Life 2003 (more on that later), and more ABBA Voyage, a seamless experience which blurs the boundaries of physical and digital as concert-goers interact in person with astonishingly-lifelike

ABBA-tars – holograms worked on by 1000 visual effects artists. By the end of the show, fans are left questioning what's real and what's virtual. But here's the important bit: it genuinely doesn't matter. Concertgoers, just like users of digital technology everywhere, want the very best experience – an enriching, memorable, joyful one that makes them feel part of something special, relevant and ground-breaking. They don't need to know the behind-the-scenes detail, or be consciously aware of what's 'real' and what's virtual. It's about generating interactions and transactions. And – just as it has always been – the onus is on network operators and service providers to understand and optimise the technology available, to improve your customer experience and generate new sources of revenue.

## **A short history of the metaverse**

Previous commercial interactions with the metaverse began around a decade ago. Second Life, launched in 2003, was one of the earliest incarnations of an alternative metaverse-type world to present commercial opportunities. Banks, entertainment companies and sports brands jostled for attention and sponsorship. By 2013, Second Life exceeded 36 million accounts (for context, Twitter has 450 million active users). Then things went a bit quiet. In 2017, Second Life's makers – Linden Labs – released Sansar, a kind of connected group of virtual reality spaces, which sold to Wookey Projects in 2020 at a point when the world was in lockdown and much of our lives was spent online. Second Life enjoyed a resurgence around that time, driven by pandemic-related restrictions and by advancements in hyper-real game play, as well as the rise in the number of gamers (now reaching over 3 billion) and – of course – mobile access.



## Growing pressure on digital infrastructure

But there's another influence that has been – and will continue to be – critical in bringing the metaverse to life: the rise in networking technologies, and resulting access to fast, secure, affordable digital infrastructure. If you think about the metaverse as layers of technologies built on top of one another, core infrastructure is the foundation.

In 2003 – when Second Life was released – BT launched a 1Mbps ADSL service for homes. Now, more than 90% of homes with broadband in the UK, for example, take a super-fast package. Average speeds are 59.4Mbps. Interacting with the metaverse places incredible pressure on digital infrastructure, requiring Gigabit speeds; infrastructure with low latency and loss tolerance; and high levels of Distributed Edge cloud compute. Some of the applications requiring the highest Bitrate according to Credit Suisse, include Holograms (300 Mbps); VR (200 Mbps); AR (80 Mbps) and 4K video (20 Mbps).

The good news is that the infrastructure capabilities are already there to meet the increasing demands of the metaverse. In the early 2000s, first came the content, then the infrastructure: the cart before the horse, effectively. Now, the digital infrastructure is in place, it's metaverse-ready and it's better than ever.

## Business opportunities in the metaverse

We're already seeing business use cases for the metaverse across a number of sectors: manufacturing, healthcare and agriculture, for example. This is extending to education – interactive video classrooms and teleportation to museums, galleries and historic events; to retail, adding another level to ecommerce;

to workforce development, creating a better sense of presence, shared physical spaces and improved collaboration; and to media, generating new forms of entertainment, with the ability to teleport into a remote concert or party, for example. Beyond these sectors, businesses are likely to extend to the metaverse to drive innovation; for digitally enhanced training and testing environments and to generate an enhanced customer experience.

## Implications for businesses and customers

Thinking of the metaverse as a virtual testing environment – a channel for trialling new opportunity and creativity – makes it feel more relevant. There are a number of fundamentals that can help businesses and their clients prepare for the new AR/VR environment. For example, it's time to start rethinking your:

1. **Customer experience.** The metaverse brings new opportunities to create meaningful engagement with your customers and communities. Start thinking now about your customers' journey and end-to-end experience. How can you connect with customers and prospects in the metaverse in a creative, memorable way that drives loyalty and deepens engagement? Could you invite them to events, trials, briefings or tours?
2. **Employee experience.** New hiring practices, opportunities for employee engagement and collaborative working will be generated within the metaverse. 66% of businesses see the metaverse as the next stage of hybrid working, according to one study.
3. **Data.** The metaverse will accelerate an exponential growth of machine-generated data. By 2025, more than 180 zettabytes of data is expected to be generated, consumed, copied and stored. That's double the figure generated in 2021. If your business

is already using or considering big data storage such as data lakes, you're on the right lines.

4. **Digital infrastructure.** Rigid contracts and physical connectivity have given way to powerful, consumption-based digital infrastructure over the past few years. The metaverse will demand the ability to scale up quickly and easily, with the flexibility to self-serve via a portal to add services, extend your network and adjust your bandwidth
5. **Access to smart analytics.** Visibility into network performance will be critical, as the metaverse generates exponential bandwidth requirements. Smart analytics generate insights into the impact of different events on the network and can include intelligent alerts and recommendations for network changes.

6. **Security.** One study found 91% of security experts are worried about data security in the metaverse. The vast amounts of highly sensitive data collected in the metaverse – such as biometric and facial recognition data – means robust, watertight infrastructure security is absolutely critical. Ensure you have protection, detection and response strategies in place – or work with a partner who does.

While the enormous potential of business in the metaverse is still to be discovered, one thing is certain: the metaverse will help us all generate extraordinary connections.



Mirko Voltolini is VP of Strategy and Innovation at Colt. In this role, Mirko seeks to underpin Colt's product capabilities with innovation and the latest emerging technologies in order to ensure Colt remains an industry leader. He works closely with the wider Strategy and Transformation team to help develop and implement Colt's long term strategy. Formerly Head of Network On Demand, Mirko was responsible for the strategy, architecture and development of the network technologies enabling Colt software defined on demand network, the IT orchestration and monitoring capabilities and the management of the on demand product portfolio. He joined Colt in 2002 and has held several senior roles in the technical development and engineering areas. Prior to joining Colt Mirko worked at GTS/Ebone, Italtel and ICT Consulting, an independent telecom consultancy company. Mirko holds an MSc in Telecommunications Engineering from Politecnico of Milan.

# OPPORTUNITIES AND CHALLENGES OF THE METAVERSE

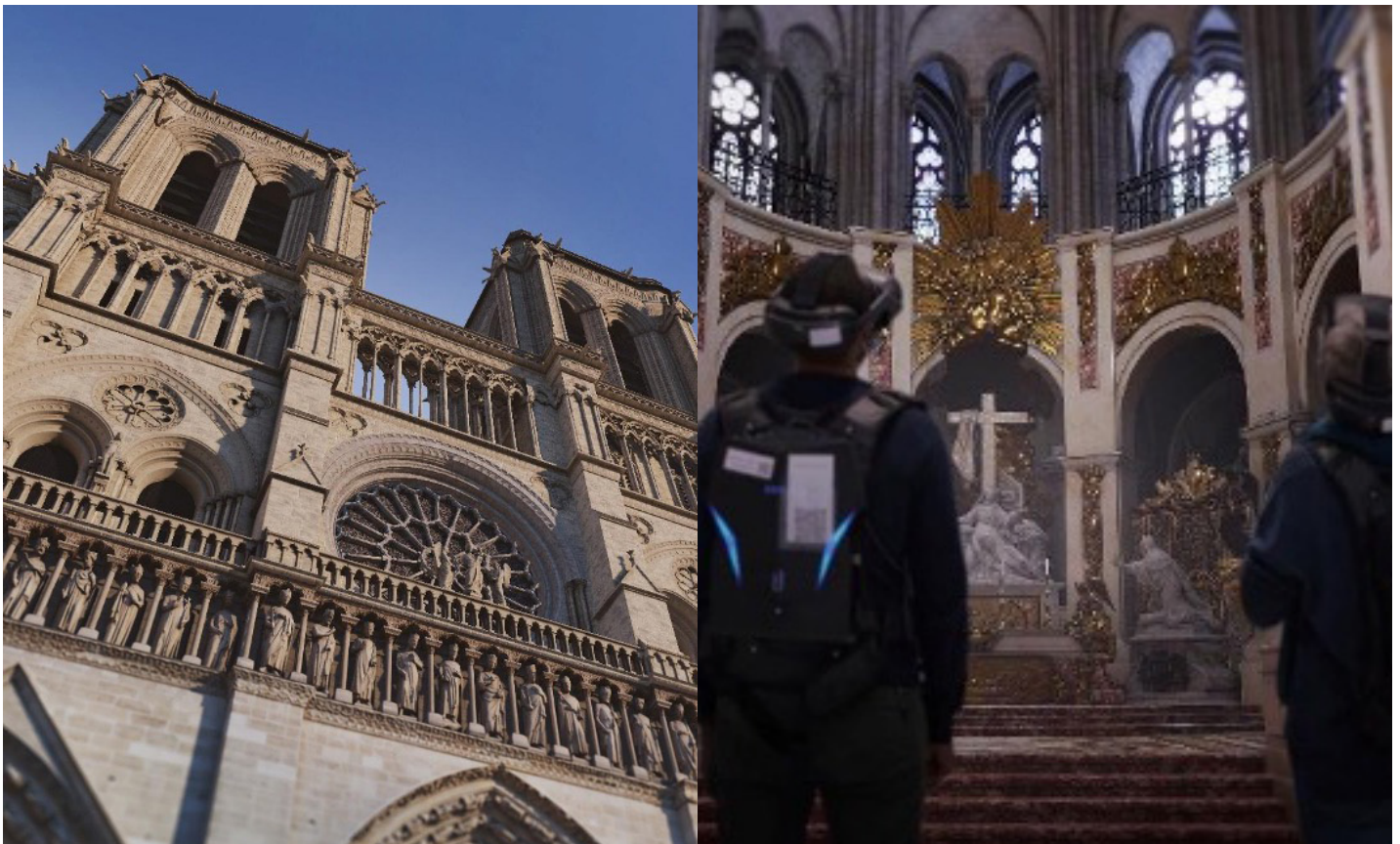
**KARINE DUSSERT-SARTHE, EVP GLOBAL PRODUCT, MARKETING, DESIGN (UX) AND OPEN INNOVATION, ORANGE GROUP.**

At Orange we know that the metaverse will be a next transformative step for our industry and we are increasingly invested in exploring the potential of the metaverse. We have established a dedicated team to explore how we can develop immersive experiences (Web 3D & AR/VR) that can unlock and enable a better and richer digital life.

To stimulate the uptake of new experiences, notably through Augmented Reality and Virtual Reality technologies, we pay particular attention to UX design and interoperability. We are obsessed to understand our user' needs, including the user's personal experience

and environment, and how these new technologies will fit into those parameters.

We have asked consumers about their attitude to Virtual Reality. Our research shows that 40% of consumers already see themselves as being somehow involved in immersive spaces and applications by 2025. So it is clear that Virtual Reality, Augmented Reality and the metaverse are no longer viewed, especially by the young, as a niche interest of a few tech nerds. Gen Z will show us the way. (Gen Z are those born from 1997 to 2010).



"Eternal Notre-Dame": When innovation meets culture. Credit: Orange

While it may require some imagination for the older generation to appreciate the potential uses of Virtual Reality and Augmented Reality, for the younger generation this is already quite normal. We mustn't forget that Gen Z will be 1/3 of the workforce in 2030, and they are already in a virtual gamified world, using cryptocurrencies, and doing in-game purchases. So it is not a big step for them to visit virtual immersive spaces like Rec Room and VR Chat and to participate in group virtual experiences with others from around the world.<sup>1</sup> To illustrate the possibilities of immersive experiences, and learn on the go, Orange have developed the "Eternal Notre-Dame" immersive experience. In the context of the Notre-Dame de Paris restoration, visitors can experience a 45-minute virtual reality tour of the cathedral through the ages as it was before the fire, and to see how their contribution is being used to recreate this magnificent monument. Visitors can access a very high-quality immersive experience.

## Exploring the opportunities

At Orange we are keen on exploring the future with partners - which is why we have invested into "The Virtual Reality Fund"<sup>2</sup> in the US. From their portfolio, we have selected two start-ups to test a few solutions in 2023 and understand consumers' feedback.

One is Mona<sup>3</sup> which enables you to build and own your own space in the metaverse. Mona spaces are beautiful social worlds that you can collect, where you can show your art, and where you can gather with others.

Another one is Obsess<sup>4</sup>, a virtual store platform which allows retailers to build virtual shops in the metaverse and to show their brands to a new type of customer. Obsess-powered virtual stores are fully integrated with the brand's e-commerce website, so that the product prices and availability are current. This enables brands to rethink their online presence away from the purely function into the realms of fantasy and delight.

Many areas of the Orange Group are also exploring the opportunities of the metaverse. Our Luxembourg subsidiary, for example, has opened an Orange Digital Centre (ODC) in cyberspace<sup>5</sup>, where users have access to various types of content, such as conferences related to technological innovation, options to develop their digital skills and ways to learn about the essence of the metaverse, alongside education about this new virtual environment.

## User education and social responsibility

Orange will only participate in a "responsible metaverse". It is important for us to take actions for user awareness about good practice and how to manage the risks in these virtual-based settings. Immersive technologies such as gaming platforms and virtual reality offer an exciting new user experience, but they still lack certain controls.

Several innovative projects are underway on that front.

For instance - we have designed a dedicated "Orange Safe Zone" for the younger audience, accessible on popular online games and virtual worlds. Integrated

1 <https://dreamlandxr.com/>

2 <https://www.crunchbase.com/organization/venture-reality-fund>

3 [Mona \(monaverse.com\)](https://monaverse.com)

4 [Obsess - Virtual Store Platform \(obsessar.com\)](https://obsessar.com)

5 <https://www.orange.lu/en/metaverse/>



Orange Safe Zone: to educate and assist in case of cyber bullying (here on Fortnite).

into each platform's gameplay, the Safe Zone<sup>6</sup> offers a series of questions and answers that address the risks associated with immersive technologies in a gamified way. A second feature enables victims of cyberbullying or witnesses of harassment to access support. On **Fortnite**, there are now Safe Zone cabins on six islands which can be accessed by several million users. On **Roblox**, The Impossible Obby minigame incorporates cyberbullying awareness and protection booths.

When playing the game, it's easy to spot an Orange Safe Zone. Once inside, you're greeted by a bot - the Orange Droid - who will guide you to the Experience space. Correctly answering questions on cyberbullying unlocks "surprises" to help you earn rewards on the platform. You're therefore continually informed of how to use immersive and online platforms responsibly. You can press a 'jump to talk' button that can stay active.

<sup>6</sup> <https://www.orange.com/en/newsroom/news/2022/safe-zone-how-orange-innovating-creating-trusted-spaces-gaming-platforms>

This keeps communications open with the Orange Droid so you can alert it to any case of cyberbullying and, whether you are the victim or a witness, receive advice about how to tackle it. You can also contact a support service via a QR code or a message that displays the number to call.<sup>7</sup>

### **Stronger networks to connect virtual and reality**

The metaverse, and more globally WEB3, will present a new set of challenges for network providers in terms of bandwidth requirements and latency-sensitive applications. These are key to take immersive experience close to reality. At Orange, we will be there to accompany these developments ensuring the high level of customer experience in all circumstances possible so that our customers can enjoy.

<sup>7</sup> <https://www.youtube.com/watch?v=sXEuafWlvQw>



Karine Dussert-Sarthe was appointed in September 2019 to her role at Orange, having previously served as an executive accountable for marketing, customer experience, customer relationships or chief of staff to a CEO, for various companies including Telstra, SFR, Match Group, and Orange France. A 20 year international telecom veteran, Karine brings to the role a proven track record of building and leading diverse teams, developing revenue in new growth territories, accelerating digital transformation, leading communications and marketing activations.

Karine has a passion for what technology and digital can do for citizens and consumers in general. She is actively focused with her team on 5G, AR/VR, next generation home experience and super apps as the next growth drivers for Orange. She is also in charge of global start-ups scouting and incubation to the benefits of Orange top line.

# FROM THE METAVERSE TO THE META-CITY: HOW TO USE THE CONCEPT OF THE METAVERSE TO IMPROVE SUSTAINABILITY

**DERRICK DE KERCKHOVE, AUTHOR AND JOURNALIST, MEDIA DUEMILA;  
FORMER DIRECTOR OF THE MCLUHAN PROGRAM**

**MARIA PIA ROSSIGNAUD, SVP TUTTIMEDIA AND EDITOR MEDIA DUEMILA**

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## **The metaverse as digital destination and destiny**

- Continuity from 1992 to the present
- Simulation and twinning as key principles of DX
- The metaverse and spatial technologies as a simulation of one's own space
- Immersion, presence, and sharing as key features of the habitability of the metaverse (Zuckerberg and Matthew Ball)

Since 1992, when the term was invented by Neal Stephenson, the metaverse, after several false starts such as Active Worlds or Second Life, has gone through many iterations to arrive at its current explosion in world markets. Although still a surprise given the previous lukewarm reception, the duplication of an immersive, not to say “living,” space was in the works from the beginning of digital transformation. Together with the incorporation of AI into every human activity, including sleep, the metaverse will be both the spearhead and focus of technological and market developments.

The metaverse makes evident something we have experienced without realizing it, namely, that we have occupied a new space, entered a new civilization, and disproportionately expanded our individual powers. Space is no longer exclusively geographical, nor is it ontological. It is virtual, yes, but now that it is technically stable it has become habitable in the way we inhabit

physical space. This is what we call “immersive.” In addition to this property, the metaverse is a “sharing” environment just like the physical one, where we take it for granted that we are in the same space with the people we meet. Mark Zuckerberg also understood this: “The defining quality of the metaverse will be a feeling of presence, as if you are right there with another person or in another place. Feeling truly present with another person is the ultimate dream of social technology.”

According to Matthew Ball, “The metaverse is a massively scaled and interoperable network of real-time rendered 3D virtual worlds that can be experienced synchronously and persistently by an effectively unlimited number of users and with continuity of data such as identity, history, rights, objects, communications and payments.” All words are important, however beyond the fact that ‘immersive’ is missing, the most significant is perhaps the word ‘persistent.’ Because this is the one that corresponds to reality and allows interesting comparisons between the physical world, dream, fiction, cinema, and metaverse. For me, the four key words beyond ‘virtual’ are, as with real space, presence, immersive, persistent, and shared.

## **From the metaverse to the meta-city**

- Two functions of the metaverse: entertainment and public service
- Entertainment drives technology and the

marketplace as literature and film provide various experiments in living

- The meta-city concept suggests the possibility of public service (Accoto)

The above does not mean, however, that the metaverse should or will remain focused on entertainment and profit, nor does it mean that it should shy away from realism. The playful version of the metaverse is also part of its heuristic function. Like literacy, which has served both fiction and science, the metaverse can be both a stimulus to entertainment economics and a public service. Hence the twin concept of “metacities.” Like the metaverse, the metacity is a simulation of immersive, interactive and participative space, but it simulates existing physical spaces so that people can act on it virtually and apply relevant decisions accordingly. We can foresee many benefits for citizens, if only to find easy access to authorities and negotiate with them plans to improve the city (and more). But one thing that a virtual environment as a metacity can do that the real city cannot is to collect and integrate all the data, all the sensors and all the traffic in real time and predict consequences or improvements.

According to Cosimo Accoto, “Environments populated today mostly by aesthetically colorful and fun avatars, for sure, but not yet inhabited by politically, socially aware and empowered digital citizens (...) will be the real challenge of the metaverse.” The concept of “meta-cities” reveals the real advantage of the current innovation trend, namely the duplication of reality, not only at the urban level, but, as the European Union envisages, also on a regional, national, continental, and ultimately, global scale. Mapping reality in its immersive dimension may become the way out of the impending ecological and social disasters. The EU, in its wisdom, has initiated the DestinE digital twinning of Europe project<sup>1</sup> as a service to improve the management of the economy and combat climate change.

## Sustainability

- Neither the meta-city nor the metaverse is environmentally friendly.
- But both are necessary for the maturation and diffusion of technology.
- As we have seen so far in the lukewarm results from a range of COP meetings, from Rio to Sharm-el-Sheikh, it seems that nothing will convince governments, industry, and the general public to take sustainability seriously

By themselves, particularly in applications visible today, neither the metaverse nor the meta-city are intended to sustain the environment, far from it. Their playful and commercial or practical applications may actually increase, rather than reduce, the already considerable consumption of energy and materials in cycles of innovation, obsolescence, renewal, and generalized consumerism.

However, industry and the market, hence consumerism, are needed to develop technologies and products that will eventually achieve (or should achieve) the necessary balance between consumption and sustainability. We cannot stop halfway, much less continue with unbridled consumerism. As we have seen so far in the lukewarm results achieved by a range of weak policies, from Rio to Sharm-el-Sheikh, it seems that nothing will convince governments, industry and the general public to take sustainability “en masse” seriously. By comparison, from the early 1960s to 2011, it took almost five decades of public persuasion to reduce the world smoking population to 20 percent.

## From the experience economy to the experience ecology

- The metaverse as the prominent technology of the “experience economy.”
- Externalization of experience (literacy vs. screenology)
- Externalization of ego in the form of the avatar
- Critical difference between metaverse and metacity
- Metaverse = extension of traditional media
- Metacity = extension of one’s own reality
- Techno-ecology depends on quantum simulation (Ball taken up by Accoto)

The market did not wait for the resurgence of 3D immersive technologies to promote the “experience economy.” But the metaverse becomes a reference point for understanding the full implications of the term. We observe in passing that experience creation began early in all literate cultures with fiction and theater. But with fiction the experience was internal to the user. Cinema externalized it again as theater had done and then TV took over, providing the watcher with a complete substitute for imagination. Today that externalizing process is shared between the user’s mind and the screen, but evermore under the control of the screen. The complete externalization occurs with the metaverse because it not only externalizes three of the five sensory experiences, but also externalizes the ego in the guise of the avatar. Here then is the critical difference between the metaverse and the meta-city.

The play and entertainment value of the metaverse, in addition to inviting the creation of a new kind of albeit conventional commercial service, is an extension of other media commodities since the invention of the theater and the novel. In comparison, the concept of the metaverse deals with reality and how to use it. Immersive simulation is directed at predicting and improving the conditions of real life, and as we can predict from current developments, the trend is already considered to go beyond the city to regional and eventually global environments. The metaverse could realize its truest destiny as the simulation of complete environments, replete with data from sensors and real-time predictive analysis to identify potential hazards and their causes, thus protecting the total environment rather than just the human environment. Perhaps we could start thinking about the ecology of experience beyond the economics of experience.

1 <https://digital-strategy.ec.europa.eu/en/policies/destination-earth>

A true difference can only be made when an immersive, comprehensive, and integrated synthesis of all data from all sensors on all key factors that threaten human survival is made available. And this can only come about through rapid advances in quantum computation.

“From a technical point-of-view, the prospective urges us to look at the metaverse both as an interpretive lens through which to begin to read the environment, and the actual architecture that will have to be developed over time for the vision to become a reality. It is therefore not simply a video game or merely virtual reality, although many people use these similes to account for it, it is a new techno-ecology within which humans, objects, data will live.” (Cosimo Accoto)

And may I add ‘animals and plants’ to complete the vision of a truly comprehensive ecology.



Derrick de Kerckhove is a journalist at Media Duemila. He has spent many years as a professor and cultural researcher in digital media and digital transformation of society in both Canada and Italy. He is a former long-term Director of the McLuhan Program of Culture and Technology at the University of Toronto.



Maria Pia Rossignaud is Director of Media Duemila, Italy’s first digital culture magazine which was founded in 1983. She is also one of 25 digital media experts chosen by the Italian delegation to the European Commission to advise on digital culture and digital transformation of the media. She is a frequent contributor to The Mobile Century and a long term supporter of the work of the GTWN.

# DIGITAL FUTURE



# A NEW NETWORK VISION FOR A CONNECTED AND SUSTAINABLE FUTURE

KERI GILDER, CEO COLT TECHNOLOGY SERVICES

- A new network architecture (at the edge) is required to power the next stage of digital transformation, connecting a hybrid and geographically distributed workforce.
- Colt and Lumen Technologies have entered into an exclusive agreement for the proposed sale of Lumen's EMEA business to Colt to build extraordinary connections for customers.
- Networks must also be sustainable, meeting ESG targets; we are working with our partners and our peers to achieve this goal.

My vision for network services is based on the need to be able to provide our customers with extraordinary connections with on demand services at scale, by extending Colt's infrastructure to new geographic markets, boosting the services and capabilities it delivers to enterprises and partners. It is very important to actively listen, and make sure that I'm hearing what's happening within our customers' businesses to understand their end goals, how the network can help them, and shape our services to their needs putting the power of the digital universe in their hands. For that, we offer our customers the best experience possible by carefully choosing our partners. For example, Colt and IBM have launched a joint lab environment to help customers adopt Industry 4.0 technologies in the manufacturing value chain. It will create an environment for customers that will optimise their manufacturing operations performance while enabling the smooth convergence of IT and OT at the network's edge.

Since spring 2020, the COVID-19 pandemic has been accelerating structural challenges and trends that have long faced the telecommunications industry. This pandemic has changed our lives in many ways, and to me, as a network engineer and CEO of a digital infrastructure company one of the main ways it has changed our

expectations is by raising customers' demand for access to their digital lives whenever, wherever and however they want. Whereas legacy IT models were built around centralized office locations and secured datacentres, the pandemic lockdowns suddenly meant that there were many millions of geographically distributed workers. This in turn created an unprecedented demand for applications, data and other network resources to be available in a decentralised fashion. It soon became apparent that legacy infrastructure and architectures are insufficient for supporting the real-time access and security demands of next-generation applications and technologies.

Cloud has made data backup, disaster recovery, and business continuity easier and less expensive because data can be mirrored at multiple redundant sites on the cloud provider's network. What cloud has done for compute in terms of cost savings, customer responsiveness and efficiency gains, this new network architecture must now do for connectivity. We provide an On Demand flex model for customers who want to benefit from the full flexibility of the On Demand platform. What we were able to do, because we already had that On Demand infrastructure in place, was actually turn up enterprise circuits in 3 minutes. That's where the remote capability comes into play. We didn't have to roll out trucks. We didn't have to roll out people, but we could enable terabytes of bandwidth on demand within 3 minutes when, where and how our customers needed it.

In terms of networks, it is now all about creating a hyper-scale digital infrastructure service and global connectivity driven by the customer's consumption demands, which will drive how we build out our networks in future.

## SASE: A New Architecture

As enterprises have increasingly adopted a software-defined wide area network (SD-WAN), which is a virtualised service that connects and extends enterprise networks over large geographical distances, the complexity of these systems has created a whole new set of network management and security challenges.

Secure Access Service Edge (SASE) is a new architectural framework designed to meet the challenges of the modern distributed enterprise. The SASE framework represents the convergence of several established technologies which aim to merge comprehensive SD-WAN capabilities and network security functions into a unified approach. There is an expectation that the applications and the data that workers require will remain always available, optimised for performance needs, and protected irrespective of where they are connecting from.

SASE was designed with the end user in mind and begins with the idea of zero trust. As long as the user can verify their identification and the connecting device then it doesn't matter where the user is physically located. In this type of environment, a trusted user can only connect to the specific resources they're trying to access and nothing else, which is often enabled by a software-defined perimeter.

And unlike traditional VPN solutions which centralise all of these inspection points, a SASE approach distributes all of these checkpoints across various regions, improving the efficiency of network resources and reducing the latency found in a conventional 'hub and spoke' model.

Ultimately this helps address the complexity of managing these components as separate point solutions that each require their own sets of tools to master. SASE offers a common and centralised cloud-based toolset that improves visibility and control across these systems, which can then be managed and orchestrated in the cloud with policy-setting distributed at the network edge.

SASE provides a range of benefits for organizations with distributed users and applications:

- It optimises network and application performance wherever users are based while enhancing access and response times to cloud-based applications;
- It leads to significant cost savings to offer on demand, automated services, rather than manual interventions;
- It accelerates security deployment and incident response, resulting in cost savings;
- It simplifies visibility and control of consolidated networking and security services;
- It automates networking functions, allowing you to do more with fewer resources, enabling enterprises to confidently adopt immersive digital experiences across distributed environments.

To continue to provide the best possible networking capabilities to its customers, Colt and Lumen Technologies have entered into an exclusive arrangement for the proposed sale of Lumen's Europe, Middle East and Africa (EMEA) business to Colt for \$1.8 billion. This transaction would mark the next chapter in Colt's exciting story of global growth and world-class innovation and will enable Lumen to continue to deliver a seamless experience for its multinational customers with needs in EMEA. Lumen Technologies and Colt envisage the transaction would close as early as late 2023.

## Ensuring sustainability

At Colt, we put environmental awareness at the heart of everything we do because we know it's the right thing to do for our planet. That's why we took the ownership to reduce our environmental impact globally and make sustainability a key strategic driver. We started three years ago to review the sustainability of our business, by focussing on the impact on the 3P's - people, planet and process in a program that we called 'Sustainability by design.'

By making sustainability and climate impact a priority for our business, we immediately prioritised efforts to reduce our carbon footprint and increase our social benefit. While efforts to minimise climate impact may not pass a business case (in the traditional sense) we recognised that we also had to take account of other, less immediately tangible factors and costs - including shareholder and stakeholder requirements for ESG compliance, and next generation requirements for more efficient and sustainable ways to do business.

In October 2022, we obtained a Gold rating from world leading sustainability ratings provider, EcoVadis, for our environment, social and governance (ESG) performance, and a B rating from the Carbon Disclosure Project (CDP) for company environmental performance. The long-term strategy of Colt is to create a lean, green and modular network whereby network optimisation is instilled as a continuous discipline.

Our aim is a carbon reduction of 47% by 2030 to meet the ambitious target of limiting temperatures to 1.5 degrees. Our objective is to provide renewable energy power and achieve 75% renewable electricity for all sites globally by 2023. Future savings will be achieved. We will decarbonise our in-house fleet through electrification, and we have committed to a 75% pure electric fleet by 2030, with an interim target of 38% by 2025.

We continue to adopt energy efficient technologies to transform our network infrastructure and data centres of Colt DCS and improve our energy efficiency by reducing emissions by 28%.

In our approach, when we are replacing our equipment with new hardware, we take all these aspects into account to make a difference. For example, at the end of December 2022, we will have all our SDH network equipment (99.99%) removed. It is not only looking

at the next generation things, but also looking at our processes in our organisation to see how we can do things in efficient way and how it will enable more sustainable infrastructure in long-term.

In summary, my vision for the network of the future is one where the customer's needs are paramount - both in terms of network architecture and characteristics as well as sustainability and environmental impact. I am working with my peers in the industry to make this vision a reality.



Keri Gilder is the Chief Executive Officer (CEO) at Colt Technology Services since May 2020. She is responsible for executing Colt's strategy which centres around transforming the way the world works through the power of the digital universe.

Before becoming CEO, Keri was Colt's Chief Commercial Officer (CCO), leading global teams across sales, presales and marketing, as well as working closely with the wider organisation to ensure Colt delivered for its customers.

Before joining Colt, Keri held several leadership roles at Ciena but was most recently its Vice President and General Manager EMEA, responsible for guiding Ciena's EMEA service provider and enterprise customers, as well as partners.

Keri is passionate about promoting Inclusion and Diversity to ensure Colt is a business where everyone feels they can bring their true selves to work. In addition, Keri brings this passion to the wider industry as the Chair of the TM Forum's Diversity & Inclusion Council and President of the Global Telecom Women's Network.

# WHY WE NEED STANDARDS TO DRIVE DIGITAL TECH SUSTAINABILITY

BRIDGET COSGRAVE, GLOBAL PRESIDENT EMERITUS GTWN, NED SINGH

Everyone has experienced the inconvenience of chargers that are incompatible with your mobile phone – and typically when you need one most – with no battery and a conference call starting in five minutes! Add to that the pile of cables and miscellaneous e-waste accumulated from every digital device you have ever bought, that now needs to be taken to a dedicated e-waste collection point, which you never have the time, nor the incentive to visit.

Well, as a former Deputy Director General of ETSI – the European Telecommunications Standards Institute – I developed a deep appreciation of the usefulness of standards to drive co-ordination between manufacturers and operators in the digital tech sector, in the pursuit of improving user experience and customer satisfaction. Hence my enthusiasm when the European Commission threw down the gauntlet to the tech industry to tackle the growing amount of e-waste from equipment chargers.

I am very proud of the fact, that as Director General of DIGITAL EUROPE, working with our members from the equipment manufacturing sector, we managed to meet the challenge of then Commissioner for EU Industry and Entrepreneurship, Antonio Tajani and present on 8 February 2011, a universal phone charger to simplify the life of European consumers.

Therefore it is satisfying to see (albeit more than a decade later!) that on 7 June 2022 the EU mandated all small and medium sized portable devices must be equipped with a USB-C charging port by the autumn of 2024. Laptops will be included under the new rule in 2027. Unbundling will also be mandatory: chargers will no longer come with new phones but will be purchased separately, if needed, when you buy a new phone. The EU stated that this new law is part of a broader effort to make electronic products more sustainable, to reduce e-waste and bring benefits to consumers.<sup>1</sup>

Discussions around a common charger began as far back as 2009, and many manufacturers, seeing the ‘writing on the wall’ voluntarily aligned their production with the new rule. As a result, more than 30 different models of charger have been reduced to just three: the new standard USB-C, the mini-USB, and Apple’s Lightning charger.

While Apple has criticised the move, arguing that regulation will stifle innovation, the new rules mean that it has had to add USB-C charging capabilities to its next generation phones, showing the power of regulation to bring about industry change and promote sustainability, even beyond EU’s borders.



Bridget Cosgrave and Antonio Tajani present plans for an EU universal phone charger on 8 Feb 2011

<sup>1</sup> This law came into effect on 28 December 2022, meaning that new phones sold in the European Union – including future iPhones – will have to use USB-C for wired charging on December 28th, 2024.

It is clear that demands for ESG accountability of digital tech companies is driving the move to global standards and reduction of e-waste. We need to all work to drive this trend further and deeper into the industry, to reduce our environmental footprint and fulfil our ESG commitments.



Bridget Cosgrave is active in corporate governance and European public affairs across the EMEA region from her base in Brussels. She is currently non-executive director at SINCH at [www.sinch.com](http://www.sinch.com) and advisor to SOPRA STERIA [www.soprasteria.com](http://www.soprasteria.com). With an track record as a successful CEO of a 1BnEUR company, BICS [www.bics.com](http://www.bics.com), as an elected official of a global standards body [www.etsi.org](http://www.etsi.org) and as a former corporate development executive and investment banker, Bridget is comfortable working alongside CEOs of publicly quoted and private-equity owned companies, finding business growth in technology transition and regulatory compliance. Fluent in French, Bridget is dual Irish/Canadian and a graduate of Queen's University in Canada, London Business School, and the World Maritime University.

# OTT AND THE COMPETITION FOR CONSUMERS

**OLGA BELYAKOVA, PARTNER AND CO-HEAD OF THE TECHNOLOGY, MEDIA AND COMMUNICATIONS SECTOR GROUP IN CENTRAL AND EASTERN EUROPE, CMS**

**VICTORIA GASKELL, PARTNER AND CO-HEAD OF MEDIA PRACTICE, LONDON, CMS**

## **The online content market – from SVOD to AVOD and beyond**

The entertainment landscape has changed beyond recognition in recent years. Across music, gaming and film and TV we have seen massive shifts. The music industry has almost completed its transition to a solely digital market (leaving aside the small but growing market for vinyl). Gaming has of course always been digital-first but has seen significant growth as advances in technology and connectivity have driven bigger, better and more engaging games.

The film and TV industry sits somewhere in the middle. This market was already on a journey to digital-first when Covid-19 hit, but lockdowns meant that traditional media players had to accelerate their plans. Global SVOD services launched, such as Disney+, and saw phenomenal growth during that time. Niche services also saw greater opportunity given the ability to access a worldwide audience. Consolidation became top of the agenda – players in smaller markets in particular needed to bolster their positions in light of the competition from US players with deep pockets – and businesses that historically competed with each other had to collaborate to ensure sufficient scale, depth of catalogue and geographic coverage to succeed.

## **New business models are emerging**

But more recently, we seem to have reached a pivotal point. SVOD is no longer the new kid on the block – the market is maturing – and consumers have a vast number of SVOD services (and other online entertainment services) to choose from but also the economic outlook has changed. Money is tighter for many households and global events have had an impact. Netflix announced a drop in subscriber numbers for the first time in more

than a decade in early 2022, before picking up again as the year progressed.

As a result, we're seeing a more diverse range of business models emerging, designed to drive subscriber growth, reduce churn and/or diversify revenue streams. There are different price points for different packages of user rights and options to pay up front for longer contracts, but at a discounted rate; Netflix and Disney+ have both launched advertiser supported tiers – and there are a range of AVOD price points, from completely free to discounted; and we're increasingly seeing SVOD services bundled with other services – particularly telco services – to give them instant access to a wider subscriber base. Aggregators are also coming to the fore, capitalising on the fact that consumers only have the capacity for a certain number of separate subscriptions and ideally want to see all of the content they subscribe to in one convenient user interface. We almost appear to be coming full circle with the likes of Sky positioning themselves as aggregators of SVOD services, in the way they have historically aggregated pay TV channels.

The sheer volume of high-end content being produced to feed the SVOD machine is dizzying (although there is talk of the likes of Netflix); reducing their overall content budgets). Whilst content remains king, cutting through is becoming increasingly harder, especially in a fragmented market. At the same time, archive content is having its moment with the rapid growth of fast channels – free online linear content loops supported by advertising.

## **Opportunities for aggregators**

It's a complex picture, with intense competition for subscribers and now advertising revenue, which is problematic for the traditional broadcasters who are

now fighting on all fronts. But there is a clear opportunity for aggregators.

In particular it seems that services focussing on specific genres are likely to need the help of aggregation platforms. Sports-only services especially seem to be under threat. For smaller players, live sports rights are generally prohibitively expensive. The global platforms can afford them but delivering what sports fans want and need has sometimes proved tricky in practice. The major live sports rights are mostly still tied up with traditional broadcasters, but there is growing competition from the SVOD players, although some have approached things more laterally, creating sports documentary series which are almost as popular as the live events themselves.

## The global SVOD players also face challenges

The move to selling and serving ads on services that have not previously had them may not be straightforward from a technical, regulatory or consumer-experience point of view. To successfully navigate the transition, operators will need to capitalise on the opportunities presented by OTT to target ads.

Personalisation and control over content are believed to be of high importance to viewers. According to Deloitte's recent report<sup>1</sup>, TV and video advertising will increasingly focus on personalised ads. This presents an opportunity for tech companies to invest in advanced AI that may help create smarter analytics to be further used by SVODs and aggregators to target advertising and assess viewing preference and history, and even to generate new content on platforms.

Another challenge comes from the markets, which are starting to view SVOD differently as the industry matures and the global economic outlook changes. Analysts are becoming less interested in subscriber numbers and more interested in revenue numbers – again driving a move towards advertising supported tiers and models.

Regulators are also increasingly concerned about the lack of a level playing field when it comes to the regulation of traditional broadcast media and OTT. Younger audiences are mostly now found online, raising concerns about the lack of regulation for many online services (there is a sharp focus on content made available on social media platforms). There is also concern about the sustainability of national public service media in the future.

All of this is feeding into a new nervousness about where the SVOD market is heading. Another challenge comes from the gaming industry.

## The rising importance of gaming

While certain sectors of the media industry are experiencing stagnation or seeing decreasing audiences, the gaming industry is enjoying significant growth in

audience numbers. According to EBU media intelligence report<sup>2</sup>, while TV viewership numbers for adults in Europe remained more or less stable, TV viewership figures for youth in Europe continually declined and are expected to decline further in the next few years.

However, gaming audiences are rising, and some experts project them to reach around 3.8 billion by 2027, which represents at least 20% growth.

The rise of the gaming and virtual worlds represents a challenge for existing media businesses especially broadcast media, which is trying hard to entice younger viewers, although often unsuccessfully, but also the SVODs.

- Gaming has some advantage over both. There are a number of reasons why younger audiences in particular are spending an increasing amount of time gaming and not watching TV or SVOD content. While watching TV shows is a passive activity and in fact barely engages the viewer (with the exception of the occasional interactive programmes, like *Bandersnatch* on Netflix, gaming offers audiences greater interactivity and exposure to those environments. Gamers can also control how they interact with the game and the level of interaction, and how they connect with other users. Further, they can choose who to connect to, as well as how they interface in virtual environments. Unlike TV, gaming gives youngsters real and active engagement in the activity.
- Not only is gaming more interactive, it also allows gamers to have a sense of community through multiplayer gameplay, debating various gaming strategies and real opportunities to directly liaise with celebrity gamers and streamers.
- Gamers comprise a broad and highly diverse audience. All of the available statistical data is consistent in confirming that an equal number of men and women enjoy gaming. Inclusivity and gender equality is naturally built into the gaming ecosystem. One recent initiative to support gamers was seen with Xbox partnering with the women-led gaming company Paidia<sup>3</sup>.
- Although sport events attract huge audiences on traditional TV and increasingly on SVOD platforms, interest in e-sports is rising rapidly. Direct connection to streamers and further opportunities to interact with gamers on streams offered by e-sport channels is not currently replicable using traditional media formats, which makes e-sports highly attractive to its audience.
- Broadcast media has been regulated for a long time, and there are several rules and limitations, including in advertising, which at times prevent the rapid promotion of innovations. As mentioned earlier, there is a divergence between the levels of regulation for broadcast, media and OTT. And there is an even greater divergence with video games. Gaming develops too quickly to be timely and

1 <https://www2.deloitte.com/tr/en/pages/technology-media-and-telecommunications/articles/future-of-tv-video.html>

2 [http://www.ebu.ch/files/live/sites/ebu/files/Publications/MIS/login\\_only/audiences/EBU-MIS-TV\\_Audience\\_Trends\\_2022\\_Public.pdf](http://www.ebu.ch/files/live/sites/ebu/files/Publications/MIS/login_only/audiences/EBU-MIS-TV_Audience_Trends_2022_Public.pdf)

3 <https://news.microsoft.com/en-ca/2023/01/12/xbox-canada-and-paidia-gaming-partner-to-up-level-inclusive-and-accessible-gaming/>

adequately regulated, which (arguably) gives more freedom and more room for innovative solutions; and, hence, for more rapid development.

- Global internet availability, the use of cloud services, and the rollout of 5G platforms hugely expedite accessibility to games. For broadcast media such access speed is sometimes unachievable, not only due to tougher regulations but also because its audience is often limited by the use of certain hardware platforms and devices.
- Gaming is believed to be the most popular hobby in the world. At the same time, unlike passive engagement in broadcast media, the young generation cannot only enjoy the gaming process, but also monetize their gaming skills by participating in various tournaments and competitions, sometimes with huge prizes for the winners.

And third, the deployment of 5G will be complimentary to all the above and will help accelerate cloud-based broadcasting, interactive media and gaming platforms, as well as increase audiences and engagement.

In any event, change looks set to be a continuing theme.

## Convergence of gaming and media

The tech space offers endless opportunities, some of which remain unseen, others poorly explored, and others not yet known to a wider audience. As developments in virtual worlds more broadly take shape, there is clearly a huge opportunity for the gaming industry. All media businesses will need to find their place in these virtual worlds if this is where the audience of the future is likely to be found - and the increasing popularity of gaming would suggest that, at least to some extent, they will.

And we are already seeing steps being taken in the convergence of gaming and media. Content-wise, the adaptation of video games on screens may increase audiences among the younger generation. For example, popular gaming titles such as *The Last of Us*<sup>4</sup> and *The Witcher*<sup>5</sup> have recently been produced as TV shows for producers HBO and Netflix, capitalising on the franchises' huge gaming audiences. Finally, in 2021 Netflix also offered a gaming subscription service when it made several mobile games accessible to its customers at no additional cost, which made the platform one of the largest gaming subscription services.

## Change will be a constant

First, we are likely to see greater "gamification" of the streaming platforms, which may bring opportunities for greater interactivity and engagement and possibly also opportunities for content related e-commerce.

Secondly, the wider adoption of cloud-based broadcasting can offer not only more cost-efficient solutions to businesses, but also allow broadcasters to streamline their video service deployments and operations while making operations more agile and preserving the quality of analogue services. Fox is one of the media giants which is known to stream live TV by means of the cloud.<sup>6</sup>

4 <http://www.theguardian.com/tv-and-radio/2023/jan/11/the-last-of-us-tv-finally-has-the-perfect-video-game-adaptation>

5 <http://www.nytimes.com/2022/12/22/arts/television/the-witcher-blood-origin-netflix.html>

6 <https://aws.amazon.com/media/tech/what-is-cloud-based-broadcasting/>



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Victoria Gaskell is a partner in the commercial media team at CMS Cameron McKenna Nabarro Olswang and co-heads the media practice in London. Victoria has over 20 years' experience focussing on commercial, regulatory and transactional work for clients in the content and digital media industries. Her clients include production companies, distributors, platforms, channels, brands, advertisers and sports clients. Victoria also acts for talent and advises on brand exploitation and joint ventures as well as on media sector M&A alongside the corporate media team. Victoria is recognised as a Leading Individual in Legal 500 and sits on the board of Women in Film & Television.

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# A CROWDED SPACE: NEW CHALLENGES FOR SPACE LAW

SALLYE CLARK, HEAD OF SPACE LAW & SATELLITE GROUP, MINTZ

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Activity in outer space has never been busier and more crowded. How will we handle issues that arise with planetary colonization, space tourism and asteroid mining? Will the existing rules from the 1960s work in a crowded space in the 21st century?

## The treaties applying to space

The treaties that regulate the use of outer space were developed over fifty years ago at the dawn of the space age. The main treaty that is the foundation of space law is the 1967 Outer Space Treaty. The Outer Space Treaty clearly and unequivocally mandated that space must be the “province of all Mankind” and that no nation could control space, the Moon or any planets. “Among the principles embodied in the Treaty are the freedom of exploration and use of space for the benefit and interest of all countries, the non-appropriation of outer space, including the Moon and other celestial bodies, and the prohibition of the deployment of nuclear weapons or other kinds of weapons of mass destruction in outer space.” (UNOOSA history of Treaties).

Several other treaties and principles support the Outer Space Treaty. These are the Declaration of Legal Principles Governing the Activities of States in Outer Space (1963), the Declaration on International Cooperation in the Exploration and Use of Outer Space (1996), the 1972 Liability Convention (a multi-national treaty that assigns liability for space objects to the launching states), the Law of the Sea (because oceans can be as inhospitable as space), the Rescue Convention (space faring nations agree to rescue and return astronauts and their ships) and the Moon Treaty (see below for further discussion). Any space related disputes that are not covered by treaties are treated as a dispute under international law.

## New space industry and its implications

When these treaties were negotiated only nations, and not private companies, were assumed to be involved in space travel and thus the treaties clearly were focused on the public sector. We can all agree that our current space race has become not only dominated by commercial

interests but that these commercial interests are now the main source of innovation in space. The days of slow and careful growth in government-only efforts in space are clearly over and the advent of a dominant commercial space raises new questions about oversight and accountability. With this dominance of commercial interests, how can we keep space accessible to all mankind when there are efforts to colonize the Moon and Mars, asteroid mining and an ever more expanding use of space and planetary resources?

Space law experts, students and policy makers have debated the legal aspects of using these treaties in every conceivable scenario. To date, there have been a few collisions between satellites, the last of which led to increased and improved surveillance of space objects over the last decade, but no loss of life, life threatening situations or related disasters. Basically, there have been few real world situations where space treaties have been relevant; there’s been no need to rescue stranded astronauts or resolve disputes about appropriation of resources in space.

## Colonies on the Moon?

With that background, let’s start with plans for the Moon. Several countries, including the U.S. and China, are planning Moon colonies. The Moon Agreement of 1979<sup>1</sup> elaborates on the provisions of the Outer Space Treaty as they apply to the Moon and other celestial bodies. (Note that the major space faring nations of the U.S., Russia, China, Japan and India have not signed the Moon Agreement). The Moon Agreement forbids the establishment of military bases, installations and fortifications on the Moon, the testing of any type of weapons, and the conduct of military maneuvers on the Moon. But the use of military personnel for scientific research or for any other peaceful purposes on the Moon is not prohibited.

Article II of the 1967 Outer Space Treaty—which all spacefaring nations have ratified – also prohibits “any exercise of territorial sovereignty over the Moon (or

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<sup>1</sup> <https://www.unoosa.org/oosa/en/ourwork/spacelaw/treaties/moon-agreement.html>

indeed any other part of outer space)”. So a nation can find and extract resources like water from the Moon but it cannot reserve any specific area of the Moon for its own use and forbid others from the area; think of it as a town water supply that’s open to all and belongs to no one. The Moon can also be compared to Antarctica or the North Pole, where nations can have scientific but not military operations. (And, in fact, there is an Antarctic Treaty that expressly establishes that Antarctica will only be used for peaceful purposes and scientific research that will be shared with other nations.)

To what extent can private companies establish their own Moon bases? Can Hilton, for example, just choose a site and build a hotel on the Moon? Will these decisions be made by the United Nations? With satellite slots, the International Telecommunication Union (ITU), a UN agency, has a system where nations request a satellite position for a private company’s satellite network and basically the first request in the queue gets the slot. Would a similar approach work for claiming territory on the Moon?

### To Mars and beyond

And of course colonizing the Moon seems quaint when you consider plans for Mars. You can understand why we space lawyers got very excited when we saw that SpaceX has the following terms of service in its Starlink user agreements:

*“For services provided on Mars...the parties recognize Mars as a free planet and that no Earth-based government has authority or sovereignty over Martian activities. Accordingly, disputes will be settled through self-governing principles, established in good faith at the time of the Martian settlement.”*

If space is the province of all mankind and has been governed by international treaties, can one company colonize and decide Mars’ sovereignty? Can SpaceX or any other space raider become the space version of the East India Company? If a private company does colonize Mars, what recourse do nations on Earth have to protect Mars for everyone else? Will it be like colonization of less developed countries on Earth, where whoever gets there first controls it? What if irreparable harm is caused to Mars by a private company’s actions?

### Mining rights in space

This also raises questions about mining asteroids. Spacecraft have landed on asteroids, proving that it can be done. The materials present on an asteroid can have an estimated worth of anywhere from \$80,000,000,000 to around \$10,000,000,000,000,000,000 (\$10 quintillion). Can any company that has the means to mine an asteroid claim it as their own? How would we handle multiple nations and private interests in a dispute over the same asteroid?

### Commercial space technologies require updated policies

The UN Committee on the Peaceful Uses of Outer Space (COPUOS), which was instrumental in establishing the key space treaties discussed above, continues to work on international cooperation in space exploration and the use of space technology applications. Owing to rapid advances in space technology, the space agenda is constantly evolving. COPUOS provides a platform at the global level to monitor and discuss these developments. A working group has also been set up to develop a “Space 2030” agenda that, among other issues, stresses the importance of global governance of outer space activities.

We clearly need to establish new treaties and policies that address the issues created by an increasingly commercialized, crowded space to ensure that space really does remain the “Province of All Mankind.”



Sallye Clark is a space and satellite attorney at Mintz who is highly regarded for her work on complex international satellite projects. She counsels her clients on legal, trade, and market access issues, represents her clients before regulatory bodies around the globe, and develops regulatory and legislative strategies for clients. You can reach her at [sclark@mintz.com](mailto:sclark@mintz.com).

# HOW STANDARDISATION IN THE MOBILE INDUSTRY WILL DICTATE FUTURE INNOVATION AND GROWTH

DARIO BETTI, CEO MOBILE ECOSYSTEM FORUM



Standardisation within the mobile industry plays a vital role in ensuring that mobile devices and networks work together seamlessly. Without these standards, consumers would have limited choice in devices and networks, creating a lot of friction within the market.

Fortunately, the mobile industry has learned that cooperation and collaboration help everyone. A rising tide lifts all boats. As such, the initial issues around compatibility, bands, roaming, and so on, have been mostly resolved. Customers can buy almost any device to run on any network anywhere in the world, with few exceptions.

Not only has standardisation helped the industry evolve but it has also changed the world, touching everything from commerce to healthcare. The impact is huge. In 2019, mobile technologies and services contributed \$4.1 trillion of additional economic value (around 4.7% of global GDP), equating to around \$490 billion in tax revenue.

These figures are only likely to grow as more people globally take up mobile services, especially in rapidly developing nations like China and India. Additionally, with the introduction of wireless 5G technology, more devices are able to connect to the internet, helping to expand the Internet of Things (IoT) market.

## Why is standardisation so important?

Standardisation forms a set of blueprints for the mobile industry and connected technologies, such as IoT devices, encouraging competition by creating a level playing field as well as helping the market as a whole innovate to meet evolving consumer needs. It is also

important to consider how wireless technology can be used as an attack vector for rival nations. As national infrastructure increasingly relies on mobile technology, security standards become a matter of national security. Even an IoT-connected washing machine could be used maliciously in an orchestrated attack to cripple the national power grid.

As such, mobile standardisation needs to achieve a balance between innovation and security: open enough to encourage the development of new technologies and services but not so open that they introduce unnecessary security concerns.

Another consideration is the environment. The mobile industry is also a major contributor to global carbon emissions, releasing more CO<sub>2</sub> annually than the global aviation industry. Over the next year or two, mobile standards will need to focus on how to decarbonise the mobile industry.

These considerations will only become more important as technology becomes more interconnected. Mobile devices and services have the potential to revolutionise our world, especially after the Covid lockdowns changed the way we work. But the increasing importance, interconnectivity and ubiquity of mobile use creates greater complexity and risk. Finding the right standards for mobile technology will, therefore, play a vital role in the coming years, directing not only the industry but society as a whole.

With that in mind, let's take a deeper dive into the three major considerations for mobile standardisation over the next three to five years. They are: innovation, security and decarbonisation.

## **Standardisation can make or break innovation**

One of the key benefits of standardisation within the mobile industry is that it allows for greater competition among manufacturers. When there are common standards in place, manufacturers don't have to create proprietary technologies that might not be compatible with other devices. Instead, they can focus on differentiating their products through design, features and pricing.

Additionally, standardisation also allows developers to create new applications and services that can be used on multiple devices and networks. This leads to a more vibrant and diverse mobile ecosystem, with greater innovation, better products and more choices for consumers. What's more, operators can more easily expand their networks and reach new customers, especially in developing countries, by using standardised equipment and technologies. This can help to bridge the digital divide and bring mobile services to people who might not have had access to them otherwise.

As mobile technology penetrates deeper into these developing regions, we will see a wave of innovation, particularly from India and Africa. Using the building blocks created by standardisation, new services will be exponentially developed to solve regional challenges. These innovations will have an impact on other areas of the world where, due to global standards, they can be implemented with minimal friction.

However, it's important that standards are not so strict that they slow down the pace of innovation. When manufacturers are required to conform to common standards, they may be less willing to take risks and try new ideas, leading to a lack of choice for consumers. This tightening of global standards will likely be driven by an increased focus on security.

## **Security will become a priority focus for mobile standards**

Over the next few years, standardisation in the mobile industry will be increasingly driven by security concerns. Mobile devices and networks are becoming increasingly interconnected and relied upon for sensitive personal and business information, making them a key component of national infrastructure.

Organizations like 3GPP and GSMA play a critical role in this process, working to establish common security standards for mobile devices and networks. They provide guidance on how to secure mobile devices and networks against attacks such as malware, hacking and data breaches. Additionally, the 3GPP's security standards also provide guidance on how to protect users' privacy, including how to manage personal information and how to control access to sensitive data.

One particular area of concern for mobile security is telehealth. The pandemic and resulting lockdown created an unprecedented healthcare crisis. The

surge in patients needing medical assistance led to greater transmission of the virus in hospitals and GP surgeries. Telehealth was adopted en masse to provide a measure of healthcare without the need for physical contact. What resulted was a rapid development of a burgeoning telehealth market. Yet, confidentiality and security of patient information became limiting factors in the growth of telehealth services, incentivising new solutions and services that would meet demand.

By establishing standards for mobile device security, developers can more easily design and implement solutions that protect mobile devices against hacking and data breaches. This can include things like encryption, authentication, and access controls, which can help to protect devices from unauthorised access and secure new telehealth services.

The other key concern for mobile security is the Internet of Things (IoT) and the resulting threat to national security. You might wonder why any foreign government might want to gain access to your smart washing machine, for example. But imagine the impact of millions of smart washing machines turning on at the exact same time. It would likely overload the national grid and potentially lead to a water shortage. With common standards for mobile security, governments can manage national security by preventing the spread of malware across mobile devices through things like software updates, anti-virus software, and sandboxing.

However, it's important to note that standardisation alone is not enough to ensure mobile device security. It needs to be combined with other efforts such as user education and regular security audits to ensure that mobile devices and networks are protected from threats. It's also important that security standards are as accessible as possible to encourage rather than stifle innovation.

## **Standardisation will play an essential role in decarbonising the mobile industry**

Unfortunately, the mobile industry currently contributes around 3.5% of total global CO2 emissions. That's double the emissions resulting from the aviation industry. As the industry continues to grow, so too will carbon emissions, unless we make some major changes.

Standardisation in the mobile operator market can play a significant role in helping to decarbonise the telecoms industry. By establishing common technical standards for the deployment and operation of mobile networks, standardisation can enable the development and deployment of more energy-efficient technologies and practices. These can include energy-efficient base stations, energy-saving modes for devices, and efficient use of spectrum.

Standardisation can also enable the development of new technologies and services that can help to reduce carbon emissions. For example, 5G enables technologies such as IoT and machine-to-machine communications, which can help to optimise energy and use, and improve

resource efficiency in various industries such as agriculture, transportation and healthcare.

Additionally, as standardisation enables the development of new services for telework and telehealth, there becomes less need for travel, helping lower carbon emissions in other areas of daily life. Over the next few years, we will see an increasing number of new standards within the mobile industry specifically targeting carbon reduction. From those directly designed to help mobile operators find more energy-efficient ways of operating, to those that impact other areas of society.

Mobile technology touches almost every area of modern life. As such, mobile manufacturers and operators can play a major role in reducing carbon and increasing security, as long as the right standards encourage, rather than restrict, innovation and cooperation.



Dario Betti is CEO of MEF (Mobile Ecosystem Forum) a global trade body established in 2000 and headquartered in the UK with members across the world. As the voice of the mobile ecosystem, it focuses on cross-industry best practices, anti-fraud and monetisation. The Forum provides its members with global and cross-sector platforms for networking, collaboration and advancing industry solutions.

Web: <https://mobileecosystemforum.com/>

Twitter: <https://twitter.com/mef>

LinkedIn: <https://www.linkedin.com/company/mobile-ecosystem-forum>

Facebook: <https://www.facebook.com/MobileEcosystemForum/>

# HERE COME THE ZELLENNIALS

## THE NEW FACES OF THE DIGITAL WORLD

ISABELLE PARADIS, PRESIDENT AND FOUNDER HOT TELECOM;  
MEMBER OF THE BOARD, GTWN AND PTC.



While attending the Pacific Telecommunications Council (PTC) from 15 to 18 January 2023 in Hawaii, I was pleased to meet up with a number of younger professionals who have chosen to make their career in our digital tech industry. I am very fortunate to have been working with the PTC as Chair of the PTC Beyond<sup>1</sup> Committee. This is an incredible initiative to get more young minds and more young professionals to attend PTC and to ensure

that we pass on our knowledge and enthusiasm about our industry to the next generation.

I am passionate about involving the 'Zellenials' in our industry - by this I mean Gen Z plus the millennials<sup>2</sup>. Together these two groups make up almost 55% of the world's population, so for this industry not to include

1 <https://www.ptc.org/ptc-beyond/>

2 Gen Z is the generation born between 1997 and 2012, with current ages between 11 and 26. The Millennials are those born between 1981 and 1996, current ages between 27 and 42.

them increasingly in the future would be a big mistake, in my view.

PTC Beyond is a program to empower companies to bring their young professionals to the PTC. We have also created a range of activities for them so once they are here, they can learn, they can network with their peers, and they can meet incredible and inspiring leaders so they can start making a difference. It is truly a win-win situation for everyone – a win for the young professionals, a win for the companies, and it's a win for the PTC as well.

During PTC'23, I met up with two young professionals who have been working with the PTC Beyond Committee, giving the benefit of their perspectives and experience and offering valuable insights into how we can attract more young people to the industry.<sup>3</sup>

**Felix Seda** is General Manager of NJFX. He believes that involving the younger generation is so important as it is about representation, participation and empowerment. According to Felix, it is about helping them to develop as leaders so they can take a seat at the table. Having young people as part of the conversation about the future of our industry allows them to have a voice. It is important for senior managers to mentor and involve younger minds in conferences and meetings, such as the PTC, so that they gain valuable experience in how the industry works and they can make a contribution from an early stage in their career.

**Maxie Reynolds** is Founder and CEO of Subsea Cloud. She believes in taking the long view and that we first

and foremost need to create the talent pipeline for the future of the industry. According to Maxie, as the younger generation has grown up as digital natives, they have taken the technology and its benefits for granted. They don't really understand it, and don't realise that there are great careers to be made in ways that they don't even recognise.

The industry is not good at breaking out the constituent parts of what makes the digital tech sector function as it does. We need to do this better, and then allow younger people to get excited about a rewarding career path that they can build. As an industry we have a lot of PR work to do and it all starts with conferences such as the PTC, where younger and older generations can mix.

I agree with Maxie and Felix that we need to listen to each other and learn from each other. This is a really important point. It is a two-way street – we need their insights, and they need our knowledge and skillset.

In summary, I believe that it is all about creating the future together. The older generation and the younger generations have their roles to play. We have to come together and build the future together.

3 You can watch the video interview here <https://youtu.be/BLR8i-RirIY>



Isabelle is President and Founder of HOTTELECOM, one of the most innovative and creative telecom research and consulting companies in the industry. HOT TELECOM has been supporting operators and vendors on a global basis for over 19 years, more particularly on the subjects of International and wholesale. More recently, Isabelle has been working with many of the world's telecom service providers to help them define their transformation strategy and has written multiple articles and speaks at conferences on this topic. She is also passionate about encouraging the involvement of women in technology and science and conducts multiple panels and interview with leading women globally. She is a member of the Youth and Women Entrepreneurship ESNB taskforce, which is a working group created by the United Nations Economic and Social Commission for the Asia Pacific (ESCAP) to promote the active engagement of the business sector in addressing the issues of sustainable and social inclusiveness in business. She is also the founder of the Inclusion Hub, which aims to encourage the participation of young people in the telecom industry. Isabelle holds a Bachelor degree in Engineering, an MBA in Finance and has over 29 years' experience working globally.

# DATA INTERMEDIARIES ARE EMPOWERING USERS

ISABELLA DE MICHELIS, CEO & FOUNDER, ERNIEAPP

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The fine in relation to personalized advertising imposed on Meta by the European Data Protection Board (EDPB) of EUR 390 million (USD414 million) announced in early January 2023 has gained much media attention, for its potential to require Meta to make costly changes to its advertising-based business model. Although restricted to the EU, the precedent created by this regulatory move has potential to vastly impact all digital media markets in all jurisdictions as well. And at the time of writing, we await the expected decision by the EDPB on WhatsApp's similar misuse of personal information for targeted advertising, which is rumoured to make the earlier fine seem small in comparison. So, what does all this mean for the future of Big Tech, as well as all businesses that use personal targeting for their business?

In my view the game is clearly up in terms of the big platforms having unfettered free access to users' private data, in an asymmetric power relationship without transparency and without compensation. And the impact will be felt by all businesses (including anyone who gathers personal data to inform their marketing, including Uber, Tinder, Deliveroo, Taxis, your Fitbit, and even broadcasters like the BBC). Here I will explain the complex, and often convoluted world of personalized advertising online, and what we, as users of online services, can do to take back control of our data and our digital lives.

## The GDPR etc

Many people in the EU, and increasingly around the world, have heard about the GDPR which came into force in 2018, which regulates the collection and use of personal data. Even if they do not know about the regulation, they are aware of its impact, in that the GDPR requires users to give informed (and revokable) **consent** about the gathering and use of their personal data. But this is not the only control that the EU has introduced on the use of personal data. The ePrivacy Directive of 2002<sup>1</sup> regulates cookies and communications (metadata),

which enable online service providers to track people and their online user habits. Transparency about the use of cookies has meant user refusal in many cases, which has significantly reduced the capacity of online businesses to track your movements and therefore develop a detailed user profile about you and monetize you as a targetable audience.

The EU's regulatory moves have had global impact. There are now 130+ countries with GDPR like regulation. In Africa, for example, governments have started fining companies which exploit personal data without user consent.

Some of the strictest privacy and personal data protection regulation so far has been introduced in California, where users can say that they do not want to have their data on-sold or monetized at all (the so called 'Do not sell' opt in). Certain States in the US, including Montana and Idaho, for example, have introduced similar measures, while the Federal Government is now proposing to introduce a federal law (which may, however, now be in doubt due to the changed make up of Congress). The new Chair of the FTC, Lina Kahn stated on 14 December 2022 that all companies must protect consumer data and that data security must be a priority for any chief executive.

## Consent and transparency

So why is there still an issue with personalized online tracking and advertising? The crux of the problem is the 40-word long definition of 'consent' in the GDPR, which has enabled online platforms to propose their own interpretation, which is now in dispute in the courts. The stakes are high, however, and Big Tech is very aware of the potential impact of consent mechanisms and also user transparency. When Apple released its new operating system iOS 14.5 in December 2021, everyone using Facebook on an iPhone was suddenly confronted with a pop-up seeking permission to track them, and a majority of users declined to give their consent (+90% in US only). Facebook said that Apple's App Tracking

<sup>1</sup> [https://edps.europa.eu/data-protection/our-work/subjects/eprivacy-directive\\_en](https://edps.europa.eu/data-protection/our-work/subjects/eprivacy-directive_en)

Transparency feature would decrease the company's 2022 sales by about USD10 billion.

## Logging in to an app

So how has the industry reacted to this new regulatory scrutiny risk? Not trusting users to consent to the use of their data, many websites moved from the open web (browsers) to the application environment (eg web and mobile apps) so they could request the user to register an account (user name and password based). The account is then used to identify and profile the user as well as to track and target him/her. Web and mobile apps can harvest a huge amount of data and information like for example the user's geolocation position automatically, such as does Uber and other delivery apps, medical services apps or even national broadcasters and media companies like the BBC if you access the premium service. This has meant that, paradoxically, users may now be handing over even more personalized information than before. And among the most valuable information is of course the geolocation data, based on which online apps can trace your movements and link this back to socio-economic data and therefore offer you individualized pricing and other local offers based on your profile as well as your known spending habits.

## Many users just click and swipe

Many online users are totally unaware of how to control their own privacy settings, as this is often very complicated to understand, some would say, deliberately so. If we assume that greater transparency and information about the use of their data will incentivize all users to take back control, we would however be mistaken. This is because much of the new digital environment has all the characteristics of a new human culture, which is now all pervasive and difficult to change. The 'Facebook generation', aged between 35 and 45, have been shown to have the least awareness of or interest in controlling the use of their data. They have been trained to 'click' and to 'swipe left or right' when interacting online. This has become an ingrained habit and many people do it automatically without even thinking about what they are doing, or the commercial transaction that is going on behind the scenes with trading their data. In contrast, the majority of the 'Tik Tok generation' who are Gen-Zers between late teens and 30, are most likely to understand the value of their data and how to exploit it for their own use. Instagram influencers also are making very profitable careers out of managing their own profiles and data online.

## Gaia-X, trade and innovation

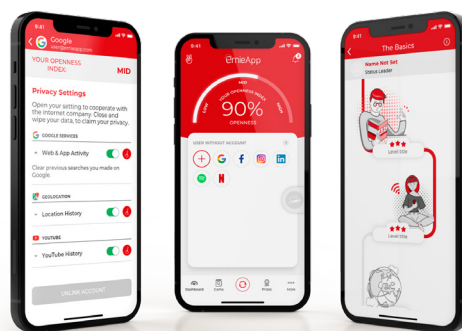
Concern about the monetization of European citizens' personal data by foreign Big Tech companies has moved beyond a desire to rein in the power of the data gatekeepers and is now driven by EU trade and innovation policy. By requiring users to become aware of the use of their personal data and the monetization of their data by foreign-based players, EU governments want to 'repatriate' these services that will become the new driver of the digital economy and spur innovation in

digital services. The aim is for EU data to be monetized in Europe, so that EU member states will be able to reap the economic benefits themselves, rather than exporting them to the US.

These policy objectives are also driving the European Gaia-X project<sup>2</sup> initiated "by Europe for Europe and beyond". It aims to create the next generation of data infrastructure in Europe, "an open, transparent and secure digital ecosystem, where data and services can be made available, collated and shared in an environment of trust". The data infrastructure is being developed to reflect shared EU values of openness, transparency, and trust. I currently serve as a member of the Gaia-X community in a Deputy Chair working group capacity. Companies will be able to plug into the federated cloud services and exchange and share 'data' in compliance with GDPR, e-privacy and other European data protection and governance regulation, benefiting from a pro-competitive level playing field, to enable the future AI connected society.

## Data intermediaries: the new business model

The future of data monetization will be driven by data intermediaries, third parties who collectively represent digital users and who develop a core business of returning value to the user whose data is being accessed, but also serve the other side of the market in need of constant data supply. The principles behind this type of service will be user choice and awareness. People will be recognized as a crucial part of the digital value chain, who deserve to be rewarded for the value that they create by sharing their data. And those who do not want to share their data will be able to choose to reclaim their freedom from data harvesting if they want. However, experience shows that many will be quite willing to exchange their data for an appropriate reward – be it monetary, loyalty points, free offers, or other benefits. This will unlock innovation and many new business models built around data intermediation, while staying compliant with the core values set by GDPR.



<sup>2</sup> <https://www.data-infrastructure.eu/GAIX/Navigation/EN/Home/home.html>

ErnieApp's mission is to offer a mobile easy to use solution (to both sides of the market - consumers and enterprises) based on transparency and fairness, to help companies quickly gain user's consent (and users to assert their rights) and match the user's data supply with the enterprise's data demand. ErnieApp should be seen as a utility application offering an outsourced 'consent management platform' solution both to the 'data intermediaries' as well as to companies in general, who want to incorporate a consent process into their data processing.

In **summary**, regulatory action in the EU to control access to personal data by US Big Tech companies has unleashed a global movement to take back control of data belonging to individuals and citizens, for the benefit of those individuals and countries. New business

models based around data intermediation will help inform the user about the value of their data and return a fair share of its value back to them. Digital will thus be reshaped through user empowerment.



Isabella founded ErnieApp ([www.erneapp.com](http://www.erneapp.com)) in 2017, one year ahead of GDPR entering into force, with the conviction that only a user-centric consented free internet based model could resolve the conundrum of how privacy, innovation and competition in a digital connected society heading toward AI and IoT could coexist peacefully. More than 150,000 unique users have downloaded the mobile app since its launch in 2020. The App is used by a wide demographic and split equally between Android and iOS users across 3 continents. App is available in 50 markets and 3 languages.

Before launching her reg-tech software company, Isabella was VP EMEA Government Affairs and Technology Policy Strategy at Qualcomm Inc. (QCOM) for 12+ years and before that she held various executive and senior positions at CISCO, IRIDIUM, ELSACOM, TELESPIAZIO, being responsible for corporate development strategy, regulatory affairs, business development, market access and IP, industry alliances and partnerships. Isabella has often advised EC and EU member states on matters related to telecom regulation (2018 Italian Broadband Action Plan), internet, IP, competition and privacy (2022 Italian Data Strategy). She is a frequent 'lecturer' in European universities (Postgraduate classes) on topics related to EU digital sovereignty policy, privacy economics and engineering, gatekeeper regulation and competition law. Isabella is an IUHED/Geneva University graduate w/major in competition law; holds an Executive MBA from (UCL) in London. In Jan. 2020 she was appointed board member of CDP Ventures (+€2Bn in assets) and is also a member of the Risk Control and Compensation Committee. She is currently managing director at HIGH PULSE and is a frequent guest on TV and Radio talking about the interplay between tech, privacy, competition, digital innovation and societal impacts. She is Vice Chair of the Business and Operational working group of GaiaX, UPA member, and Digital EU SME Alliance member. More recently she was appointed by SBS as standardization expert to ISO/IEC JTC1/Standard Committee 35 which is responsible for standardizing user system interfaces in ICT. In 2018 she co-created the concept of the Right to Monetize with Luca Bolognini, President of the Italian Institute of Privacy which proposes a responsibility for digital companies to provide users a fair compensation for the contribution they give to the innovation cycle (through data generation).

# SECURITY IN A POST-QUANTUM WORLD: HOW CAN LEADERS PREPARE THEIR ORGANIZATION?

ANA TAVARES LATTIBEAUDIERE, EXECUTIVE DIRECTOR, GLOBALPLATFORM

Every day as I read the news, I keep an eye open for stories about quantum computing. As the Executive Director of an organization dedicated to developing, deploying, and managing trusted digital services and devices, I take data security very seriously.

However, like many of my fellow executive leaders, I recognize how difficult it can be to prepare for vague and ill-defined threats that seem to exist on the far-off horizon. Around the world, governments and big corporations are spending billions of dollars to unlock the power of quantum computing, to accelerate advancements in science and industry and develop new cryptographic tools that can withstand quantum threats. Warnings about the dangers of Harvest Now, Decrypt Later (HNDL) attacks, where bad actors steal encrypted data with the intention of decrypting it down the road, pop up regularly, highlighting the need to take action. Since it's only a matter of time before quantum computers can break today's gold standard for cryptographic security, organizations must start moving toward Post Quantum Cryptography (PQC) now.

Yet without a clear-cut understanding of the threat and potentially limited resources to tackle the problem, how are leaders supposed to prepare their organizations?

## What is quantum computing?

The first step in preparing for quantum computing is to understand what it is and how it can impact security at your organization.

Quantum computing is a type of computation that relies on the phenomena of quantum mechanics, such as superposition, interference, and entanglement. These phenomena allow quantum computers to perform computations that are exponentially faster and more powerful than super computers.

Chances are extremely high that the security tools used by your organization rely on public key cryptographic algorithms, such as RSA<sup>1</sup> and Elliptic Curve, to encrypt your data and protect your digital assets. These mathematical formulas allow us to encrypt data easily because it would take computers commercially available today years to decode. Quantum computing, on the other hand, has the potential to crack current cryptography quickly, putting digital societies and economies at serious risk. No one knows exactly when quantum computers will be reliable enough to break current cryptographic systems, but some experts believe it could be as soon as 2030.<sup>2</sup>

## The role of crypto agility in preparing for quantum computing

To prepare for quantum computers, cryptographic researchers have already begun searching for quantum resistant cryptographic algorithms upon which to base new encryption methods. This research, known as Post Quantum Cryptography (PQC) has yielded some promising results. For instance, the U.S.

1 The RSA algorithm (Rivest-Shamir-Adleman) is a suite of cryptographic algorithms that is widely used to secure sensitive data, particularly when it is being sent over an insecure network.

2 <https://www.mckinsey.com/featured-insights/themes/how-quantum-computing-could-change-the-world>



National Institute of Standards and Technology (NIST) announced the names of the candidate algorithms chosen to advance to the fourth round of the PQC standardization process. This process, which began in 2016, has identified possible alternatives to the current asymmetrical algorithms that form the basis for today's public-key encryption.

Cryptologists will continue to test and refine these candidate algorithms for possible standardization. Once these algorithms have been approved for standardization, organizations can begin using them as the basis of their PQC security strategy. According to NIST, the full transition to quantum-resistant cryptography may take as long as 15 years.<sup>3</sup>

However, since these algorithms have not yet been standardized—and because cryptologists agree that it can take decades to identify vulnerabilities in an algorithm—it's important for organizations to develop a phased approach to PQC and to develop a security strategy that enables crypto agility.<sup>4</sup>

Crypto agility enables organizations to switch the cryptography underlying their security framework quickly and with minimal disruption to their operations, much like replacing a lightbulb in your house without having to rewire the whole structure. They can do so because the cryptographic protocols they've put in place were developed at a sufficiently high level so that it's possible to switch the underlying cryptography when a quantum threat becomes effective.

Crypto agility is absolutely essential for future-proofing the encryption models that protect our data

and communication systems. But it is also absolutely essential for any organization that takes data security and protection seriously, since crypto agility enables organizations to deal with threats based on current classical computing.

### **Case study: the automotive industry**

Developing a crypto agile strategy to support the migration to PQC should be a key priority for all connected industries. The automotive industry offers valuable lessons about how to think about quantum threats and how to take action.

Since vehicles in development today will almost certainly be impacted by quantum computing attacks, automotive industry leaders recognize that decisions to protect tomorrow's consumers must be made now. Additionally, vehicles already on the road are at risk since they have a long lifecycle.

GlobalPlatform's Automotive Task Force<sup>5</sup> is working with key industry stakeholders to define use cases and requirements where GlobalPlatform technologies can help deliver cost effective, secure services across a vehicle's lifetime. The group is bringing players from across the automotive industry together to collaborate on the development of a winning post-quantum crypto migration strategy for automotive. This includes PQC to protect the data from quantum threats that vehicles store and use to communicate.

### **Concrete actions to prepare for nebulous threats**

As leaders in device security standardization, GlobalPlatform is at the forefront of anticipating

3 <https://src.nist.gov/publications/detail/white-paper/2021/04/28/getting-ready-for-post-quantum-cryptography/final>

4 <https://globalplatform.org/crypto-agility-the-cryptographic-key-to-data-security-in-a-digital-world/>

5 <https://globalplatform.org/task-forces/automotive-task-force/>

the changing security requirements and enabling organizations to prepare for the post-quantum era. Our Security Task Force<sup>6</sup> (STF) provides regular recommendations to cryptographic algorithms and key lengths, by maintaining a classification table that is based on the recommendations of several national agencies - including NIST and the SOG-IS - that is continuously updated as new threats are anticipated.

GlobalPlatform has also defined a number of specifications and certification schemes - using cryptographic algorithms - for different use cases related to the management of standardized Secure Elements and Trusted Execution Environments in digital devices. These specifications provide a specific, 'secure channel' that is proven to protect against quantum computer threats. This is achieved by creating a baseline for crypto agility in the form of clear security frameworks. These help device manufacturers protect their products and associated content across a range of use cases, from payments to smart homes/cities, government and enterprise ID.

## Moving forward with confidence

As cryptography trends and technologies evolve, all organizational leaders in both the private and public sectors must seek sound guidance about which approach to take for each phase of their organization's

PQC migration. They must continue to develop cybersecurity protocols that ensure cryptographic agility and be aware of new developments in the field of quantum-resistant cryptographic research. Security certification is another key consideration. There is already much discussion around proper governance for quantum-computing, and as 2030 approaches we can expect requirements will emerge for products to demonstrate adequate protection against quantum-based attacks.

This might seem like a tall order, especially for busy executives with limited knowledge of cybersecurity and with an organization to run. This is why GlobalPlatform is bringing together security experts from across industries in a global collaborative initiative to address the challenge which faces us all. We welcome the participation of all who wish to work with us on enhancing the security of their industry.

6 <https://globalplatform.org/task-forces/security-task-force/>



With over 20 years' experience, Ana is a well-recognized leader in the Telecoms and IoT space. As Executive Director for GlobalPlatform, she is responsible for the organization's overall strategy, marketing and business development across key vertical sectors. Prior to joining GlobalPlatform, Ana was appointed Chief Strategy Officer for 10TTech and started work to support many innovative companies on defining their strategy and path to success. Before that she held key positions at GSMA where she was responsible for global strategy, global IoT strategy and vertical engagements and most recently as EVP and Head of North America, responsible for driving global initiatives such as Networks (4G, 5G), IOT, RCS, eSIM, Identity, Spectrum and Gender Diversity. Driving strategy and innovation has been at the core Ana's career, having held strategy consulting positions at BCG, Deloitte Consulting and Accenture and in private banking at Merrill Lynch. Ana is also a proud Board member of the Global Telecom Women's Network where she drives initiatives that promote gender diversity in tech sectors.

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# CHANGE MAKERS

# LEADING CULTURE CHANGE IN TELECOMS

INTERVIEWS WITH KERI GILDER, CEO COLT TECHNOLOGIES AND KATE JOHNSON, CEO LUMEN TECHNOLOGIES

## Drivers for change

When the GTWN was founded over thirty years ago, there were very few women in senior roles in the communications industry. GTWN founding members were so few in number that they were able to meet in a small room. These meetings took place entirely separately from the mainstream of industry conferences, such as the ITU congress in Geneva or the PTC in Hawaii. (The GSMA was only established as a mobile industry standards body in 1995). GTWN founding members dreamed of a day when women would lead major communications companies, and the culture of the industry would evolve to become much more diverse and inclusive of all peoples and all talents.

## Change makers of today

Fast forward to today, when we see an increasing number of women leaders at the helm of major digital tech companies. The Mobile Century spoke to two of these leaders – both passionate change makers. GTWN Global President Keri Gilder, CEO of Colt Technologies and Kate Johnson, CEO of Lumen Technologies share their insights into how they are leading change in the industry, and where they see the challenges for the future.

## KERI GILDER, CEO COLT

**TMC:** Looking back over the time you have been in the CEO role, what do you think are the highlights, or the major turning points, which brought about the most significant developments and achievements?

**Keri:** When I was appointed to the role of CEO in May 2020, it was during the first year of COVID and during

lockdown. It was a very challenging time for everyone, and made me realise, even more than ever, that we as human beings need and crave connectivity above all else. And of course, I was now responsible for executing Colt's strategy which centres around transforming the way the world works through the power of connectivity.

**TMC:** What are you most passionate about in your job as CEO of Colt?

**Keri:** I am passionate about promoting diversity and inclusion to ensure Colt is a business where everyone feels they can bring their true selves to work. I also bring this passion to the wider industry as the Chair of the TM Forum's Diversity & Inclusion Council and President of the Global Telecom Women's Network. I am an engineer, having worked prior to Colt at Ciena, Lucent Technologies, and before that for Hughes Aircraft as a Network Engineer. But I also value my family life, being the mother of two children, and believe in flexible working conditions for both women and men.

**TMC:** What are the major changes that you have seen since joining the industry?

**Keri:** What stands out for me, when comparing the way the telecom industry is today compared to when the GTWN was founded, is that the industry is becoming much more demand driven and customer focussed.

When I first came into this role, I thought that the telecoms industry had not really changed much over the past decades. The industry used to have a culture of being supply driven, without much concern for the needs of the customer. But the industry has surprised me. We are undergoing enormous change as digital transformation impacts every area of life and work, and as AI, 5G, cloud and many other innovations create new opportunities as well as challenges.

As CEO, I've changed the way that we approach our businesses cases. We at Colt only "Build it, and they will come" proactively into major data centers where we know the consumption of bandwidth and traffic is going to be high. We always have an anchor tenant for our digital infrastructure, or intelligence to say that demand is coming that will provide the return on investment needed. Being customer driven means that we must have a more complex sales proposition and a more complex product proposition that not only includes our portfolio - the connectivity piece - but the portfolio of others, which could span the cloud, the compute, the mobility, and the access side. As such, we have been bringing on board a series of partners that have specific capabilities which integrate with ours.

**TMC:** What does the telecom industry need to do in future to stay ahead of the game?

**Keri:** We are an industry that is aging and because of that, it is exceedingly difficult to change mentalities to do things differently. However, with the new era of software and software-defined networks, as well as the current economic climate that has triggered many mergers and acquisitions (M&A) in the telecoms industry, things are starting to change rapidly. All of this is creating an environment that is rife for disruption.

Companies may be large, but they must think about data differently. We must look at the digital infrastructure, and see how everything within it can be monetized, almost like how a real estate agency appraises property. We have not done that as an industry but now is the time to start. We need to be more curious. Curiosity is what is required for us to fulfill some of the next generation customer needs and requirements.

**TMC:** What initiatives have been put in place to ensure that the culture in the industry becomes more diverse and inclusive?

**Keri:** I have worked for the last two and a half years with Nik Willets and Vicky Sleight at the TM Forum to produce the inclusion and diversity score (D&I score)<sup>1</sup>. The reason we did that was because as a female executive - one of the very few female CEOs in the industry - I have held the flag for diversity for a long time. I do not know why that flag is always given to the woman, but it is. And so, when Nik approached me, we talked about the importance of doing something that would actually manifest change.

For me, as a business executive, what we measure is what matters. So, we produced the measurement system. It is half inclusion and half diversity. It uses machine learning to understand what are the five or six themes that are coming out of the responses on employee sentiment on inclusion.

**TMC:** Do you have an example of where Colt has successfully changed its culture?

**Keri:** Building on our work with the D&I score, we have been able to build interventions that truly make a

difference. At one point within Colt, I found that most of my employees felt they were disadvantaged because they had English as a second language and felt that they would not be promoted unless English was their first language. This is clearly a perception because in actual fact, my CMO is Japanese and my head of sales has Chinese heritage. But it is a perception and perceptions become reality.

To address this, we immediately changed our communication style and started communicating in multiple languages. That slight change made an enormous difference and helped to create an inclusive environment within the company. While the results were encouraging, we still have a long way to go.

**TMC:** What is the one thing we should all be doing to encourage more women to make their careers in this industry?

**Keri:** While we have made tremendous progress since the GTWN was founded more than 30 years ago it is clear that there is still a lot to do. One study found just 14% of telecoms firms have majority female ownership. We can do a lot more if we can get men in male executive roles to start looking at this as more of a strategic imperative and measuring it like one, instead of looking at it as a moral obligation. It is a business imperative, and if we do not take it seriously, then we will not be able to attract more talent into this industry. We need more 'outside-in thinking', more collaboration and more investigation into other industries.

## KATE JOHNSON, CEO LUMEN

**TMC:** You have been in your current leadership role at Lumen for only a few months now. What has surprised you most about the telecom industry since you joined Lumen, and how does the industry compare to your previous experiences in the tech sector?

**Kate:** I took this job because the people are great, the assets are great, and there is a lot of room to make a positive difference. I am naturally a change-maker - I have been driving change for a couple of decades. I thrive leading people through change and am excited about driving transformation and growth at Lumen.

I learned a lot about the industry and Lumen's place in it already during the selection process. And since then, I have been learning about the many opportunities, but also challenges that we in the telecom industry are facing because of digital transformation. There is a lot of work we need to do.

**TMC:** As a change maker, taking on the CEO role at Lumen, what are the main drivers of change that you are using to reshape Lumen and its culture?

**Kate:** It all starts with clarity - articulating a clear vision of who we are, who we serve and what our strengths are compared to our competitors. This is the foundation of our "North Star" which will provide the guidance

1 <https://www.tmforum.org/diversity-and-inclusion/>

to lead our journey. The second part is our economic model. Combining the two leads us to a short list of core priorities for the business. As some telecom businesses are in decline, due to commoditisation and legacy technologies, we need to create a path forward for growth based on an obsession with our customers and their needs.

**TMC:** What do you mean about 'customer obsession' and how does this approach differ from the way the telecom sector has operated in the past?

**Kate:** I have a different perspective on the industry as I have come from a more traditional technology, not a telecom background. In telecoms, the company developed an offering, brought it to market, and collected the return from those assets. In technology, you shape things to solve problems, and you need to understand your customer's business and challenges to provide solutions that will solve these problems.

**TMC:** How are you changing the internal culture of the company to meet this new economic environment and drive growth?

**Kate:** In the past, like most telecom companies, Lumen was internally focused, taking costs out of the business to drive operational efficiency. Now, we are thinking from the outside in – understanding our customers' key needs so we know where we innovate and invest for growth. We are changing our focus to be growth-oriented, led by our mission to digitally connect people, data, and applications – quickly, securely, and effortlessly. This is a massive shift in mindset, which requires shifting the culture internally. As we look ahead, we will be doing fewer things, but we will be doing them really well.

**TMC:** What other approaches are you using in order to change the mindset and culture of the company?

**Kate:** A key to our future growth will be building great partnerships that are deeply strategic. I believe in a large partner ecosystem, with partners who can help you build out the complete portfolio of products and services that customers need. In the past, telecom companies wanted to be a 'one stop shop' and a gateway provider for their customers. Customers these days don't want to have just one vendor because this entails too much risk to their business. We also need 'feet on the street' – partners who can service our customers at the local level.

**TMC:** Are you seeing change in customer behaviour since the start of the pandemic, and what does this mean for telecom businesses?

**Kate:** There are two main changes that I see. Firstly, customers are focusing on their core challenges, and what meets their changing needs for their data and applications. Secondly, with the shift to hybrid work – with part of the week spent at home and part in the office – our customers are wanting edge technology, to bring low latency, secure, and reliable connectivity to their workers wherever they happen to be.

**TMC:** As a change maker, what do you see as the remaining challenges that the industry needs to address to continue to grow and meet the needs of its customers?

**Kate:** We need to continue the transformation of the telecom industry's culture, to make it more inclusive, more customer focused, and more innovative. There are enormous opportunities for the industry to solve technology challenges for business across sectors including retailers, healthcare providers, manufacturers, and government agencies. We can all contribute to delivering outcomes which will ensure economic growth and prosperity into the future, but we need to focus on understanding the human element and our customers first.



Keri Gilder is the Chief Executive Officer (CEO) at Colt Technology Services since May 2020. She is responsible for executing Colt's strategy which centres around transforming the way the world works through the power of the digital universe.

Before becoming CEO, Keri was Colt's Chief Commercial Officer (CCO), leading global teams across sales, presales and marketing, as well as working closely with the wider organisation to ensure Colt delivered for its customers.

Before joining Colt, Keri held several leadership roles at Ciena but was most recently its Vice President and General Manager EMEA, responsible for guiding Ciena's EMEA service provider and enterprise customers, as well as partners.

Keri is passionate about promoting Inclusion and Diversity to ensure Colt is a business where everyone feels they can bring their true selves to work. In addition, Keri brings this passion to the wider industry as the Chair of the TM Forum's Diversity & Inclusion Council and President of the Global Telecom Women's Network.



Kate Johnson is the President and CEO of Lumen and a member of its board of directors. A seasoned business technology leader, Kate has a proven track record of driving business and digital transformation success at the world's top Fortune 100 technology companies. Hyper-focused on moving innovation and shareholder value forward, Kate leads with the strategic and go-to-market skills developed over 20 years as a growth-oriented B2B enterprise technology disruptor. Kate champions digital innovations that create the best customer experience and solutions. This starts with unlearning old success models and creating an environment that spurs advancement and sets Lumen apart. Kate joined the company in 2022. Prior to Lumen, Kate held executive leadership roles at Microsoft, GE Digital, and Oracle, as well as various commercial and technology leadership roles at Red Hat, UBS Investment Bank, and Deloitte Consulting.

Kate earned her bachelor's degree in electrical engineering from Lehigh University, and her MBA from the University of Pennsylvania's Wharton School. She lives in Denver with her family and serves on the board of directors for UPS since 2020.

# CLOSING THE DIGITAL FINANCE GAP

ROSALIA GITAU, CEO BIXIE AND BOARD MEMBER GTWN

Uncertainty. That was the mood of the 500+ women that day in September 2022. We were jam packed in a room on the outskirts of Manila. We didn't need to ask them how they felt in order to gauge the vibe. It was visible in their shifting seats, darting eyes, fidgeting hands. Stillness is the purview of the rich, the comfortable. Whereas continuous motion is the characteristic flow of the financially uncertain. And that day these women had travelled from all over Manila, through heavy traffic and despite missed school-runs, to hustle, work and lean in for a better future for themselves and their families. We realised we had to make it worth their while.

## Impact of financial exclusion of women

On average women live longer and die poorer than men. Women compromise their children's nutritional and educational futures because of our lack of financial shortcomings. And this is the reality for 4 billion women around the world, 500 of whom are sitting in this room probing us for a solution.

And these women are not alone or unusual. Taking the global view, 1 in 3 women are completely financially excluded, and 99% are absent from financial investments. As highlighted by the GSMA in its Mobile Gender Gap Report 2022, women are 28% less likely than men to own a mobile money account further widening the gap. But why? The technology is there. The digital investments are here. But we're not, to the tune of USD3 trillion. And this absence is harmful, not only to the individuals concerned but also to the wider society.

The World Bank refers to this as the 'unrealised economic potential' that is holding many countries back. Research into gender disparities in financial empowerment has shown that providing women with greater control over household chores through their own earnings or cash transfers boosts a country's growth prospects by changing spending habits that will benefit their children and future generations.

## The solution is here

In contrast, I see a future where women can turn our network into our net worth- and Web3 technology enables that. Our solution is to build the world's first female aggregator in Web3, turning our social capital into real capital.

Bixie<sup>1</sup> is a fitness app for female finance, taking women on a journey from insecurity to reaching achievement in a way that we understand and can connect too. Bixie was founded by me and launched in the Philippines in 2022 and has 10,000 users to date. It is grounded on the premise that men and women are different when it comes to money. Not only in the differing amount of it that men and women generally have, but also in how we approach risk, confidence, and our ambitions. A lot of this difference is the result of social conditioning. Some of it is anthropological. But it's real and we see this visibly manifest in the USD3 trillion finance gender gap. So at Bixie, we go room-to-room, country-to-country, to convince women that they have everything they need in the palm of their hands, in the form of a mobile phone app, to close this gap.

## Project RISE

In late 2022 Bixie teamed up with AXA<sup>2</sup>, Unionbank of the Philippines<sup>3</sup>, and Catholic Relief Services<sup>4</sup> to launch project RISE<sup>5</sup> (Resilience Investment for SMEs that Empower women). RISE provides female owned MSMEs with capital investments, SME insurance and SME loans to take their businesses from side hustle to production. "Our partnership with Bixie enables us to accelerate our goal of financially empowering women to drive growth to the society," commented UBX Managing Director for Banking Services, Anne B. Yosucio.

1 <https://www.mybixie.com/>  
2 <https://www.axa.com/>  
3 <https://www.unionbankph.com/>  
4 <https://www.crs.org/>  
5 <https://www.mybixie.com/rise>



Bixie also hosts live events on its social media platforms discussing topics such as entrepreneurship, insurance, savings, and investment tools, and even including digital assets such as non-fungible tokens and cryptocurrencies. Our partners include various aid and humanitarian groups that channel their assistance to women from developing countries through Bixie's platform.

### From uncertainty to confidence

Unbeknownst to the women gathered in that room in Manila on that hot day in September last year, these women were about to embark on a journey that: taught them about finance through gamified learning;

connected them to financial experts and entrepreneurs to network in their success; and enabled them to access unique investment products tailored to their needs as MSME owners. This joint effort resulted in women moving from uncertainty to ownership, insecurity to confidence.

These images speak for themselves. No more shifty eyes, no more hunched shoulders. These are women who are empowered. And that is the power of digital finance— all from the palm of your hand.

Learn more about Bixie and RISE at [www.mybixie.com](http://www.mybixie.com) or download the app and be part of a movement to empower women through digital finance.



Rosalia Gitau, Esq. is a FinTech Executive, Attorney, Author, and Humanitarian. She is the co-founder and CEO of Bixie, an award-winning Financial Technology company for women recognized as a Top FinTech company by The Manila Times, The Manila Bulletin, 1Million Startups, the Financial Alliance for Women, and Women's World Banking ( Bixie Press Pack available here). Rosalia has over 15 years of international law, diplomacy and finance in Asia, Africa, the Middle East and the Americas with the United Nations, Alibaba, Shearman & Sterling, LLP, and the governments of the USA, Liberia and Sierra Leone. She is a PEN Award nominee and the co-founder of the Humanitarian Women's Network, the largest global network of women in international affairs.

Rosalia is a Visiting Fellow at Zinc Venture Capital, a United Nations University and Brookings Institution scholar and sits on the Boards of HWN, the Global Women's Telecom Network, and the Special Olympics Committee in Thailand. She holds a BA from UCLA, an MSc from the London School of Economics and J.D. from New York University School of Law. Rosalia is a world-record holding mountaineer, marathoner, and sailor, living her best life in Thailand with her husband, daughter and labradors. She hails from the Philippines and Kenya, by way of California.

# PORTRAIT OF @AFRICATECHIE: REBECCA ENONCHONG



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GTWN is proud to welcome Rebecca Enonchong as a member of our International Board. Rebecca is the founder and Chief Executive Officer of AppsTech, a leading global provider of enterprise application solutions. She is also co-founder of I/O Spaces, an inclusive coworking space in the Washington DC metro area.

A leading tech figure in Africa and the world, Rebecca has been described by The African Report as the “free spirit of African tech.” She is an important voice in the African tech scene, and her work and advocacy for Africa led to her participation, earlier on, in the founding of the Africa Technology Forum, a non-profit dedicated to helping technology startups in Africa. She has since been working relentlessly as a mentor and advisor to many startups.

Starting her career fully in 1996 with the Inter-American Bank, Rebecca later moved on to work for Oracle just two years later as a consultant. This brief stint lasted a little less than two years, after which she founded Appstech in Bethesda, Maryland with one of its services being the distribution of Oracle Solutions throughout North America and Europe. She has since grown the company into a viable organisation and her leadership and stewardship actions have led her to seats on the board of many organisations.

She served as Board Chair of Afrilabs, a Pan-African network of over 347 innovation centres in 52 African countries supporting over 1 million entrepreneurs in Africa from April 2017 until October 2021. She chairs ActivSpaces (African Center for Technology Innovation and Ventures) supporting entrepreneurs from three tech hubs in Cameroon.

She is Vice Chair of the WHO Foundation and also sits on the boards of the International Chamber of Commerce, Venture Capital for Africa (VC4Africa), US Exim SAAC, and the UNECA Center for Digital Excellence. She is the co-founder of the Cameroon Angels Network and

co-founder and Vice-President of the African Business Angels Network (ABAN).

A recipient of numerous awards, Rebecca was named a Global Leader for Tomorrow (GLT) by the World Economic Forum of Davos, Switzerland. Forbes Africa listed her as one of Africa’s 50 most powerful women in 2020. NewAfrican magazine named her one of the most influential Africans in 2014, 2016, 2017 and 2020. Jeune Afrique magazine listed her as one of Africa’s 50 most influential women of 2017 and as one of the world’s most influential Africans in 2018, 2019, 2020 and 2021.

Rebecca is a global citizen and a digital native. On the spur of her long experience working in Technology, Media and Communications and of her business relationship with many tech executives and investors, she has used her platform to become a beacon of information and advocacy for African techpreneurs, amassing an audience of close to 190,000 followers on Twitter to which she constantly relays timely information and advice.

Rebecca is also known, amongst her followers, for her firebrand commitment to civil society actions. She constantly advocates for good governance and strong institutions on the continent and never misses an opportunity to speak on issues that plague African societies and young Africans in particular. In her native Cameroon, for example, she was an important voice in the online campaign, in October 2022, for the curtailing of a new tax on phone purchases - a tax meant to fill financial holes created by the Cameroon customs’ inability to properly control contraband phones brought into the country.

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# USING SPACE AND SPACE TECHNOLOGIES WITH BLENDED GLOBAL FINANCE TO MEET THE SDGs AND INTERNATIONAL CLIMATE GOALS

**CANDACE JOHNSON, SERIAL SPACE ENTREPRENEUR, CHAIR SERAPHIM SPACE ADVISORY BOARD AND PARTNER, VICE-CHAIR NORTHSTAR EARTH & SPACE, EXECUTIVE BOARD MEMBER ICC**

Space is ubiquitous<sup>1</sup>. In the digital world and thanks to IoT, sensors, AI, robotics, etc. our world and our planet have become connected via space and in space. It is not an overstatement to say that today our world and our universe are dependent on space, whether it be for connectivity, observation, analysis of all things, people, weather, mobility, infrastructure, environment, climate change, etc.

It is also not an overstatement to say that “Space” is the perfect realisation of Global Blended Finance, having from the very beginning inspired innovation in a spirit of international cooperation that has benefitted governments, citizens, and our earth. One need only look at such examples as the International Space Station, public-private launch and satellite consortia, publicly funded research giving way to space exploration and exploitation as examples of “Blended Finance” in a sector which by its very nature is global. We are at a critical point in our utilisation of Space and just as we sounded the alarm bells for our planet, we must now all come together to make certain that Space remains the valuable resource it is for life on earth.

Space fulfils all of the SDGs on earth and more in the universe. Were you only to think of the GPS satellites which are essential to our mobility today, not even mentioning autonomous driving; when you think of the

weather satellites; when you think of the “traditional” satellites such as SES, Intelsat, Inmarsat, together with the new satellite constellations such as Kacific or Starlink providing the Internet either directly or via trunking to billions around the world; when you think of the advent of 5 G, many times enabled by satellite frequencies or in the case of new constellations such as AST Mobile, actually bringing 5G directly from satellites to the phone, space is green, clean, democratic, universal, connected and more. Space helps alleviate poverty, bring education and communication to all, monitor our oceans, our planet, our air, our climate.

In April of this year, 2022, the United Nations charted a new path for “Meaningful Universal Connectivity”. This means that anyone, anywhere, regardless of geographic location, socio-economic status, race, gender, or any other differentiating demographic, has access to affordable services and devices to connect to reliable and safe internet.

Whereas certainly space tourism captures the imagination of many, the role of space in our digital world and economy is crucial, critical, and enabling.

But just as we are recognising that the earth’s resources are not limitless, and that we must limit and if possible eliminate pollution and degradation of our earthly environment, we are now understanding that space is also a limited resource which must be shared equally

<sup>1</sup> This article was first published on the occasion of the author’s speech at the G20 in Bali, Indonesia, 15-16 November 2022.

amongst all of the world’s population, so that some countries, in particular the emerging “Space Faring” ones are not excluded from reaping Space’s benefits. Just as we strive to overcome “Digital Divides”, we must make certain to not have a “Space Divide” with those countries who are only now asking for access to space orbital positions and frequencies.

This is why I recently helped pen the European Business Angels’ Manifesto for a Clean, Safe, Equitable and Peaceful Space for All<sup>2</sup>, and why I am urging all nations, citizens, and stakeholders to pursue the following 5-Point action plan to ensure that Space will continue to be the great resource for all life on our planet and in the universe:

- International co-operation through peaceful participation in international organisations, such as the UN and the ITU to devise new rules for space exploration and commercialisation.
- Transparency of space activities, so that everyone on earth can see and understand what companies and governments are doing in space, and what the implications for life on earth and their future will be.
- Co-ordination of our efforts through working together in diverse and open space communities on a national, regional and global scale.
- Use of good design principles, coupled with social awareness, to drive innovation and investment in new space technologies and services.
- Entrepreneurs, governments and academia being involved on an equal basis in creating the peaceful use of space for the future.

<sup>2</sup> <https://www.eban.org/manifesto-for-a-clean-safe-equitable-and-peaceful-space-for-all-by-eban-space/>

## MANIFESTO

### For a Clean, Safe, Equitable and Peaceful Space for All

- Space is the largest resource in the universe.
- It needs to be protected and made accessible for all.
- As the digital transformation gains further momentum, more and more countries and citizens around the globe are becoming dependent on space as a resource for their economies, for their societies, for the health and well-being of all life on the planet and for peace in the Universe.
- The United Nations Sustainable Development Goals (UN SDGs) and the United Nations Declaration of Human Rights must now be extended to space. Without this, the same devastation that has occurred on earth and our oceans will also be encountered in space, thus depriving us of this most valuable resource. Mindless, unintended and intended harm is already endangering the access and ability to operate in space. This includes pollution coming from fossil fuels, debris, and inefficient use or colonisation of frequencies or orbital positions. This is leading to an inequitable use of this invaluable resource.
- We must take action now to preserve and protect space in order to keep it clean, safe, equitable and peaceful for all.
- In order to do this, we call on all existing and future operators to apply the UN SDGs and the U.N. Declaration of Human Rights. We as investors will not be able to ensure the financial viability of the ventures we are financing without applying these very principles and guidelines.
- In addition, we refer to the excellent work being done by UNOOSA / EUSPA on the report covering how space technologies such as GNSS and space data contribute to the SDGs<sup>1</sup>; as well as work being done by The Secure World Foundation and several publications on Ethical and Socially Responsible Investing.
- All countries and citizens around the globe need access to space for eternity.
- Let’s make it happen.
- Humanity deserves a clean, safe, equitable and peaceful space for all.

<sup>1</sup> [https://www.unoosa.org/res/oosadoc/data/documents/2018/stspace/stspace71\\_0\\_html/st\\_space\\_71E.pdf](https://www.unoosa.org/res/oosadoc/data/documents/2018/stspace/stspace71_0_html/st_space_71E.pdf)



Candace Johnson is Founder/Co-founder SES, Loral Teleport Europe, Europe Online, GTWN, OWNSAT, VATM, GBRW. Currently: Chair Seraphim Space Advisory Board and Partner, Vice-Chair NorthStar Earth & Space, Executive Board Member ICC.

# MAKING DIVERSITY, EQUITY AND INCLUSION OPPORTUNITIES INTO REALITY

BY MARIA FERNANDA GARZA, CHAIR INTERNATIONAL CHAMBER OF COMMERCE

Women have been a growing factor in the success of the global economy since the 1970s. The additional productive power of women entering the workforce over the past 50 years accounts for about a quarter of global GDP.<sup>1</sup>



But, still, the full potential of women in the workforce has yet to be tapped. This is not only a moral failure. It represents a missed economic opportunity of truly massive proportions.

Given the many headwinds the world faces today, it is critically important that we strive together to bring more women into the workforce... And fully deploy the talents, ideas and capabilities of women to create new economic opportunities and drive productivity growth across the world.

As the work of the B20 this year has shown, however, creating the conditions to unlock the full potential of women to achieve our shared economic goals is a complex and difficult challenge.

At a corporate level, where many high-skill women are employed, the opportunity is to continue to advance women into leadership positions where they can make the greatest contributions. Despite the sincere efforts of major corporations, the proportion of women falls quickly as you look higher in corporate hierarchies. Overall, this picture has not improved for years. Indeed, the fact that I am the first woman chair of ICC in its 100-year history is, arguably, symptomatic of a broader trend. One which clearly calls for a step-change in approach from business leaders.

In short, we can no longer just have good intentions when it comes to gender parity in the leadership of companies. We need to deliver far better results.

However, I want to focus today on what is arguably a bigger challenge at the macro-level.

Specifically, the potential to raise the labour participation rates of women in most – if not all – economies, including those of the G20. Women make up half the world's population but only constitute around 40% of the global workforce according to the latest data from the International Labour Organization.

What's more, emerging evidence shows, that women were disproportionately impacted by the Covid-19 pandemic and the ensuing crisis in terms of unemployment and business closures. Sadly, the same pattern is likely in the context of economic disruptions currently being felt as a consequence of the war in Ukraine.

<sup>1</sup> This keynote address was given by Maria at the B20 Summit in Bali on 13 November 2022.

In this context, it is vital that all governments do not lose focus on the specific needs of women entrepreneurs, producers and workers when providing financial incentives and other means to restart businesses. G20 governments must lead the way in this regard.

On a related note, as ICC, we also see an important role for the G20 in driving reforms to better harness the global trading system as a vector of gender equality and women's empowerment. By way of context, I want to be clear that over the last 50 years international commerce has been a powerful force for the inclusion of women in the workforce.

My point is that there is more we can do to leverage trade as a driver of genuine inclusion. There is, for example, a growing evidence base to show that when women entrepreneurs seek to trade, they face legal, commercial and cultural barriers that limit the growth of their businesses.

I believe, in the current economic context, there is a strong rationale for concerted international action to tackle these barriers:

- In order for societies to recover from the economic impacts of the pandemic and the Ukraine war, we need to engage all businesses and workers to revitalize our economies;
- Resilient supply chains require diversified suppliers, which means better engaging women entrepreneurs and producers; and
- Digital technologies are creating remarkable opportunities to boost the participation of women in global trade...

In this context – and picking up on some of the excellent recommendations from the B20's communique – I would like to suggest four specific areas where the G20 is uniquely placed to accelerate the inclusion of women in cross border trade.

First, G20 governments should adopt a cast-iron commitment to adopt language in their existing WTO commitments that would oblige them to ban gender discrimination when it comes to participation in the global economy.

Second, the G20 should commit to a clear action plan, with annual targets, to close the gender connectivity gap by 2030.

While mobile connectivity expanded rapidly over the course of the COVID-19 pandemic, its reach did not extend equally... leaving women behind, according to the latest industry data.

A new ICC study<sup>2</sup>, published earlier this year, points to innovative models that can be harnessed by governments to bring meaningful connectivity to everyone, everywhere.

<sup>2</sup> <https://iccwbo.org/publication/icc-white-paper-on-delivering-universal-meaningful-connectivity/>

## ICC WHITE PAPER: DELIVERING UNIVERSAL MEANINGFUL CONNECTIVITY EXECUTIVE SUMMARY

Despite enormous progress in expanding connectivity (94% of the world's population lives in areas covered by a broadband network), only 63% of the global population were using the Internet in 2021, with 2.9 bn people still remaining offline. Closing these coverage and usage gaps depends on addressing barriers to any of the three layers of the digital ecosystem (infrastructure, application and skills). This requires an appropriate mix of economic, technical and regulatory approaches—and hinges largely on private sector investment. Drawing on extensive consultations with business across a broad range of geographies, this paper aims to:

- Identify, clarify, and classify major obstacles to delivering connectivity.
- Spotlight innovative and scalable industry approaches to tackle coverage and usage gaps.
- Establish an actionable roadmap for policymakers to enable and support business efforts to deliver meaningful connectivity and drive associated private sector investment. Based on the learnings and strategies derived from the private sector's experience, we offer the following two basic principles for policymaking and highlight three priority areas for improvement.
- Policy and regulatory mechanisms should promote the value of the entire communications and digital services ecosystem.
- Policies should be non-discriminatory, technology-neutral, and supportive of innovative business models and the development and deployment of a wide range of technologies, standards, and system architectures.
- To incentivise rapid and efficient action to close the connectivity gap, governments, in collaboration with businesses worldwide, should: 1. Facilitate investment across the entire digital value chain 2. Effectively manage spectrum 3. Ground policies in evidence and data.



I believe the G20 is uniquely placed to drive this agenda – and, in doing so, unlock the full potential of ecommerce and digital tools for women-owned businesses around the world.

Third, we know that difficulties accessing trade-related finance are a particularly acute barrier to the growth of women-owned businesses. The G20 should adopt a commitment to significantly scale the availability of trade finance guarantees for women entrepreneurs – building on existing development bank schemes, such as those offered by the IFC.

And, finally, we believe that the G20 should provide an explicit mandate to the World Bank to collect gender disaggregated trade data from 2023 onwards.

Faster progress in targeted data collection will help us identify and develop more effective solutions to the problems women are experiencing.

These are the sorts of specific, practical measures that we feel can make a real difference to the participation of women owned business in international commerce. And, by extension, the shape of the recovery from the shocks we have all faced since 2020.

On that note, I would like to take this opportunity to commend the leadership shown by B20 Indonesia on these and other gender issues over the past year. The final communique contains a compelling action agenda that I believe it is incumbent on us all as business leaders to stand behind.

And, finally, I would like to take this opportunity to offer my full support to the One Global Women Empowerment legacy platform from B20 Indonesia. We see real potential for this initiative to act as a unifying force and catalyst to accelerate the development of policies and programs aim at supporting women in business.

And please count on the full support of ICC’s global network in the future development of what I believe will be a very important legacy from a truly remarkable B20 cycle.

# CLOSING THE DIGITAL CONNECTIVITY GAP IN SUB-SAHARAN AFRICA

KENECHI OKELEKE, DIRECTOR, REGIONAL, SOCIAL AND POLICY RESEARCH AT GSMA

Closing the digital connectivity gap is crucial to realising the full potential of digital technology and ensuring that all areas of the world reap the benefits in terms of their economic and social development. Accurate data about the coverage and usage of digital communications is vital for governments, civil society, investors, and other stakeholders to help bring unconnected people online.

One region of the world that is being recognised as representing enormous opportunities for the mobile industry, as well as many unique challenges, is Sub-Saharan Africa. Mobile connectivity was at the centre of the Covid-19 response in Sub-Saharan Africa. During the pandemic, mobile acted as a critical lifeline for consumers. As the predominant form of connectivity in the region, the vast majority of services that moved online amid lockdown measures utilised mobile networks to reach end users. The mobile industry has also continued to bring connectivity to people and invest in network coverage and capacity expansion to help people interact with the communities and environment around them.

At GSMA Intelligence we produce the definitive source of global mobile operator data, analysis and forecasts, and publish authoritative industry reports and research. Our data covers every operator group, network and MVNO in every country worldwide – from Afghanistan to Zimbabwe. It is the most accurate and complete set of industry metrics available, comprising tens of millions of individual data points, updated daily.

The GSMA Intelligence Report<sup>1</sup> on The Mobile Economy Sub-Saharan Africa 2022<sup>2</sup> provides comprehensive analysis and data about the mobile market in the

countries across the region. Many in the mobile industry are surprised to learn that 40% of the adult population across Sub-Saharan Africa are now connected to mobile internet services. However, another 44% live in areas covered by mobile broadband networks but do not yet use mobile internet services (the usage gap). Addressing the main barriers to mobile internet adoption for these people, including affordability and digital skills, should be a priority for stakeholders in order to realise the potential of mobile connectivity to drive economic growth and social development in a post-pandemic world.

Here are some more key data from the report about mobile usage in the region:

- There will be nearly 100 million additional mobile subscribers in Sub-Saharan Africa by 2025. Nigeria and Ethiopia will account for almost a third of these.
- There were 515 million unique mobile subscribers in 2021, which is estimated to reach 613 million by 2025.
- More than 40 per cent of the region's population is under the age of 15, so young consumers owning a mobile phone for the first time will remain the primary source of growth for the foreseeable future.
- The Covid-19 pandemic spurred new ways of working and living, accelerating the shift to digitalisation, including virtual experiences. The metaverse ecosystem is growing, given the young tech-savvy population and thriving tech start-up ecosystem.
- By 2025 smartphones will account for 61% of total connections, on average, across the top six markets of South Africa, Kenya, Cote d'Ivoire, Nigeria, Tanzania and Ethiopia.
- 4G accelerates as 3G reaches its peak and 5G activities gather momentum.
  - While widespread 5G rollout is more of a long

<sup>1</sup> <https://www.gsmainelligence.com/>

<sup>2</sup> <https://www.gsma.com/mobileeconomy/wp-content/uploads/2022/10/The-Mobile-Economy-Sub-Saharan-Africa-2022.pdf>

term prospect in Sub-Saharan Africa, there is a strong case to utilise the technology in some scenarios to serve certain connectivity requirements for individuals and enterprises.

- Subscriptions growth remains strong and revenue growth outlook remains strong.
  - Smartphone adoption and data traffic are on the rise; Sub-Saharan Africa's demography, with a sizeable proportion of the population under the age of 18, means that subscriber growth will remain strong for the foreseeable future as young consumers move into adulthood and are able to subscribe to mobile services.
- Mobile continues to contribute significantly to economic growth.
  - In 2021, mobile technologies and services generated around 8% of GDP across Sub-Saharan Africa, a contribution that amounted to almost \$140 billion of economic value added.
  - The mobile ecosystem also supported more than 3.2 million jobs (directly and indirectly) and made a substantial contribution to the funding of the public sector, with \$16 billion raised through taxes on the sector.
  - By 2025, mobile's contribution will grow by \$65 billion (to almost \$155 billion), as the countries in the region increasingly benefit from the improvements in productivity and efficiency brought about by the increased take-up of mobile services.

## The way forward

Policymakers can help spur inclusive digital development with targeted policies to address the infrastructure and consumer barriers to mobile internet adoption. Specifically, policymakers should:

- Support initiatives to make smart devices more affordable for citizens, such as smartphone financing schemes.
- Tackle the gender gap in mobile ownership and internet adoption through policies that make it easier and safer for women to go online.
- Collaborate with industry players and civil society on programmes to improve digital skills levels, especially among the elderly and low-income populations.
- Provide an enabling environment for the creation of locally relevant content to spur demand for connectivity.
- Eliminate sector-specific taxes on mobile services and devices which affect the most vulnerable citizens disproportionately.
- Ensure that spectrum is made available in the right terms to encourage the cost-effective rollout of mobile networks, especially in underserved areas.



Kenechi Okeleke leads the delivery of GSMA Intelligence's regional, social and policy research, including the Mobile Economy, Digital Societies and Region in Focus report series. He has been a telecoms and IT industry analyst for more than 12 years, leading research across a wide range of topics, including tech innovation, 5G, AI, IoT and Big Data. Kenechi speaks regularly at industry events and provides media commentary on key issues within the telecoms and IT ecosystem. Kenechi joined the GSMA in 2014. He holds a BSc in Mathematics from the University of Benin and a Masters in International Business (with Distinction) from the Grenoble Graduate School of Business.

# GTWN INITIATIVE “GLOBAL BOARD READY WOMEN” LEADS TO EUROPEAN QUOTA FOR WOMEN ON BOARDS

CANDACE JOHNSON, GTWN FOUNDING PRESIDENT  
AND BRIDGET COSGRAVE, GTWN PRESIDENT EMERITUS

Ten years ago, the GTWN was called on by GTWN Lifetime Achievement Award Winner and the then 1st Vice President of the European Commission, Viviane Reding to help her with her initiative to establish a quota of 40 % to put Women on Boards of publicly listed companies throughout the European Union. As Viviane said at the time, “We don’t like Quotas, but we like what they do”.

## Establishing a Task Force

We quickly swung into action, enlisting all of the GTWN International Board Members and the European Business Schools to support this initiative. They were joined by a group of incredibly motivated and active women executives around Europe. This task force included the likes of Cristina Vicini, President TIAW (The International Alliance of Women); Lori Gonnu SFR Vice President; Audrey Mandela, President of WiTT (Women in Telecoms and Technology); Lesley Stephenson, Publisher FT Board Director Programme, Owner Governance Publishing; Lady Barbara Judge; Marina Niforos, Director AmCham France; Elissa Sangster and Diane Morgan, Forte Foundation; Anne Negre, Vice President International Federation of University Women, Marijo Bos, President European Professional Women’s Network; Brigitte Boone, CEO Merchant Banking Fortis Bank and Claire Bergery-Noel, Vice President EDHEC.

## Global Board Ready Women database

Galled by the fact that Executive Search firms and many corporate boards were saying that “they could not find enough qualified women” as well as, despite many reports by McKinsey and Goldman Sachs, among others, showing that “diversified” boards had better results than mostly (sometimes all) white male boards, they went into action to disprove this overwhelming sentiment and myth and to establish a list of highly qualified women. This resulted in the setting up of the Global Board Ready Women data base, together with the Association of Executive Search Consultants and the Forte Foundation, [http://www.fortefoundation.org/site/PageServer?pagename=women\\_boards](http://www.fortefoundation.org/site/PageServer?pagename=women_boards).

## Establishing Criteria and the role of the Business Schools

First action to be undertaken was to establish globally accepted criteria for Board positions. For be it men or women, the task force soon found out that there were no real criteria for choosing Non-Executive Directors or Independent Board Members.

The link to the Business Schools had early on been established as critical. They had a list of C-level Alumnae which could be consulted; they usually had a Board of Governors who had corporate Chairs and CEO’s who could appoint women to their boards; and they had a

pool of corporate governance professors who could help establish criteria for NEDs and Independent Board Members. The pioneering work and support of such business schools to this endeavor - including EDHEC, London Business School, INSEAD, ESPC, Esade, Essec, etc. - cannot be overestimated. In particular, EDHEC, France's largest business school, played a critical role by hosting the GBRW website, convincing the other business schools to join us, and providing corporate governance leadership and tracking.

As such, the GBRW Task Force had access to the best minds on Corporate Governance and set Quantitative and Qualitative Criteria, which were used to inform the database and which has consequently set the global standard for selecting NED's and Independent Board Members. The criteria may be found at [http://www.fortefoundation.org/site/PageServer?pagename=women\\_boards](http://www.fortefoundation.org/site/PageServer?pagename=women_boards).

## **From European Business School Women on Boards to Global Board Ready Women**

Viviane Reding had purposely set the quota to be applied only for publicly listed companies as they would be the most prone to replying to shareholders who would need to follow what today is ESG, but at the time was CSR. The idea was also that in focusing on Board positions, this would trickle down to the C-Level and then within the entire corporate structure. It quickly turned out that whereas the initiative was aimed at European corporations, the arena in which Vice President Reding was operating, there was a real need for most of these corporations to have Board members who had experience and expertise in regions and countries outside of Europe. The GTWN/European Business School Board Ready Women thus became the Global Board Ready Women initiative.

## **Selecting the Candidates**

It was one thing to have an excellent list of experienced Women Executives which the Business Schools and professional associations around the world, (the Global Women's Accounting group, the Women Lawyers group, etc.) including of course the GTWN, it was another thing to apply the criteria and select truly Global Board Ready Women. Every Saturday, Bridget, Cristina, Lori, and Candace would go through the candidates who had been recommended to apply to our Global Board Ready Women Linked In group. We knew that we would have highly qualified candidates, but we were exhilarated to receive applications from immensely qualified women who were then selected to be Global Board Ready Women. We were also thrilled to find candidates who, although not fitting the criteria precisely at the time of application because of age or lack of experience, would soon do so. We were thus ensured of the "next generation" of women on boards, reinforcing the GTWN's purpose of "Changing the Culture of Communications... from Generation to Generation".

## **Destroying the Myth of "not enough qualified women"**

Armed with a database of more than 8000 qualified women, we began promoting it to executive search consultants, corporations, and institutions in which governments had large shareholdings, such as the British Business Bank, Deutsche Telekom, Telecom Italia, etc. We discovered that at the time, executive search consultants were usually not paid for to find board candidates. Without any of the formal selection criteria that we had established, appointments relied on individual recommendations from existing board members of people from their own networks, thus largely excluding anyone from outside those groups. This discovery also led to the practice of requesting women who were asked to be on a board but could not accept the appointment for a variety of reasons, to always recommend other women who could fill the position. It also led to us realise that we also had to change the culture of executive search consultants, among others.

## **Partnership with the AESC Executive Search and Forte Foundation**

In 2013 we announced a partnership with the Association of Executive Search Consultants (AESC). This partnership was specifically aimed at encouraging their key members, including Korn Ferry, Spencer Stuart, Heidrick & Struggles, etc., to be pro-active with their clients in working with them on board appointments. They were also given access to our GBRW database, while those women were given free membership of the AESC Blue Steps program. This resulted in the program swelling to become a database of more than 25,000 women executives, who had access to executive search consultants around the world.

In 2017, we solidified our relationship with the Forte Foundation to manage the database going forward. Their partner, international search consultants Phoenix Executive, also agreed to not only use the database but also to promote it to corporations and publicly-owned corporations.

## **A vision is realised**

Currently only 8.5% of Board Chairs in Europe are women. By 2026 companies will need to have 40% of the 'underrepresented sex' (which is always women) among non-executive directors or 33% among all directors. Member States will have two years after publication of the Directive to transpose its provisions into national law.

On becoming EU President, Ursula von der Leyen committed to building a majority to unblock the Directive on women on boards, which had been delayed by Member States through most of the past decade. Finally, on 14 March 2022, the Council adopted its general approach, unblocking the file. On 23 March 2022, the European Parliament reconfirmed its position, allowing to start the negotiations with the Council of the EU. On

7 June 2022, the European Parliament and the Council reached the political agreement, paving the way for the final adoption of the file.

On 06 June 2022, the night before the Parliament voted on the Quota of 40 % of Women on Boards, EU Commission President Ursula van der Leyen, an early supporter when she was a member of the cabinet in Germany, called Viviane Reding to invite her to Strasbourg to be present at the vote. The first call Viviane made was to the GTWN and the GBRW to thank us. We know this is just a first step, but one that we truly believe will bring about better corporate governance today and for the next generation.



This photo of Viviane Reding and Ursula von der Leyen was taken on the night of the decision.

On 22 November 2022 the European Parliament formally adopted the new EU law on gender balance on corporate boards. This was a great day for the GTWN and for all of the women in European business who have worked so hard for more than a decade to make this a reality.

Watch the video which provides Viviane Reding's personal view of the importance of this initiative and the reasons behind it: [https://www.youtube.com/watch?v=DQPX\\_vxct4g](https://www.youtube.com/watch?v=DQPX_vxct4g)

## **Changing the Culture of Communications... from Generation to Generation**

Everyone who has tried to change the status quo knows how difficult it is. Which makes this achievement all the more remarkable. When we first started on this endeavour, we knew it would be difficult but none of us fully understood that it would take a decade of hard work to realise Viviane Reding's initiative. All we knew was that we HAD to do it for the future of women and the future of business and society and to fulfil the GTWN's promise of 'changing the culture of communications... from generation to generation'.

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