

THE MOBILE CENTURY

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DIGITAL GENERATION

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Platinum Sponsor



CMS is proud to continue our Platinum Sponsorship of the GTWN's flagship publication *The Mobile Century* for 2024.

The Mobile Century provides a global perspective on the most important issues facing the digital technology sector, while championing the role and contribution of women leaders in bringing about meaningful change. These characteristics align closely with the professional and cultural values of CMS' Technology, Media and Communications Practice.

The TMC practice at CMS is a global team of specialist lawyers who are experts in the drivers behind the unprecedented changes in this fundamental sector. They have been exposed to all of the risks, challenges and opportunities that clients face and are best placed to deliver real world solutions through our award-winning disputes, corporate, IP, commercial, data privacy and security, employment and tax practices.

In this fast-paced industry innovation is key, and so tech and telecoms suppliers, and creators and distributors of media, need to protect their investments and maximise their commercial opportunities. Sector convergence coupled with the rapid evolution of new technologies has also opened up a wealth of opportunities in this industry and our clients are well aware of the need to adapt, diversify into new business lines, and often to grow, while all the time complying with new regulatory requirements.

The digital generation: challenges and opportunities

The promise and anticipation around Artificial Intelligence has captivated worldwide attention over the past year like no other recent technological revolution. Governments around the world have rushed to understand how they can respond to *generative AI*, ensuring that their industries are well placed to capture maximum value from this innovation, whilst also not exposing their populations to undue risks. This edition of *The Mobile Century* includes an insightful essay by CMS Partner and Co-Head of the TMC Sector Group, *Dóra Petrányi* on finding the appropriate balance between AI ethics and AI regulation. It also includes an inspiring fireside chat between *Dóra* and *Francesca Rossi*, who is a computer scientist, an IBM Fellow and the IBM Global AI Ethics Leader.

At the same time, society is facing other new challenges, as the *digital natives* – those who only know a digital world – see all aspects of their lives transformed. As certain jobs and even professions are being transformed by digital technology, what does the future look like for those who are inheriting our digital world? What do governments, regulators and industry itself need to do to ensure the benefits of these technologies outweigh the risks that have emerged?

Global, interdisciplinary collaboration is vital

To answer these and other questions, we need to work together across disciplines, across industry sectors, and across the public and private sectors. 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 navigate the digital world

There are over 1,000 Technology, Media and Communications (TMC) sector specialist lawyers at CMS in over 40 countries. In this edition of The Mobile Century we highlight some of our partners' incredible work to help our clients gain the most value from digital transformation.

CMS partner and 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 with 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.

María González Gordon is the Co-Managing Partner and heads up the Intellectual Property, Industrial Property and Digital Business department at CMS Albiñana & Suárez de Lezo. She specialises in advising domestic and international companies on intellectual property, industrial property, copyright and technology, particularly in litigation and dispute resolution. Moreover, she is well versed in the drafting, negotiation and termination of a wide range of IP/IT agreements (licences, trademarks, designs, software, outsourcing, distribution agreements, transfers, assignments, etc.), not to mention her expertise in advising on technology, digital transformation and data analytics in sectors such as insurtech, fintech, energy, health and wellbeing and real estate, among others. Maria is an expert in digital media regulation and shares her insights about the impact of the new EU regulation of digital media and services and what this will mean for the future of the digital tech sector in Europe and beyond.

Eva Talmacsi has written a thought-provoking essay on the sustainability of data centres and their environmental impact. She is a UK, US and Hungarian qualified partner based in London and focuses her international practice on a broad range of M&A and corporate finance matters in Central & Eastern Europe and the UK. She advises clients including private equity and venture capital funds, corporates, financial institutions, investment banks and energy companies.

CMS also uses its extensive expertise in all areas of digital technology to help our clients start and scale-up their business. Building a successful business takes more than a good idea, it takes a lot of energy and determination plus the right opportunities and the right people. As an early-stage business, legal advice may be pushed to the bottom of the priority list, not least due to the issue of cost. However, for a business to scale successfully, especially when investors are involved, having the right foundations is imperative. The *CMS equip program* supports start-ups who are intellectual property rich and connects them with legal experts and advisors who can provide the tools which are essential for start-ups to succeed.

Helping the GTWN create value

At CMS, 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.



Dóra Petrányi is a partner and CEE Managing Director at CMS and 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.

For more information about CMS, visit www.cms.law or contact dora.petranyi@cms-cmno.com.

Foreword



Digital Generation was chosen as the theme for the 2024 edition of The Mobile Century as it encapsulates several of the most important issues currently driving the global debate around the future of the digital tech sector.

Generative AI rose to prominence in 2023 with the launch of ChatGPT and other large language models. Artificial intelligence suddenly became the topic on everyone's lips, with predictions about the impact that AI would have on human society ranging between extremes of the wildly optimistic to the downright scary. Governments reacted with proposals to regulate and control some of the more worrying aspects of AI generation, while industry experts cautioned against an over-reaction that could stifle innovation. We are thankful to the global experts who have contributed their perspectives on this important issue and know that this discussion will further the international debate on the future of AI.

Secondly, we explore the legacy that the digital tech industry is passing on to the generation of *digital natives* – the post Boomer generations of Gen Y, Gen Z and Gen Alpha. In little more than 30 years the industry has become the backbone of the economy and society, with digital natives in particular living their lives on their mobile devices. What impact has this legacy had on these younger generations? What are the positive and negative outcomes, both foreseen and unforeseen? What challenges have we created and are passing on to them, and what are the potential solutions? Has digital technology become so disruptive to education, for example, that schools have no alternative but to ban its use in the classroom? And if so, what does this say about the future relationship between users and technology? Do we need to forge a new partnership between humans and digital tech, and if so, how should this be done?

Thirdly, how can digital technology be used to *generate economic and social change*? In 2023 the GTWN launched its Call to Action to focus attention on the need to ensure broadband access for all. In this edition we expand this theme to reflect on how digital technology is being used around the world as a driver of global trade, economic and social change, and the empowerment of women.

Our thanks as always to our platinum sponsor, CMS, for their continued engagement and sponsorship of this important work. We would also like to acknowledge the time and effort dedicated by our GTWN colleagues and friends to create a superb collection of articles which provide a unique snapshot of the digital tech sector today.



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

DIGITAL LEGACY



Creating a digital legacy

Three GTWN Board members share their insights as digital tech pioneers and offer some advice to current and future digital generations, on creating a valuable legacy by following your career ambition while holding fast to your human values.

Incubating change

Walda W. Roseman, Chair, Arthur C. Clarke Foundation

Looking back on the legacy created by pioneers of the modern digital technology sector, I am struck in particular by the impressive contrast between my early days and today in terms of the role and number of women in the industry.

My career began as a journalist and editor for school administrators in the early 1970s where I found myself editing a publication on educational technology. The blue-sky baby of the educational community was cable television. Schools were gaining access to dedicated cable channels through the local franchise processes. Regrettably, most such channels were not being used because, mainly, teachers didn't know how to use them. One of the first schools that successfully did launch programs was in Reading, Pennsylvania, where the teachers put their 10-year-olds in charge of producing a news program. That piqued my interest in both the capabilities of technology and the essential roles that young people could play in the new media environment.

It also led me in 1974 to the then White House Office of Telecommunications, which was becoming an incubator for more open telecom markets, global satellite communications, and much more. One of the "mores" was terrestrial mobile communications. OTP was leading the way for release of government held spectrum to private services, beginning with amateur radio. Needless to say, OTP developed powerful enemies among such established players as AT&T and commercial broadcasters and was moved to the Department of Commerce as the National Telecommunication and Information Administration.

While the power of direct White House backing might have diminished, the seeds had already been sown for more open communications markets, development and release to the public of spectrum and advancing technology, and a growing

focus on international communications. For most of my career, one of my key focuses was encouraging governments worldwide to understand potential economic and social benefits of more open telecommunications markets. Today we can mark significant progress in bringing communications services to heretofore unserved and underserved populations, but this job is still unfinished.

I've had a fortunate career, catapulting professionally into the midst of perhaps the most pivotal time for advancing communications and its benefits. It came when there was some awareness that hiring a woman for a professional post was good legal insurance. For most of my career, I was the sole woman executive, seldom occupying a position that had previously existed. We women had to continually prove our value. Being the sole senior woman also had pluses and minuses, which I won't fully enumerate, other than to say that in addition to having fascinating jobs, it made me a visible target by some. I'm grateful to the men who chose to mentor me and have my back.

I'm shortcutting my career because I want to make a few points about the future. In 1990 as Director for International Communications at the FCC and then with my own advisory company, much of my focus shifted to the International Telecommunication Union. Once again, I often found myself as the only woman in a negotiation or the only one of a handful of women who attended ITU meetings.

In 1992 I decided that the 13 women (a jump from five the previous year) at its Administrative Council should meet each other over dinner. That was the launch of 26 years of gatherings of the women over breakfast during key ITU meetings. When these ITU Women's Breakfast networking programs caught the attention of Candace Johnson, the GTWN was born, starting with the GTWN Power Breakfasts.

With growing visibility, the breakfasts began to swell in numbers and influence. These lasted through 2014, when women's programs shifted into higher gear. We worked to see the day

when women would be given opportunities to develop their talents, gain the recognition they deserved, and lead global industry organisations such as the ITU and major digital and communications tech companies. Today Doreen Bogdan-Martin is the Secretary-General of the ITU.

I also engaged the ITU between 2001 and 2010 in a collaboration to drop Youth Forums into its regional and global Telecoms. The Youth Forums were attended by a young man and woman from virtually each ITU member. We linked the young women with the professional women in the breakfast meetings, resulting in some wonderful mentoring. Many of these young people went on to become a major influence in their countries and globally in the communications sectors.

So can I reach any conclusions that the digital generation might find helpful?

Let me try these:

1. Growing participation and leadership of women in communications bodes favorably for the future of women and for the positive power of communication technologies.
2. We women, however, are not automatic panaceas for what challenges the industry. The heart of our power might well derive from our holding true to our values and to the purposes behind what we hope to achieve. The workplace doesn't always make this easy. We've advertised that "if only women ruled the world, things would be better," so let's make sure they are.
3. As much as we know about the future of technology and how it might wisely be developed, young people -- our digital and mobile denizens -- might see the future differently. We would be smart to involve them directly in our visioning and business and technology planning.
4. We can wield our corporate influence and collective powers as women to promote hands-on creativity and innovation in the schools for boys and girls, extending it beyond STEM to include the arts and humanities. This isn't just a "woman thing." The future of the communications business and much, much more depends on the talent that we help flow forward.

Digital legacies for rural and developing regions

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.

Legacy is a formidable term. It is hard to believe that I began a career in communication for rural development fifty years ago (as a graduate student)!



Walda Roseman has had a distinguished career as an executive, strategist, advocate, ICT expert, and entrepreneur, primarily in the satellite, international information and communications technology, Internet, and entertainment sectors. She has also devoted her energies to promoting social and economic development worldwide through technology and public policy. She was honored by the UN agency for ICT, the International Telecommunication Union, with its Gold Medal for advancing the roles of women in ICT and empowering young people to embrace technology and creativity as tools for positive economic change.

Ms. Roseman is Chair of the Arthur C. Clarke Foundation. She served as founder and CEO of CompassRose International, an international advisory firm that she established in 1993 and led until she joined the Internet Society in 2011. At the Internet Society she served as Chief Operating Officer and Chief Strategic Communication Officer. Ms. Roseman founded the first international communications office of the Federal Communications Commission. She held executive positions with Intelsat, the Corporation for Public Broadcasting, National Public Radio, and the former White House Office of Telecommunications Policy.

Ms. Roseman has been active on the boards of a number of professional, non-profit, academic, and arts organizations. In addition to the Arthur C. Clarke Foundation, she sits on the Board of Chesapeake Mosis. She has served as a member of the Boards of Youth Service America and on the US ITU Association, as a founding member. Her former Board activities also include service as Vice Chairman of the of the American Refugee Committee (now Alight), the ITU Telecom Advisory Group, including as Chair of Africa Telecom 2001, where she launched and chaired the ITU Youth Forum (2001-2010). She was a member of the Norwich University MPA Advisory Board and has served as Adjunct Professor at George Washington University. She is an alumna of Cornell University and studied in post-undergraduate programs at Harvard University and Texas A & M.

I have been fortunate to have played a small role in helping to bring satellite communications to remote Alaskan villages and helping to extend access first to telephony and then to the Internet and broadband in remote and developing regions of the far North and the global South.

I have learned from many people – including academics and policy makers, but most of all from the people I have met in rural communities from Alaska to Alice Springs, and Tonga to Timbuktu. They told me why they needed reliable telecommunications – to get help in emergencies, to stay in touch with distant family members, to follow up on promises made by visiting officials, to order supplies and market their products, to organize for their own development.

Among the key components of this era for ICT4D (ICTs for Development) are:

Innovation: I have been privileged to know some of the Internet founders and innovative engineers who designed the first satellite equipment for rural communities. Technical advances have been astounding – from mainframe computer chips in mobile phones, from narrowband to broadband, from analogue to Gigabits, from two-way to multipoint communications including teleconferencing and social media.

Ingenuity: I have witnessed numerous examples of rural users' ingenuity -- from a university extension worker in the South Pacific who pulled on two strings she tied to an antenna to point it at a satellite, to a young Cree trapper using GPS to download coordinates for his trapline in the Canadian North, to young Inuit texting updates on whale sightings in the Arctic Ocean.

Competition: The “perceived wisdom” early in my career was that telecommunications were a natural monopoly optimally provided by one entity. Competitors soon emerged, often providing cheaper services connecting more subscribers. However, this monopoly mentality persists among some incumbents, who continue to insist that introducing competition would force them to abandon investment in remote regions.

Indigenous/small providers: Some rural residents now provide their own communication services. They may operate community networks, typically using fixed wireless to provide Internet access. Others may also provide Internet telephony (VOIP), mobile services, and their own middle-mile networks. Indigenous providers in northern Canada have partnered with government agencies to offer online high school completion and telemedicine in remote communities. Yet facilitating small and local providers is often overlooked as a means of both extending services and creating jobs in rural communities.

Sustainability: Providers need business models that can sustain ongoing operations following Capex investment in network

infrastructure. Rural networks can also facilitate community sustainability by providing “smart” services such as monitoring wind and solar energy to minimize use of fossil fuels, and connecting sensors and drones to monitor crops, wildlife, and climate trends.

Yet challenges remain:

Research: We will still need to understand how ICTs can contribute to social, cultural, and economic development; which strategies work and which should be discontinued; what users need to know and what challenges they face.

Access and affordability: The digital divide may continue to shrink, but it is not likely to disappear, as users will require more bandwidth and technological upgrades to keep up with new applications. And incentives or subsidies may be required to reduce prices for low-income users.

New Skills: The Internet and whatever comes next will continue to offer new opportunities to share, to learn, to create. But the need for “digital literacy” will also evolve – how to harness Artificial Intelligence (AI) and understand its threats and limitations, how to identify misleading content, how to protect privacy, how to ensure that users' communications are secure.

So what legacy are we handing on to the digital generation? Despite the progress in bringing the Internet and broadband to rural and remote communities around the world, there is still much work for younger generations to do to ensure that the gains we have made are preserved and that the benefits of digital technology are distributed equitably.

An Inuit resident of Arctic Alaska commented: “As Iñupiaq people ... we adapt. We have always adapted.” I am confident that digital generations in rural and developing regions will also continue to adapt – and to innovate.

A global legacy of entrepreneurship

Candace Johnson, Chair of the Advisory Board and Partner, Seraphim Space; Founding Vice Chair, NorthStar; Executive Board Member and Vice Chair Policy Commission International Chamber of Commerce; Member of the Board and Chair Nomination and Remuneration Committee VusionGroup; Co-Founder of SES and Chief Architect of SES Global; Founder Teleport Europe, Europe Online, VATM and OWNSAT (Oceania Women's Network Satellite), first investor in Kacific; Co-founder GTWN, GBRW (Global Board Ready Women); President Emeritus EBAN and Sophia Business Angels.

Although today many people feel that digital technology is a phenomenon of the late 20th century, it has been informing



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.

She can be reached on LinkedIn or at hehudson@alaska.edu

and shaping our lives for more than two centuries. Ada Lovelace realized that Charles Babbage's Analytical Engine was really "a link...between the operations of matter and the abstract mental processes of the most abstract branch of mathematical science", thus becoming the world's first computer programmer. Today, we would call her a true protagonist of AI.

Just as then, when people were worried about being replaced by machines and predicting dire consequences of letting technology go rampant, the human at the center of our universe has found ways of harnessing technology and applying it for the betterment of mankind.

Thinking about what my generation is handing down to the digital natives of today, I began to reflect on my own childhood experiences and how the home environment I grew up in had a profound impact on my own lifelong belief in the value of entrepreneurship and personal drive.

My earliest memories are of coming home every day and finding boxes of punched computer cards that my mother and my father were working on. My father was an Air Force officer and data and telecommunications pioneer and in that role was working on such projects as ARPANET, the Apollo Mission and the US's first satellites, etc. My mother was working nights punching computer

cards to make ends meet and feed and educate a family of four on a young military man's salary. This mundane, selfless work of my mother helped to raise a PhD in Game Theory, two serial entrepreneurs in telecommunications and data communications and a CIO/CAO of one of the world's largest financial institutions.

From my parents' example I learned my work ethic and also that technology could be used to achieve good outcomes – for yourself, but most importantly, for many others as well.



Photo courtesy of Marcel Tockert/Photothèque de la ville de Luxembourg

To the universe, and beyond

Throughout my professional career, I have been privileged to continue, as my mother and father did, in a micro and macro way to use digital technology to advance the quality of life on the planet and in the universe.

Digital technology democratizes communications amongst peoples, geographies, networks, and devices. It facilitates medical advances and renders healthcare accessible for billions. It unlocks secrets of our origins and our universe and disintermediates traditional distribution processes and supply chains. When applied in its best well known forms of the Internet and the Internet of Things, it reduces costs, creates the "Death of Distance" (Frances Cairncross, 1997), and, as the Deputy Chairman of Goldman Sachs, Bob Hormats famously said in 2001: "There has never been a commercial technology like this in the history of the world, whereby from the minute you adopt it, it forces you to think and act globally".

A global impact

I look back with satisfaction and a certain amount of pride that very often I was able to use "digital technology" to help create a better life for the citizens of our planet during the first 40 years of my career:

- helping introduce D2, the first private mobile digital network in Germany; fighting for fair competition in data network provision with the VATM, (Association of Private Telecom Operators)
- introducing satellite digital television to the world with SES;



Photo courtesy of Thales Alenia Space

- providing digital telecommunication networks in eastern Europe thus “leapfrogging” the legacy networks of western Europe with Teleport Europe;
- helping teach kids in Lebanon and mothers in Kenya to learn how to code and program via Youth2Youth and Manas2Mamas with Raspberry Pi’s; and
- bringing Broadband Internet to schools, hospitals and villages across the Pacific with the Kacific satellite system.

These advances were achieved despite the fact that many times, then as now, the ‘status quo’ operators, systems, and organizations fought, often ferociously, to keep their own legacies intact by declaring “the sky is falling” and “We cannot let the newcomers in - They will ruin the system!” Indeed! Looking back over my 4 decades in the industry, I see that there were always the “naysayers” against new technologies - usually those who thought they had the most to lose. But thankfully there were also always the innovators and entrepreneurs who saw a bright new future and worked to bring it about.

But entrepreneurs do not operate in a vacuum and need the help and assistance of other bright and enthusiastic people of vision. Enlightened politicians and governments such as M. Pierre Werner the Prime Minister of Luxembourg who enabled the creation of the world’s largest private satellite system in his little country; Viviane Reding, the European Commission Vice President who fought against the continuation of mobile roaming charges and introduced GDPR to protect citizen’s data rights were integral members of the change makers. The positive success of the GDPR regulation is now inspiring and informing the current European AI legislation, the only attempt by governments, innovators, entrepreneurs, corporations and users to create a positive framework for society and the economy to balance profit from AI with protecting those who are vulnerable.

Space is the new frontier

Over the past decade I have been extending my scope of activities in space and my entrepreneurial legacy to exciting new ventures and new technical frontiers in the following roles:

- Chair of the Advisory Board and Partner of Seraphim Space, the world’s largest Space Tech Venture Fund;
- Founding Vice Chair of NorthStar Earth and Space, the

world’s first space-based Space Situational Awareness network which will work to maintain “Clean, Safe, Accessible, and Peaceful Space for All”;

- Vice Chair of the European AI Institute, working for a humanistic AI; and
- Vice Chair of the Policy Commission and Executive Board Member of the ICC - International Chamber of Commerce, the world’s largest organization of business devoted to being ‘Merchants of Peace’ and actively involved in bringing a digital transformation to international trade.

All of these roles, although they may at first glance seem disparate and unconnected, have one thing in common. They are all addressing new entrepreneurial opportunities created by digital transformation.

Lessons for the future

The Internet and Digital Technology spawned a breeding ground for innovators and entrepreneurs to help solve the world’s biggest challenges. As we all now tackle the opportunities and challenges provided by AI and Generative AI, there are many lessons to be learned from the past.

Do not allow others to create doubt due to their own fears and insecurities. Instead, let your light shine brightly to illuminate a pathway for others to find their way.

The naysayers are usually those who represent the status quo and think they have the most to lose, whereas if they really looked at it objectively, they usually have the resources and wherewithal to gain the most from the new innovations. Above all, let us not forget our humanity and humility as we go forward.

Looking forward to the next decade, I see myself being involved more and more in the development, financing, and promotion of quantum technology as I believe it will be the ‘next big thing’, surpassing the reach and impact of even our current use of digital technology. The future has just begun!



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.

Digital generation Ensuring a sustainable future for communications

Keri Gilder, CEO, Colt Technology Services

When I speak to young people they tell me that they are looking for two main things: 1) a values driven, equitable work environment where all skills and talents are celebrated and they can bring their authentic selves to work; and 2) to be part of an industry which cares about the environment and is working to reduce its environmental impact.

For the past three years, I've been open with my concerns about these issues as well. As the talent shortage is reaching a crisis point, particularly across the tech industry, I remain concerned about the long-term impact this will have on innovation, industry, society and the economy. We as leaders in the industry therefore have to tackle both of these issues, if we are to ensure a sustainable future for the communications industry.

Catalysing the link between talent and innovation

The ongoing skills shortage creates barriers against achieving this critical interconnected goal. To what extent does this dilemma validate a *reassessment of traditional leadership and cultural models*? And how can channel leaders tackle what is perhaps the biggest challenge facing ICT businesses – *nurturing a more diverse and inclusive leadership profile and creating a culture that encourages innovation*?

We've reached a pivotal point in the narrative around the skills shortage. 77% of CEOs¹ see the limited availability of key skills as the biggest business threat to company growth. Businesses are worried, with those in the tech industry perhaps the most concerned of all. Tech must accelerate – and deliver – the roadmap for the digital economy; a roadmap to facilitate a connected global society, built on innovation. At the same time, the industry shoulders the responsibility to drive this transition

1 <https://www.pwc.com/gx/en/ceo-survey/2017/deep-dives/ceo-survey-global-talent.pdf>

in a sustainable, fair and equitable way. Digital infrastructure is a priority, and ESG credentials top the agenda, but these plans are at serious risk of derailment by one critical factor: access to talent.

In late 2023 I participated in a round table organised by EY and attended by UK Deputy Prime Minister Rt Hon Oliver Dowden MP to discuss topics such as digital inclusion, the UK's future technology roadmap and the urgent requirement to build sustainable infrastructure and talent for the country to lead in AI and quantum. I was struck by the passion and determination of everyone present to make the UK a technological superpower. One of the key areas our discussion centred around is an ambition to build and promote the UK as a world leader in this area. The need for investment in growth and skills in quantum is fundamental to achieving this goal and will present exciting opportunities for the channel. Acknowledging and investing in the skills gap is a critical first step.

Demand outstrips supply – skills are just not growing at the same pace as disruptive tech. Businesses won't be able to innovate or compete; they will be unable to deliver what they need to in order to grow. One study² found 84% of businesses questioned are being held back from delivering major cloud projects, due to a lack of skilled tech talent to support their goals, while just one in ten workers have the skills in AI that are in-demand, according to Salesforce³.

It isn't just tech talent that's in demand: 77% of CEOs say they are struggling to find the innovation and creativity skills they need for their businesses. Which leads to the obvious question: why? Why are they finding it so hard? The post-Covid Great

2 <https://www.cloudthat.com/resources/blog/the-tech-talent-shortage-its-impact-on-businesses-and-the-solution>

3 <https://www.salesforce.com/news/stories/digital-skills-based-experience/#:~:text=Artificial%20Intelligence-,New%20Study%20Reveals%20Only%201%20in%2010%20Global%20Workers%20Have,education%20qualifications%20or%20career%20background.>

Resignation and boom in hybrid roles should have opened up the market to a pool of talent unconstrained by geographic borders. But this hasn't happened at the pace we expected. Some leaders are still readjusting, unfamiliar and uncomfortable with new working models. Some organisations are still not set up operationally to deliver a remote employee experience that replicates a traditional workplace experience. Businesses that had built strong cultures based on being present in a traditional workplace were forced to rethink what mattered most.

What the next generation want

In hiring for the tech channel, we must start by bridging the gap between what companies have to offer, and what job seekers actually want. Despite the wave of excitement the tech industry continues to ride – buoyed by the AI and metaverse buzz – job seekers need more than promises of flashy offices with beanbags before they commit to a role.

Today's candidates actively search for businesses whose values align with their own. They seek businesses where difference is celebrated; where commitments to diversity, equity and inclusion are not just goals but are part of an organisation's DNA. LinkedIn found that 59% of respondents in Europe wouldn't work for an organisation that did not share their values. A Glassdoor study⁴ found 32% of job seekers would not apply for a job at a business they felt didn't show a commitment to diversity and inclusion. Diverse companies are proven to outperform others; to deliver a better customer experience and see greater levels of innovation. Employees are more engaged, and retention levels are higher.

Holding on to talent

Narrowing the skills gap must reach far wider than the hiring stage. Stopping talent leaving the industry is a huge challenge. People with disabilities report being shut out of the industry, facing barriers to successfully delivering their roles from physical accessibility to a lack of access to supportive technologies. 60%⁵ of women in tech have considered leaving the industry. 35%⁶ of workers feel 'too old' for the industry and 71%⁷ of young people in tech say their gender, ethnicity, socio-economic background or neurodiversity has made them feel uncomfortable at work.

Unless we address these issues head-on and commit to change – to removing barriers to progress – the stark truth is, we're not going to reduce the skills gap in our lifetime; or even for our children's generation.

4 <https://www.glassdoor.com/employers/blog/diversity/?nabe=6392912005562368:1>

5 <https://www.businessleader.co.uk/most-men-but-only-a-quarter-of-women-think-women-have-equal-progression-opportunities-in-tech/>

6 <https://www.cwjobs.co.uk/advice/ageism-in-tech-press-release>

7 <https://peopleofcolorintech.com/break-into-tech/young-black-people-are-leaving-tech-because-of-bad-culture-study/>

The importance of fairness and equity

It has never been more important, morally or economically, to create a fair and equitable workplace where everyone can thrive. We must take action to remove bias; set goals and report progress; invest in internal mobility and commit to a culture of learning. Change starts at the top, and we have to create leadership teams reflective of broader society. We need greater collaboration across the industry; we must forge deeper connections between government, education and business; and we must deliver against our duty of care, to support and nurture our employees at every stage of their career.

We're on the cusp of a new digital age which presents incredible opportunity. Right now, the onus falls on tech leaders, government and educators to come together to build the skilled, diverse and equitable workforce of the future.

Finding workable solutions

Of equal importance to the digital generation is finding workable solutions to the climate crisis. What can we tell them about how we are working to rescue the environment and build a sustainable industry? Everyday we are faced with very inconvenient truths and the stories in the media seem to get worse, with no clear solutions in sight.

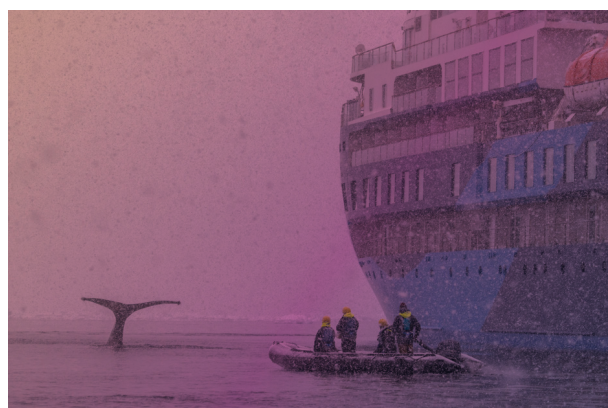
So what if...we do nothing?

The temperature rises 2 degrees. Extreme weather starts impacting the global economy. Critical infrastructure, including communications infrastructure is disrupted.

Too often we seem to set aspirational goals but do the bare minimum to actually achieve them. What if, as industry leaders:

- we sign up to science based targets, but hit them in 2040
- we offset our energy use, but don't actually reduce it
- we distribute the responsibility to our teams, but don't hold ourselves personally accountable?

Well, I can tell you first hand, it's not good. These are pictures from two of my employees in Antarctica – where it rained.



We sent them down there with a sustainable exploration team to find out what really was going on. They learned that 10.8 billion tonnes of ice has melted since 1992. And in March of last year – roughly around the time my team was there, the temperature spiked to an astronomical level and has never come back down.



It may be hard for everyone to relate to Antarctica - unless you have been there like my Colties, but I bet you can relate to a paper towel. Not surprising, given the average person uses around 3,000 paper towels at work in a given year.

In my house, you could probably double that – we use them for everything! Cleaning countertops, wiping down cats, picking up spills on the floor, even covering our food in the microwave. And like most of us, I really didn't think much about them until recently. But after I started learning about climate change, we had a challenge at Colt. We had a hack-a-thon to come up with ideas on how to be a part of the climate solution, in our professional AND personal lives. From this hack-a-thon, I learned ways to live more 'green'. I purchased bar soap and shampoo.

I started using sustainable toilet paper. I even bought sustainable cat litter. And for the most part, this was all pretty easy.

Until it came to the paper towel. We just couldn't get our heads around it. Putting a cloth towel over our food in the microwave seemed weird. Using a cloth to wipe the dirt off my cats seemed weird. My kids would even ask, "Mom – what do I do with the cloth afterwards?" because they were so used to throwing it away. Changing the paper towel to cloth itself was not that hard – it was just a purchase on Amazon.

Changing the mindset of my family - that was really hard. The disruption it made in our daily habits was huge. What I realized is that climate change is not about WANTING to do the right thing. It is about ACTUALLY doing it. Even when it is hard.

Why am I so focussed on what seems a minor issue, like paper towels? Because paper towels are the biggest waste coming out of US homes according to the Environmental Protection Agency. They contribute to the deforestation of 110 million trees. If each US household reduced their annual use by just 3 rolls of paper

towels per year we could eliminate 120,000 tons of waste. I am not trying to make everyone feel bad about their paper towel use (well, perhaps a little). But what this shows is that we need to talk more openly about changing behaviour, changing the mindset across our industry.

Changing the industry's mindset

Climate change isn't about putting some ambitious goals on a powerpoint. It's about changing behaviour. It's about changing our mindset from what is "normal" – whether it is a paper towel or a process to remove legacy equipment. It's changing our behaviour from doing what is "easy" in the short term but creates a false economy in the long term.

At Colt, we have changed out MANY "paper towels". We have enabled a "green mindset". We have changed our behaviour, our thinking in how we engineer our networks, how we work with suppliers, how we procure our power, how we develop our products. We have changed our minds to a "new normal". And by doing this we have achieved a Platinum rating by Ecovadis. We are the only telecoms provider to achieve this rating.

We achieved this by holding everyone accountable – our employees, our partners, our suppliers. We set achievable targets in each area of our business and put sustainability and customer experience at the heart of everything that we do. We "DID SOMETHING" in every part of our business even if it was hard to change our habits.

Sustainable digital infrastructure - what we mean

At Colt, we've demonstrated that we are committed to sustainable infrastructure across the entire value chain: through reducing emissions by using sustainable energy resources, refurbished hardware components and incorporating end-of-life processes which promote circular economy principles.

In designing network architecture for the future, we integrate specific measures, features and capabilities which are built on – and contribute to - our commitments to sustainable digital infrastructure. This way, customers and partners benefit from innovative, powerful next generation network design with minimal environmental impact.

These measures include:

- **Network Optimisation:** updating of equipment in line with technological advancements to increase data transport capacity while maximising efficiency of assets.
- **Promoting circular economy principles:** purchasing of refurbished equipment to extend the life of equipment where possible –
 - 14,739 pieces of high-quality secondhand equipment

bought in 2021 and 2022

- 75,452 pieces of equipment reused in 2021 and 2022
- Estimated 22.6 tonnes of e-waste avoided over a 5-year period (i.e. avoided materials being dug up and refined due to remanufactured equipment kept in use)
- *Introducing bio diesels for back-up generators*
- *Working towards zero waste to landfill* - making a concerted effort to ensure all our waste is prevented where possible, reused, recycled or converted into usable energy. This includes waste from our network equipment, IT equipment, office equipment and our supply chain.
- *SDH End of Life programme* (not including migration of customers to other products) will see a reduction in power over 5 years (includes: 30,000+ devices, 32 TDM Switches, 11,000 sites, 135,000 circuits, 13 countries)
 - 1st year is 2023 which should see a reduction of 14.2GWH and we have already achieved 3.84GWh/year reduction (not including cooling reduction)
 - Optical network evolution sees a 5900% increase in bandwidth with an 81% decrease in power and a 99.4% decrease in space
 - Ethernet network evolution sees a 771% increase in bandwidth and a 91% reduction in power and 99% reduction in space

As AI comes to the forefront of our industry, and according to DeepMind, computing power is doubling every 3.5 months. It is an imperative for the industry to think differently. We are estimated to consume more energy than the transportation sector in just a few years. We are quickly becoming the PRIMARY problem for the planet.

So the question to you is not

What If...

The question is WHAT?

What are you going to do about it?

What are you going to do to change the way you work, day to day?

What are you going to do to change the mindset of your people?

What is your "paper towel?"



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 Emeritus of the Global Telecom Women's Network.

Digital humanism

Harmonizing humanity and technology

Victoria Hernandez, Financial and Telecom Executive. C-level and Board serial member. Digital Humanist, Business Angel, and International Speaker

In the relentless pursuit of progress, the force of technological progress has reshaped our world fundamentally. Amid this transformative whirlwind, the concept of Digital Humanism is emerging as a guiding light, prompting a recalibration of our relationship with technology in a more human-centric manner.

At its core, Digital Humanism is a call to reassert our personal and social responsibility in the face of advancing technology. While acknowledging the potential of machines and digital systems to enhance our lives, this should not absolve us of our ethical and moral responsibilities. Similarly, French author and aviator Antoine de Saint-Exupery saw airplanes not just as machines, but also as tools for knowledge and self-understanding:

"We will forget the machine, the tool. ... it does what it is supposed to do, unnoticed. And through this tool we will find again the old nature, the nature of the gardener, the aviator, the poet." (from *Wind, Sand and Stars*, 1939)

Human 4.0

Descartes defined human beings as a type of machine, a reasoning entity, and an end in itself, which immediately ties into Artificial Intelligence. In this Cartesian logic, I am a sort of software, and introspection could be viewed as a programming language ready to launch a new version of myself at any time. The question then becomes: How can one become an augmented Human - a Human 4.0?

The latter half of the 20th century has seen more scientific and technological advances than all preceding human history. However, our brain's structure dates back to the Neolithic era and



isn't equipped for the deluge of information we, as humans, are exposed to today: media, social networks, and more. Modern-day monasteries are connected to the internet, and those traditionally dedicated to pillars of knowledge might now be the subject of memes and GIFs on social platforms. Even a hermit in the remotest corner of the Earth might possess a personal satellite phone and have their own YouTube channel.

How can introspection be practised in a world pulled between technology and humanism - between the craving for data, tools that enhance our lives, and narratives and dreams that provide meaning? To preserve our sense of humanity we need to adapt to this new layer of complexity and evolving context.

I don't know any more if I'm sleeping in the office or working at home.

Digital identity crisis

When everything arrives in algorithmic disarray—a joke, a Ukrainian news headline, a meme, a commercial promotion, a forest fire, your aunt's vacation photos—*coherence and the very sense of being in the world suffer*. In this context, my mind might resemble my internet browser: 15 open tabs, two frozen, and music playing without me knowing its source.

We are shaped by society, our parents, and our beliefs—often donning masks that don't truly reflect who we are. Unmasking this 'persona' and identifying our inner selves are prerequisites to finally becoming who we truly are. But have we considered how many WhatsApp groups we belong to? Each represents a micro-mask or micro-identity, a reality where we juggle multiple digital, physical, professional, and hybrid identities. We replace half of our social network (broadly speaking) within seven years—maintaining contact with only about 30% of those we converse with or seek help from.

What, in the end, is our true digital identity? And what impact does it have on our real identity. How can one gather coherent identities into a unified whole, comprehensible externally and consistent within oneself? Furthermore, which psychologists are adequately trained to address our potential digital identity schizophrenia?

If you can't control the world, control your context.

In my extensive thinking about the world, the benefits of innovation, and the impact of technology on society, I occasionally stumble upon a fascinating concept: *contextual collapse*¹. It denotes the impossibility of maintaining coherence in real life with our diverse digital identities shaped by the various social media platforms we use.

This collapse could explain the rise of fake news today, general apathy, and the success of conspiracy theories—like 'flat-earthers'. 1 in 10 French people believe the Earth is flat². This loss

1 Term invented by researchers Danah Boyd, Alice Marwick, and Michael Wesch.

2 <https://www.nationalgeographic.fr/sciences/un-francais-sur-10-pense-que-la-terre-est-plate>

of context intensified after the COVID pandemic, revealing that some friends or family members had detached themselves from truth and science. Presently, a fake news piece travels six times faster than a factual one³.

Critical ignorance: a remedy for digital saturation?

At school we're taught critical thinking—the ability to discern and judge. Critical thinking is a combination of an attitude (critical thinking) and a set of capabilities that allow for proper critique. In the present world, adding a filter for knowledge or critical ignorance to this equation becomes imperative. In the future, distinguishing fertile from toxic contexts and recontextualizing information will increasingly depend on our filters. Information that grabs attention and is potentially harmful, the immense time loss it generates, not to mention its overall mediocrity—all within our limited attentional and cognitive resources. Hence, we now need to consciously *choose what to ignore*.

Critical ignorance is educated ignorance and an understanding of filters. It aligns with philosopher Arthur Schopenhauer's "*The Art of Not Reading*", a precondition for reading good books by not reading bad ones: for life is short⁴. It also involves enhancing our free will: does the algorithm send me the information I like? Or am I beginning to like it due to constant exposure? Where is our free will in this scenario?

We must apply Socrates' three filters: "*If what you wish to tell me is neither true, good, nor useful, why would I want to know it?*" Adapted to our era, they retain relevance and become a necessity for a modern ascetic. Thus, my consciousness could be liberated from the weight of established truths and become a clear-sighted eye within my inner realm.

We waste years by not being able to waste hours

—Amos Nathan Tversky (1932-1996) - Mathematical psychologist, author of foundational works on decision-making in a risky environment.

Utility of the useless

Over 2,500 years ago, the ancient Greeks warned us about certainty. Engraved on the temple of Apollo in Delphi: "*Certainty brings ruin*" (Eggya Para D'Ata). However, today, we are surrounded by sensors: I know when my bus will arrive, I know where my Uber or Amazon package is located, etc. These

3 <https://www.nouvelobs.com/sciences/20180308.OBS3317/twitter-les-fake-news-se-propagent-beaucoup-plus-vite-que-la-verite.html>

4 Arthur Schopenhauer, Parerga und Paralipomena, 1851

functionalities and apps could be termed “Ambient Certainty,” inducing a reassurance effect in our daily lives.

I once contemplated the possibility of being an ‘augmented Human’ in the depths of self-discovery and truth-seeking. Instead, I risk being a diminished and shrunk self, not a lost voice but an unfindable one—because my reality and daily life resemble an Airbus 380 dashboard.

To break away from constant performance and perpetual dashboards, one must recognize the value of the useless. What for? Absolutely nothing! Meandering, allowing the mind to wander, nourishing our imagination, and ultimately reflecting in the silence of truth. For, by constantly trying to predict and control everything without imagining, it’s not machines we should fear but the machines we might become.

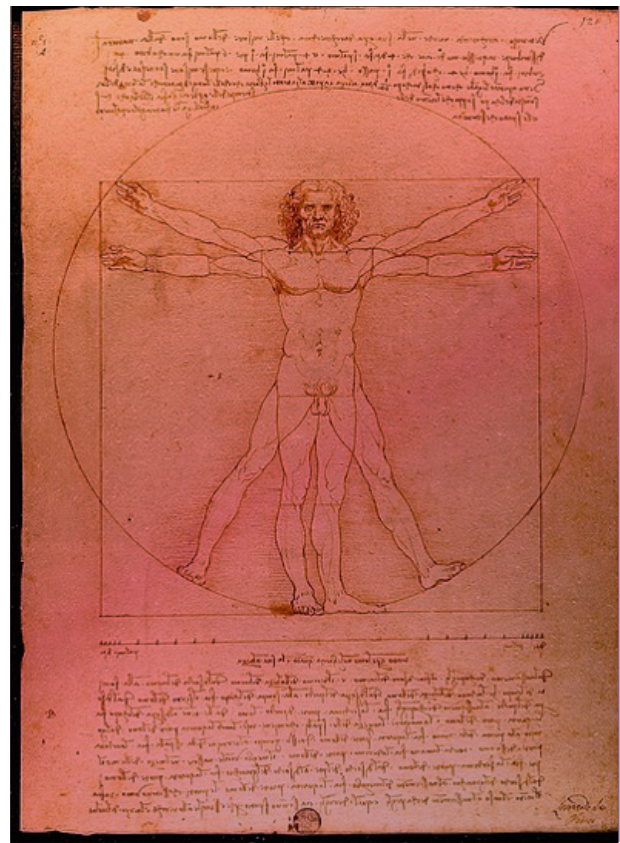
Eugène Ionesco beautifully wrote about the ‘utility of the useless’⁵ as an art form. To that, I add nurturing our ability to see the beauty of the world and our inclination towards wonder—a trait we had in childhood but forgot in our adult lives. It involves beholding the grandeur of nature, unforgettable artworks, and even the marvels of daily life—like watching our child have breakfast.

This is what Japanese culture calls *Mono No Aware*, the art of perceiving emotion in things and transcribing them—an art of the ephemeral. An attitude tinged with melancholy in the face of impermanence. I’ve always appreciated Don Quixote’s comment: “*Until death, everything is life.*” Ultimately, wonder is to relish the taste of life.

We are not machines

So, can I be an augmented Human? A Human 4.0? My answer is no. We’re not machines; my true aim isn’t to publish a new ‘upgrade’ of myself as a Human. Instead, it’s about unveiling my authentic version and recognizing myself in it. We’re entering the exponential era, where everything moves rapidly. With the exponential life ahead, it’s a duty to comprehend technology to realize that we can no longer think in the same way as we did even ten years ago.

To find myself, I must resist certain types of information and online actors. I must adopt new mental habits that aid my development, such as critical ignorance and the art of the useless. Just as we seek the path of moderation in virtues within our journey, there’s a middle ground in the use of innovation and technology that we must learn to recognize: Where technology no longer liberates but entraps.



Digital humanism demands introspection

I realise that I am a ‘locksmith’ crafting new mental keys previously inexistent or buried within me—some to close doors, like critical ignorance, and others to open them, like my predisposition for wonder and embracing uncertainty. This, for me, gives meaning to the splendour of creating new abilities (or keys) of understanding that transcend within me and make me, a real human being.

Consider the impact and influence of online discussion, something that is inconceivable without digital technology. It has become a cornerstone of public interaction, shaping opinions, policies, and societal norms. However, the rampant spread of misinformation, the creation of echo chambers, and the manipulation within these digital worlds all threaten the basis of human interaction. Digital Humanism demands introspection, questioning whether our online interaction aligns with the ethical responsibilities we hold as individuals and societies.

An illustration of this tension lies in the evolution of social media platforms. Once simple communication mediums, they have transformed into influential entities that shape user behaviour, influence political decisions, and mould societal narratives. This power shift underscores the urgent need to uphold human responsibility in the digital environment.

5 Eugène Ionesco “L’art de l’inutile” conference in 1961 at the Sorbonne University in Paris, France.

We need a Digital Humanism task force

Today we are witnessing the co-evolution of technology and humankind, altering societal fabric with a deluge of data, algorithms, and computational power. This disruption creates and threatens jobs, generates and diminishes wealth, and betters and harms our ecology. As lines blur between humans and machines, the quest for enlightenment and humanism becomes paramount.

Digital Humanism advocates for a symbiotic relationship between technology and human values. It pushes for technology as a catalyst to augment human potential and elevate collective well-being. Reflecting on the influence of algorithms in shaping our digital and online experience sheds light on the urgency of integrating ethics, technology, and psychology within a Digital Humanism task force.

This interdisciplinary approach, drawing expertise from ethics, technology, sociology, law, psychology, and economics, becomes vital in championing Digital Humanism. These diverse disciplines offer a comprehensive perspective, exploring the ethical, societal, legal, and psychological dimensions of technology's impact on humanity.

Inventor of the World Wide Web, Tim Berners-Lee's assertion that "the system is failing"⁶ underscores the dichotomy inherent in digitalization. While offering unprecedented opportunity, it raises grave concerns about web monopolization, extremist behaviour via social media orchestration, the creation of filter bubbles, privacy erosion, and digital surveillance. This revolution disrupts societies, demanding the creation of a just and democratic society where humans remain central to technological progress. His response is a Contract for the Web⁷, which implores academic communities, industry leaders, policymakers, and professional societies globally to engage actively in shaping policies. It represents a collective effort driven by concerns and hopes for the future, acknowledging our joint responsibility in navigating our technological trajectory.

Digital technologies encapsulate choices that embody values, norms, economic interests, and assumptions. In alignment with critical rational reasoning, interdisciplinary collaboration emerges as the key to shaping a future where technology harmonizes with human needs. This amalgamation of humanistic ideals with critical reflections on technological progress aligns with the intellectual tradition of humanism, striving for an enlightened humanity.

The core principles endorsed include designing digital technologies to foster democracy and inclusivity, prioritizing privacy and freedom of speech, establishing effective regulations derived from public discourse, addressing tech monopolies,

⁶ <https://cacm.acm.org/news/222901-tim-berners-lee-on-the-future-of-the-web-the-system-is-failing/fulltext?mobile=false>

⁷ <https://contractfortheweb.org/>

asserting human decision-making, fostering interdisciplinary collaborations, recognizing universities' pivotal role, encouraging ethical awareness in education, and acknowledging practitioners' shared responsibility in technology's impact.

A unified vision for responsible technology

Digital Humanism stands as a guiding principle that reasserts human values and responsibilities in the face of advancing technology. It emphasizes the need to shape digital advancements in alignment with human needs, ethical considerations, and societal well-being. At its core, Digital Humanism seeks to:

Reaffirm Human Responsibility: It emphasizes that technology should not absolve individuals or societies of their responsibilities. Instead, it calls for an expanded scope of accountability, challenging the delegation of responsibility to autonomous systems.

Align Technology with Human Values: Digital Humanism advocates for technology that serves humanity's needs and values, rather than reshaping human behaviour in undesirable ways. It emphasizes the importance of using technology as a tool to enhance human potential and improve quality of life.

Reflect on Ethical Implications: This concept prompts us to delve deeper into the ethical implications of technology. It urges a philosophical introspection on the impact of technology on fundamental concepts, such as discourse, and calls for a proactive approach to addressing these challenges.

Given its importance, a task force dedicated to Digital Humanism should encompass interdisciplinary expertise:

Ethics and Philosophy: These disciplines play a crucial role in guiding ethical reflections and understanding the societal implications of technological advancements.

Technology and Engineering: Expertise in technology and engineering is necessary to understand the practical implications of implementing ethical frameworks within technological systems.

Sociology and Anthropology: These fields provide insights into how technology shapes societies and cultures, allowing for a deeper understanding of human behaviour in digital environments.

Law and Policy Making: Legal experts and policymakers are essential to navigate the regulatory landscape and develop frameworks that uphold human values while governing technological advancements.

Psychology and Behavioral Sciences: Understanding human behavior in digital spaces is vital. Experts in psychology and behavioral sciences can shed light on how technology influences human actions and decisions.

Economics and Business: Given the commercial aspects of technology, experts in economics and business can provide insights into the economic impacts of Digital Humanism and guide responsible business practices.

By uniting these diverse disciplines within a task force, Digital Humanism can be effectively implemented, ensuring that technology serves humanity while respecting fundamental ethical values.

As we stand at the precipice of the future, action becomes imperative. It's time to steer technology towards a future that honours human values, fosters inclusivity, and advances societal well-being. The responsibility rests upon us to shape a future where technology and humanity coexist harmoniously.



Victoria Hernandez-Valcarel, a seasoned Financial and Telecom Executive with a C-level and Board background, is renowned for her impactful roles across various companies and organizations. As a non-executive Director at CaixaBank Payments & Consumer and a member of the European Innovation Council (EIC) she oversees substantial funding applications. She represents the EIC's €10.2bn fund in influential telecom and technology companies and EC programs. Additionally, she serves on the boards of TeamEQ and Cashway startups, leveraging AI & ML for HR solutions and innovative financial technology.

Victoria's career highlights include leadership positions as Alliances' Director British Telecom Europe, Executive Chairman Orange Spain, and Senior Vice-President International Proximus. Beyond her corporate endeavors, she's a driving force in promoting gender diversity, serving as President of Europe for the Global Telecom Women Network (GTWN) and founding member of the Global Board Ready Women (GBRW) Task Force, which championed the 40% Gender Diversity Quotas for publicly listed European corporations.

She holds a Bachelor's in Engineering in Computing Sciences from UPC, an EMBA from INSEAD, and completed programs at Columbia Business School and Harvard University in Digital Marketing and Financial Technology. Victoria lives in Paris and speaks fluently 5 languages. She has one lovely daughter (Rita).

Information age

Six networks that changed our world

Prof Tilly Blyth, Professor and Head of Museum Studies
at Leicester University, UK

If you don't know where you have come from, you don't know where you are going. - - *Maya Angelou*

I have been fortunate in my career to be able to combine all of my key interests into one coherent whole - science and technology, the history of people and cultures, and the humanising influence and creativity of the arts.

I began my academic studies in sciences, completing a degree in physics and working on a PhD with BT. From that point on I remained fascinated by the potential of digital technology and soon moved to a digital design agency, Illumina Digital, where we combined interactive design, software development and editorial and production skills, enabling the delivery of innovative solutions for a wide range of media, government education departments and cultural institutions such as museums.

It was a natural progression for me to take up a position at the Science Museum in London, where for over twenty years I built on these various experiences. As Lead Curator of the Information Age Gallery I developed the strategy for one of the most important computing, telecommunications and television collections in the world, delivering a gallery that, as one journalist described it "gives the sector the story of its history and its future". Its aim was to tell the stories of technological transformation through the experience of those who made, used and developed them. Later I became Head of Collections and Principal Curator at the Science Museum and I went on to build a Curatorial, Research, Library and Archive team that delivered many stunning galleries and award-winning exhibitions, on subjects as varied as Robots, the prophet of the computer age Ada Lovelace, codebreaker Alan Turing, and the history of the UK intelligence service, GCHQ.

One of the key aims of the Information Age Gallery is to inform and excite everyone, in particular the *digital generation*, about the

rapid advance in information and communications technology, but to see this history through the experience of change for each new generation. I wanted to bring in the voices of the users, as well as the inventors, to reflect the range of people involved in the development of a technology. I didn't want visitors to see these technologies in isolation, but to understand technological transformation as part of a broader set of social, economic and personal networks. I and my colleagues are thrilled with the reception of the Gallery by the public, who continue to share our enthusiasm for the stories and objects on display and who gain a renewed insight into the importance of information and digital technology to everyone in all walks of life.

Now, after twenty years at the Science Museum, I have once again taken on a new challenge as Head of the Department of Museum Studies at the University of Leicester in the UK. Here we deliver outstanding research and excellent postgraduate teaching incorporating theoretical, historical and practical study that focus on the changing role and value of museums and cultural institutions, as they navigate what it means to provide cultural value, commentary and connection in the 21st century. This work is also at the intersection between innovation, technology, cultural heritage and sociology, broadening students' appreciation of the inter-relationships of these disciplines.

My message to the *digital generation* is to follow your own interests and seek out areas where you can explore how to use both technology and the humanities to enact change and bring about a better future. We can no longer see technological development in isolation from society, and whilst new technologies such as AI and the metaverse present fantastic opportunities, they also reflect the biases and inequities of the world we live in, so we need to work to understand, address and improve that.

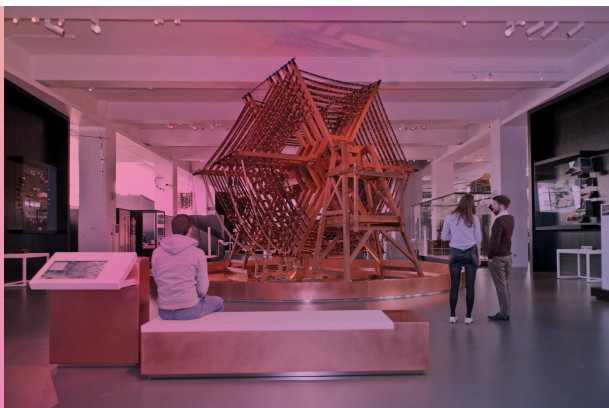
The Information Age Science Museum London UK

Our messages – from the mundane to the memorable – can be counted, compressed and reduced to fundamental ‘bits’. This is information. The UK Science Museum’s exhibition *Information Age*¹, of which I was the lead curator, told the story of 200 years of information and telecommunication networks. Across six networks, it revealed the hidden infrastructure and devices that have allowed us to send more information further and faster than ever before. Through 21 transforming moments, it presented the extraordinary people who have created, used and been affected by each new wave of technology.

The following is a summary of some key milestones in the development of the Information Age in Britain and around the world, to remind us all of the incredible advances that have been made in such a short span of human history.

Aerial tuning inductor from Rugby Radio Station

This enormous structure resembles a gigantic hexagonal spider’s web and it stood at the heart of the exhibition space. On 1 January 1926, Rugby Radio Station began sending messages to the world. Its very-long-wave, low-frequency radio signals could bend around the curvature of the Earth. Long wavelengths can also penetrate water, so Rugby Radio Station became a hub for encrypted military communications with ships and submarines.



1. The Cable

Telegraph networks send information from point to point in the form of electrical pulses. The telegraph could send information at high speed, over long distances, giving rise to the first global communication network, and radically shrinking our world. Its impact on society was every bit as significant as the development of later information networks, such as the internet.

¹ The Information Age gallery opened in October 2014. It is available online here: <https://www.sciencemuseum.org.uk/see-and-do/information-age>

- In 1858 the continents of Europe and North America were linked for the first time by a submarine telegraph cable. Just three weeks later the cable failed and it took eight more years of research and investment before telegraph signals at last crossed the Atlantic. It meant that messages could be sent across the vast ocean in minutes rather than weeks. The Great Eastern was the world’s largest passenger ship but it was commercially unsuccessful. Later it was fitted with both paddle and screw engines to become an ideal cable-layer.
- William Thomson designed an extremely sensitive mirror galvanometer in 1858 to detect faint telegraph signals.
- A practical electric telegraph was first demonstrated in London in 1837. Telegraph and railway networks spread in parallel, bringing the need for a commonly agreed time reference. From the 1850s, time signals sent from Greenwich were used to set clocks all over Britain. By 1884 one-hour time zones were agreed for the globe.
- In 1843 William Cooke installed an electric telegraph alongside the Great Western Railway between Paddington and Slough. On 1 January 1845 this instrument sent a message declaring that suspected murderer William Tawell had boarded a train. Tawell was later arrested and hanged.



The telegraph: the nervous system of commerce

The development of printing telegraphs accelerated the rate at which information travelled through the network. In October 1929 telegraph lines were overwhelmed with information and stock tickers ran several hours late. The chaos of the Wall Street Crash showed the reliance of business on communication links.

- Sending information on stock and share prices was one of the earliest uses of the electric telegraph. The ‘stock ticker’ installed in offices printed out details of share price movements in a form easily understood with a few minutes’ training.
- The dramatic rescue of over 700 survivors from the Titanic disaster in April 1912 was made possible thanks to wireless telegraphy. The event widely publicised the advantages of the new technology.

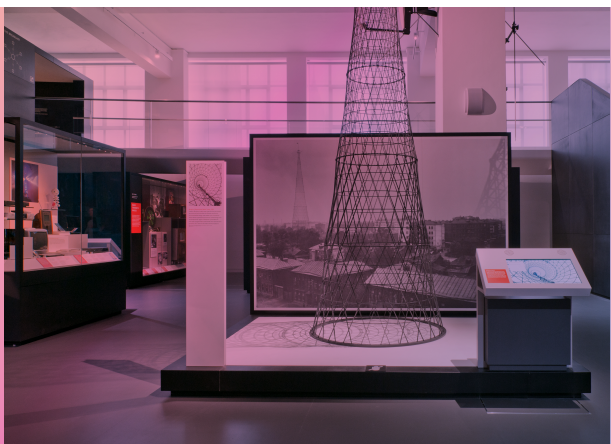
- By 1910 nearly all passenger ships on the north Atlantic run had wireless telegraphy installed. The Marconi Company hired its equipment to shipowners and provided a trained operator. Morse code was used, but the range was still restricted and messages from mid-ocean had to be relayed to shore by other ships.



2. The Broadcast

Television and radio networks use radio waves to carry information from a transmitter to many receivers. Information is transmitted simultaneously, connecting millions of people watching or listening to the same programme at the same time. Digital broadcast technologies use cable, satellite or internet links to distribute huge quantities of information more efficiently. By providing choice and control, they transformed the way listeners and viewers interact with radio and television.

- In the 1920s amateur radio operators used skills learnt during the First World War to develop small communities of experimenters and listeners. In 1922 the BBC transmitted its first radio programme, marking the beginnings of official state broadcasting, and a new era for listeners at home.
- On a foggy November night in 1922, the words 'This is 2LO calling' announced the arrival of the BBC. The BBC's first transmitter, 2LO transmitted words and music from Marconi House near The Strand and to listeners at home.



On the box

In the interwar years many radio enthusiasts began to experiment with television. By 1953 families and communities gathered around newly purchased television sets to watch the coronation of Elizabeth II. For the first time more people watched an event unfold on their television screen than listened to it on the radio.

- The early television receiving apparatus used by John Logie Baird in 1926 in a demonstration at the Royal Institution, London.
- In 2005 Britain's communications regulator, Ofcom, announced that a digital switchover to digital television would commence and that the last analogue television transmitter would be switched off in 2012. A huge engineering challenge was undertaken to upgrade Britain's television transmitters. In parallel, a public relations plan was implemented to ensure that users did not lose their television signal.
- In 2002 owners of the British television transmitter network collaborated with broadcasters to form Freeview. Purchasing a Freeview set-top box allowed viewers to watch new channels free of charge. The numbers of digital television viewers rose rapidly.



3. The Exchange

The telephone converts speech into electrical signals, carried through wires and switched across the network by telephone exchanges. Subsequent telephone networks transmit digital signals over fibre optic cables, radio, microwave or satellite links. The telephone gave rise to new forms of behaviour and social etiquette, transforming working lives and relationships. As a teacher of deaf people, Alexander Graham Bell experimented with transmitting speech electrically.

Telephones entered homes and workplaces in the early 1880s, transforming social and business relationships. Picking up the receiver connected callers to a switchboard operator, usually a young woman. From 1912 automatic exchanges made it possible for callers to make their own connections.

- Operators at a manual switchboard² spoke directly to local callers, connecting them to other users by plugging a cord into one of the sockets or ‘jacks’ in the upper part of the switchboard, or forwarding the call to another exchange using other connections.
- Electromechanical exchange equipment could be used to serve a very small number or thousands of people. This private automatic exchange from Holmsted Manor, a converted country house in Sussex, connected only about 20 offices.
- On 26 May 1957 the American singer Paul Robeson’s distinctive bass-baritone voice filled St Pancras Town Hall in London. Yet he was in New York: the new transatlantic telephone cable, TAT-1, carried his voice across the ocean.
- The first transatlantic telephone cable (TAT-1) provided cheaper and better-quality calls between Britain and America. Submerged repeaters boosted the electrical signals travelling through the cable. Rigid electronic repeaters were laid between Newfoundland and Nova Scotia. Another part of TAT-1 connected the cable to Oban, Scotland.
- In 1953 Chad Varah, Rector of St Stephen Walbrook in London, invited the ‘suicidal and despairing’ to telephone and talk about their distress. The phone number was widely publicised and volunteers listened 24 hours a day, every day. The foundation of the Samaritans heralded a new use of the telephone, unanticipated by its early pioneers.



4. The Constellation

Satellite networks relay information between Earth and space. Using super-high-frequency waves, they deliver voice, image and data to parts of the world that other communications technologies cannot reach. Although remote in the Earth’s orbit, satellites are intimately connected to people’s lives.

- In 1945 Arthur C Clarke predicted that just three satellites could broadcast television images around the world. Twenty-two years later, Clarke’s prediction became a reality. Combining contributions from 14 countries, the BBC’s ‘Our

² The last manual exchange in England, at Abingdon, Berkshire, ended its service on Thursday 26th June 1975. The last manual telephone exchange in Australia was located in Lismore, New South Wales, and was closed on November 14, 1991.

World’ television programme was broadcast live to millions of viewers.

- In service for only six months, Telstar marked a new era in satellite communication. It transmitted the first live television pictures from the United States to Europe and the first phone call through space.
- NASA’s Landsat 5 took over 2 million pictures of Earth, far exceeding its original three-year mission. Equipped with a range of scanning instruments, Landsat supplied high resolution images and information about our planet for mapping and environmental projects.
- During the first Gulf War in 1991, troops buffeted by sandstorms advanced through an unmapped desert. Coalition forces successfully used emerging satellite navigation technology in the disorientating terrain. The accuracy available to the military was later extended to civilian GPS systems.
- The global positioning system (GPS) is a constellation of satellites, each equipped with an atomic clock, sending accurate time and location information to Earth. The first Block IIF satellite was launched in 2010 as one of 30 satellites in the constellation. During the first Gulf War there were only 14 active GPS satellites in orbit.
- In 2001 Keyhole, a small computer graphics company, launched a product that could seamlessly stitch together satellite images, aerial photography and geopositioning. Users could fly across the world to see amazing detail of distant landscapes. This product became Google Earth, which gave anyone with a computer a personal eye in the sky.



5. The Web

- The Pilot ACE (Automatic Computing Engine) computer of 1950 embodied Alan Turing's idea of a universal machine that could perform any logical task.
- On 25 July 1973 a computer at University College London sent packets of data across the Atlantic. This was the first international link on the ARPANET network, the forerunner of the internet. In spite of their origins in the closed world of Cold War politics, computer networks rapidly became a tool for open collaboration.
- The first email was sent in 1971 using two PDP-10 computers located side by side and connected through the ARPANET.
- In 1986 Peter Kirstein connected this Cisco router to the fledgling internet. Routers are the gateways which allow information to flow between computers in a network.
- In June 1980 Tim Berners-Lee arrived at CERN, Europe's centre for particle physics research. CERN was a melting pot of people, ideas and information. Within a decade he devised a tool, called the World Wide Web, to 'link all the bits of information in every computer at CERN and on the planet'. Sir Tim used a NeXT computer to host the first web page at CERN on 25 December 1990.
- A corkboard server was an essential component of Google's first search engine. A server responds to requests within a computer network. In 1998 the young company made do with inexpensive materials including off-the-shelf personal computers and thin sheets of corkboard for insulation.

- In the 1970s personal computers arrived. At first these machines were wildly popular with hobbyists who had expertise in electronics, but ordinary home users were put off by having to program them with switches and complex commands. It was not until the introduction of the graphical user interface that they were transformed into accessible tools for everyone.
- In 1983 Apple introduced its first computer with an innovative interface that enabled users to click on recognisable graphic icons and navigate through familiar-sounding pages.

6. The Cell

Mobile networks use a series of base stations arranged in a cellular pattern. As users travel across cell boundaries, their mobile devices are seamlessly transferred to the next base station, keeping them in constant touch. In 1982 the British government licensed two companies, Cellnet and Vodafone, to operate the country's first cellular phone networks. Engineers raced to build a network from scratch, and within three years they had over half a million subscribers. The mobile phone was a luxury item that slotted neatly into the 'yuppie' culture of the mid-1980s.

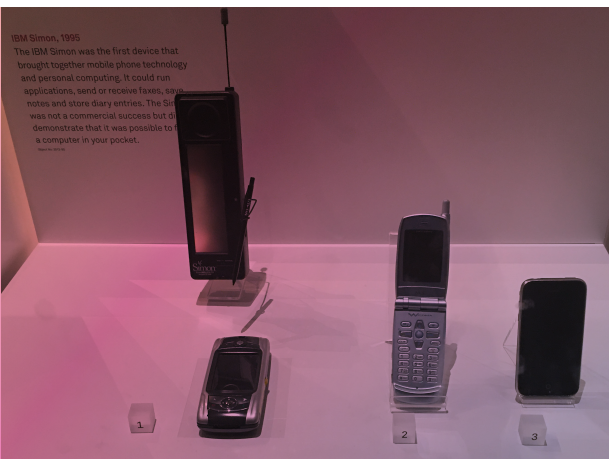
- Early mobile phones needed large batteries to ensure the signal was powerful enough to communicate with a base station antenna and the first ones were mounted in the central console of a car.
- When Vodafone and Cellnet's networks launched in 1985, base stations like this were at their heart. The cylinders visible on the right are 'cavity resonators'. They give a sense of the scale of the network. Each cavity resonator could only support one mobile phone call at a time.
- In Africa, access to modern communications was very limited. Until 1997 few people had access to phones in Cameroon, for example. The land-line network was limited and expensive. From a standing start, mobile phone companies flourished as creative Cameroonians set up businesses giving customers access to handsets and selling discounted call time. Cameroonian entrepreneur Emmanuel Bongsunu ran a mobile phone business from a small call box in Bamenda for over a decade. Its bright colours and strategic roadside location attracted ever more customers.
- From the 1990s new microprocessor technology began to transform mobile phones. No longer simply tools for making calls, they became versatile computing devices. Third-generation mobile networks, launched in the 2000s, transformed the way we generated, consumed and shared data.
- In the 1980s the microprocessor company ARM designed a new kind of RISC (reduced instruction set computing) microprocessor. This required low power, but had high performance. Later versions supported the kind of





complicated processing needed for the mobile phone to become a smartphone.

- The IBM Simon was the first device, in 1995, that brought together mobile phone technology and personal computing. It could run applications, send or receive faxes, save notes and store diary entries.



*All images copyright Science Museum



Tilly Blyth is the Professor of Museum Studies at the University of Leicester, where she brings together sector knowledge with creative practice and academic research, to build a new generation of global museum professionals. Prior to joining academia, Tilly spent over twenty years working with national museums, including the V&A, British Museum and Science Museum. As Head of Collections and Principal Curator at the Science Museum her leadership of the curatorial, research, library and archive teams resulted in stunning new masterplan galleries and a programme of temporary exhibitions, with the Science Museum being declared a winner of the Art Fund Museum of the Year prize in 2020. Tilly is also a trustee of Bletchley Park Trust, an adviser to English Heritage's Blue Plaques Panel, a member of British Academy of Film and Television Arts (BAFTA) and a fellow of the Royal Society for Arts, Manufactures and Commerce.

Our digital legacy

A discussion facilitated by Maria González Gordon, Managing Partner and Head of IP, Industrial Property and Digital Business at CMS Albiñana & Suárez de Lezo.



María González Gordon heads up the Industrial/ Intellectual Property & Digital Business department at CMS. She specialises in advising domestic and international companies on intellectual property, industrial property, copyright and technology, particularly in dispute resolution. She is expert in the drafting, negotiation and termination of a wide range of IP/IT agreements (licences, trademarks, designs, software, outsourcing, distribution agreements, transfers, assignments, etc.). She has particular expertise in technology, digital transformation and data analytics in sectors such as insurtech, fintech, energy, health and wellbeing and real estate, among others.



Lucy Lombardi currently heads the Technical Partnership, Governance, Safety and Certification department in Telecom Italia, which is involved in the ongoing layering of the fixed access network within Telecom Italia. Lucy was nominated by Mobile Communication International and Telecoms among the most influential women in telecoms in 2015.



Nicola (Nicki) Palmer is a distinguished technology executive with over 30 years' experience in various leadership positions at Verizon. Nicki began her career at Bell Atlantic, a Verizon predecessor company, in 1990 and has held a number of leadership positions in engineering, operations, and technology, supporting advanced data and wireless products across customer segments. She has served as Verizon's Chief Engineering Officer as well as the Chief Technology Officer of Verizon Wireless where she led the 4G and 5G network deployments.

Maria: This is one of a series of webinars organised by CMS in collaboration with GTWN around the theme of the *digital generation*¹. We will be discussing how future generations will be impacted by the actions of the founders of digital technologies and those in the industry today. We are honoured to be joined by two top industry veterans *Lucy Lombardi* and *Nicola Palmer*.

I would like to start by setting the scene. It's important from time to time to review where we have come from and where we are going. I am sure you both remember, like me, having to wait at least 5 minutes for my modem to work and then another two or three minutes for a website to open. But now our expectations have changed and I will probably call my IT guys if it takes more than 10 seconds. What has happened to bring about this lack of patience, increased frustration and lack of tolerance? Is technology playing a role in this change in user behaviour?

Lucy: The world is very different from the world that we grew up in. Technology has played a significant role in the last 20 years in changing our behaviour. When I was a teen, I had a fixed phone line and no privacy when we wanted to talk to our friends. And I remember writing my thesis on a shared computer in the lab. Today my children, in their 20s, are writing their uni work on their mobile phones and collaborating with others on digital platforms. This is mostly due to mobile technology and the Internet and our kids are benefiting from tools that we didn't have when we were growing up.

Nicki: The digital generation looks at the world and uses technology differently than we did at their age. I feel so fortunate that our industry has been at the heart of many of these amazing changes. When you talk to kids about taking a road trip, for example, they don't even think about where they're going before hopping in the car. I remember preparing for road trips at the kitchen table with my father, pouring over a series of maps.

Kids today are digital natives - they grew up with phones in their hands and are reliant upon the utility they provide. What does that mean in terms of impatience? There's been a lot that's written about how

¹ This webinar took place on 16 January 2024.

connected we are to our devices and how this can be very problematic for mental health.

Our brains are evolving and we probably won't know for many years what always on, immersive, digital technology is really doing to our neural pathways. Customer impatience is a pressure on our industry, for sure, but it's not something we should shy away from. The Verizon credo states that we have work because our customers value high quality products and services. User requirements are always getting more stringent and that means we have to continually up our game. Impatience from the user is a sign of the times. We have to rise to meet that pressure and it's only going to get more intense going forward.

Maria: Let's talk about leadership styles and what works best for the digital generation. Humans, especially of our generation, tend to react to the proverbial 'stick' by improving our performance. But the stick approach no longer seems to work very well with the digital generation, especially our kids, who for example may just copy and paste from ChatGPT to do their homework as a quick solution, without fully understanding the consequences. There are experts who still think that young people are stick driven and advise us to use this to provide motivation. Do you think that the availability of digital technology may have played a role in the attitude of kids today, and if so, how will technology companies approach that in future?

Nicki: I am not sure that I totally agree with you. I think positive reinforcement and excitement around goal attainment are much better ways to achieve what you want as a leader, or as a parent. I agree that there's a place for the stick, such as in a crisis where a command-and-control type of leadership style often works better. Younger people don't only respond to positive reinforcement, but nevertheless it is a much better leadership style over the long run.

Having many more women in the workplace and in leadership roles has had a profound effect on how we collectively manage the workforce, which has been a great and much needed advance.

Lucy: It's also a matter of education about how to use digital technology and what to expect from it. Educators today, such as parents and teachers, are mostly not digital natives and don't necessarily have the skills to educate others on how this technology works and aren't able to explain to children how to use technology in a healthy way and avoid the pitfalls.

Some of my friends have asked me to explain to their children about online privacy

because they were unable to understand it and to explain it. Not all young people get a healthy digital education.

All they see is people making a lot of money on TikTok or on Instagram by sharing sexy pictures and getting money out of promotions. This may seem to them to be an easy way to make money and to feel successful.

Maria: Let's now consider what the future will look like for the younger generations. They demand fast, immediate and very intense experiences otherwise they get easily bored. Knowledge has to be available at their fingertips and trends are always changing fast. How does a company stay at the cutting edge and remain competitive?

Lucy: I previously headed up the innovation team in Telecom Italia and that really was an eye opener. As an industry we really tried for a long time to be at the forefront of innovation developing in house or in partnership, digital or IOT based solutions: smart homes, mobile apps, media, financial services, agrifood, automotive, etc. And most of these plays were not very successful for telecom players who were unable to compensate through innovation the decreasing revenues from traditional telecom services.

The lesson learned from telecoms is that big companies should not chase innovation per se, but should focus on innovation that can scale and that responds to customers' demands and can simplify the life of customers.

The pandemic provided examples of practical innovation, such as telehealth and booking vaccinations online. This is just a new way of doing old things, but it's applying innovation to simplify our lives and that's the innovation that big companies should focus on and that will stick and that will provide revenue, leaving the more disruptive innovation to smaller more risk-taking startups.

Nicki: If you're not innovating, you're stagnating or losing ground. A culture that supports new ways of thinking is paramount. When people think of innovation they often just think of startups. That is only one very small part of innovation. In our industry not much of note happens by the amazing work of just one person. And it's not just teams of people within a company, but an ecosystem of different companies, even in different industries, that must come together to do anything of significance or anything at scale.

You can innovate by changing an existing process to make things a little bit more streamlined for customers, saving millions of dollars and increasing customer satisfaction. Those are the types of innovations I get excited about because the other types - moments of genius, for example - are just too few and far between.

In my career I always tried to stay on the cutting edge of technology, even when the cutting edge was copper wires, DSL and ISDN. If you don't have that learning mindset to fuel innovation, you're in for a rough ride because things are changing so, so quickly. For example, generative AI was only really known to a few experts until recently. Now even my mother knows what ChatGPT is. But there are leaders and CEOs in the industry who didn't know what it was. So don't just sit back and lament that the tech is passing you by. Leaning into what is new and exciting is part of the fun of our industry.

Maria: Social media and new apps have provided access to a lot of information about important issues like mental health, caring for the environment, diversity and inclusion and women's empowerment. What other topics do you think will be given attention in the years to come?

Lucy: We are already talking about AI, generative AI and deep fakes. Quantum computing is another topic gaining attention.

An important topic will be the amount of energy used by all this digital technology. For instance, data centres.

They are big warehouses full of servers that support all our digital social networks, online gaming, media and everything. They consume a lot of energy to power the servers but also to keep them cool. In 2018, the energy consumption of data centres in the EU was 76.8 TWh. This is expected to rise to 98.5 TWh by 2030 - a 28% increase.²

The recent European climate commitment estimates that digital technologies account for 8 to 10% of energy consumption. And this is only data centres. AI also consumes massive amounts of energy, about as much as the whole energy of a small country like Ireland according to the New York Times. The application of AI will be restricted until you solve these underlying problems. Similarly for quantum computing which uses massive amounts of energy. In order to ensure the innovative trends around AI,

quantum etc can scale up, we need to address the underlying energy consumption problem.

Nicki: That makes me think about the role that technologists need to play to connect these dots because unless we get like-minded, diverse groups of people together that can actually figure out the energy requirements and come up with solutions, we won't get there.

I'm convinced you can't name a single problem: energy, climate, hunger/food insecurity, international conflicts that technology won't have or shouldn't have a place in helping to solve. But we need to connect the dots so that we can actually realise that potential.

Maria: Let's turn to the question of ethics. To what extent do you consider AI ethics should be a matter for companies rather than the regulator?

Nicki: It's always been both and it always needs to be both. Ultimately, it is up to regulatory bodies, companies, teams, and individuals. You need to think about what integrity means to you personally, what your ethics are, and how you bring that to work. I'm not just talking about "doing the right thing". I'm talking about people who really understand the tech and where it's going, and what ethical challenges are emerging due to this evolution. While companies might be on the front lines of technology, regulators may see what individual companies can't see, like geopolitical issues or the impact on the whole population, not just a particular customer base.

Lucy: It is also a matter of speed as technology evolves very quickly and it's sometimes challenging to understand what kind of ethical dilemmas new technology poses and what positioning to adopt at any point.

I think both companies and regulators believe by and large in adopting ethical solutions and products and procedures. And it's a partnership, we need to work together to meet the expectations of customers.

Sometimes you will have regulators moving forward quicker than companies and so companies will have to adopt what regulators impose on them. And sometimes you will have companies that have a better understanding of what is going on and they will adopt their own principles. For example, the European regulator struggled to define ethical guidelines on AI and most European telco companies adopted AI ethical guidelines within

² https://energy.ec.europa.eu/news/commission-takes-first-step-towards-establishing-eu-wide-scheme-rating-sustainability-data-centres-2023-12-12_en#:~:text=The%20Directive%20identifies%20the%20Information,2030%20%2D%20a%2028%25%20increase.

their own company while waiting for the European guidelines. When dealing with ethics, it doesn't matter who moves first. It's a partnership between all the players.

Maria: When companies are based in different jurisdictions, it might be difficult to address those dilemmas as there are different jurisdictions with different legal approaches. If you are a global company you will still have to establish a corporate policy. Is there anything you can share on managing this?

Nicki: It's tricky... nations are obviously sovereign entities. They have the ability to regulate, depending on the country and the legislative framework. If you're providing products and services in a variety of geographies, it can be very helpful to have employee representatives in those countries. This will provide a deeper knowledge of the regulatory and policy environment than simply managing a global business from one part of the world, for example. When it comes to networks, the most efficient network designs don't necessarily conform to country or state boundaries. Data traverses these networks and has to comply with rules based on where it originated, terminated, and the path it takes along the way.

Designing networks to comply with all the restrictions or regulations in each country is quite a challenge. That's why we need to work together in a partnership to understand the best way to achieve efficient solutions that meet the unique regulatory environments.

Maria: What are your views on governance and corporate responsibility? Are there any examples from your experience that you want to share?

Lucy: In my company we have always had a focus on sustainable development. In 2020 we adopted a core strategy that put sustainable development at the centre of our strategy. And we set out some targets in terms of environmental, social and governance areas and we integrated them into our business plan. It wasn't only storytelling; it was integrated into the operations of the company. We focused on 4 main areas: Environmental Protection, promoting the circular economy and digital growth in Italy. This required a lot of education and strengthening internal governance on sustainable development. Some specific measurable targets were identified and each year we measure our performance against these targets.

Most large companies are rated by ESG certification authorities and the rating can provide feedback on how you are doing around ESG.

Thanks to a very concrete approach, TIM's ratings have improved dramatically over the past years. We've been recognised for this in several reports on sustainable development. It has been a success story also from an internal cultural point of view as employees are much more aware about this issue on a day-to-day basis, which is also very good.

Nicki: I think many companies in our industry have been forward thinking about ESG and sustainability goals. During my time at Verizon, I was always very proud of our climate commitment and our path towards net zero. We issued green bonds that were very successful. And while Verizon's energy use and transition to renewable energy is on a solid path, it's important to always endeavour to do more.

Maria: How would you advise an 18-year-old who is about to start studying at university or start working about choosing their career path?

Nicki: I'm so impressed by this generation. They are so smart, so willing to learn, and so purpose driven. They want to solve big problems and their ability to pick things up is amazing. I know a lot of people are frustrated by what is seen as impatience in this generation and the drive to rapidly climb the corporate ladder. But I really think this generation is absolutely amazing. Those of us that are closer to the tail end of our career than the front end can learn a lot from them.

I have one child recently graduated from college, another in college, and one in high school. So I'm giving this type of advice all the time. I advise that technology must be part of your formal and informal education. I fully understand if tech is not the centrepiece of what you want to do with your life.

No matter what career you desire - technology will make you better at it. It is a part of every industry in every single way and you really can't get by without it. So find a way to stay current with technology, even if you think it's not your jam.

Lucy: I think we're in the middle of what the World Economic Forum calls the cyber physical revolution. Even if you don't want to know about technology you are using a mobile phone so you need to know how to insert a SIM card inside and how to connect it. To use your computer you need to be able to use basic software like Word or Excel.

My key piece of advice to the next generation is to never stop learning.

I studied optical physics and robotics, but I could never have imagined that I would end up in telecommunications. I could never imagine that the mobile revolution would be so pervasive, and I ended up doing things that didn't relate to what I had studied. I think the next generation's experience will be more and more like that. They will study and learn some skills, but then throughout their career they will have to never stop learning.

Maria: I would like to ask you both about how companies should react to regulation of digital technologies. In Europe at present, and probably also in the US, there are massive waves of new tech regulation that needs to be implemented. So how do companies want to be perceived amongst their peers and remembered by society in relation to these regulatory proposals? What kind of actions have you taken in your current positions or in previous roles to make sure that you are seen as a surfer rather than a drifter?

Lucy: It's about adopting a day-to-day approach to new things, rather than one-off decisions. We are facing technical evolution and new dilemmas every day and there's no rule book to guide us, especially as managers within a company that is quickly evolving. We have to make decisions daily and implement new procedures and advocate also for new ways of doing things within our companies, within our teams.

It's more about the values you bring as a manager within your company than one single decision or action you did throughout your career.

Nicki: It's a good strategy to make some time in your schedule for learning. It always seems there's not enough time or there's other priorities that get in the way. But continuous learning is how you surf as opposed to getting crushed by the waves. You know you're going to feel the pressure of those waves, but the only way to rise above is to go with that flow and be willing to learn.

Some people still feel that the executive or the manager is the one that should have all the answers. I think those days are gone and that's why it's a matter of learning from this new generation coming up because they're pretty impressive - so keep your ears open.

Maria: We have a question from the audience: are digitally native companies more able to deal with consumers?

Lucy: I definitely think so because we experience the technology ourselves and we are able to understand them a little bit better. Employees of a telecommunications company are consumers

too, so we are in a better position than other companies to explain the technology we're selling to non-digital natives as well as digital natives.

Nicki: You have to meet customers where they're at. Someone who is a digital native is going to have certain requirements and demands. They're going to speak a certain way. They're going to want to deal with companies that understand that and meet them where they're at. Take the example of paper billing. So many companies have been talking about doing away with paper billing over time for the cost savings and positive impact on the environment. The digital native says - don't send me a paper bill, I might not see it, it might not get paid. They aren't expecting it and don't want it. But there are customers out there who aren't digital natives.

Companies have a responsibility to serve a broader population and have to be mindful of both. It's about understanding the different segments of customers and the unique ways they want to interact with service providers.

Companies that are small and digitally-enabled and native can move fast. The trick for large company leadership is to try to be nimble like a small company while taking advantage of the resources and institutions of an incumbent. It's also one of the reasons why a company like Verizon and others have experimented with sub brands. Verizon has a brand that's called Visible that is 100% digital, with no stores, no paper bills, everything is online and geared towards the digital native. It might not be for everybody, but it is certainly on target for a segment of the population. And so those are the types of things I think that the larger companies need to do to stay relevant to this generation.

Maria: I would love to hear from both of you about your vision about these new trends we'll be facing in the years to come.

Lucy: I'm a fan of innovation and trends that make sense, but I am not a fan of slogans. I'm very practical and pragmatic from that point of view.

Every industry will have to look at the next big thing that works for their own company, there is not one size fits all.

From a telecommunication perspective, it really depends whether you're working in a developing market or a highly developed market. In Italy we have a mobile penetration rate above 95% which means 95 people out of 100 have a mobile connection

including newborn babies and the elderly. We have coverage for most of the population. The pandemic relied heavily on telecommunications and this brought a renewed focus on core services: most of our innovation strategy today is around making things better, using innovation to improve internal procedures. Using AI to help us to better filter out the trouble tickets that come from our network. Using IoT to measure or monitor the longevity of the poles for our telecommunication network. How we use drones for instance, to check our radio base stations up on the pole without having somebody climb up there and risk injury. These are the next very concrete innovations that we're looking into.

Nicki: I couldn't agree more, especially the use of AI for internal operations. I think that is getting missed in the conversation because it's just a very broad topic.

For industry, AI can drive efficiency, provide new insights, and even improve reliability and security if done right.

There are also other technology trends in our industry that have been around for a while but are really starting to heat up. First off, whether you call it mobile edge compute (MEC) or whether you are just changing your topology to have additional resources closer to where customers develop them and need them, MEC is a major trend that is affecting the wireless, landline and satellite industries.

Private networking is also a huge trend. Every company has a digital strategy, whether it's just for their own internal operations, to enable a mobile sales force or to connect with their customers. It is no surprise then that these companies also want more control over their networks and now they're able to do that. Network slicing is also uniquely enabled by 5G. We're at nascent stages here but this is a big trend in the B2B space.

Virtualization is not new but is pervasive now and is partly why some of my recommendations to this generation relate to software - because software will be powering everything. Virtualization is in part of the core network as well as edge elements and the RAN. It's all about skills and talent and how do you really skill up your workforce because these networks are very different from the networks of the past.

In addition to software skills, there's an enhanced requirement for integration expertise since operators are not buying as many purpose built, end to end solutions from infrastructure providers.

The last trend I want to mention is simply spectrum depth. In 2000, when Verizon was formed we had about an average of 50MHz of wireless spectrum in the US. In 2010, 4G LTE total average spectrum depth had doubled to around 100 MHz but 4G was only 20 MHz of that - 10 uplink and 10 downlink. That's it. And now as we enter 2024, that number grows to almost 300MHz average spectrum depth in the US for VZW. So what does that mean?

Greater capability but added complexity - how to ensure the right spectrum is used for the right use case at the right time in the right places. Ultimately, that's the work of mobile operators but it's becoming more complex, there are more integration challenges, and it's certainly more software driven. That's what I see in the future of the mobile industry.

Maria: Thank you both for sharing your experience and insights into the digital generation and the legacy that we in the industry are now passing on to them. You are both an inspiration to us all.

The digital divide

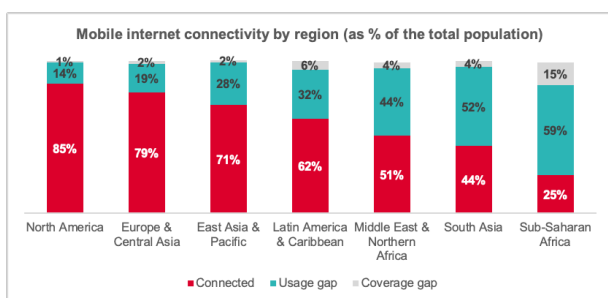
A persistent challenge especially for women

Claire Sibthorpe, Head of Digital Inclusion, M4D, GSMA

As we consider the digital legacy we are leaving to current and future generations, we need to be mindful not only of the immense benefits that broadband and mobile connectivity have brought to the world, but also of the persistent digital divide which remains, and how we can work to overcome it.

Today, more people are connected than ever before using mobile as the primary – and often only – way to access the internet. This is transforming lives and creating unprecedented opportunities to achieve global development objectives. However, GSMA data show a significant digital divide remains, with 3.4 billion people excluded from the benefits of mobile internet. The unconnected are disproportionately women, poorer, less educated and living in rural areas. It is key that we address the barriers they face, to ensure we leave no one behind.

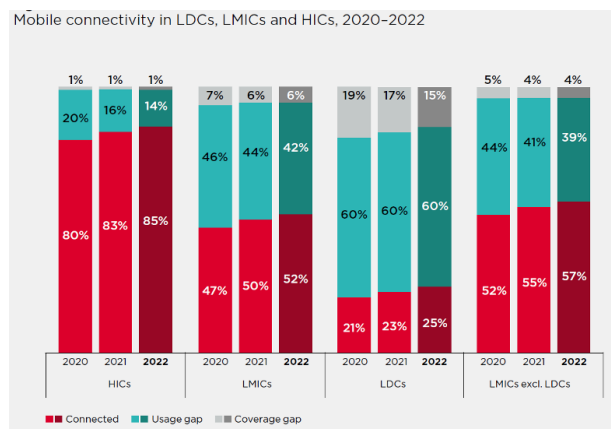
Connectivity varies by region, with 95% of the unconnected living in low- and middle-income countries (LMICs)



Source: GSMA State of Mobile Internet Connectivity Report 2023

Of the unconnected, the vast majority (3 billion people, or 88%) live in areas already covered by mobile broadband, which is referred to as the usage gap¹. The usage gap is largest in Sub-Saharan Africa (59%) and South Asia (52%). There is also a significant difference in uptake between least developed countries (LDCs) and LMICs. In LDCs, only 25% of the population use mobile internet, compared to 52% across LMICs overall and 85% in high income countries (HICs).

¹ GSMA (2023) The State of Mobile Internet Connectivity Report 2023. (<https://www.gsma.com/r/somic/>)



Source: GSMA State of Mobile Internet Connectivity Report 2023

Women are behind at every stage of digital inclusion

Those who remain excluded from the benefits of mobile internet are disproportionately poorer, less educated, rural, persons with disabilities and women. Alarming, women's rate of mobile internet adoption across LMICs slowed for the second year in a row in 2022². Women across these countries are now 19% less likely than men to use it, which translates into 310 million fewer women than men. There is also a 17% gender gap in smartphone ownership and a 28% gender gap in having a mobile money account. Even when connected, women tend to use mobile internet for a narrower range of activities and spend less on mobile services.

Gender gaps in digital and financial inclusion (adults across low- and middle-income countries, 2022)

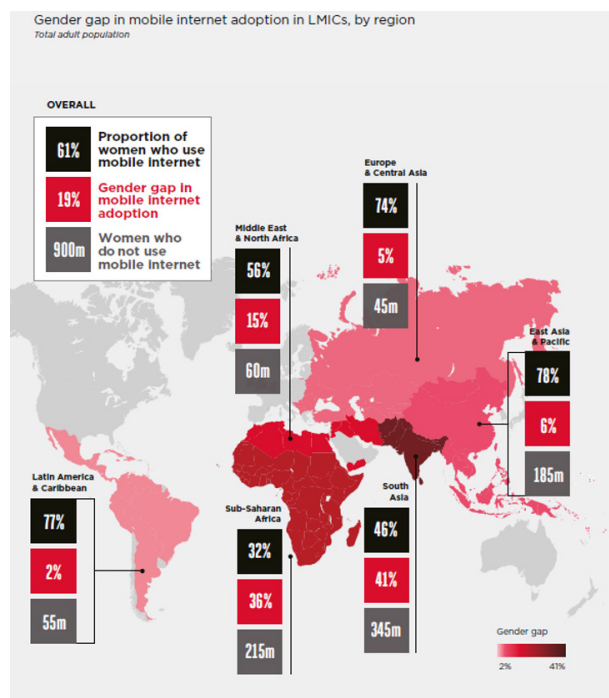


Source: ADB/GSMA blog: Working towards digital and financial inclusion of women in Asia and the Pacific

People in rural areas are also left behind: adults in rural areas are

² GSMA (2023) The Mobile Gender Gap Report 2023. (<https://www.gsma.com/r/gender-gap/#:-:text=The%20Mobile%20Gender%20Gap%20Report%202023&text=Gender%20gaps%20in%20smartphone%20ownership,%25%20and%2017%25%2C%20respectively.>)

29% less likely to use mobile internet than those in urban areas³. Rural women in LMICs are being left behind in particular. Even in countries where there is a small gender gap in mobile internet use overall, in the rural context the gender gap is notable⁴.



Source: GSMA Mobile Gender Gap Report 2023

Reducing the digital divide requires a focus on addressing the barriers to mobile internet adoption

The digital divide is largely characterised by the usage gap. Therefore, governments, the development community, mobile operators and other stakeholders should work together to address the barriers to mobile internet adoption and use, considering the unique circumstances and needs of the underserved, especially women⁵:

- **Affordability:** Ensure more people can afford internet-enabled handsets and data services;
- **Knowledge and Digital Skills:** Increase awareness and understanding of mobile internet and its benefits, and develop digital skills strategies that help people meet their life goals and needs;
- **Safety and Security:** Address safety and security concerns and build user trust;
- **Relevance:** Support the expansion of local digital ecosystems with content, products and services that meet

³ GSMA (2023) The State of Mobile Internet Connectivity Report 2023. (<https://www.gsma.com/r/somic/>)

⁴ GSMA (2023). Rural women have so much to gain from mobile, but are being left behind. (<https://www.gsma.com/mobilefordevelopment/programme/connected-women/rural-women-have-so-much-to-gain-from-mobile-but-are-being-left-behind/>)

⁵ See also Accelerating mobile internet adoption. Policy considerations to bridge the digital divide. (<https://www.gsma.com/mobilefordevelopment/resources/accelerating-mobile-internet-adoption-policy-considerations/>)

user needs and capabilities; and

- **Access:** Increase access to networks and enablers (e.g. electricity, agent networks, formal IDs) and improve the usability of handsets, content and services.

No single stakeholder can solve this challenge on their own. All stakeholders have a role to play and can do more to better measure, understand and address the barriers to digital inclusion to ensure everyone can benefit from an increasingly connected world.



Claire Sibthorpe is Head of Digital Inclusion in the Mobile for Development (M4D) team at GSMA. She leads the Connected Women and Connected Society programmes which are focused on accelerating digital inclusion for the underserved in low- and middle-income countries. Connected Women has a specific focus on accelerating digital and financial inclusion for women. She has been working for over 25 years with public, private and international development organisations on social policy and service delivery with a focus on information and communications technology (ICT) policy and practice.

These factors will influence the development of the global internet

Paul Brodsky, Senior Research Manager at TeleGeography

While artificial intelligence (AI) has been the most hyped demand driver in recent years, its impact on international internet capacity is not entirely clear.

A large amount of AI-driven demand is likely to be carried over the private networks of Google, Microsoft, Amazon, and Meta. Microsoft's infrastructure is also supporting OpenAI, the company behind ChatGPT.

Here are some other factors that will shape how the global internet develops in the coming years

Post-COVID-19 Growth Trajectory

Initial evidence suggests that the spike in the rate of bandwidth and traffic growth in 2020 from the pandemic was a one-time event, and we have largely returned to more traditional rates of growth.

IP Transit Price Erosion

International transport unit costs underlay IP transit pricing. As new international networks are deployed, operational and construction costs are distributed over more fiber pairs and more active capacity, making each packet less expensive to carry. We already see a major shift from 10 GigE requirements to 100 GigE requirements and expect that 400 GigE will emerge in two to three years as a significant part of the market.

The introduction of new international infrastructure also creates opportunities for more regional localization of content and less dependence on distant hubs. As emerging markets grow in scale, they too will benefit from economies of scale, even if only through cheaper transport to internet hubs.

We already see a major shift from 10 GigE requirements to 100 GigE requirements and expect that 400 GigE will emerge in two to three years as a significant part of the market.

International Versus Domestic

While there's little doubt that enhanced end-user access bandwidth and new applications will create large traffic flows, the challenge for operators will be to understand how much of this growth will require the use of international links.

In the near-term, the increased reliance on direct connections to content providers and the use of caching will continue to have a localizing effect on traffic patterns and dampen international internet traffic growth.

Bypassing the Public Internet

The largest content providers have long operated massive networks. These companies continue to experience more rapid growth than internet backbones, and they are expanding into new locations.

Many other companies, such as cloud service providers, CDNs, and even some data center operators, are also building their own private backbones that bypass the public internet. As a result, a rising share of international traffic may be carried by these networks.



Submarine Cable Map 2023

In our IP Networks Research Service¹, we analyze the meaning of our robust internet capacity and traffic data sets. We also discuss factors impacting IP transit pricing and the role individual backbone operators play.

Download the 2023 Executive Summary² to keep reading our latest analysis.

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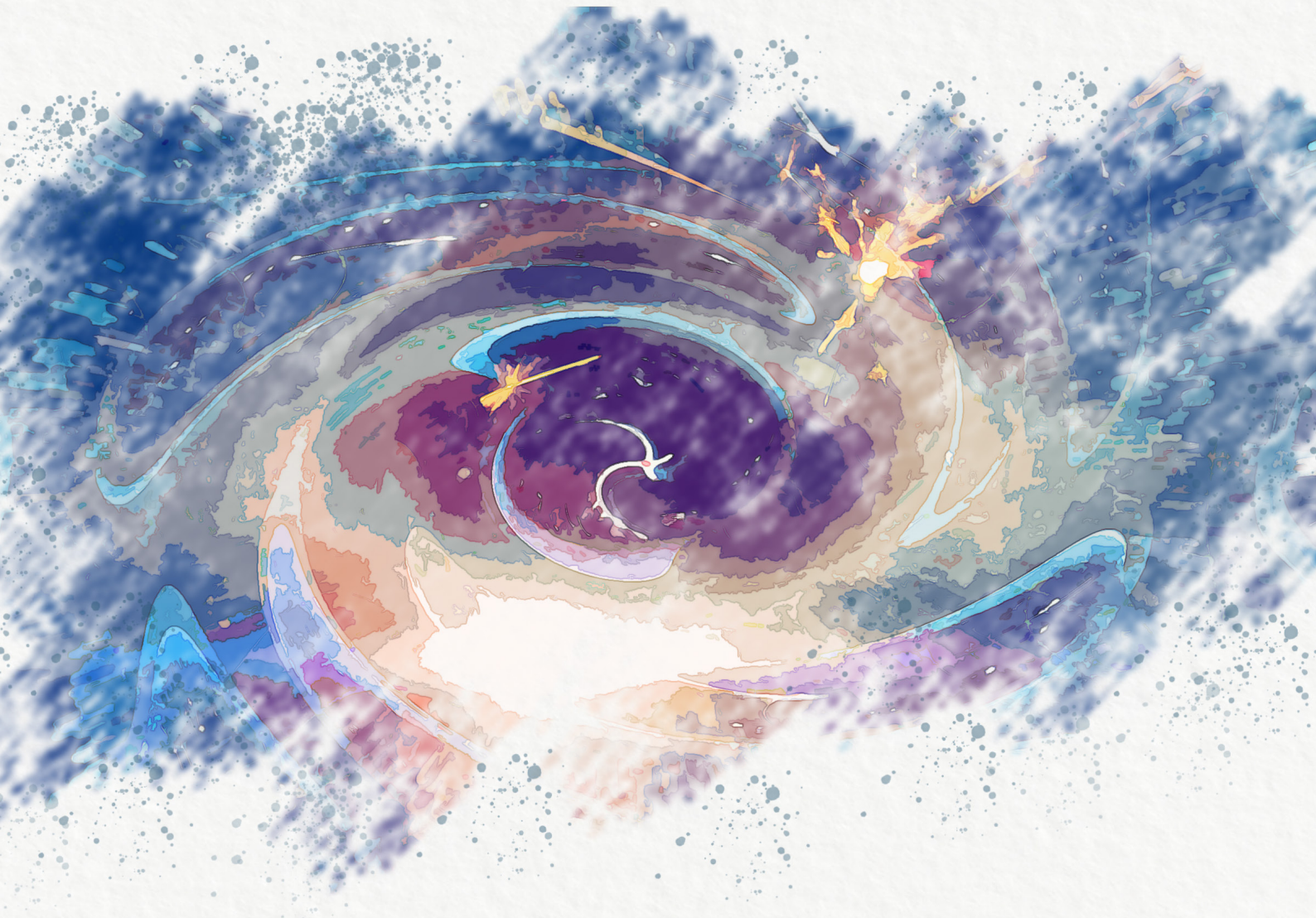
Paul Brodsky is a Senior Research Manager at TeleGeography. He is part of the network, internet, cloud, and voice research team. His regional expertise includes Europe, Africa, and the Middle East.

1 <https://www2.telegeography.com/global-internet-geography?hsLang=es>

2 <https://www2.telegeography.com/download-the-global-internet-geography-executive-summary>

3 <https://www2.telegeography.com/>

DIGITAL FRONTIERS



Fireside chat Perspectives on AI

Dóra Petrányi, CEE Managing Director and Co-Head of the TMC Group, CMS
Francesca Rossi, IBM Fellow and AI Ethics Global Leader

The following is an edited transcript of a GTWN/CMS webinar on AI which took place on 8 November 2023¹.

Dóra: AI is a very hot topic nowadays. Francesca, could you start with an update on what you see as the current highlights concerning AI and some of the AI related work you have been involved in recently.

Francesca: IBM delivers technology to many corporate and government clients. Over the past year the priority for IBM has been to understand how to use generative AI for our clients and for many kinds of applications. We have been in close discussion with our clients to understand what can be useful to them in using generative AI for their internal operations and services.

The increasing attention on generative AI resulted in the building of an IBM large language model (LLM) as well as Watson X, which is a platform that can be used with any LLM to build an AI solution. We have also been doing a lot of work in evolving our AI ethics framework to account for the expanding number of new risks that generative AI and LLMs create, including misinformation, deep fakes and hallucinations. These new risks are in addition to the well-known AI risks like fairness, explainability, transparency, privacy, etc. These new risks have developed because of the ability of generative AI to create its own content.

I've also been working with some multi-stakeholder organisations like the OECD. Yesterday, for example, there was a meeting of the OECD AI Network of Experts which tries to envision what the future could be with AI by building a taxonomy of the risks and the benefits of AI along different dimensions. For example, we consider how important each risk or benefit is and how easy it would be to mitigate those risks or to achieve those benefits.

Recently I also participated in a high-level meeting on AI safety. There is increasing attention on the additional safety risks as AI models develop more and more capabilities. The UK AI Safety Summit² was held on 1-2 November, a day after the US

Administration published an Executive Order from President Biden about AI safety³. Until recently these risks were not being considered at the highest policy level, but now they are being given such a high level of scrutiny, they may bring about an evolution of AI frameworks, from companies, regulators and civil society.

Dóra: I know that you also attended a very special visit to the Vatican in early 2023, related to the renewal of the Rome Call for AI Ethics. Can you tell us more about this very special visit?

Francesca: The Rome Call for AI Ethics⁴ is a document that was initially published by the Pontifical Academy for Life in February 2020, just before the covid pandemic started in Rome. And it's a document that includes several principles that should be used and values that should be considered when building and using AI, including human centeredness or digital inclusion, so that nobody is left behind, and that AI is developed responsibly.

But at the beginning, in February 2020, it was signed by only two companies, Microsoft and IBM, as well as some other Institutions like the European Parliament and the Italian Parliament. Two and a half years later, in January 2023, we went back to Rome and this time we met with the Pope, who gave a 10 minute speech on AI ethics and the value of using and building AI in a way that is centred around human beings and humanity. This was a very historic occasion because the Rome Call was signed by the three Abrahamic religions, Judaism, Christianity and Islam. I think it was the first time that these three religions signed a document concerning the right approach to a technology.

IBM and Microsoft renewed their commitment and we described what we have been doing around those values and those principles in the intervening three years and what we plan to do in the future.

Dóra: AI has been with us for some time and you've been researching it for many years. But with degenerative AI tools

¹ This transcript was prepared with the aid of an AI transcription tool and edited by Vicki MacLeod

² <https://www.gov.uk/government/topical-events/ai-safety-summit-2023>

³ <https://www.whitehouse.gov/briefing-room/presidential-actions/2023/10/30/executive-order-on-the-safe-secure-and-trustworthy-development-and-use-of-artificial-intelligence/>

⁴ https://www.vatican.va/roman_curia/pontifical_academies/acdlife/documents/rc_pont-acd_life_doc_20202228_rome-call-for-ai-ethics_en.pdf

especially, I think it's fair to say that what used to be more niche and for experts only is now centre stage. I find it fascinating that the Pope did the Rome Call three years ago, before there was such global interest in AI. This shows how forward thinking the Vatican actually is, and that the emphasis on human centred use of technology is extremely important when we talk about AI.

New AI risks

Dóra: I think it's fair to say that many of the early discussions on the risks of AI and AI ethics were addressing the old concerns regarding bias, discrimination and transparency. There is now a new wave of concerns as well about truth, about data accuracy, and about security and safety, just to mention a few.

Francesca: The fact that these models have the capability to generate content expands some of the well-known risks that we were considering earlier with the more traditional AI approaches. For example, bias can occur not just in the decisions made by classifiers or predictive models, it can also be in the actual content that is generated - in the pictures and in the text. Explainability was already challenging with traditional machine learning approaches. Now it's even more of a challenge since generative AI is based on unsupervised learning rather than supervised learning with humans labelling the data and the examples in the training data. These models generate their own content, the provenance of which is not easy to trace. If a LLM generates a piece of text, it is not easy to trace where this came from.

There are also new issues such as the phenomenon of so-called 'hallucinations' where the model can generate content that is not true, but it looks very plausible. It can generate content that is not true even if everything in the training data is true and correct, because of the way it combines different elements of the training data.

It is important to remember that these systems are not built to distinguish truth from false content. They are built to generate one word after the other one, in the case of a LLM, or one pixel after the other, in the case of text to image models. Every word is just the most probable word given the context and given the words that have been generated so far. This is all they are trained to do well, and they can master natural language very well in this way. But it doesn't mean that they have a perfect model of the world which would generate only true and correct content.

Dóra: From a legal perspective, it's very interesting for me to see how different authorities are taking different approaches when it comes to protecting users. To raise the awareness about, for example, hallucinations and about the limitations of the current models.

Francesca: True. And we must not forget there is also the complex issue of copyright. There could be copyright in the

training data used by the LLM to create its own content. But the actual generation does not trace back to the source and does not mention that what is generated comes from copyrighted information in the training data. Further, if the input contains confidential information, like proprietary code for example, and this is put in the prompt, then this could be used to retrain the system and therefore could be used and generated by other users. In this case it's no longer protected, as it's shared with others where it should not be shared. That happens because people may not be aware of what could be done with the data that they write in the prompt.

Different cultures, different approaches to AI

Dóra: I also think it's important to see that this is a global issue. You mentioned the UK Safety Summit, which is a perfect example, where 28 nations signed the Bletchley Declaration. There are so many cultural and societal differences in our world. When it comes to AI and the use of AI and the feeding of AI with big data inputs, we need to be very mindful of these differences. It is very encouraging to see that there seems to be emerging global consensus about the overriding principles like safety and human centeredness, just to highlight a couple.

Francesca: For the first time, China was at the table at the UK AI Safety Summit in a discussion about AI ethics and safety and signed this declaration together with the other countries. While this is a very encouraging first step, the agreement on some principles does not mean, and it is reasonable that it is so, that the same laws or the same approach will be used everywhere. Because these countries have different cultures where different values are prioritised over others. This implies that there are different priorities among the values to be embedded into AI, such as the importance given to individual privacy versus societal harmony.

We all have completely different legal systems, meaning not just China but also the US and the European Union. We've already seen these differences emerge in the approaches to regulating AI. In Europe we have the draft European AI Act that is very close to being approved and is a law that will be applied to all the member states. In the US the President's Executive Order is not the law, it just directs the various federal agencies how to work on AI implementation with a view to possible laws in the future. In the US there has not been a uniform approach, with laws relating to the use of AI being passed in individual states or even in cities, including the city of New York.

In Europe we have the example of the GDPR for protecting privacy. The US does not have anything similar, so we cannot expect that an approach to AI will be completely uniform at every level. But there should at least be some discussion about the main principles which should apply to this technology when we build it and when we use it. These principles should come

from society as a whole. It should not be a matter for individual companies to decide what principles and what values should be embedded in AI.

Dóra: These cultural differences also define the role of regulation. As a lawyer, I am always fascinated how different parts of the world take totally different approaches to the same issue. I've always worked in technology and innovative areas of law and probably this is the reason why I like regulation which is the least intrusive and at the same time provides enough regulatory certainty for all the parties involved. And that not only includes those who are developers, and those taking innovative approaches to issues, but also the potential users of these new technologies.

This is a very similar challenge to what we saw with GDPR in Europe, which provides a single approach to privacy across the European Union. But the EU is still only one relatively small part of the world, especially in terms of population. What we have learnt from the development of the GDPR is that AI will affect the competitiveness of European business and the traditional European values, especially the right to privacy. Given that AI is very much data centred and data focused – let me stress that this is at the moment - we can see a very similar approach to AI regulation as that taken in the draft European Data Act. We see a risk-based approach, which I very much welcome. But even with these similar approaches, when you look at the definitions, there are still so many questions yet to be answered.

And when you think about the world beyond Europe, in the US, Africa or China, we can see how governments will potentially be approaching the very same questions differently. It might well be the case that rushing to regulate AI in these various jurisdictions could cause harm to those who want to do business there, while also not necessarily protecting the values that you would want to see protected.

The scope and timing of AI regulation

Dóra: I have read many of your articles and speeches on AI and totally agree with you that less is more when we are considering regulation of new technologies. I always caution against over-regulation. It's very important to properly educate users and set or confirm some basic rules, especially about risks, risk awareness, reliability and safety. These are included in the draft AI Act and I very much back that approach. Can I ask for your thoughts on regulation and the role of regulation where AI is concerned?

Francesca: I think some regulation is needed, but of course it should be done in a way that addresses the real risks and does not impact innovation and competitiveness of individual countries, where the regulation is being applied to a whole region, such as in the case of the European AI Act. I also prefer a risk-based approach, in other words imposing more obligations

on areas where there is more risk. If there is low or no risk, I'm not going to impose many rules. Only when you know how you're going to use AI can you understand whether it is high risk or not. I therefore prefer an approach where risk is associated with the uses of AI and not with the technology itself. It makes sense to focus on the use cases.

The draft AI Act lists a number of high-risk AI applications, including those related to transport, education, employment and welfare, among others. Before putting a high-risk AI system on the market, or in a service in the EU, companies must conduct a prior "conformity assessment" and meet a long list of requirements to ensure that the system is safe.

However, there is a growing push to move upstream from the use cases to the technology, especially with regard to LLMs and the more open-ended models that can be used in many different ways. Some proposed amendments to the draft AI Act are based on the view that if the technology can be used in high-risk ways, then it's high risk and should be put under all the obligations relating to high risk use cases. I think this would be a big mistake because it would really stop innovation. If these proposals are adopted, then companies in Europe, especially small companies, would not use LLMs, especially in low-risk applications, because then they would have to abide by all of the obligations that apply to high risk scenarios. I would rather focus on the AI system, in other words the specific purpose for which the technology is to be used and not the AI per se.

Another reason not to focus on the technology per se, is that the approach is not very future proof, especially where the technology is evolving very rapidly. In two years there will be another form of AI or evolution of the technology that you're not covering in the regulation. So you should focus on the actual uses of the technology, as the initial draft did. It mimicked product-based regulation that focuses on the product itself, rather than on the pieces that you use to build the product, to assess the level of risk.

Dóra: I totally agree with you that we should take that approach. To me the biggest challenge is that we don't know what's going to happen in two years' time. But what we know for sure is that AI will be at a totally different stage than it is now. We have just started to see the potential of these LLMs and foundation models, so we need to allow for many other use cases.

When we consider how fast things are changing, we also need to consider that even if we had the AI Act agreed in Europe this year, it would only enter into force in two years' time. AI developers need that amount of lead time to prepare. This is why you should be very, very careful when you pick the topics to regulate, or you could end up regulating something in a very niche form which no longer exists or is easy to circumvent. Technology in my view is always at least 2-3 years ahead of the law and that is why we need to use our common sense. We need to go back to ancient,

basic legal principles that I believe are very important to cherish and to protect when it comes to technology.

Francesca: Some people think we need AI regulation because there are no rules, but this is not true. For example, IBM has a lot of clients in the financial sector, which is very heavily regulated. The healthcare sector is also very heavily regulated whether you use AI or not. So another possible approach would be to adapt these sector-based regulations to the application of AI in those areas.

Dóra: One of the key challenges for sectoral regulation might be that all the sectors would take a common denominator like the overall regulation and then start deriving their own sector specific applications from it. As you say, highly regulated industries already have a highly regulated environment around them and actually many of the existing rules do provide protection against abusive AI use cases which would to a certain extent intersect with the main principles applying to that industry. That could actually help address the global challenge, that is how to introduce any regulation nationally or regionally when these questions are global and applications are available globally.

The role of market forces

Dóra: If regulation is only part of the answer to the challenges of AI, what else do you think we can do to enable the best of AI while mitigating the risks around it?

Francesca: Some regulation is needed, if it is done well, but it is just one ingredient of many complementary mechanisms, to ensure that the technology is used in the right way. Companies have a part to play in terms of their internal processes such as auditing and internal governance. There is also a role for international standards bodies, which have shown themselves to be very useful in creating some harmonisation and even forcing companies to do something in a certain way.

Market forces will also have an impact on our clients, who are usually in very regulated environments. They ask us to provide assurance that our technology has the right properties, will be deployed in an inclusive way, and that the user is educated enough to use that technology in the appropriate way. Any team who is developing a use case always comes to the AI Ethics Board to get a review before a deal can be signed with the client.

Companies also have a role to play in educating themselves, their clients and their partners, in AI best practice. The technology is moving very fast, and the companies can evolve much faster if they focus on their internal processes, than they could under regulation.

Culture change is needed

Dóra: One of the challenges is that bigger entities with lots and lots of resources are able to set up an ethics board to set up the rules and the principles. They can lead by example by actually showing how this is done. Microsoft and IBM are often mentioned as the two leaders in this sense. On the other hand, what happens if we are talking about a smaller entity in fast startup mode. This is when it can become extremely challenging.

Francesca: I agree because you need to put together a lot of separate elements, and technology is the easiest one. The most difficult part is really to understand how to build and use it in a responsible way. That requires more than just testing the technology. It also requires a lot of internal culture change. So building a playbook and building the tools was just the first step.

When we started doing bias testing, some of our developers could not really understand what we meant by bias. Some said that in their model there were no protected variables, so there are no features that relate to people, so there can't be any bias in the model. They were not aware that there could be proxies like zip codes or others that are highly correlated with a protected variable. You can have bias and you can create discrimination within your model even if there is no feature corresponding to human beings. We needed to help these developers change their culture and their point of view, educate them and also help them understand that they could not just talk amongst themselves as technologists, but they as needed to consult with other people, who could help them understand the societal impact of what they were doing.

Ethics create value

Francesca: Companies need to understand that investment in AI ethics, including the tools and the time it takes to do the tests, will improve the business outcome and also the value to the client. At first it may seem like an ethics review is slowing down the ability to deliver the technology. This is a challenge that we have even seen internally at IBM, when Teams were initially reluctant to have their models reviewed by the Ethics Board. But they saw we added value and that it is also a business differentiator to be able to demonstrate you are anticipating the European AI legislation by developing and delivering technology that is done in the right way.

Further, the work that large companies like IBM and others have done in AI ethics has resulted in experience that can also be useful to small companies who don't have to go through what we went through over several years. At first we didn't have this type of board, we had a discussion group, then we had an Advisory Board and then we had the decision making board. Smaller companies can accelerate their understanding and apply this approach immediately.

A multi-disciplinary approach

Francesca: It is so important to have a form of education which is much more multidisciplinary than we have now. For example, in Italy the university system is very siloed. If you study computer science, you study only computer science and you learn nothing about sociology, philosophy, psychology and so on. You don't have to become a philosopher or a sociologist, but you should be able to understand the possible impact of what you're studying and the technology that you are building. I still don't see that multi-disciplinarity in Italy. When you want a career in academia, if you start being multi-disciplinary, your results may suffer because you may not be able to demonstrate sufficient study in certain areas. Universities don't evaluate your study as a whole. Culture and multi-disciplinarity are important and the first step is to understand this and to adapt courses accordingly.

Dóra: We also need much greater digital literacy in the population generally. Europe is still lagging behind other regions. Education about digital issues is also very important, not just for youngsters but also for the generations who did not grow up as digital natives. This is probably the biggest challenge, because they might not understand the risks like the younger generations. They might not know how their data is being used or might not care as much about putting their data into their devices.

Fast versus slow thinking

Dóra: We are at a very interesting crossroads or milestone of the evolution of the AI, because we can see what the technology can do and now we are waiting to see the full potential, which is still far, far away. There are some people who see this future in terms of doomsday scenarios, like the end of humanity or the end of all jobs for humans. I'm a natural born optimist, so I'd like to think they're all wrong and actually this is just a better way to do things and to drive benefit for mankind, if we use it well. This leads me to an issue that you have written about, and that is the difference between fast and slow thinking, and what this might mean for the future of AI.

Francesca: The technology right now is very useful for many different applications. But it has a lot of limitations and raises a lot of issues because of these limitations. This is because LLMs don't distinguish between true and false.

In some scenarios it is very important to make sure that what you get from an AI is true because otherwise the whole thing, even the legal system, will be disrupted. Developers are trying to prevent the generation of hallucinated or abusive content by using some techniques that are in the pipeline, but these approaches are still very primitive. After you build a LLM and it has been trained on the training data, you can use techniques like reinforcement learning, trying to prevent it generating content that you don't want. This is a type of patch which corrects the problem, but it

doesn't resolve the issue. There are ways to bypass this patch by carefully crafting a prompt that generates unwanted content.

It would be definitely much better to have guidelines embedded into the system when you train it on the data so that it only learns to behave in the correct way. We are not there yet. This leads me on to my research into *fast and slow* AI that my research project is about, where we try to get inspiration from how humans think and behave to extrapolate some principles.

Humans have two broad modalities of reasoning. One is *fast thinking*, which means almost unconscious decision-making that we use every day for things that we don't need to think too deeply about. The second one is *slow thinking* for things that require all our attention and all of our conscious cognition to solve the problem. We know how to combine and switch between one and the other type of thinking.

An example is learning to drive a car or riding a bicycle. When we start to learn we use slow thinking, to learn each complicated step deliberately and safely, but then after a while we switch to fast thinking and we do it almost unconsciously. We know how to combine the two types of thinking to acquire information and knowledge from the world, transform it into knowledge that then use to make conscious decisions.

Current AI just learns from data. It acquires information from implicit knowledge, the knowledge that is embedded in the data, and then it tries to derive something to demonstrate the behaviour that reflects what has been learned from the data. But this is all implicit knowledge. It is not yet at the stage of explicit knowledge or slow thinking.

I and many others think that we need to remove some of the limitations on AI that generate some of the risks. There are many different approaches that are being tried. Our project aims to get inspired by these cognitive theories on how humans make decisions and how humans self-regulate. For example, maybe using my fast thinking I want to eat a whole jar of cookies. But my slow thinking tells me that my doctor has told me not to. This is how we self-regulate according to some values or for some other reason. There are many approaches that are trying to embed these capabilities into an AI model, rather than trying to patch and correct the behaviour afterwards.

Focus on humanity

Dóra: This is where I believe it will be even more important to acknowledge the cultural differences and the societal differences across the globe. I really like UNESCO's approach to AI. On the UNESCO homepage⁵, you'll find a lot of publications, announcements and notices on AI, especially on education and ethics.

5 <https://www.unesco.org/en/artificial-intelligence>

As I understand it, slow thinking methods relate to your routines, your everyday behaviours. If you want to teach the AI to adopt this slow thinking mode, you will have to teach them, probably, in different ways, in different cultural contexts, in different countries. AI is not just a technology issue but also a cultural, societal and educational one. Can you share any actions or initiatives which demonstrate this type of approach?

Francesca: IBM is a founding member of the Partnership on AI⁶, which has about 100 members now, of which only 20 are companies. The other stakeholders are universities, research labs, civil society organisations. You need to not only have different mechanisms but also different people involved in designing the right mechanism to drive the technology in the right direction. The Partnership on AI, in this multi-stakeholder way, recently released the guidance for a foundation model deployment which addressed many of the issues that we have been talking about – what to do while developing and deploying AI and even post deployment. This guidance covers technology, social consultation, regulation and many other things. This shows that these organisations understand that these are social and technical issues that need both social and technical solutions.

Dóra: Let us close with a technical question. Do you think future AI safety can be addressed using kill switches?

Francesca: To terminate an AI in this way you would embed something in the software or even in the hardware that cannot be removed by anybody. But you need more than a kill switch, what is needed is a very well-designed risk management framework. This is done also in many other technologies like in cybersecurity for example. Nobody can assure you that things are 100% safe, but you have to mitigate the risk with a risk management framework. So I am not sure that a kill switch is feasible, in the hardware or software. It also runs counter to the idea of open source, which I support. I would rather see other mechanisms to address the risks, especially those that focus on our humanity.

If we focus on our humanity as we create our technologies, our potential is unlimited because the ultimate goal is not to improve AI but to improve us as human beings through the advancement of AI.



Dóra Petrányi is a partner and CEE Managing Director at CMS and Co-Head of the Technology, Media and Communications Group (TMC). Dóra is the Co-Chairman of the Regulatory & Ethics Committee of the Hungarian AI Coalition and has assisted the Hungarian Ministry of Justice in providing comments and formulating a legal position in relation to the EU's draft AI Liability Directive and the EU's draft AI Act. She has also advised a wide range of clients on AI-related issues.



Francesca Rossi is an IBM Fellow and the IBM AI Ethics Global Leader. She is based at the T.J. Watson IBM Research Lab, New York, USA, where she leads research projects and she co-chairs the IBM AI Ethics board. Her research interests focus on artificial intelligence, with special focus on constraint reasoning, preferences, multi-agent systems, computational social choice, neuro-symbolic AI, cognitive architectures and value alignment. On these topics, she has published over 220 scientific articles in journals and conference proceedings, and as book chapters. She is a fellow of both the worldwide association of AI (AAAI) and the European one (EurAI). She has been president of IJCAI (International Joint Conference on AI). She is a member of the scientific advisory board of the Future of Life Institute, the board of the Partnership on AI, the steering committee of the Global Partnership on AI, and she chaired the 2023 AAAI/ACM Conference on AI, Ethics, and Society. She also co-chairs the OECD Expert Group on AI Futures and she has been a member of the European Commission High Level Expert Group on AI. She is the current president of AAAI.

6 <https://partnershiponai.org/>

Navigating the digital regulation tsunami

María González Gordon, Head of Intellectual Property, Industrial Property and Digital Business at CMS Albiñana & Suárez de Lezo

Watch out: Businesses all around the world are facing a Digital Regulation Tsunami!



There are significant global developments in digital media policy and regulation which all companies urgently need to learn how to navigate successfully.

In the context of the European Parliament's initiative 'A Europe fit for the digital age', the European Commission is carrying out an important legislative exercise by setting forth regulations to address the evolving digital landscape, marking a paradigm shift in regulatory frameworks. This is what I like to refer to as the 'Digital Regulation Tsunami'.

A whole set of recent and upcoming regulations and directives is being promoted by the European Union, to respond to the challenges of the digital era. All eyes are now on the European Union regulator, on the lookout for every new wave of regulation. Many companies, however, seem to be unaware of how to surf and master this 'Digital Regulation Tsunami'.

This expanding regulatory landscape has driven the creation of over 80 EU-level regulations. Examples of this legislative effort include:

- the Digital Services Act (DSA), aiming to create a safer digital space where the fundamental rights of users are protected and to establish a level playing field for businesses;
- the Digital Markets Act (DMA), which is a useful tool to comprehensively regulate the power of gatekeepers;
- the NIS 2 Directive, which aims to provide a harmonised framework for cybersecurity risk management; and
- the Data Act, seeking to make more data available and facilitate data sharing across sectors.

There is also a large pipeline of regulatory proposals currently under review:

- The AI Act, trying to ensure better conditions for the development and use of AI, while ensuring the protection

- of AI users through a risk-classification of AI systems;
- the Gigabit Infrastructure Act, which is expected to introduce measures to reduce the cost of deploying gigabit electronic communications networks; and
- the European Media Freedom Act, which establishes a common framework for media services in the internal market.

CMS conducted a survey amongst 450 General Counsels based in the European Union and the UK from a wide range of business perspectives for a better understanding of their position in terms of awareness, concerns, commercial threats, and commercial advantages they foresee. The results show that even if companies recognise what is at stake, they don't seem to be acting upon it effectively.

Now is the time to act

It is necessary for businesses to assess the impact of digital regulation. In fact, over three quarters of the survey respondents agree that the ability to adapt to regulation will determine who succeeds in digital business in the next five years. Moreover, businesses know they can't wait: 73% agree that acting quickly on new regulation is essential to keeping pace with digital innovation. However, only 36% have revised their digital transformation plans, despite looming deadlines. And falling behind schedule is not an option.

The findings of our survey also unveil a less-than-ideal approach adopted by businesses. A clear indication of this is the fact that only 9% consider non-personal data (NPD) to be 'highly' strategic to their business. This surprising figure underscores a concerning trend where 91% may be overlooking the profound implications of the EU's non-personal data strategy—a strategy laying the groundwork for a new era in the data economy. The NPD regulations' objective is to level the playing field and provide greater access to data across all sized business in fair, reasonable and non-discriminatory terms, providing efficiencies and a more competitive landscape. In an era where data is universally acknowledged as a strategic asset, its pivotal role across sectors cannot be overstated. Consequently, businesses that fail to grasp the significance of NPD may find themselves grappling with adverse consequences as the regulatory landscape evolves.

Risks of AI regulation

When it comes to AI, the chief commercial threat suggested by the respondents of our survey is the reduced ability of business to compete compared to Big Tech. Most companies expect the AI Act to have legal or compliance implications for their companies. Specifically, increased complexity of contracts and risk of litigation is feared by most of the businesses. Although commercial and legal risks of AI adoption can be greatly reduced by taking appropriate prevention measures, a lot of companies

still fail to understand the risks that this regulation poses and, even more, to implement a plan to ensure compliance with this new and intricate AI regulation.

Heads up for all in-house counsel: you should be drawing up plans for compliant AI adoption, so your business has the confidence to innovate ahead of your competitors.

It is also significant that 78% expect to have moderate or significant legal implications in relation to digital platform regulation, such as increased technology/operational costs to ensure compliance. A particular compliance concern surrounding this regulation area is how to determine what constitutes a platform, especially in the context of large online services. In some cases, businesses may be operating as a platform without knowing it, exposing them to the risk of regulatory penalties. It seems that a clearer answer to this question might be now falling into place. If in-house counsels have not yet assessed its impact on their organisations, now is the time to do so.

Cyber security as a strategic asset

Moreover, a notable 40% express concerns that adherence to cyber safety regulations may stifle innovation. It is surprising that a significant proportion of senior in-house legal counsel seem not to be aware that security can help unlock technology adoption. In the contemporary business landscape, where market dynamics emphasize a fervent appetite for innovation, technological solutions, and creations fortified by robust cyber safety protocols, it becomes imperative for industry leaders to acknowledge the inherent synergy between these elements. Companies that are not prepared to deliver distinctive products coupled with a comprehensive cyber safety package, don't stand a chance, not only to meet market expectations but also to drive substantial demand.

Compliance with these regulations becomes imperative, and understanding their nuances can also yield strategic advantages. The most widely anticipated opportunities are the ability to develop a long-term technology strategy, an increased ability to disrupt competitors and the possibility to enable new products and services. As we navigate this intricate regulatory landscape, it is our role to ensure that our clients are not only aware of the regulations, but also positioned to leverage them to their benefit. Careful and strategic preparation will ensure that businesses can predict and mitigate compliance costs, minimize risks, and identify and capture the opportunities that this regulation presents. Companies that recognise this opportunity, and act upon it, will be the ones that thrive in the coming decade.

A global regulatory tsunami

The ‘Digital Regulation Tsunami’ goes beyond companies located in the European Union, or companies focused on core digital activities. Every client is inherently a digital client. This assertion holds true because a client’s core business may be inherently tech/digital, or they may engage in tech/digital projects and businesses—selling products online, offering content to third parties, or collecting data. Additionally, clients may embark on AI projects or integrate AI into their daily operations and would therefore need legal advice.

For instance, a company engaged in a project involving AI and data, even if their core business is unrelated, can benefit by understanding the regulations that impact their project by assessing the proposals for the Artificial Intelligence Liability Directive (AILD) or the Artificial Intelligence Act. A food company, for example, involved in an AI and data project for production processes could potentially benefit from implementing the Data Act allowing cloud users to seamlessly switch between servers, showcasing how regulatory insights can inform strategic business decisions.

Therefore, the ‘Digital Regulation Tsunami’ will not only affect tech/digital-centric businesses, but a wide array of industries, especially those in Business Advisory and Financial Services (BAF), Energy, and Technology, Media, and Communications (TMC). Professional legal advice therefore becomes an invaluable asset for any client seeking clarity and strategic advantage in the complex digital regulatory landscape.

The expected impact of this new regulatory framework will definitely be global. It is therefore vital, not only for EU citizens, but also foreign players and companies anchored in traditional industries and sectors to, first, catch up with digital regulations, and second, align their operations with EU standards to be able to maintain their EU market share.

The European Commission intends to establish comprehensive standards for companies both within and also outside the EU to precisely transform the digital business regulatory landscape on a global scale. Every business that has contact with the EU must comply with these set of regulations, irrespective of whether it is because they are based in the EU, or because they target the EU market. As international businesses tend to align with the strictest regulatory standards, EU rules often become global standards. And, by doing so, positioning the EU as a competitive force against the US and Asia. In fact, the EU digital business regulatory framework might help to create a level playing field, resulting in greater competitiveness for companies established in the EU.

With the General Data Protection Regulation (GDPR), the EU has already shown that it is capable of setting new standards that shape global markets. After that example, it seems that the

Commission decided to mirror the experience with the GDPR, where the establishment of benchmarks catalysed a global ripple effect. Considering the Commission’s latest moves, the AI Act might become the next regulation causing a domino effect worldwide.

Navigating the tsunami: be proactive

Whether companies view this regulatory tsunami as an opportunity or as a threat, they need to learn to skilfully navigate this new environment to survive and, even better, leverage it as early movers. Many companies all over the world have already started to adapt their businesses, motivated either by a positive desire to be ahead of their rivals, as a result of fear of the impact of the new EU regulations, so that they can continue to offer their services and products in the internal market.

Companies can use a first-mover strategic advantage by being an early implementer and master of these legal frameworks. It transcends mere compliance; it is about identifying the benefits and seizing the opportunities inherent in this evolving regulatory landscape. The key is to transition from a stance of strict compliance to a proactive approach that identifies and capitalizes on business opportunities.

For instance, businesses can explore the opportunity of acquiring industrial data access from competitors, following the FRAND standard (fair, reasonable and non-discriminatory data access conditions), under the Data Services Act and other EU legislation. The flexibility to switch between different cloud data-processing service providers and putting in place safeguards against unlawful data transfer (portability and standard setting) is another advantageous aspect. Companies can also benefit from mitigating their liability in relation to third-party content hosted on their websites and marketplaces thanks to the DSA. Furthermore, these regulations offer the prospect of avoiding the use of payment mechanisms within app stores, allowing businesses to use their own payment methods and retain a significant portion, up to 30%, of their revenues. Navigating these regulations strategically allows businesses not only to comply with them, but also to proactively leverage the opportunities they present, thereby gaining a competitive edge in the dynamic digital landscape.

This ‘Digital Regulation tsunami’ will create an immense business potential, if it is understood and companies receive the correct guidance on how to adapt to it. Nevertheless, as with any transformative shift, challenges will still emerge. Clients may grapple with the complexity of understanding and implementing these regulations, requiring comprehensive legal guidance to navigate potential pitfalls. The rapid evolution of the digital environment requires continuous adaptation, making it crucial for businesses to stay informed and agile. The role lawyers play is therefore pivotal in assisting clients in deciphering the intricacies of these regulations, ensuring compliance, and strategically

leveraging them to foster growth and innovation by mastering these regulations.

All businesses who are adrift amongst the challenges of the 'Digital Regulation Tsunami' need to seek expert help and guidance to surf the choppy waters and identify the business opportunities that lie amongst these regulatory waves!



María González Gordon heads up the Industrial/Intellectual Property & Digital Business department at CMS. She specialises in advising domestic and international companies on intellectual property, industrial property, copyright and technology, particularly in dispute resolution. She is expert in the drafting, negotiation and termination of a wide range of IP/IT agreements (licences, trademarks, designs, software, outsourcing, distribution agreements, transfers, assignments, etc.). She has particular expertise in technology, digital transformation and data analytics in sectors such as insurtech, fintech, energy, health and wellbeing and real estate, among others. María was appointed by INTA as a member of its European Global Advisory Board as well as its representative at the Observatory of the EUIPO in the IP in the Digital Working Group. She is a member of the steering committee of EUIPO's expert group in the Anti-Counterfeiting technology Guide project. She is also a member of the board of the Spanish group of AIPPI. She has been recognized in the field of IP by leading legal directories including Chambers & Partners, Legal 500, IP Star, IAM patents, MLI and Who's Who Legal.

The FCC Space Bureau Women leaders shaping the future of space

A TMC interview with six stars of the Space Bureau

In April 2023, the US Federal Communications Commission launched the Space Bureau to reflect the growing needs of the next-generation Space Age. This change and new emphasis on space innovation was led by FCC Chairwoman Jessica Rosenworcel, the first woman to permanently serve as Chair of the FCC.

Chairwoman Rosenworcel notes that, “There are now so many new technologies in the space industry, so many applications pending before the agency, and so many more innovations on the horizon that the agency can’t keep doing things the old way and expect to thrive in the new. Today, the Space Bureau is up and running. It is designed to support United States leadership

in the space economy, promote long-term technical capacity to address satellite policies, and improve our coordination with other agencies on all of these issues. Of course, an organization is only as strong as its leadership.”

The Chairwoman appointed international communications attorney Julie Kearney to head the Bureau. She leads a team of talented experts, many of whom are women, who have been appointed to senior leadership roles. The Mobile Century has a long-standing interest in the New Space sector and was fortunate to speak to several of the Bureau’s senior women leaders, to understand how they came to pursue a career in space policy and regulation, and the Bureau’s key issues during its first years.



Julie Kearney
Chief
FCC Space Bureau



Kerry Murray
Deputy Chief and
Chief of Staff
FCC Space Bureau



Jennifer Gilsenan
Deputy Chief
FCC Space Bureau



Whitney Lohmeyer
Chief Technologist
FCC Space Bureau



Merissa Velez
Chief, Satellite
Programs and Policy
Division
FCC Space Bureau



Jeanette Kennedy
Associate Chief
FCC Space Bureau

Julie Kearney, Chief, FCC Space Bureau

TMC: Congratulations on your appointment as the first Chief of the FCC’s Space Bureau. For those who are not familiar with the FCC and the new Space Bureau, could you explain the Bureau’s main role and responsibilities?

Julie: Thank you – I am honoured to be at the FCC during this exciting time for space innovation. The Space Bureau plays a key role in advancing the Commission’s Space Innovation Agenda to

meet the needs of the next generation Space Age. The Bureau promotes a competitive and innovative global communications marketplace by leading policy and licensing matters related to satellite and space-based communications and activities.

Among its responsibilities, the Bureau:

- leads complex policy analysis and rulemakings;
- authorizes satellite and earth station systems used for space-based services;
- streamlines regulatory processes to provide maximum

flexibility for operators to meet customer needs; and,

- fosters the efficient use of scarce spectrum and orbital resources.

The Space Bureau also serves as the FCC's focal point for coordination with other US government agencies on matters of space policy and governance and collaborates with our Office of International Affairs (OIA) for consultations with other countries, international and multi-lateral organizations, and foreign government officials that involve satellite and space policy matters.

TMC: You have had a long and distinguished career in communications law, regulation and policy development, driving innovation in leading companies and organisations including Twilio, Loon (Alphabet), National Public Radio, MCI, the Consumer Technology Association, and in private legal practice. What sparked your interest in digital communications and digital tech, and in particular the space sector?

Julie: My career has spanned a wide range of roles and employers, but the thread connecting each role has been rooted in enabling technologies that connect people. Technology, including communications technology, has the power to change and improve lives. In fact, almost 27 years ago, I wrote my law review article on regulatory issues surrounding telemedicine delivery. I highlighted the benefits for children in Pripjat, Ukraine, in the years following the 1986 Chernobyl disaster. Communications services have come a long way since then, with regulatory frameworks to enable access. My interest in the space sector is a natural extension of my passion for creating regulatory frameworks that foster an innovation-friendly environment for both new and traditional technologies. Since the FCC licensed the first commercial satellite in 1962 to today, it is remarkable to see the commercial space sector grow and thrive. The next-generation space age is being fuelled by communications, and the FCC - along with many of our regulatory counterparts around the globe - plays an active and critical role in determining the success of new applications and technologies.

TMC: The New Space sector is facing a number of important challenges in coming years, as well as opportunities to contribute to finding solutions to the major issues facing the planet and mankind. How do you see the Space Bureau contributing to this important work?

Julie: The FCC and the Space Bureau are important contributors to the broader connectivity and economic ecosystem of this new Space Age. We're licensing commercial satellites that are providing greater connectivity to unserved and underserved communities. At the same time, we're in an era of novel space activities, like lunar landers, space tugs that can deploy other satellites, and space antenna farms that can relay communications. All of these rely on robust communications systems that we license, not to mention the launches that put

commercial satellites into orbit. At the same time, our satellite licensing rules have included requirements for orbital debris mitigation since 2004 – twenty years. With communications as a predominant driver for space activities, the FCC and Space Bureau will continue play a key role in protecting and sustaining space – for now and for future generations.

Julie Kearney is the first Chief of the Space Bureau at the Federal Communications Commission (FCC). Launched in April 2023, the Space Bureau plays a key role in next generation Space Age.

Prior to joining the FCC, Kearney was Vice President of Communications Regulatory Affairs and Policy at Twilio Inc. At Twilio, she led global regulatory and policy efforts pertaining to telecommunications and law enforcement response.

Previously, she was Global Head of Communications Regulation and Policy for Loon, a subsidiary of Alphabet, where she led the company's US and international regulatory initiatives. Other roles include: VP of Regulatory Affairs for the Consumer Technology Association; government affairs at NPR; international affairs at MCI (now Verizon); and associate at Haley Bader & Potts (now Foster Garvey).

Kearney is a past president of the Federal Communications Bar Association (FCBA) and she also served as chair of the FCBA Foundation. She was a long-serving member of the Federal Communications Commission's Consumer Advisory Committee and recently served on its Broadband Deployment Advisory Committee. Other Board positions include USTelecom and the United States Technical Training Institute (USTTI).

Kearney earned her B.A. from Mount Holyoke College and a J.D. from Catholic University's Columbus School of Law with a certificate from its Law and Technology Institute. She recently completed a 3.5 year term on the Columbus School of Law's Board of Visitors. A trained singer, she has sung with choruses in the San Francisco Bay Area and Washington, DC area, most recently with Schola Cantorum (CA) and the Choral Arts Society of Washington (DC).

Kerry Murray, Deputy Chief and Chief of Staff, Space Bureau

TMC: What do you see as the potential contributions/benefits of space tech to the solution for the many issues facing people

today? How can we collaborate to achieve these solutions on a global scale?

Kerry: There are so many possibilities – the space industry is incredibly innovative and we hear about exciting new ideas every day. Space-based services seem uniquely situated, however, to help us reach the goal of universal broadband deployment. There are many locations in the United States and around the world where it's not practical to deploy fiber or access is difficult even with mobile telephony services. Satellite services can reach these locations. In addition, the technology exists to connect regular smart phones with satellites to provide back-up, life-saving emergency text, and messaging services. We are already starting to see the benefits of this development in search and rescue and disaster recovery efforts, and these trends will likely only increase. In terms of collaboration, we have upcoming, global opportunities to support innovative uses of satellite technologies for every day and lifesaving uses.

TMC: The Space Bureau is remarkable in the qualifications and breadth of experience of the women who have been appointed to lead its work. The GTWN has recently celebrated 30 years supporting women at the senior levels of the communications industry, including the space sector. What do you see as the future role of international organisations such as the GTWN in supporting the process of culture change?

Kerry: The industry – and the FCC – has made remarkable strides in terms of attracting and retaining women and people of diverse backgrounds to senior levels. At the FCC, we've recently broken that barrier – with the first US Senate-confirmed woman, Chairwoman Jessica Rosenworcel, to lead the FCC. Still, it would be nice to see more diversity at the very highest levels in more space-based companies. The industry as a whole has made strides in that direction. I believe that actually seeing women perform at the highest levels will inspire the next generation of women achievers. I have no doubt that GTWN will play an

Kerry Murray currently serves as Deputy Chief and Chief of Staff of the Space Bureau of the Federal Communications Commission. She has served in these roles since April 2023, when the Space Bureau was established. She joined the International Bureau as Deputy Chief of the Satellite Division in 2015, where she has focused on regulation and licensing of space and earth stations, facilitating emerging technologies and satellite broadband services. Previously, she served as Director of Global Government Affairs & Public Policy at Dell, Director of International Affairs at MCI, Senior Counsel in the Telecommunications Division of the International Bureau, associate at Squire, Sanders & Dempsey. She earned her law degree from Georgetown University Law Center, and her bachelor's degree from Duke University.

essential part in nurturing and mentoring the next generation of STEM leaders who work in the space industry.

Jennifer Gilsonan, Deputy Chief, Space Bureau

TMC: One of the key objectives of the Bureau is to advance the FCC's Space Innovation Agenda including ensuring sustainable growth for the space sector. How is the Bureau contributing to this goal?

Jennifer: The FCC has long had a role in promoting a competitive and healthy satellite industry. Chairwoman Rosenworcel's creation of the Space Bureau brings a focus on all of the multifaceted issues of space-based services. Across the Bureau, we are working to update our rules, increase staff, and build a faster, and more transparent satellite licensing process. Towards this end, we have increased staff; onboarding talented engineers like Whitney, as well as other experts, to better position us to advance the Space Innovation Agenda. We've worked to foster the efficient use of scarce spectrum and orbital resources by promoting new spectrum sharing opportunities. And last fall, the Commission adopted the Space Bureau's recommendations to streamline rules to expedite the processing of new satellite and earth station applications.

Safe and responsible use of space goes hand-in-hand with promoting space innovation. The FCC was forward-thinking when it developed rules to mitigate orbital debris in 2004 and again just a few years ago when it updated the rules to address an influx of applications with proposals for thousands of satellites. And again last year by requiring satellite operators in low-Earth orbit to dispose of their satellites within five years of completing their missions. The FCC is serious about orbital debris and space sustainability. In fact, we took our first space debris enforcement action in October 2023.

Satellite networks have become essential for improving access to information, education, health and other vital services, not to mention disaster recovery. The bureau will continue to collaborate with other government agencies, international organizations and commercial satellite stakeholders to ensure space sustainability to allow growth for space-based services.

TMC: You've been at the FCC for the majority of your career; what has kept you motivated and staying on top of your game?

Jennifer: Quite simply, the issues and the people. My first project as a new attorney - too many years ago - related to an authorization for a global low-earth orbit constellation proposing 66 satellites. At the time, this proposal was a really big deal. After that project, I was hooked on spectrum issues and satellite work. Today, as Julie noted, the Bureau receives applications for new and novel space-based services including constellations comprised of thousands of satellites across different frequency

bands. On a daily basis, the team meets with industry innovators with business plans supporting space-based solutions to solve connectivity issues, aid in disaster assistance and clean-up space debris. The work constantly challenges me. I've also had the great fortune to work with smart and hard-working colleagues from a variety of disciplines.

Jennifer Gilsean currently serves as Deputy Chief of the FCC's Space Bureau. Jennifer has worked on satellite and spectrum regulatory issues at the FCC for over two decades. She most recently served as Assistant Chief of the former International Bureau focusing on satellite licensing and rulemakings. She also held several other leadership positions within the International Bureau, including Deputy Chief, of the Strategic Analysis and Negotiations Division, where she managed bilateral spectrum negotiations, as well as serving as Associate Chief of the Satellite Division and Chief of the Satellite Policy Branch in the Satellite Division. She earned her law degree from the University of Baltimore School of Law, and her bachelor's degree from the University of Delaware.

Dr Whitney Lohmeyer, Chief Technologist, Space Bureau

TMC: The space sector is often considered to be a very male dominated one. It is also assumed to require a STEM education and career path, which may potentially discourage younger women from other educational backgrounds from seeking a career in space. As the Bureau's Chief Technologist, how important do you think a STEM background is for women working in the space tech area? Or are there other educational backgrounds and skills that are also needed, and if so, how?

Whitney: Space is an inherently multidisciplinary field, which requires expertise in a diverse set of backgrounds. I personally chose to pursue an education and career in STEM, because I enjoyed science and math and wanted to use these skills to help improve the world. When I entered industry, working to start what is now OneWeb, I quickly realized that having technical skills was important, but that the system would never connect individuals if we didn't also have team-members working in policy, finance, business and marketing also at the table. I often say that the technical aspects of the space sector are challenging but are limited ultimately to the laws of physics. Whereas the regulatory and strategy worlds are more like a unique game of chess, where at any point the rules of the game (the rules of the ITU or FCC Regulations) can be reviewed and rewritten.

Looking back on my career, my degrees in engineering have

provided me with a framework for analysing technical and non-technical problems systematically and building confidence in other sectors of the field like spectrum regulations and international coordination. If I had to do it all over, I would still choose engineering! But that's just me – If you love space, and you're not keen to study STEM, there are many other roads to our industry! Just don't give up.

TMC: How important do you think role models and mentors are for women in the space and broader digital tech sectors? Did you/do you have a role model for your inspiration? Do you have a mentor, or are you a mentor to others?

Whitney: Community and support are imperative for women and for everyone in space and in the broader digital tech sector. I feel incredibly fortunate to have worked alongside and worked for numerous female leaders. At the same time, I have also been the only woman in many rooms, which can feel isolating if you let it. I'd like to shift the focus from mentorship to community. On occasion, I have heard students and individuals early in their careers ask, "how do I find a mentor?" or "will you be my mentor?". Rather than searching for an individual, I like to challenge folks to build a diverse community around them. Identify individuals who have interesting career paths, or who are currently in positions you strive to one day hold, and genuinely get to know them. Ask them about their approach, not in hopes of them one day mentoring you, but out of kindness and curiosity.

Often times, women don't support other women. I particularly see this in STEM. Whether it's through mentorship, or collegiality, we must all come together and change this. We are not in competition, but instead are members of one of the most exciting and impactful industries.

Whitney Lohmeyer is currently serving as the Chief Technologist of the FCC's Space Bureau. She is on leave from her role as faculty at Olin College of Engineering and as a Research Affiliate at MIT. Whitney is passionate about higher education and enabling affordable Internet to empower individuals, and connect schools and healthcare centers. She has advised more than thirty companies on wireless system design and spectrum strategy. Whitney was the first engineer hired at OneWeb, where she worked with Qualcomm, actively contributed to policy reform at the FCC and ITU, and served on the US Delegation to the 2015 World Radio Conference. Whitney received her Ph.D. in Aeronautics and Astronautics from MIT in 2015, and her M.S. in Aeronautics and Astronautics from MIT in 2013, and her B.S. in Aerospace Engineering from NC State University in 2011.

Merissa Velez, Chief, Satellite Programs and Policy Division, Space Bureau

TMC: The satellite industry is undergoing fundamental change in terms of the roles of public and private actors, as well as the economics of the industry. How do you see the balance of these roles and interests developing over the next 5 or 10 years or so, and how regulation may need to evolve?

Merissa: The private sector is increasingly conducting the types of missions that used to be solely conducted by government actors, and this private sector activity shows no signs of slowing down. At the same time, regulatory frameworks are evolving to accommodate new types of missions and objectives, and work continues to ensure that these types of missions can be conducted successfully and sustainably. A key challenge is providing certainty around the regulatory environment, so that private actors know what to expect from the process, while the process remains nimble enough to accommodate new types of missions and address the unique issues that can and will arise in the context of those missions.

As one example, private actors are heavily involved in new demonstrations and plans for future mission categories like in-space, servicing, assembly, and manufacturing, and I think we're likely to see more and more missions in this category in the next five or ten years. Missions of these types can have some challenges from a regulatory perspective, but also have great potential for benefits to the space environment – like the potential for active debris removal. I am also interested to see the extent to which private actors become more involved in scientific missions beyond Earth's orbit, to the moon and beyond.

TMC: What do you see as the main social and economic benefits of new age satellites to digital empowerment, education, healthcare, agriculture, etc?

Merissa: I think in many ways the “new space age” is building on the foundations of legacy space systems in terms of bringing important services to the public. Services like remote sensing, position, navigation, and timing, emergency communications, and provision of internet connections to remote areas have long been conducted using satellites.

One exciting aspect of “new space” is how the existing foundations of traditional satellites and satellite systems are being built upon to develop creative solutions to 21st century concerns. For example, if you look at food production, there are new and increasingly innovative ways in which satellite operators are leveraging existing systems as well as launching new satellites and systems in order to do things like improve precision in farming, remotely monitor agricultural land, and effectively track cargo shipments, among other things. And this is just scratching the surface of the applications of satellite systems. The UN Office for Outer Space Affairs (UNOOSA) has

interesting information on, for example, how space can be used in support of sustainable development goals.

I think the public in general is becoming increasingly aware of the benefits of space services and the unique advantages that satellites have from a technological standpoint, including the provision of broadband service to underserved or unserved areas, and the use of satellites for communications in the aftermath of natural disasters, for example. That being said, I think there's room for more information and messaging on the innovative and critical ways in which space-based services are used. The critical nature of many of these services also underscores the importance of ensuring that issues like debris mitigation continue to be part of the conversation when it comes to “new space,” to ensure the continued availability of space services.

Merissa Velez is Chief of the Satellite Programs and Policy Division. In this role, Merissa oversees a team focusing on legal and policy issues associated with the licensing and regulation of satellite systems. Merissa has focused on satellite regulatory issues at the FCC for almost ten years, and was most recently the Chief of the Satellite Policy Branch in the International Bureau's Satellite Division. Prior to joining the FCC, Merissa clerked for the Supreme Court of Hawaii and worked in the publishing industry. Merissa is a graduate of Brooklyn Law School and Middlebury College.

Jeanette Kennedy, Associate Chief, Space Bureau

TMC: You have worked both in the private sector, and now in government policy and regulation. How important do you think it is for policymakers to understand the drivers of the digital technology sector and the digital economy? Are there areas where each side could learn from the other, and if so, how is the Bureau promoting greater consultation and collaboration?

Jeanette: The short answer is: It is critical that regulators understand the technologies and business models that we cover so there are better outcomes for consumers and society as a whole. That said, the private sector should view government as a partner toward growth and progress. As Julie mentioned, the FCC and particularly the Space Bureau, is enabling a competitive and innovative space marketplace by leading policy and licensing matters. It should be the responsibility of all sides to understand and consult with each other so that our frameworks move us forward and reduce unintended consequences. Our roles are not always inherently in conflict with the other; and I hope that

both private sector and government would not approach items with this attitude.

Under Julie's leadership we are making additional efforts to better connect with companies and their technologies and operations. This should help us all build trust and strive for the highest standards.

TMC: Would you encourage people to pursue a career in digital tech, and in space tech/policy in particular? If so, how can we work to encourage a welcoming DE&I environment and culture for them, so that these skills are retained in the industry for the future?

Jeanette: Whitney talked about building a community and supporting each other through our respective journeys. I want to +1 (or is that +2?) on those sentiments. When I was going to school I loved tech but thought that since I wasn't in STEM those careers were closed to me. I would say, follow your interests and let your (healthy) curiosity drive you since there are so many roles that use a variety of skillsets. Be open to change and continuous learning since all your experiences contribute to your capabilities and what you have to offer.

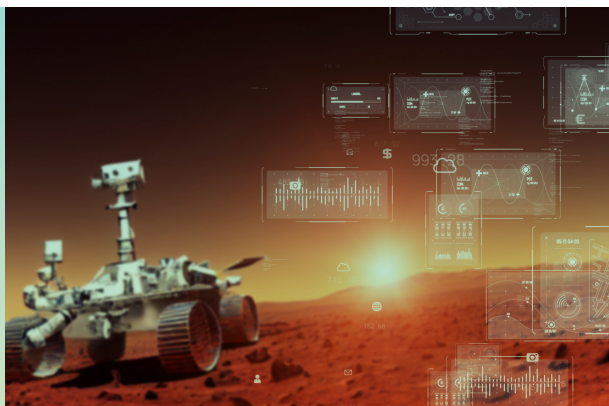
TMC: Thank you all from everyone at the GTWN and all our colleagues, for your candid responses, for sharing the benefit of your experience, and for your continued work to promote the role and contribution of women in the space sector.

Jeanette Kennedy joins the FCC as Associate Chief of the Bureau. Jeanette brings experience and knowledge in tech policy from representing technology companies, equipment manufacturers, and service providers, on issues including technical regulation and standardization, trade policy, spectrum management, public safety communications, and innovation. She has also previously served at the First Responder Network Authority. Jeanette received her Master of Arts Degree from American University, and her undergraduate degree from the University of Puget Sound.

Benefits and challenges of AI in space

Sallye Clark, Head of Space Law practice and Member, Mintz

Artificial intelligence (AI) is providing numerous benefits to society in the context of space. Developments in manufacturing, remote sensing, spacecraft control, and coordination will ease constraints to boost productivity and growth in the satellite industry. AI can drive down costs, increase innovation, mitigate space debris concerns, and guarantee certainty when operators find network coordination increasingly complex.



Benefits of AI in space

The beauty of AI is that it can mimic human intelligence through machine learning, by analyzing data independently or through autonomous embedded systems. Machine learning teaches machines to learn for themselves by ‘training’ a relatively simple algorithm to become more complex. Huge amounts of data feed into an algorithm, which adjusts and improves itself over time. Swarms of devices share their information in a network and learn from each device’s experience through hive learning. AI will progress from self-driving cars to autonomous navigation of spacecraft around Earth and other planets.

Examples of AI uses in space

AI is being used across four key areas: manufacturing, imaging, telemetry, and spectrum usage to perform tedious, time-consuming yet necessary tasks. AI is being used to identify areas of surveillance by learning to process and act upon signals it

receives, disregarding substantial amounts of unnecessary data. AI is used to sort through Earth imaging data to monitor projects in remote areas, such as detecting pipeline leaks to measuring the impact of climate change:

- AI is being used to monitor and control satellites. For example, *SpaceX* has implemented AI operations to avoid satellite collisions. AI could be used for other tasks, such as executing debris avoidance manoeuvres automatically. *SpaceX* is also using AI during take-off and landing of spacecraft to automate engine operations and manage functions such as deploying landing gear. This helps to optimise the use of fuel. *Space X* also uses an AI autopilot system to enable its Falcon 9 craft to carry out autonomous operations, such as docking with the ISS.
- *Lockheed Martin* now has an “Operations Center of the Future,” which has the capacity to handle multiple space missions at once through automation, AI, and machine learning, to manage the rapidly increasing number (and complexity) of satellite constellations being deployed in an already crowded low Earth orbit.
- *NASA* has set up an Artificial Intelligence Group that performs basic research that supports scientific analysis, spacecraft operations, mission analysis, deep space network operations and space transportation systems. *NASA* has also cooperated with *Google* to train its extensive AI algorithms to sift through the volumes of data from the Kepler exoplanet mission¹. This led to the discovery of two new exoplanets previously missed by human scientists. AI is also being used on data from *NASA*’s TESS mission to identify candidate exoplanets.
- AI is being used to simplify coordination for space-to-Earth transmissions to manage spectrum usage as the growing number of NGSO constellation becomes increasingly challenging. Satellites can learn to transmit using the appropriate frequencies and level of power output to avoid interference by detecting and avoiding co-channel interference at different stages of the satellite

¹ <https://www.nasa.gov/news-release/artificial-intelligence-nasa-data-used-to-discover-eighth-planet-circling-distant-star/>

orbit. Adopting deep learning technology and automatic detection of transmitted frequencies from networks in proximity will reduce the interference burden for satellite networks.

- *The European Space Agency (ESA)* is using AI in its space missions to enable rovers to autonomously navigate around obstacles, while data download from Mars rovers is scheduled using AI.
- *The German Aerospace Center (DLR)* has been developing AI methods for space and earth applications for a number of years and in 2021 announced its intention to establish an institute for AI Security. Since 2018 it has supported astronauts onboard the ISS with an AI-enabled, voice-controlled interactive companion called CIMON (Crew Interactive MOBILE companion).
- *French space agency CNES* has worked with French company Clemessy² to optimise the filling of rocket tanks using AI neural networks.
- The *UK Space Agency* has funded a project involving the University of Southampton that uses AI³ to detect buried archaeological remains in satellite imagery providing construction companies with higher accuracy at an earlier stage. This will save them time and money during the planning permission process and help them reduce their carbon footprint.

Challenges of AI in space

Despite these many advances, the implementation of AI in space is not without its challenges. The widespread use of AI increases the risk of unauthorized system hacking, such as signal blocking, satellite takeover and destruction. To overcome these threats AI based systems will need to implement cybersecurity applications to protect against hacking.

While AI systems have clearly proven to be well suited for repeated tasks in harsh and hazardous environments, there is a potential mismatch between the AI's current level of ability in perception and the intelligent decision-making that is required of humans when undertaking complex tasks in space. For AI to realise its full potential in space, we need to make advances in both autonomy and automation, thereby freeing humans to focus on tasks for which they are better suited.

We also need advances in robotic sensing and perception, mobility and manipulation, rendezvous and docking, onboard and ground-based autonomous capabilities. We will need human-robot integration and a suite of other data analysis tools for the foreseeable future to expand humans' exploration of space.

The balance struck between human control and AI autonomy will depend both on the degree of social acceptance of the risks inherent in automation, and the level of cultural and political agreement about the human values and principles to be preserved in the development of increasingly autonomous systems.

Space law challenges of AI

Each legal jurisdiction will develop its own response to questions of liability, accountability, and responsibility where AI is applied to space. This will depend on the existing legal framework, including the specific features of criminal law, international humanitarian law, tort law, administrative law, etc. Current principles and rules in these fields may fall short in dealing with the interactivity, opacity, and unpredictability of autonomous "space objects."

AI challenges of space law include those covered under the Liability Convention, a treaty that holds signatories to space related liabilities such as the damages to be covered, the procedure to be followed once such damages occur, or whether and to what extent the decisions of these "objects" fall under the fault of persons for whom a state is liable. These liability issues also concern the use of AI systems for space-based services, such as AI systems using Global Navigation Satellite System (GNSS) signals to support emergency response services, autonomous vehicles and unmanned aircraft systems.



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.

² <https://www.actuia.com/english/cnes-and-clemessy-develop-a-fluidic-systems-simulator-using-artificial-neural-networks/>

³ <https://www.gov.uk/government/news/new-funding-for-innovative-space-tech-to-help-solve-problems-on-earth>

How the use of quantum technologies could transform the space sector

Guest blog¹ from Dr Mike Short, CBE
Chief Architect, Satellite Applications Catapult, UK



This article tries to identify the specific areas of keen interest mainly from a Satellite industry perspective.

When looking out towards 2030 some of this QT based Innovation can be seen now through a new lens of Quantum as fitting the following categories or themes:

Sensing and Imaging – one of the key roles in the Catapult includes looking at Applications based on Earth Observation and remote sensing. This may be in response to agricultural, climate change or emergency services. Monitoring erosion or topographic change may all be part of this, coupled with the growing accuracy of imagery available from above the earth. Quantum has for some time offered prospect for improved accuracy and imagery, and some of this has been demonstrated from the UK Quantum hubs and NQT Programme. As this process is industrialised, we need to ensure Applications work can harness the best of this to benefit all Applications developers and users. Quantum holds the prospect of taking Earth Observation onto a whole new level, but we need to prepare for maximum impact and commercialisation.

¹ Part of the Supercharging Innovation Week #SuperchargeUKtech <https://www.techuk.org/resource/how-the-use-of-quantum-technologies-could-transform-the-space-sector.html>

Instruments – whilst QT are much more than Computation techniques, we need to recognise the importance of precision in Space based instrumentation where QT can play a bigger part. This requires stronger knowledge transfer into the space-based instrumentation community and SMEs involved. As research bridges to commercialisation in this area there may also be some skills transition challenges requiring demonstrators, testing and certification regimes that could also apply in the space domain. For maximum impact the context of the above missions needs to be understood well to ensure requirements can be specific and properly met for Space with the introduction of QT.

Position, Navigation and Timing (PNT) – QT also may change the way we look at PNT in terms of accuracy, testing and precision. This is important globally and requires a degree of standardisation in implementation to be cost effective. Some of the great work by NPL on Timing and standards is helpful in this area but the work needs to extend to all areas of PNT, with device testing and certification in mind. Accuracy for terrestrial and autonomous objects on earth will depend on higher levels of precision and resilience from the PNT supply chain. We need to be in a position where QT based developments retain the confidence of the user community. This is likely to apply to all 4 missions described above.

Communications – this is likely to evolve with QT but needs to be demonstrated, tested, and standardised. Early examples of Quantum key distribution show the power of Quantum in ensuring privacy of data transfer and privacy. The recent GSM Association Post Quantum initiative shows how Mobile operators are planning for a Quantum safe regime through new architectures and standards. Non terrestrial networks (NTN) involve satellites alongside Mobile in standardisation since ETSI 3GPP Release 17, and the requirements for Mobile – Satellite convergence are likely to grow with coverage and user

requirements. Our ever-growing dependency on Broadband communications will extend to remote and rural areas as well as communications on the move where QT and future computing will make ever bigger differences. International standards in this area will be critical for cost effectiveness and appropriate communications control for both terrestrial and satellite communications.

Computing - Whilst Quantum Computing (QC) may take more time we already see the influence that Computing has had on data communications in particular alongside Internet developments. QC is likely to affect future Satellite operations and services delivery in ways we cannot yet imagine. However, we also need to design in QC when the time is right.

Space debris - We already see the challenges of Net Zero and Space debris in some of the work we already do in the Catapult. QT needs to be applied to sustainability as well as efficiency. The forecast growth to approximately 60 K satellites by 2030 shows ever growing interest in space as the constellations get bigger with much smaller individual satellites. However, the prospects of harnessing these benefits will be significantly reduced unless we address space debris in a coordinated international fashion. QT could have a major role to play in helping to minimise the risks and harness the true power from space.

It is important to acknowledge the great work undertaken so far by the Research communities in Quantum, but when looking at the sectoral opportunities there are many that now need to be explored more deeply for commercialisation and implementation. These will bring new research and innovation challenges, but the time seems right now to ensure we help smooth the way towards wider sectoral impact.



Dr Mike Short, CBE is the Chair of the UK Telecomms Innovation Network Advisory Board (UKTIN AB) and Chief Architect - Satellite Applications Catapult. He was Chief Scientific Advisory at the UK Department for International Trade (DIT) from November 2017 to February 2023.

He has over 40 years of experience in the electronics and telecommunications industry, latterly as Vice President of Telefonica for 17 years to December 2016. In that post, he managed the launch of 2G (GSM) and 3G mobile technologies in the UK, established an office in Brussels and went on to lead international research, innovation and standards for Telefonica Europe.

His career includes the promotion of international technical standards in mobile and digital technology. He is a former chairman of the GSM Association, the UK Mobile Data Association, and was president of the Institution of Engineering and Technology in 2011 to 2012.

He was honoured with a CBE in 2012 for his services to the mobile industry.

From AI ethics to AI regulation

Dóra Petranjy, CEE Managing Director and Co-Head of the TMC Group, CMS

I have been working on the legal and regulatory context of Artificial Intelligence for at least 5 years now, well before it was considered a priority issue. During that time, I have often considered the arguments relating to whether AI should be regulated, and if so, how and to what purpose.

Until recently, there has not been much attention on the need for regulatory intervention in the use of AI. But this question has taken on a new dimension in the wake of the attention surrounding ChatGPT over the past year, and in view of the proposed EU regulation of AI¹. And considering what is happening with AI in the rest of the world, in China, the US, Asia, we need to ask ourselves whether the EU should be pursuing AI regulation? And if you agree that we should have AI regulation in the EU, then what is the purpose and scope of EU regulation of AI? Is it all about ensuring human rights and preserving European values? Or should Europe take a more economic, competitive approach? Or should it be both?

In thinking about these questions, we can look at what industry leaders are saying about AI and its impact on the economy and society.

According to the CEO of IBM, Arving Krishna, this is the Netscape moment of AI.² He was referring to the web browser that made the internet widely known in the 1990. ChatGPT is, in his view, now putting artificial intelligence in the public sphere in the same way.

"AI and ChatGPT today is kind of a 30-year overnight wonder," Krishna said. "There are lots of things in technology like that, they look like overnight wonders but there has been 30 years of hard, grinding work."

1 This is based on a presentation given on Wednesday 28 June 2023 at the Conference on Human-Centred Regulation of AI in Budapest, Hungary. Shared album - Péter Hanák, Rozália Feri - Google Photos (https://photos.google.com/share/AF1QipMkClc13kxZm515fZKq-pOVu52E-E0YjldNeGFoepfc5kqEvAqMM7v5rXYrTc_LQ?key=V0UzclhuLWZRbE10Uk5HcXFBeWZ4YnlKMC1tbnRR)
2 <https://wraltechwire.com/2023/05/04/ibms-ceo-sees-a-netscape-moment-in-ai-powerful-future-of-quantum-computing/#:~:text=Krishna%20said%20we%20are%20in,overnight%20wonder%2C%E2%80%9D%20Krishna%20said.>

According to Microsoft CEO, Satya Nadella, AI is moving fast but in the right direction. Every time a new disruptive technology emerges, he says, there is a 'real displacement' in the job market, but he believes that AI will also create new jobs.

"I mean, there can be a billion developers. In fact, the world needs a billion developers," ... So the idea that this is actually a democratizing tool to make access to new technology and access to new knowledge easier, so that the ramp-up on the learning curve is easier... Humans are in the loop versus being out of the loop. It's a design choice, which, at least, we have made."³

We are already seeing many examples in the media, not just in Europe but around the world, of how AI is being used in what many would consider unethical or at least dubious ways.

Firstly, the impact on media and the creative industries. In the US, we have seen the launch of RadioGPT⁴, which promotes itself as the world's first localized radio content powered entirely by artificial intelligence. This AI-driven radio station has raised many concerns about how AI is being used in the media, and the future of human presenters on radio and TV. The 148 day strike by Hollywood writers and artists, which ended with a new deal with the studios in October 2023, demonstrates the real impact of the use of AI on the creative industries.

Secondly the use, or misuse of biometric data in breach of individual privacy. In Australia, retail giants and police have been using AI software Auror to catch repeat shoplifters. But to do this they also capture all of the biometric data of all of the shoppers who come into the shop, without their prior knowledge or

3 <https://www.cnn.com/2023/05/17/microsoft-ceo-talks-ai-concerns-and-its-impact-on-jobs-education.html>

4 <https://futurimedia.com/radiogpt/>

consent. This has raised concerns that privacy regulation has not kept pace with technology, especially as retailers are already under investigation for using facial recognition technology in a similar way⁵. Because of these and many other examples, everyone is now interested in how AI is being used and in the possibility of AI regulation.

Should AI regulation focus on economics or human values?

If we need AI regulation, should it be focussed on preserving our human values, or should we mainly be concerned about creating jobs and growth in Europe, so that we do not lose out to countries where AI is not being regulated? In fact, we already have an answer, now that the EU is a step closer to setting the first rules on Artificial Intelligence.

On 14 June 2023 the EU Parliament agreed their draft proposal for AI regulation. There were 499 votes in favour and 28 against, with 93 abstentions. The negotiation position to be taken by the Parliament in the Council debate on the AI Act was approved. So negotiations between the Commission, Parliament and Council, the tripartite negotiations, have already commenced. The rationale for the approach taken in the draft Act was set out at the time of the release of the agreed draft:

"The legislation is intended to ensure that the development and use of artificial intelligence in Europe fully respects European fundamental rights and values, ie. That it remains under human control, is safe, transparent and non-discriminatory, and that it benefits society and the environment."⁶

364 pages and 771 paragraphs, it is different from that of the European Commission. So this is not the end of the debate about AI regulation in the EU, it is just the beginning of the debate amongst the three European authorities – the Parliament, the Commission and the Court. And what is very important is that it is all about fundamental European rights and values. The human is always put first.

We have already had many discussions at the European and Hungarian level about the possible regulation of AI and these always focus on two basic questions: Firstly, what happens if Europe regulates too early or too late. We know that in China

⁵ <https://www.abc.net.au/news/2023-06-10/retail-stores-using-ai-auror-to-catch-shoplifters/102452744>

⁶ <https://www.europarl.europa.eu/news/en/press-room/20230505IPR84904/ai-act-a-step-closer-to-the-first-rules-on-artificial-intelligence>

there is not going to be AI regulation and companies there will have access to a huge amount of data. Does this mean that developers there have a huge commercial advantage over the EU? On the other side, we know that the general approach to regulation in the US is to always wait and see what happens in the market, and only if there are some areas of concern or there is seen to be unfair competition, do the regulators step in.

The policy framework for AI regulation

One of the key policy arguments put forward against regulating AI by its opponents is that moving too early, before the market is fully developed, will stifle innovation and investment, and sideline European businesses in the global marketplace.

To see if this could be true, we can consider the example of the General Data Protection Regulation (GDPR). Before it was brought into force, there were many people claiming that it was dangerous to regulate privacy in this way, that it was far too early to do so, and that the GDPR would severely disadvantage European competitiveness. The reality has been quite different. In fact, many countries, including many US states, take the GDPR as the starting point for their own regulation. The EU hopes that the proposed regulation of AI will become a benchmark for other countries, in a similar way to the GDPR, and I personally hope that this will prove to be the case.

The focus on human rights, rather than just economic considerations, is the foremost advantage of the EU approach to issues, whereby the EU always tries to provide a balance between these two competing objectives. This is very important because this is rather different to the policy approach initially taken by the European Commission. It initially based its discussion about AI on the basis of ensuring European competitiveness in the global market, not European values and rights.

On the other hand, the discussion in Europe has not taken place in a policy vacuum. In fact, the EU has been considering the ethical framework for AI for some time. On 8 April 2019, the High-Level Expert Group on AI presented Ethics Guidelines for Trustworthy Artificial Intelligence. The Guidelines⁷ are based on 7 principles, which aim to help verify the application of each of the key requirements:

- Human agency and oversight
- Technical robustness and safety
- Privacy and data governance
- Transparency
- Diversity, non-discrimination and fairness
- Societal and environmental well-being
- Accountability.

In my view these are the fundamental principles which will be reflected in the EU's AI regulation, when it is finalized and

⁷ <https://digital-strategy.ec.europa.eu/en/library/ethics-guidelines-trustworthy-ai>

eventually comes into force. There have already been quite a few changes made to the draft legislation, compared to the negotiating position that the EU Commission originally put forward. This is understandable given that the Commission's draft was completed before the so-called 'Netscape moment', while the Parliament had about 4 months to work on their draft during or after the Netscape moment.

The key changes reflected in the EU Parliament's proposal are:

- The definition: The rules on the AI Act's scope include the additional descriptor 'human centric' alongside 'trustworthy' in the description of desirable AI.
- There is a new requirement that generative AI systems must be designed in line with EU law and fundamental rights, such as freedom of expression.
- A "fundamental rights impact assessment (FRIA)" obligation is now placed on the deployer of all high-risk AI systems, except for operating critical infrastructure.

This shows that fundamental rights are now front and center in the EU approach to AI.

The scope of the regulation

It is very important to get the definition of AI right in the legislation, as this will determine the scope of the regulation. If something is outside the scope of the definition of AI, then it will not be covered, and so I found it disappointing that one element was missing from the definition of AI in the Commission's original proposal - the word 'human'. In that original draft, there is no mention of 'human instructions' or 'human purpose' and so I was very happy to see that finally the word 'human' is back in the draft Act passed by the Parliament. It is now a purpose driven definition of the scope of AI and refers to 'human centric' and 'trustworthy' as two key elements of the legislation. In other words, if the system or service impacts human rights, then this is within the scope of the AI regulation. That is a very big step forward, which I believe is in the right direction.

There is also a new definition of *generative AI*, which puts it within the scope of the regulation. Often when something is hyped, like generative AI has been, firstly a name is created for the concept, and then a regulation is framed around that word. I totally disagree with this approach, as if the definition is too narrow, you can undermine the whole purpose of the regulation. For example, someone could say, I am not really using '*generative AI*' which falls within the scope of the regulation, I am really using '*generativity AI*', so then this would no longer be included in the scope of the regulation.

But at least we now have a definition of 'generative AI', which is one of the examples given for general purpose AI. That means that you will have to navigate several layers within the regulation to work out what you need to do about generative AI, which is something which needs further clarification.

There is also a new phenomenon introduced in the draft, which is the Fundamental Rights Impact Assessment (FRIA), which is very similar to what we already have in the GDPR. The onus will be placed on anyone developing a service using AI to determine whether it falls within the scope of the legislation, and if so, that an FRIA is done and submitted for approval if necessary, or kept on record for any future audit.

If you are using a general purpose AI, you will need to have done a FRIA, to make sure that you are not in breach of the Act, because general purpose AI is now included in the list of high risk AI definitions.

There are a number of AI practices that are prohibited in the current draft:

- "Real-time" and "ex-post" remote biometric identification in public places.
- Biometric categorisation based on sensitive personal data (gender, race, ethnicity, nationality, religion, political affiliation).
- Predictive policing based on profiling, place of residence or criminal history.
- The use of machine emotion recognition in law enforcement, border control, the workplace and educational institutions.
- Creating facial recognition databases using non-targeted facial images from the internet or from closed-circuit television networks (in violation of human rights and privacy).

This list is longer than in the earlier draft and it is all about preserving human rights. In the earlier draft there was a very broad exception for biometric identification. Now the only exception to the prohibition on the use of biometric identification in public places is if you have a warrant from a judge.

There are exceptions for anti-terrorism or national defence applications, which are outside the scope of the regulation.

Scope of existing law vs new AI law

There are existing laws which cover the use of these types of AI driven applications. In fact, we have already had a case of predictive policing (like the Australian example cited earlier), where AI was used to recognize emotions.

There was a case in Hungary, the Data Protection Office⁸ levied a heavy fine against some banks for using software which used AI to determine the emotions of people calling their call centres. If the AI felt that the caller was too emotional or too worked up, they were immediately connected to a manager. This practice was punished by the DPO, not on the basis of this EU prohibition, because it didn't exist at that time, but on the basis of existing regulation, as the callers had not been told by the banks that AI

⁸ <https://www.lexology.com/library/detail.aspx?g=a9c66d5f-4faf-4500-a1bd-458bf9ebceec7>

was being used in this way, without human intervention. The caller didn't have a choice about whether he wanted his call handled in this way, which was the problem.

This case shows that you don't always need new rules when you have old rules that result in the same outcome. But in any case, under the proposed new EU regulation, there is a general prohibition on the use of machine emotion recognition. This applies in the case of law enforcement, border control, workplace and educational institutions. It is a good start.

New obligations regarding general purpose AI systems

Under the proposed new regulation, developers of general purpose AI systems would only be allowed to place their products on the EU market after: (i) Having assessed and mitigated the potential risks (to health, safety, fundamental rights, the natural environment, democracy and the rule of law), and (ii) have registered their models in the relevant EU database.

So this means that you can only launch a general purpose AI once you have registered it. You need to be able to show you have made an assessment of the impact on health, safety, fundamental rights, natural environment, in other words, against European values. This is all going back to the 7-point list we discussed above. Human agency and oversight is not yet in the draft, but I am sure it will be.

There are further transparency requirements in relation to general purpose AI. In all cases, it must be indicated that the content was produced by AI. It is all about driving innovation, supporting SMEs and protecting rights. This is very European, supporting innovation despite to balance the introduction of regulation.

Help must be provided to distinguish "deepfake" images from real images. Appropriate safeguards must be put in place to prevent illegal content generation. For example, a detailed summary should be published of the copyrighted data used to teach the systems.

What are considered high risk AI applications?

AI applications will be considered "high-risk" if there is a significant risk to people's health, safety, fundamental rights or the environment. New items on the list are:

- AI systems capable of influencing the outcome of an election and the voting behaviour of natural persons. A further condition for "high-risk" is if there is a significant risk to people's health, safety, fundamental rights or the environment.

- Referral systems used by social media platforms with more than 45 million users.

These two examples relate to current concerns about the dangers of AI influencing the outcome of an election or the impact on social media platforms with more than 45 million users. The targets for both of these inclusions are obvious.

Driving innovation, supporting SMEs while protecting human rights

The draft seeks to drive innovation and support SMEs, while protecting rights, by limiting the obligations relating to research activities and AI components made available under open-source licenses. There are also special considerations for regulatory test environments, where public authorities test AI systems by simulating real-life situations.

There are also more rights for data subjects – they may raise a complaint about the use of AI systems. Detailed information must be provided on decisions with a significant impact on fundamental rights. The powers of the EU's AI agency will be expanded to monitor the implementation of the rules.

Global view of alternative approaches to AI regulation

While the EU has already reached in principle agreement on its AI regulation, it is not in force yet. Given the accelerating pace of change with AI, is this too long? What happens in the interim, and are there alternative proposals which could be implemented immediately?

One alternative proposal that has been put forward is for an AI Pact to curtail the immediate risks of AI. Under this proposal, countries and companies would voluntarily adopt the draft regulation so it can apply earlier.⁹

A second proposal is for a Code of Conduct based on a set of principles which align with the ethics outlined in the draft legislation.¹⁰

In July 2023 the US National Telecommunications and Information Administration (NTIA) received more than 1400 responses to its earlier call for comments on its proposal on AI accountability, which is part of President Biden's commitment to seizing the opportunities AI presents while managing its risks. The White House has also released a Blueprint for an AI Bill of Rights, with the aim of "making AI systems work for the American people".¹¹

9 <https://www.politico.eu/article/big-tech-rumble-europe-global-artificial-intelligence-debate-ai-pact/>

10 <https://techcrunch.com/2023/05/31/ai-code-of-conduct-us-eu-ttc/>

11 <https://www.whitehouse.gov/wp-content/uploads/2022/10/Blueprint-for-an-AI-Bill-of-Rights.pdf>

The UK Information Commissioner's Office has released guidance on AI and data protection, including "Guidance on "Generative AI: eight questions that developers and users need to ask."¹² This approach relies on developers to know their data protection responsibilities and to comply with them and be prepared to show how they are compliant.

"Organisations developing or using generative AI should be considering their data protection obligations from the outset, taking a data protection by design and by default approach.¹³ This isn't optional – if you're processing personal data, it's the law."

In Hungary, where I am based, there is draft legislation under consideration, which is open to public comment. Its focus is on regulating the data input to AI based systems, for example what US based companies can do with your data.

Both Australia and Canada are considering their policy and regulatory response to AI in the wake of the proposed EU legislation. Meanwhile, other jurisdictions are taking more of an industry collaborative approach. The Singapore government is making efforts to build trust on the basis of ethical AI, asking companies to collaborate in the world's first AI testing toolkit, called AI Verify This is a not-for-profit wholly owned subsidiary of the Singapore regulator and supported by tech companies including Google, Microsoft, IBM, Red Hat and Salesforce.

Next steps

In the EU, with the adoption of a compromise text by both the Council and the Parliament, the legislative procedure moved to the next stage, the so-called 'trialogue' procedure, ie the phase of tripartite consultation between the three EU authorities – the Commission, the Council and the Parliament.

In the triologue procedure, the Commission acted as a mediator, to facilitate the convergence of the Council and Parliament positions, which led to the adoption of the AI Act. MEPs reached a deal on 8 December 2023 and the EU Parliament will vote on the proposed Act in early 2024. It is expected to come into force in early 2025.

¹² <https://ico.org.uk/about-the-ico/media-centre/blog-generative-ai-eight-questions-that-developers-and-users-need-to-ask/>

¹³ <https://ico.org.uk/for-organisations-2/guide-to-data-protection/guide-to-the-general-data-protection-regulation-gdpr/accountability-and-governance/data-protection-by-design-and-default/>



Dóra Petrányi is a partner and CEE Managing Director at CMS and 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.

The crisis of language and truth

Humans vs algorithms

Derrick de Kerckhove and Maria Pia Rossignaud, TuttiMedia / Media Duemila

We have entered a new era of human evolution. Since the end of the last century human beings have been delegating their faculties to machines, first to the computer then to the cell phone and now to Artificial Intelligence. Human societies around the world are faced with harmful and dangerous misinformation on the one hand and, on the other, the ability of GPT to produce human discourse without awareness or responsibility for what it entails. We are thus reaching the pinnacle of the epistemological crisis that we have already predicted and foretold in many articles published by Media Duemila, the primary Italian magazine about digital culture.

The EU's Media Freedom Act¹ is a response to increasing concerns about the politicization of the media and the lack of transparency of media ownership. It seeks to put in place safeguards to combat political interference in editorial decisions and guarantee media freedom and pluralism, as the basis of democratic life.

What to believe: the exponential growth of information

Information has always been a feature of human activity. In more recent times, information has been expressed by human beings, produced by machines and then processed by information technology. Understanding the links between the information and the eventual message has been made increasingly difficult by the enormous growth in complexity in social, economic, political, cultural, industrial, and scientific fields. Now human society is generating an entirely new organism, driven by an incredible increase in information flows. While this could lead to a much richer and more powerful body of knowledge, it may nevertheless also degenerate into a disordered and damaging cancer.

It is therefore no surprise that people all over the planet have become both fascinated and terrified by generative AI. Humanity

¹ <https://www.consilium.europa.eu/en/press/press-releases/2023/12/15/council-and-parliament-strike-deal-on-new-rules-to-safeguard-media-freedom-media-pluralism-and-editorial-independence-in-the-eu/>

is entering an era of unprecedented doubt: what to believe?

Real vs fake

The response to two award-winning photographs illustrates the increasing difficulty of distinguishing the real from the fake.

The first is the 2023 World Press Photo of the Year by Ukrainian photographer Evgeniy Maloletka²: the missile strike on the Mariupol Maternity Hospital in November 2022, which led to the death of Iryna Kalinina and her stillborn son Miron. The official Russian media immediately claimed it was a fake photograph doctored by Ukrainians. The denial of authenticity to the World Press winner is standard behavior to be expected from Russian State media. It is part of the general panorama of fake news and denial of evidence to which the world has become accustomed since social media began to be used for political and business purposes.

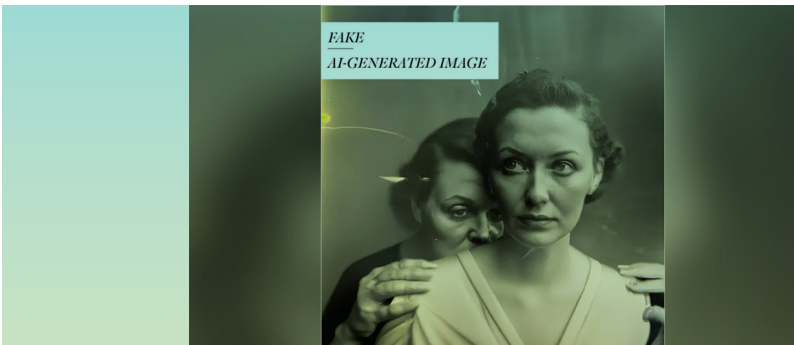


The story behind the second image, on the other hand, is another matter altogether³. German artist Boris Eldagsen turned down the award in the creative section of the 2023 Sony World Photography competition, confessing that the now famous picture of two women - "Pseudomnesia: The Electrician" - was not a genuine photo, but one concocted by a prompt to a

² <https://www.worldpressphoto.org/collection/photo-contest/2023/Evgeniy-Maloletka-POY/1>

³ <https://www.theguardian.com/artanddesign/2023/apr/18/ai-threat-boris-eldagsen-fake-photo-duped-sony-judges-hits-back>

cleverly creative software. Eldagsen explained to the press that he refused the award, not out of remorse for having fooled the jury but to bring attention to the present and immediate danger such a potent technology as AI driven photography could become in a world already attuned to the production and circulation of effective – and lucrative – politically or personally damaging persuasion.



As regular consumers of photographs both private and public, this was a shocking eye-opener for us. For years, like most of our contemporaries, we had been used to accepting photography as a reflection, representation, and guarantee of the veracity of events and physiognomies. Yes, of course, as other media scholars, we were aware of the many critical approaches to the “illusion of reality” thanks to which people generally trust photography. But this creation of ‘reality’ ex nihilo was something else altogether. Our trust in photography has been shattered forever. In other words, the sudden arrival of photography in the category of questionable evidence was equal to the breaking down of the last wall of defense that we had unconsciously erected to protect objectivity from subjective erosion and distortion. Eldagsen’s courageous move should be a fair warning to journalists worldwide and in the European Union in particular.

Language as an operating system

Anybody who, for whatever reason, has had to migrate from Windows to Apple OS, or vice-versa, knows how tedious, difficult, and time-consuming this can be. For some, like us, it may take weeks to get fully adjusted even if you have already had over 40 years’ experience of using personal computers. Imagine then how much more painful the same transition is when imposed on a whole culture. And yet, that is exactly what is happening to the world’s various cultures today. And this is not just a software issue, but a transformation of the whole basis of human civilization – a rapidly accelerating switch from human literacy to machine-driven algorithms.

Language is the main *operating system* of any community. It is through linguistic exchanges that a community, from the family unit to the clan and the tribe, sets standards and rules of behaviour that affect religion, education, local practices etc. That is not really news because no-one would seriously doubt or play down the role of language in organizing human societies.

Context and meaning

The question becomes a lot more precise when the metaphor of an operating system is applied to writing. The difference between, for example, phonological systems, like western literacies and iconic ones, like Chinese, are well-documented and make intuitive sense. Reading English doesn’t require anything other than knowing the sound of the letters and the language itself, while reading Chinese doesn’t require you to know the language but rather to be in a position to guess the meaning of the icons according to the right context for whatever language is being used (and there are more than 80 different languages in China). Putting the text before the context or vice versa define two very different operating systems that affect and condition the cognitive processes of the reader.

Less obvious, but still critical are the different cognitive approaches needed to read Latin or English in comparison to those used to decipher scripts without vowels, such as Arabic or Hebrew. There again, the context must come first, merely to enable the reader to decipher the text. A better understanding of such differences would go some way to explaining some of the key features that distinguish Western and Eastern civilizations. But that is not the present purpose of invoking the theory. The question is rather: what are key features of a society that transitions from being run and ruled by linguistic operators to one that delegates its decision-making processes to algorithms and AI?

The first and perhaps most important feature modification is that, perforce, language works by, with and through meaning. Algorithms simply don’t. Anyone who has used automatic translation knows that neither Google nor Deepl.com (another excellent translating software) knows any language at all. It operates iconically by matching answers to queries and selecting the best option by statistical ranking. That is pretty well how chat GPT and the others work. Of course, the analytics obey simple instructions provided by humans, and, at first, supervised by data scientists, but the lightning advances made by successive generations of GPTs come from the possibility of trusting the instructions to be sufficiently precise to allow from the program to download and sort humongous amounts of data ‘unsupervised’, thus saving thousands of years of human labor. The present quantum leap of AI is owed to that step and to the advances made by machine-learning and computing processing power. All to the good? Yes, but . . .

The siren call of the LLM

The problem with a machine providing usable and circumstantial answers to our questions is not that they may not be good enough. Quite the contrary, the problem is that they may be too good to ignore. The temptation to use them will not abate in view of the phenomenal progress the Large Language Models, or

LLMs, have made in a very short time. It may make perfect sense for humanity to take advantage of all the inputs it has made into the collective heritage of human intelligence and memory since the Internet was first made available to you and me, that is, January 1st, 1983.

We can collectively reap the benefits of decades of human discourse online, some of it banal, inconsequential, or deliberately misleading, but most of it filling valuable data banks. Overall, there seems to be little wrong and much right going along full steam with such an unexpected opportunity. The question then becomes: are we really ready to change our operating system from dialectic, deliberative and reflective to quasi-oracular? Are we ready to demote language from being our main mass medium and to delegate our cognitive functions and strategies to automation? Can we afford to let algorithms become the accepted authority and enable them to claim objectivity?

A loss of individual expression

Language first and later writing have allowed people for millennia to operate a good part of their lives on their own, provided they conformed to legal and social guardrails. Letting machines think in your stead will not guarantee that this opportunity continues. Some scholars, such as Paolo Benanti, talk about the foreseeable ‘loss of competences’. This may cover specific skills beginning with the proper or pertinent use of language itself. Journalists are known to be among the principal users of LLMs. It saves them time and guarantees linguistic correctness, a vanishing skill. Even before any direct intervention from LLMs, we have already observed a general trend in school, online, and even in print material, to lose, downplay, or ignore grammatical and orthographic skills. This neglect of the right word or the right spelling translates into a loss of individual power, not to say of *individuality* itself. Indeed, although addressed to individual queries, LLMs operate like a collective cognitive system. So does language, by its nature, the difference being that language and writing work their ways within the mind of the individual while LLM do that work from the outside of human bodies. Then there is an ethical as well as a cognitive issue, that is, of responsibility. Humans stand behind their words. If it is found that they don’t, they are held to account by law and shunned by their peers.

Language is being detached from reality

So, how does all the above announce an epistemological crisis? It’s all about language. Whether spoken or written, language is not in itself a way of thinking, it is only a code. Like photography, writing is not ‘reality’ but a representation of it. Many people, however, take the oracles of GPT for the expression of thought, just as they take photography for the representation of reality. Of course, informed people do not make that mistake but combined with the onslaught of fake news and science denial, automated simulated thinking detaches language from its association

with authentic reporting. Overtaken by algorithms as a system for decision-making, language is demoted to an auxiliary role. It loses its function of guaranteeing a reliable attempt at presenting ‘reality’ in context. In that turmoil a clear distinction between objective and subjective is gradually disappearing. The result is that using words and sentences turns into a ‘free-for-all’ information system run by anybody, anywhere, with any media.



Maria Pia Rossignaud is Senior Vice President of the Osservatorio TuttiMedia, publisher of the first Italian digital culture magazine “Media Duemila”. Dr Rossignaud is a journalist expert in technologies applied to media and society. Italy’s President Mattarella awarded her with the honor of “Knight of Merit of the Italian Republic”. She is among the twenty-five digital experts of the Representation of the European Commission in Italy. Her publications anticipate and analyze the effects of the digital transformation on political, economic and cultural affairs. “Beyond Orwell: the digital Twin” is one of her widely commented books. Also concerned with the status of women she sits on the board of “Stati Generali delle donne”, and she is involved in the GTWN (Global Telecom Women’s Network). She has been professor at LUISS University – Sapienza – IULM. And she involved as speaker in many international conferences on digital transformation media, communication and advertising.



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.

AI and ethics

It's not all about technology

Carla Cico, Chairman of the Board, Vendis

AI has been increasingly adopted in many sectors which have benefited from its use: healthcare, energy, and financial services just to name a few. However, for me the most important questions are not about the operational arguments for and against AI technologies but are instead concerned with the nascent debate on AI ethics, potential regulatory models, and the various types of governance that could be applied to monitor its use.

AI: cure or curse?

Nowadays, not a day goes by that AI is not mentioned either in TV or in major newspapers. However, many of these discussions are colored either by excessively alarmist or utopian perspectives, which respectively either magnify potential threats posed by AI or wax lyrical on the benefits society will reap from its use.

Bodies and institutions ranging from international organizations to government agencies, along with countless sociologists and philosophers are all involved in finding the solution for the ethical application of AI. Are their approaches the right ones? Is strict control really needed to avoid disastrous consequences for humanity?

While I may not be able to offer definitive answers to these questions, I would like to draw attention to some incongruences and overreactions that accompany many discussions about AI and ethics, along with proposing some potential alternative actions that may be adopted in their stead.



Towards a human-centric approach

The EU guidelines on ethics set out AI core principle that state the EU must develop AI following a “Human-centric approach”¹:

“The human-centric approach to AI strives to ensure that human values are central to the way in which AI systems are developed, deployed, used and monitored, by ensuring respect for fundamental rights, including those set out in the Treaties of the European Union and Charter of Fundamental Rights of the European Union, all of which are united by reference to a common foundation rooted in respect of human dignity, in which the human being enjoys a unique and inalienable moral status. This also entails considerations of the natural environment and of other living beings that are part of the human ecosystem, as well as a sustainable approach enabling and flourishing of future generations to come.”

As for the United Nations, their Guidelines are built upon the deliberations of the Chief Executive Board for coordination on “Principles for the ethical use of artificial intelligence in the United Nations system”²:

- Right to privacy, data protection and data governance
Individuals’ privacy and rights as data subjects must be respected, protected and promoted throughout the life cycle of artificial intelligence systems. When the use of artificial intelligence systems is considered, adequate data protection frameworks and data governance mechanisms should be established or enhanced, in line with the personal data protection and privacy principles, also to ensure the integrity of the data used.

- Sustainability

Artificial intelligence should be aimed at promoting environmental, economic and social sustainability. To this end, the human, social, cultural, political and economic environmental impacts of such technologies should be continuously assessed

¹ EU guidelines on ethics in artificial intelligence: Context and implementation – Briefing, 2019

² United Nations System, Chief Executives Board for Coordination, 27 October 2022

and appropriate mitigations and preventive measures should be taken to address adverse impacts, including on future generations.

The above extracts are just a limited example of the details of the regulatory and policy frameworks that are still being developed, but that eventually will become the rules designed to limit the potential negative impacts that the use of AI could bring upon society.

Will regulation be effective?

Concerns about security, data protection and privacy have become well-trodden conceptual ground. Since the mass take up of internet access, such concerns have been faced by a multitude of entities and indeed continue to be a major obstacle to regulation in all sectors, not just AI. Private companies have spent billions of dollars to mitigate these, while regulatory agencies continue to adapt and develop new regulatory strategies. However, they have not been entirely successful; for example, we all know that anytime we log in on a site or simply navigate online, our privacy can be breached, regardless of the level of security of any specific site and/or of the device used to log in.

The same goes for all the other praiseworthy principles listed both by the EU and the UN: safety and security, fairness and non-discrimination, sustainability, right to privacy, data protection and data governance, child protection, etc. are the same principles that are at the core of policy makers in the “analogue” (offline) world. Why should we expect that these issues will be solved in the digital arena when they are still unsolved in the analogue world?

A new approach is needed

When considering a new way ahead, we must understand that AI is not an independent machine or creature. AI is still dependent on humans for the data upon which it is trained, the algorithms which it uses, and the fields in which it is deployed. This fact has largely been ignored to date in the polarized debate on AI and AI and human society are treated as if they were separate entities. Whether society aims to benefit or protect itself from AI, AI is always seen as separate and independent from the society it may impact.

Instead, when issuing new rules and regulations to resolve the issues that have been part of human society since time immemorial in the field of AI, those entities involved in the regulation of AI and ethics should have a more practical approach, focusing on what can be achieved rapidly and with concrete positive outcomes. This principally entails making citizens knowledgeable of what AI is (and how it works). The aim should be to promote a nuanced and balanced debate on

AI, free from the fear-mongering propagated by mainstream information channels, while informing citizens about the potential negative effects that can result from excessive reliance on cyberspace and online interaction. Regulators should focus on controlling the areas that are most at risk while making individuals knowledgeable, responsible and accountable for their actions in using and deploying AI.

User education is key

This is the crux of the issue: the average internet user does not have a developed understanding of digital technology in general and AI specifically. To redress this, age-specific campaigns and training courses must be sponsored by Governments and/or Governmental Agencies to explain the basics of AI and in order to increase user awareness of his/her decisions and actions. Users should understand that they are also accountable and responsible for breaches of privacy (whether the data be their own or of others) as much as the companies that should guarantee it. The publication of potentially sensitive personal data, such as photographs of underage children, for example, is one example of how adult users can be unaware of the risks that online exposure brings.

The vulnerable need special protection

A specific emphasis should be placed on children. Why is it that young people can get a driving license to venture out in the real world only from about 16, yet toddlers are allowed to freely navigate an online world - which in many cases can be more dangerous - from the moment they are able to understand how to use a touchscreen? In the former case, we all agree that certain limitations on individual freedom are necessary to protect these same individuals from dangers they might be unaware of or are as of yet unable to properly understand, yet such sensible concerns are seemingly ignored with regard to the digital realm. Limitations on digital exposure at an early age would bring a host of benefits, ranging from better social development to safer interactions and accelerated learning. In the meantime, young people would learn how to navigate the digital realm and become responsible internet users.

The internet allows information to be exchanged easily and with anonymity. To redress negative outcomes that stem from this, such as criminality, terrorism, and illegal pornography, international cooperation between Public and Private entities should be instituted, with the support of local Governments, agencies, police forces as well as large technology companies.

Finding the right balance

I believe that we need to find the right balance and adopt a more down-to-earth approach to AI. This will achieve more concrete results compared to the declarations of wishful thinking which

dominate current efforts at AI regulation. These utopian wish-lists, while reflecting a general aspiration, are usually very difficult to implement or are simply used to place the burden of their implementation onto the private sector by avoiding concrete actions by governmental agencies.

AI is the latest creation (for the time being) in the long line of human innovations. Just as with previous technological advancements, its potential effects will prove to be either negative or positive depending on the ethics, regulations, and situations of its implementation rather than the technology itself. It is up to us humans to continue to develop AI and to achieve even more amazing outcomes, while also being guided by a desire to preserve and maintain the best of human society and ethics.



Carla Cico has many years' experience as a CEO in both public and privately held companies. With a strong international background, backed up by M&A and extensive management experience, she has been a pioneer in both digital transformation and ESG implementation. She has served as a Member on many Boards, as well as the Chair of Committees, in listed and unlisted companies, companies backed by Private Equity and startups. She is a sought-after speaker at many conferences and summits, with a focus on Telecommunications, Management and Strategy, Digital Transformation and developing countries. She was the first South American female CEO in the Telecom sector.

New US standards for AI

Michele M. Merrell, President, GTWN, Americas and President, Merrell Consulting Group



In October of 2023, the United States government issued a landmark Executive Order¹ on safe, secure, and trustworthy Artificial Intelligence (AI). This order marked a significant step forward in the development and implementation of ethical AI practices in the United States. With the rapid advancement of AI technology and its integration into various industries, and even political elections, the implications of this Executive Order are impactful. The implications of the order and the potential effects on society, economy, and international relations are wide reaching.

The drive over the past year to develop AI technologies that are safe, secure, and trustworthy is a response to the growing concerns around potential harms caused by AI, such as bias, discrimination and unintended consequences. Extensive media

coverage both in the US and around the world has warned about these possible dangers. There has also been public concern about the apparent lack of controls on the use of this technology, particularly as some feel it could be a threat to democracy, as the technology could be used for AI-powered misinformation campaigns or cyber-attacks. Those with malicious intent could quite possibly test the security of the American electoral process by giving bad actors the ability to flood the country with generative AI that amplifies cybersecurity risks and makes it fast, easy and cheap to flood the country with fake content. This has now made the regulation of AI a top priority for lawmakers and regulators of media, communications as well as the use of data in the US, EU and elsewhere². The question is whether this rapid response is appropriate and justified at this relatively early stage of AI development, and what will be the implications for the digital tech sector going forward.

¹ Fact Sheet: President Biden Issues Executive Order on Safe, Secure and Trustworthy Artificial Intelligence, October 30, 2023. <https://www.whitehouse.gov/briefing-room/statements-releases/2023/10/30/fact-sheet-president-biden-issues-executive-order-on-safe-secure-and-trustworthy-artificial-intelligence/>

² As AI Booms, Lawmakers Struggle to Understand the Technology; March 3, 2023. <https://www.nytimes.com/2023/03/03/technology/artificial-intelligence-regulation-congress.html>

The role of US federal agencies in AI regulation

The Executive Order highlights the role of federal agencies in promoting responsible AI development and deployment. This includes a requirement for agencies to prioritize AI research and development that aligns with ethical principles and values, as well as the establishment of standards and guidelines for the responsible use of AI.

Furthermore, the Executive Order acknowledges the need for collaboration and coordination between different stakeholders, including government agencies, private companies, and academia. This indicates a shift towards a more holistic approach to AI development that involves input from diverse perspectives. It also presents an opportunity for the creation of innovative and ethical AI solutions.

However, the federal government has been involved in AI for more than six decades. Reaching back to the 1960's the Defense Advanced Research Projects Agency (DARPA) began funding the research and development of the technology, particularly for use with drones and cyber security tools.

Implications for business use of AI

The implications also extend to the economic sphere. With the growing importance of AI in various industries, the development and deployment of safe and secure AI will become a competitive advantage for companies. This Executive Order can be seen as a commitment from the government to support the growth of AI-driven industries by promoting responsible AI practices.

It may also lead to the creation of new jobs in the AI sector, as companies invest in developing and implementing ethical AI solutions. While Washington initially took a 'hands off' approach to AI development, the boom has taken over Silicon Valley with Microsoft, Google, Amazon, Meta and others racing to further develop the technology. The debate on AI has now shifted as chatbots are writing songs and poetry, and cars are driving themselves, with some fearing the technology can eventually replace humans in jobs.

Moreover, the Executive Order has implications for international relations. The US is considered a leader in AI development and has reaffirmed its commitment to ethical AI. With countries around the world also investing in AI research and development, this Executive Order can serve as a model for other nations to follow. It can also lead to increased cooperation and collaboration on ethical AI standards and guidelines at the international level. The European Union has taken a leadership role in AI technologies that might create the most harm, such as facial recognition and applications linked to critical public infrastructure like the water supply. The EU measures would require makers of AI to conduct

risk assessments of how their applications could affect health, safety and individual rights, like freedom of expression.³

Challenges of AI regulation

While the development of AI presents numerous economic and social opportunities, it also raises several significant challenges. One such challenge is the implementation and enforcement of ethical AI practices. It will require a significant number of resources and efforts from both the government and private sector to ensure compliance with these practices. Additionally, the highly dynamic nature of AI technology may require continuous updates to the guidelines and standards to keep up with new developments and potential risks.

Some areas to consider in the development and governance of AI to ensure for safe, secure, and trustworthy technology innovation include:

1. **Ethical frameworks:** Establish clear ethical guidelines and frameworks that prioritize fairness, transparency, and accountability in AI development.
2. **Diverse representation:** Ensure diverse representation in AI teams to prevent biases and promote a more inclusive approach to technology development.
3. **Transparency:** Encourage transparency in AI systems, making it easier for users to understand how decisions are made and fostering trust in the technology.
4. **Privacy protection:** Implement robust privacy measures to safeguard user data, ensuring that AI applications comply with relevant data protection regulations.
5. **Bias mitigation:** Develop and deploy techniques to identify and mitigate biases in AI algorithms, preventing discriminatory outcomes across different demographic groups.
6. **Continuous monitoring:** Establish mechanisms for ongoing monitoring and evaluation of AI systems to identify and address issues that may arise during their lifecycle.
7. **Interdisciplinary collaboration:** Foster collaboration between technologists, ethicists, policymakers, and other stakeholders to create a holistic approach to AI development that considers societal impacts.
8. **Standardization:** Work towards international standards for AI safety and ethics to provide a common framework and facilitate responsible AI development globally.
9. **Public engagement:** Involve the public in decision-making processes related to AI development to gather diverse perspectives and address concerns about the societal impact of these technologies.
10. **Legal and regulatory frameworks:** Develop and adapt legal and regulatory frameworks that keep pace with AI advancements, ensuring that there are clear guidelines and consequences for unethical or unsafe AI practices.

³ <https://www.nytimes.com/2023/03/03/business/dealbook/lawmakers-ai-regulations.html>

In conclusion, the United States' October 2023 landmark Executive Order on safe, secure and trustworthy AI carries a wide range of implications. It presents a commitment from the government to promote ethical AI practices, fosters collaboration between different stakeholders, and has potential economic and international impacts. While there may be challenges in its implementation, this Executive Order serves as a crucial step towards the responsible development and use of AI in the United States.



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, US 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.

DIGITAL NATIVES



Empowering the next generation in telecom

Isabelle Paradis, CEO HOT TELECOM

I'm the founder of HOT TELECOM, a trailblazer in telecom strategic consulting and market research for 20 years. As the landscape evolved, so did we. Now, we're not just about strategy; we create unforgettable content and host standout events for telecom operators worldwide.

Though my roots are Canadian, I've made the UK my home. Yet, the world is my workplace. I travel globally, serving our clients and navigating the intricate world of international telecom. Our specialty? The niche, wholesale realm of the global telecom arena.

Our clientele? The major players. We collaborate with leading carriers, wholesalers, and other international operators. Our expertise spans data centers, subsea infrastructure, voice messaging, and the full suite of services powering the international telecom landscape.

People often ask about my journey into telecom and the knowledge and skill set the ICT sector demands. As a seasoned woman in the industry, I believe it's crucial to mentor and guide the next generation. Especially young women who might be pondering a future in this field or haven't yet seen its potential. The industry needs their fresh insights and talent.

So, here's my offering: a distilled account of pivotal lessons from my 30+ years in the sector and my top advice for budding professionals.

The "accidental" engineer

At a glance, people who know me in the business world might be surprised to learn that I'm an industrial engineer with an MBA in finance. Pursuing the MBA was a conscious choice to bolster areas I felt less confident in.

Unlike many engineers, I didn't grow up with a burning ambition to join the field. In fact, as a child, engrossed in ballet and later transitioning into professional figure skating from age 5 to 18, the world of engineering was the furthest on my mind. I dedicated countless hours, six days a week, to my passion for skating while pursuing my academic studies.

But around 18, a crossroads appeared. Would I chase the elusive Olympic dream? Realizing that wasn't my path, I hung up my skates to fully embrace academia.

Engineering wasn't an obvious choice. My family, deeply entrenched in the medical field, hoped I'd follow suit. But medicine wasn't for me. I needed a direction when my brother stepped in with a suggestion: "Why not engineering? It's a foundation that will unlock any door you wish to open." Although we didn't always see eye to eye, this was a piece of advice I'm glad I took. Once I delved into engineering, I was enamoured.

There's a prevalent misconception about the dichotomy of creative and analytical minds, particularly among women. Many deem themselves as either "left-brained" (logical) or "right-brained" (creative), thinking the twain shall never meet. My journey disproves that. I'm evidence that it's possible to possess a flair for both artistic pursuits and analytical problem-solving.

Indeed, my creative and analytical sides aren't at war—they synergize. My structured approach to problem-solving, coupled with my creativity, allows me to bridge technical aspects with the user experience in business. In essence, I believe we shouldn't box ourselves into categories; explore, and you might be surprised where your talents lie.

Know yourself

First and foremost: embrace authenticity. During my time at engineering school, where women were a rarity, I thrived. Yet, contrary to some preconceptions, I was—and remain—a proud "girly girl." A prevalent myth suggests that femininity and engineering are incompatible. I stand as evidence to the contrary: you can be an engineer and wholly embrace your femininity.

Young women often approach me with concerns, like the appropriateness of wearing a dress while presenting. My counsel is always straightforward: be unapologetically yourself. Authenticity is your strength. Pretense can be discerned, leading to a lack of trust and credibility. I'm living proof that creativity, femininity, and engineering are harmonious, not contradictory.

My inclination towards industrial engineering was not arbitrary—it was a marriage of solution-oriented thinking with the managerial aspect, reflecting both facets of my skills. My pursuit of an MBA after engineering wasn't a fleeting thought. It was a deliberate move to complement my strengths and bolster areas where I perceived gaps. Recognizing your strengths and weaknesses and proactively addressing them is key to personal and professional growth.

Luck and planning in equal measure

My second tip is to recognize that both serendipity and meticulous planning can shape your career. Cultivating a robust network of connections is invaluable. In 1993, at the heart of a recession, my job hunt seemed endless. But then, a friend's positive experience at Teleglobe and a fortuitous newspaper ad merged my path with theirs. Accepting that role marked a thrilling new chapter in my life.

Teleglobe, transitioning from a monopoly, had an innovative CEO, Charles Sirois. His vision: to reinvent the company's competitive edge. His strategy? Recruiting 30-40 youthful minds from eclectic fields—economics, politics, engineering, marketing—to instigate transformation. As part of this dynamic group, I witnessed the power of diversity firsthand. It cemented my belief that fresh perspectives can revolutionize industries.

In the energetic environment of Teleglobe, my roles were manifold—from product management to regional direction across continents. This whirlwind of experiences underscored the importance of continuously seeking opportunities. It not only kept monotony at bay but also nurtured my creative spirit.

Know yourself and trust yourself

Here's my third piece of advice: truly know and embrace yourself. To any young woman considering engineering: dive in. It equips you with invaluable life skills. It teaches problem-solving, teamwork, and the rewards of hard work blended with enjoyment.

While I'm often asked about challenges I've faced as a woman in the ICT sector, my gender hasn't been an obstacle. Occasionally, it's an advantage. Being the only woman in a room means you stand out. All it requires is the confidence to raise your voice and trust your abilities.

Admittedly, confidence didn't come naturally to me. At 18, I had my fair share of self-doubt. Through sports, I understood that persistence is the path to success. Growth comes from stepping out of comfort zones. While confronting a daunting task, like public speaking for the first time, might induce stress, with repetition, it becomes second nature. Always remember, mistakes aren't the end of the world. People root for your success.

Laugh off missteps and push forward. Self-doubt hinders growth. Choose to believe in yourself.

Positive energy is transformative. When you exude passion, your audience is captivated. They remember not just what you say, but how you made them feel. Celebrate your uniqueness—it's memorable.

Now, as I introduce young individuals to the stage, their initial apprehension is palpable. But by the end, most express exhilaration, eager for the next opportunity. Seeing that transformation? That's when I know I've made a difference.

Women in today's ICT

At the outset of my career, the rapid evolution and increasing inclusivity of the industry was beyond my wildest dreams. Today, we see greater representation of women and individuals from diverse ethnic and social backgrounds. While progress is evident, there's more ground to cover, particularly for the next generation. The influx of younger talent will undeniably shift the industry's culture, creating a ripple effect of change. Regions once challenging for women are witnessing positive transformations. My contributions to organizations like PTC and GTWN are laser-focused on accelerating this shift.

The rise in women CEOs serves as a beacon of possibility for young women, illustrating that leadership roles are within their grasp. This underscores the vital importance of mentorship and role models for tomorrow's leaders.

Being an entrepreneur

I actively mentor young women in entrepreneurship. Today's youth often harbor dreams of helming their own ventures rather than joining large corporations, akin to my career path. Embarking on entrepreneurship is undeniably appealing, but it comes with its unique challenges and responsibilities. Every dollar earned is a direct result of your efforts – you can't just show up and expect financial rewards.

Becoming an entrepreneur necessitates self-awareness. Recognize your strengths and actively bridge the gaps in your skill set. Additionally, a successful entrepreneur needs a strong risk tolerance. My entrepreneurial journey began with more enthusiasm than clarity, and I've since learned that while you might be free from corporate layoffs, your venture's success hinges on your grit and character. It's a demanding path, but immensely fulfilling.

The silver lining for budding entrepreneurs is the increasing support from both public and private sectors. Leveraging these networks can offer invaluable guidance and resources as you build your vision.

The cool kids

When I first embarked on my journey with Teleglobe, the tech industry epitomized innovation and was undeniably “cool.” We were at the forefront of change, reshaping the world for the better. Over time, this dynamic landscape has evolved into a domain dominated by established corporations. The zeal and novelty, it seems, have taken a back seat.

However, the technology itself remains just as exciting, with groundbreaking advancements like 5G, AI, ultra-fast cabling, and revolutionary space tech. The problem? The industry doesn’t market itself as the thrilling space it once was, leading to a dearth in awareness among the youth.

To revitalize our sector, we need an infusion of fresh energy. It’s crucial to attract young, vibrant minds who can not only reinvigorate the industry but also serve as ambassadors to their peers. By doing so, we can inspire the next generation to see tech as a realm of endless possibilities and compelling career prospects.

Positive energy end giving back

The magnetic force of positive energy is undeniably potent. While it might not be the entire equation, it undeniably constitutes a significant portion. There’s a certain vibrancy to the energy we radiate, and I deeply resonate with the idea of mirroring and reciprocating energies. Embodying positivity not only ensures a harmonious atmosphere around oneself but also magnetically draws in like-minded individuals.

But the ripple effect of this energy extends beyond personal interactions. My guiding philosophy is channelling this positivity to uplift and support the budding talents of the younger generation. They are the pillars of our industry’s future, and we have a collective responsibility to ensure they find their rightful place.

Translating this ethos into my professional sphere, I aim to create ripples of positivity with my clients. It’s more than just business transactions; it’s about impacting their lives and enterprises positively. Whether it’s keeping the environment light-hearted, fostering camaraderie, or simply offering a friendly gesture, every little positive act compounds over time. As I’ve learned, when you consistently radiate goodwill and strive for others’ best, life has a beautiful way of repaying the kindness manifold.

This article is based on a Nomad Futurist podcast. Isabelle was interviewed on 18 September 2023 by Nabeel Mahmood and Phillip Koblence. Listen to the podcast here: <https://www.nomadfuturist.com/empowering-the-next-generation-in-telecom/>



Isabelle Paradis, a seasoned expert with 30 years of global experience, serves as the President and Founder of HOT TELECOM—a trailblazing telecom research and consulting firm celebrated for its innovation and creativity. Over the past two decades, HOT TELECOM has provided invaluable support to global operators and vendors, with a specialized focus on International and wholesale realms.

In recent times, Isabelle has become a leading voice in guiding the world’s telecom service providers through their transformation strategies. A prolific thought leader, she frequently authors articles and graces conference stages to discuss the future of telecom.

Beyond her industry-specific contributions, Isabelle champions the inclusion of women and young minds in the tech and science sectors. Through hosting global panels and interviews, she’s an active advocate for diversity in tech. Her dedication is evident in her roles with key organizations: she’s a distinguished member of the Youth and Women Entrepreneurship ESNB taskforce initiated by the United Nations ESCAP, sits on the PTC Board of Governors, and holds a board position with the Global Telecom Women’s Network.

Isabelle has a Bachelor’s Degree in Engineering and an MBA in Finance, equipping her with a robust foundation that underpins her illustrious career.

advancements in wireless and broadband technologies, we as a digital industry have been phenomenally successful in making the world smaller. While maybe not in a literal sense, the world today is much more reachable and extremely connected. We can connect to anyone almost anywhere around the globe, be it through video call or social media platform. Our lives have become interconnected in more ways than any other generation before us, and that has brought about vast improvements to billions of us in the way we live, work and play.

My early experience - a disconnected world

This is nowhere more obvious than when I look back to my early experience in India as a young woman growing up. I went to an engineering school almost 900 miles away from home in Pune, which is a city in the western Indian state of Maharashtra. Pune is now one of the largest IT hubs in India. But at the time I was a student there, we had very limited access to communications. At the college, we had access to one shared landline amongst 200 students. We used to wait hours for our turn or set a time in advance for our parents to call us. I suppose this experience is very similar to many in the Baby Boomer generation, who grew up without the type of easy access to instant communication or mobile phones that we now take for granted.

A hyper-connected world

Fast forward to today, and it seems as if the world has shrunk and has become almost one as a result of the spread of digital technology. My parents call me from India twice a day, allowing for the time zone differences. And if I don't pick up immediately, they get anxious. While my parents get to see their grandchildren grow up on video calls, my 3-year-old niece, a real 'digital native', only wants to do video calls. She doesn't even understand the concept of a voice call without a picture. This type of advancement has made the world hyper-connected.

Social responsibility of tech leaders

As the saying goes - "With great power comes great responsibility". This is true in the tech world too. On one hand, we have created a world where banking is at our fingertips, working from home is technically feasible and driverless cars are a real possibility. But on the other hand, we may be creating a technology which is widening the gender gap in the tech world either by flawed design or by a lack of checks and balances. As leaders of the tech industry, it is our responsibility to consider the social impact of all these technology advancements - especially on women.

My daughters are now teenagers and I am aware that they are entering a digital world which has many benefits, but also many risks. I constantly think about whether humans are now driving the technology or whether the technology is driving humans.

Being part of the tech industry, I do find the technical part of social media impressive. Being able to have quick access to data, research, connect with people miles apart, do a job search, find educational content are but a few ways social media has made our lives much more efficient. But as a mother, it sometimes gives me sleepless nights.

As a parent, the impact of social media¹ is a big concern. As our children are still developing psychologically and socially, we need to be cognizant of the impacts of prolonged social media use. Adolescent girls see a perfect world out in the land of social media with teenagers having perfect hair, skin, body and life. This is not only making them conscious of their own body image, but it is also leading to eating disorders, social comparison and mental health impacts. Photo editing software is no longer a tool for just artists. Technology advancements have put this tool at the fingertips of many young influencers, changing the impact of these photos on our impressionable youth. These problems can be exacerbated when we talk about children's online safety and the access the world might have to them through social media. So, my question is: what are we, as an industry, doing about it?

Verizon is trying to educate parents and caretakers through its Parenting in a Digital World² blog. Often it's not a matter of "understanding" the technology that parents struggle with, but rather keeping up with trends, uses, and social implications of technology.

Additionally, it's important the positive impact social media and technology can have. It's still a vital tool in connecting, educating, and empowering children. Through the Verizon Innovative Learning³ program, Verizon has now provided over 3.5M students nationwide with digital skills training. By partnering with trusted education partners, edtech innovators and cultural institutions, educators have access to a growing suite of programs and resources, including new tech-driven lesson plans that leverage the power of augmented reality (AR) and virtual reality (VR) apps in the classroom. Through our commitment to addressing the digital divide, Verizon has committed to providing ten million youth with digital-skills training by 2030.

A shared responsibility

My daughters have a disadvantage (or advantage?) of having a technocrat for their mother. I am able to utilize parental controls provided by the phone manufactures and different social media websites. But is everyone able to do the same?

It is our responsibility as parents to make sure there are checks and balances in place on our children's use of digital technology, either through industry self-regulation or through government

1 <https://www.verizon.com/about/parenting/what-are-effects-social-media-teens>

2 <https://www.verizon.com/about/news-subcategory/parenting-in-a-digital-world>

3 <https://www.verizon.com/about/news/verizon-innovative-learning-expands-new-schools-content>

regulation, to ensure that children's use of social media is better controlled. One approach is to provide ready access to training for parents on how to put parental controls on social media accounts. Social media companies also have a big responsibility to ensure that parental controls are not bypassed, data is kept safe and risks to children are minimized.

Importance of mentorship and role models

An obvious way to work towards how to solve this is to get more women into tech fields. Over recent years, the industry has done well to build programs to encourage more women to apply to tech companies. However, there is definitely more work that needs to be done. Affinity bias is real. As humans we have a tendency to socialize with, hire, and promote people who are like us.

We often have to address the barriers to entry that prevent us from introducing new people and ideas into our fields. Verizon is rethinking many aspects of its process like mandatory college degrees, where we recruit from, and even the language we use in our job descriptions.

By the time many young women become aware of digital technology careers, they may already have chosen their career path and study course. I believe we should focus on early intervention in elementary schools and middle schools to get more girls interested in Math and Science. We should also focus our efforts on supporting more women to establish their career and build a support network, in what is still a male dominated industry. This is where mentorship and sponsorship can play a very important role in accelerating the changes in diversity and inclusion that we need to make.

Verizon has recently launched a program for children of employees to participate in a "Virtual Summer Camp" style program focused on introducing children as young as elementary school to technology.

So, what else can we, and our younger colleagues, do? My advice is to speak up - call those out who treat you differently than your peers either in private or in public. If the internal culture in your organization needs to change, call it out. Being talked over is the number one issue I hear from my mentees. Women cannot solve this alone; they need allies. We need leaders, both men and women to speak up when they see unconscious bias.

I also believe that younger women in the industry need to step up and really think about their life plan, and how they can take more control over their own destiny. I am very fortunate to have a husband who is very supportive and who encouraged me to take a less traditional path in my life and career. My hope for other women is that they also get the support they need to achieve their life plans.



Garima Garg is the Executive Director, Network Engineering for the Tri-State Region (NJ/ DE/ Eastern PA). She is responsible for RF Design, System Performance, Network Assurance and Implementation of new solutions to support wireless network growth and maintenance, including functions to build and grow the RAN network supporting Verizon's 4G LTE service and 5G implementation.

Garima is passionate about mentoring and coaching younger generations and preparing them for leadership roles.

Prior to this, Garima was the Director of Tech Strategy in Verizon's Technology and Product development organization. She led the team responsible for strategy and technical aspects of all connected devices and was responsible for driving device ecosystems in partnership with global chipset, OS, SIM and device vendors.

She has been with Verizon for 18+ years. In her previous role, Garima led Illinois and Wisconsin from System Performance perspective including Chicago, the 3rd largest CMA in the country. She led the effort to launch Verizon's first 5G NR network and 5G home product in Chicago. Garima strategized RF plans for the region, improved performance KPIs, tested and trialed new technologies like 5G - NR, LAA and CBRS. She has also served multiple positions with increased responsibilities across Performance, Transport and System Design in the Greater Boston area.

She earned a bachelor's degree in Electronics and Telecommunication from Pune University in India and a Masters in Computer Engineering from the University of Massachusetts, Lowell.

Soft skills: The new hard skills for thriving in the new digital era

Laina Raveendran Greene, Founder & CEO @ Angels of Impact

The advent of new digital tools, such as artificial intelligence, has brought about a profound transformation across various facets of our world, revolutionizing automation, personalization, customer experiences, language translation, financial services, and even agriculture. Integrating the right AI tools has become imperative for any entrepreneur to succeed.

The pace at which these changes occur is nothing short of exhilarating. Drawing from over 30 years of experience in the tech industry, I've witnessed firsthand how, in the past, innovations showcased at trade shows typically took around 15 to 30 years to transition into mainstream adoption. Consider the Internet revolution; it originated in 1971 with the inception of the first email sent across mainframe computers. However, it wasn't until the development of tools like the World Wide Web in the 1990s that it began to gain user-friendly accessibility for the masses. Even in the '90s, the creation of web pages was confined to larger companies capable of bearing the costs of domain names, storage, bandwidth, and professional web developers. Since then, in a short period, website creation has become remarkably simplified, often free, requiring minimal to no technical skills, and today, at an even shorter span, AI tools can even create websites in seconds.

We need more than hard skills

Amidst the constant buzz around technology, there's a prevalent tendency to perceive it as an ultimate destination rather than a means to achieve specific objectives. Consequently, an excessive emphasis exists on fostering hard digital skills, such as coding, often neglecting the equally essential soft skills. Take web page development, for example; it's not solely about mastering the technical aspects but hinges on nuanced elements like user interface design, graphics, comprehension of user engagement psychology, alignment with the website's purpose, and the ability to foster a sense of community. These facets constitute soft skills that are indispensable for the success of a webpage.

This principle holds universally for most digital tools, including routine corporate utilities. Many instances highlight companies' struggles in effectively deploying digital tools due to overemphasizing their flashy features, while insufficient attention is given to offline support mechanisms or a comprehensive understanding of the behavioral change dynamics necessary for their implementation.

This reality extends to AI tools as well. ChatGPT's effectiveness, for example, relies on both the quality of the prompts it receives and the user's capacity to capitalize on the data offered to them, for example, the ability to differentiate between information and fabrications—a domain where the tool has exhibited occasional shortcomings. Instances abound where ChatGPT has produced counterfeit book quotes, displayed lapses in common sense, or demonstrated biased deductions, recognizable primarily by astute users. As AI increasingly integrates seamlessly into applications without explicit user consent, such as facial recognition for crime prevention, there also arises a need for empathy, good data analytic skills to remove bias, advocacy, policy development, regulatory understanding, and communication to create awareness. These skills are essential to safeguard against AI's potential detrimental use within society at large. Likewise, the success of AI tools will depend on their applicability within relevant laws such as copyright laws and the use of online digital content—as this could threaten the tool's successful implementation. Already, we see many corporations disallowing their employees from using ChatGPT and calling for increased regulation over AI.

Essentially, I view this new digital revolution through the lens of continuity. As before, it's not solely about the technology itself but about how it seamlessly integrates with our lives, how well it serves as a facilitator rather than an endpoint, and how adeptly it amplifies our innate human abilities. Soft skills remain indispensable for sustainable success in the digital age.

What are soft skills?

Soft skills encompass diverse capabilities, including communication, critical thinking, creativity, adaptability, and emotional intelligence. Many companies prioritize hiring for Emotional Intelligence (EI) over technical skills in the contemporary job market. This emphasis stems from recognizing the pivotal role that interpersonal abilities play in fostering a positive work environment, nurturing effective teamwork, elevating customer experiences, and fueling innovation. Notable companies prioritizing EI in their hiring practices include Google, Zappos, Southwest Airlines, Apple, Salesforce, IBM, and IDEO. These companies acknowledge the evolving diversity within their workforce and customer base, the complexities of virtual work environments shaped by remote work and global time zones, and more. Hence, soft skills emerge as genuine hard skills essential for achieving success in today's dynamic professional landscape despite the rampant digital tools that exist.

Lean start-up Methodology

Despite this increasing awareness of the importance of soft skills, I consistently witness technopreneurs persistently prioritizing technology as the ultimate panacea. As an investor in entrepreneurs globally and an instructor of entrepreneurship at the National University of Singapore Business School (formerly also at Stanford University), this recurrent inclination is a pattern I frequently encounter. Hence, I've adopted the Lean Startup methodology in my classes—originally formulated by Eric Ries and Steve Blank—to emphasize the significance of employing a soft-skill approach and offering a good methodology. The Lean Startup methodology revolves around systematic listening to customers, validated learning, iterative product development, and a build-measure-learn feedback loop. Its core objective is to minimize wastage and optimize resources.

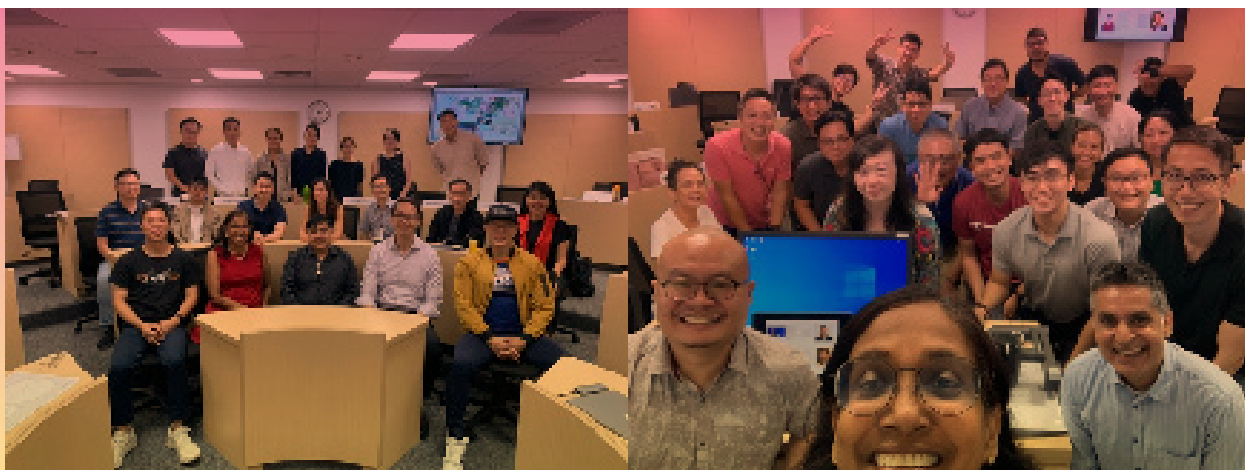
Implementing this methodology requires various soft skills, such as attentive and empathetic listening, adept people management, and effective team collaboration. Despite

equipping students with this methodology gleaned from scrutinizing numerous successes and failures of tech startups in Silicon Valley, many of my students continue to undervalue this approach. Instead, they often excessively rely on their technological innovations, erroneously assuming they are the sole catalyst for their success. Consequently, even after acquiring this methodology, they persist in pitching their technology solely, anticipating triumph without adequately considering broader business strategies and customer-centric approaches. So much more interesting to focus on the shiny object.

Repeatedly, this mindset has resulted in numerous tech startups failing, as they often offer solutions without a clear market demand rather than crafting solutions that perfectly align with a good product-market fit. Conversely, companies like Dropbox, Airbnb, Intuit, Toyota, and General Electric continue to thrive by consistently innovating and learning utilizing the Lean Startup methodology. Every now and then, reflecting on their experiences, I do have some entrepreneurs I have taught admit to overlooking the crucial aspect of addressing their customers' needs as the cause of their failure. This realization underscores a vital lesson I aim to for my students and aspiring entrepreneurs to grasp, thereby helping them make less costly mistakes and increase their chances of success. The bottom line is that while technology holds immense value, its success relies on a delicate harmony between technological expertise and soft skills.

Technical + soft skills

The evolution and deployment of pivotal AI solutions will only mean that the harmony between technical proficiency and soft skills remains indispensable. Just as we will increasingly require AI technologists capable of making ethical decisions concerning data privacy, bias mitigation, transparency, and fairness in AI algorithms, innovative entrepreneurs will, even more than ever, need employees with as much soft skills as hard skills to leverage AI tools for business success. We are already seeing jobs such as administrative support, production line workers, retail customer service, telemarketing, entry-level legal work, and even routine



healthcare tasks being replaced by AI tools. However, jobs such as human resources, counseling, healthcare and medical professionals, senior leadership, teaching, scientific research, comedians, or jobs requiring a human touch or mind will not be replaceable by AI anytime soon. It is not farfetched to conclude that soft skills will be equally, if not more important, than hard skills, despite this new digital revolution.



Laina Raveendran Greene has been a Senior Adjunct Lecturer at the National University of Singapore Business School since 2017 and is the founder and CEO of Angels of Impact, which has funded and offered capacity-building support for women entrepreneurs in Southeast Asia for over seven years. Before this, she was the Executive Director of Inti Bangun Sejahtera (IBS), an Indonesian cell phone tower company, and Board member of an American Stock Exchange company, Globetel Communications.

Before becoming an investor, she had a long history in entrepreneurship, having started, run, and sold over 10 years a B2B marketing company in Singapore (which later was sold to Hotwire). She also ran a tech consulting company out of Silicon Valley for almost 20 years. Laina's journey in the technology sector began with her involvement in prominent institutions such as the International Telecommunication Union (ITU), the International Satellite Organisation (INTELSAT) and the Asia-Pacific Network Information Centre (APNIC). In her consulting practice, she did business development work for Cisco Systems, Juniper Networks, and was a Business Manager at Singapore Telecom. Laina holds a Master's Degree from Harvard University, USA.

A digital native perspective

Carlotta Barone-MacDonald, Undergraduate student at Ecole Polytechnique, Paris

My heart raced as I exited the plane. In 2022, Candace Johnson invited me to the Mobile World Congress as her mentee, while she was hosting the Global Telecom Women's Network 30th annual gala. In the daunting and tumultuous halls of the Congress, I ran from booth to booth, trying to absorb the air of innovation, of the tech revolution.

Immersed in this plethora of ideas, I suddenly realized that I was the odd one out; a young woman, a student, drowning in an ocean of suited men, leading the world through digital transformation. I could not help but wonder: *where then do I fit into this world?*

I was born in 2004, to the boom of telecom and digital change, in a year marked by the foundation of Facebook and the rise of Skype. Having grown up in France, raised by an American mother, I learned early on to use digital tools to reach my family, who lived an ocean away. I was lucky enough to be able to communicate with them effortlessly and have only seen these technologies develop as I grew up. I am a proud member of the digital generation: a group of people whose lives have been shaped by digital technologies since their birth.

A non-linear path

It therefore does not come as a surprise that, like many of my peers, I was drawn to work in the tech industry. However, my path has not been linear. Studying Mathematics and Physics at École Polytechnique in Paris, my first introduction to technology, and AI in particular, was through ethics.

In my freshman year, I worked with a UK-based non-profit, Teens in AI¹, to build a course on AI Ethics for youth 12 to 18, based on current case studies. Speaking to students a few years younger than me, I realized how quickly the perception of technology changes, and how vital it is to include youth in decisions related to the technology that shapes their lives.

Building on this experience, and my technical background in STEM, I represented France at Huawei's Summer School

¹ <https://www.teensinai.com/>

for Female Leadership in the digital age² (ELA) in 2023. The program was designed to empower young female leaders to thrive and lead Europe into an inclusive, sustainable digital future. The school welcomed 29 women from 29 European countries, coming from a wide variety of backgrounds, ranging from engineering and biotechnology to humanities and social sciences. Over a week in Valencia, Spain, we had the chance to participate in panels led by business executives, tech experts, researchers, Members of the European Parliament, and more. The topics addressed brushed over the immense power of technology to transform society, for instance during discussions on Generative AI & Ethics led by Aleksandra Pzegalinska, or Tech and Healthcare Innovation, as well as the current barriers faced by digital tech, such as lack of gender diversity, or climate change.

Diversity profile of digital tech

These experiences shone a light on the critical need for diversity and sustainable thinking in tech, a shortage I am determined to address. Surrounded by women of all ages, from many backgrounds, and with diverse goals, I began to see a place for myself among the sea of suits.

An analysis by VISIER of 330,000 Anonymous Employee Records showed that the average tech worker is 38 years old, compared to 43 years old for non-tech workers³. Unsurprisingly, the tech workforce is younger than average, but who are these workers?

It is no secret that women and other minorities are underrepresented in tech sectors. In 2022, women made up 28% of the tech workforce⁴. This leads to bias in innovation. The only way to fight this is by encouraging the scientific curiosity of girls through education and mentorship. The first step towards this is inviting young women to join networks such as the GTWN early in their professional journeys. Solidarity and inclusion are greatly lacking, but they are necessary for sustainable progress in the tech sector.

² <https://www.europeanleadershipacademy.eu/>

³ <https://www.visier.com/blog/four-common-tech-ageism-myths-debunked/>

⁴ <https://www.zippia.com/advice/women-in-technology-statistics/>

Moreover, collaboration between disciplines will lead to extraordinary breakthroughs. Given its broad application scope, tech has much to learn from external sectors. The industry needs to reform to foster transversality as a sign of force. One possible way to do this is to encourage a diverse panel of backgrounds to enter the tech workforce – not only of gender but of socio-economic and academic backgrounds as well.

At the ELA I worked with a team of 5, with academic backgrounds ranging from politics to engineering, to build a policy brief on the importance of fostering soft skills in the European tech sector. Our diversity was our strength – with everyone bringing a new perspective to the table. Of course, for this diversity to make its way to the tech sector at large, we need to first bridge the digital divide, and make sure that all sections of society have access to the current communication and information tools. Great advancements are being made in this direction, with increased accessibility to broadband in rural areas for instance, or digital literacy programs, but efforts mustn't cease.

Fresh perspectives and opportunities

The digital generation is particularly well-placed to build a bridge to overcome the digital divide, with 96% of young people aged 16–29 years in the EU reported using the internet every day, compared to 84% of the adult population in 2022⁵. My generation is already armed with digital skills, which they use daily. We need to find ways to foster these skills in-depth, so that they may understand the technology behind familiar digital tools and bring people from all walks of life to consider careers in the tech industry.

One of the main barriers faced, however, is the need for more synchronicity between current technology trends and relevant policy. The current pace of policy making is no match for the fast-paced evolution of digital technology, and generative AI in particular. Moreover, technical expertise is greatly lacking in policy spheres. We should encourage the digital generation to take active decision-making positions - encouraging both the development of technical expertise and a big-picture approach, fed by knowledge of ethical, climactic, and geopolitical implications of the technology they develop.

Overall, sustainability, in the broad sense, should be fundamental to tech innovation rather than an afterthought. I see mentorship as a primary lever for action and as a two-way street. Young people entering the workforce have a lot to learn from established industry leaders, and mentors may also benefit from fresh perspectives - to create relevant digital tech and consolidate decisions with current technical innovation. We need established structures, such as the GTWN, that actively seek out young mentees to join networks.

⁵ https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Being_young_in_Europe_today_-_digital_world&oldid=564756#A_digital_age_gap

The digital generation should not just be a product of digital tech, and expert consumers, but producers of innovation themselves. I, for one, have learned a lot from my mentor, Candace Johnson: she has shown me by example the art of leading, and I look forward to one day paying this forward. Joining the GTWN has allowed me to meet industry experts across generations and fields. It has also given me confidence in my ability to be an active player in the tech industry.



Carlotta Barone-MacDonald is an undergraduate student in Mathematics and Physics at Ecole Polytechnique, in Paris, France. She has been one of Candace Johnson's mentees since 2021.

Carlotta has previously worked on quantum computing problems at Imperial College London. She is passionate about finding new ways to apply quantum mechanics to real-world issues, particularly regarding energy technologies and information science, examining their interplay. She is currently researching the parallels between quantum mechanical processes in photosynthesis and quantum annealing at MIT, within the frame of her bachelor thesis.

School phone bans

Dr Joanne Orlando, Researcher: Digital Literacy and Digital Wellbeing,
Western Sydney University, Australia

School phone bans seem obvious but could make it harder for kids to use tech in healthy ways.

School phone bans¹ may seem like the answer to reeling in young people's technology use. But if we ban phones and bury this issue under the sand, when and how do our kids learn to have a healthy relationship with technology in a world becoming more tech-focused by the day?

Existing bans in Australian schools

School mobile phone bans have experienced a domino effect throughout Australia. Most jurisdictions now have full or partial bans.

Victoria has banned mobile phones in both primary and secondary schools since term 1 of 2020². Western Australia³ and Tasmania⁴ have similar "off and away all day" policies.

South Australia is transitioning⁵ to a ban in all public high schools by term 3 of 2023. New South Wales will ban them in public high school schools in October, as part of a flagship election policy from the incoming Minns government.⁶

Earlier this month, Queensland⁷ said it was looking at the issue as well.

Talk of a national approach

While schools are largely a state government responsibility, the phone ban rhetoric has gained popularity at the federal level. Last week federal Education Minister Jason Clare called for a

national approach, saying he will meet with state and territory counterparts in the middle of 2023 to discuss and encourage this.

I think the time has come for a national approach to the banning or the restriction on the use of mobile phones by students in schools.

If a national ban is instated, it would likely mean students in all government primary and high schools around the country will be restricted or completely banned in their use of a mobile phone at school.

Countries with a similar national approach include China⁸, France⁹ and Sweden¹⁰. Many countries, including the United Kingdom¹¹ and United States¹², enable individual schools to create their own policy as per their individual needs.

Students need to be included in this

Clare says he will prioritise a collaborative approach to phones and

not make the decision on our own; talk to parents, talk to principals, talk to teachers about what's the best approach to take.

An obvious omission from this lineup is students. As studies of phone bans overseas show¹³, children's views are highly important as they are the policy receivers and beneficiaries.

1 <https://www.nsw.gov.au/media-releases/nsw-government-begins-mobile-phone-ban-public-high-schools>
 2 <https://www.vic.gov.au/mobile-phones-schools>
 3 <https://www.mediastatements.wa.gov.au/Pages/McGowan/2019/10/State-wide-mobile-phone-ban-for-WA-public-schools.aspx>
 4 <https://www.abc.net.au/news/2021-02-05/tasmania-mobile-phone-ban-in-schools-proves-a-success/13113128>
 5 <https://www.dpc.sa.gov.au/news/phones-off-when-schools-on>
 6 <https://www.nsw.gov.au/media-releases/nsw-government-begins-mobile-phone-ban-public-high-schools>
 7 <https://www.9news.com.au/national/australia-state-by-state-guide-school-mobile-phone-bans/a71172b6-98e8-4830-88d0-622b1b09ab50>

8 <https://www.bbc.com/news/technology-55902778>
 9 <https://www.forbes.com/sites/alexledsom/2019/08/30/the-mobile-phone-ban-in-french-schools-one-year-on-would-it-work-elsewhere/?sh=2564671d5e70>
 10 <https://www.gu.se/en/news/mobile-phone-ban-in-school-does-not-work>
 11 <https://educationhub.blog.gov.uk/2022/02/09/mobile-phones-in-schools/>
 12 https://nces.ed.gov/programs/digest/d21/tables/dt21_233.50.asp
 13 <https://www.sciencedirect.com/science/article/abs/pii/S0360131516302305?via%3Dihub>

Scenes of school phone bans gone wrong are all over TikTok¹⁴, with footage of Australian students breaking open pouches often purchased by schools to lock phones away. This footage is quite different from the pro-ban scenes filmed for the nightly news.

It is easy to see why bans are popular

Banning mobile phones is popular with some parents¹⁵, as it seems like the obvious answer to young people's problematic technology use. But this popularity in part is underpinned by uncertainty on how to control children's technology use.

Parents often resort to confiscating phones at home when they don't know how to control children's use of technology. School bans are confiscation on a large scale.

They began as a means to stop bullying and to keep kids focused in class – important issues that are proving difficult to solve. But they risk sweeping important issues under the rug. This could make life harder for children in the long run.

What are adults doing?

Many young people I am interviewing as part of new research¹⁶ for the eSafety commissioner¹⁷ agree their technology use is not controlled, meaning that they feel they spend too much time using their phone in unproductive and habitual ways. This worries them.

However rather than pointing the finger at the kids, let's consider what's happening with the adult population and mobile phones.

Our all-consuming approach to phones has become so worrying that Problematic Mobile Phone Use (PMPU)¹⁸ has been identified by the Australian Psychological Society as one of the biggest behavioural addiction challenges of the 21st century.

Adults use their phones all the time, especially in places they should not be. A 2018 study¹⁹ by Education company Udemy showed millennials (the parents of many school-aged children) checked their phone two hours a day for personal activities during the workday. The 40-hour week has turned into a 30-hour work week, plus ten hours on your phone.



As adults we find it very difficult to cope with mobile phone bans. BreakingPic/Pexels

14 <https://www.tiktok.com/@the.tiser/video/7196106557589949697?lang=en>

15 <https://www.smh.com.au/lifestyle/life-and-relationships/hiding-behind-their-phones-why-parents-don-t-need-to-freak-out-about-a-school-ban-20230403-p5cxju.html>

16 https://www.westernsydney.edu.au/newscentre/news_centre/more_news_stories/western_wins_funding_to_establish_new_online_and_digital_safety_guidelines_for_families

17 <https://www.esafety.gov.au/>

18 <https://psychology.org.au/for-members/publications/inpsych/2017/oct/problematic-mobile-phone-use-an-emerging-disorder>

19 https://research.udemy.com/research_report/udemy-depth-2018-workplace-distraction-report/

As adults we find it very difficult to cope with mobile phone bans. There are now hundreds of hidden mobile phone detection cameras to catch us out because we can't be trusted not to use our phones when driving.

These cameras collected collected about A\$66 million²⁰ last year in fines. This was a \$4 million increase from the previous year. It shows how real issues with adult phone use have not been solved with bans or arbitrary penalties.

Where's the evidence this will work?

The scant research available²¹ shows no change to either bullying or class engagement after²² school phone bans²³ are introduced.

One 2022 Spanish study²⁴ did attempt to say bans had led to better academic results. But in careful reading of the study, students were permitted to use phones in schools as a learning tool for educational purposes. The researchers state this may have been the reason for increased scores.

Policies need to be made using evidence, and right now we don't really have any.

In the meantime, bans make it likely we will leave our children without skills they need to be able to learn, work and live in a world saturated with technology. This includes their home and bedroom where they do their homework after school.

Meanwhile, we need a broader conversation about how all of us – children and adults alike – can use phones in a healthy way.



Dr Joanne Orlando: I focus on understanding what influences our uses of technology and why. A large part of my research explores children as technology users and the ways parents, teachers, policy makers, media, and online networks impact on their uses. My aim is to gain a holistic understanding of why children are using technology in the ways they do. What I find out in my research is often surprising as what children do with technology is often not what adults expect. I also more broadly explore our digital lives as adults. This includes the ways technology influences how we communicate, our relationships, our identity, what we strive for and what we think is important. Some describe technology as a tool, but my research shows that it's much more than that to us! I focus on understanding what influences our uses of technology and why. A large part of my research explores children as technology users and the ways parents, teachers, policy makers, media, and online networks impact on their uses. My aim is to gain a holistic understanding of why children are using technology in the ways they do. What I find out in my research is often surprising as what children do with technology is often not what adults expect. I also more broadly explore our digital lives as adults. This includes the ways technology influences how we communicate, our relationships, our identity, what we strive for and what we think is important. Some describe technology as a tool, but my research shows that its much more than that to us!

20 <https://www.revenue.nsw.gov.au/help-centre/resources-library/statistics/penalty-notice-dashboard>

21 [https://www.thelancet.com/pdfs/journals/lanchi/PIIS2352-4642\(17\)30011-1.pdf](https://www.thelancet.com/pdfs/journals/lanchi/PIIS2352-4642(17)30011-1.pdf)

22 <https://www.sciencedirect.com/science/article/abs/pii/S0272775719303966#:~:text=According%20to%20a%20web%2Dbased,mobile%20phone%20ban%20in%20schools%20>

23 <https://www.sciencedirect.com/science/article/abs/pii/S0272775719303966#:~:text=According%20to%20a%20web%2Dbased,mobile%20phone%20ban%20in%20schools%20>

24 <https://www.emerald.com/insight/content/doi/10.1108/AEA-05-2021-0112/full/html>

Broadband connectivity for a digital future

Angela Y. Kung, Partner / Co-Chair of the Technology, Communications & Media Practice at Mintz

Benefits of digital technologies

There is no question that the explosion of digital technologies has fundamentally shaped the way we live our lives. When I look around my home, I have smart devices everywhere that help me navigate the day.

The blinds in my bedroom open promptly at 7:00 am to let the sunlight in and wake me up, no matter how many times I hit the snooze button on the alarm clock. I can start and warm up my car with the push of a button on my phone. And when I head to work, my garage door tells me if I accidentally forgot to close it. My smartwatch gives me gentle reminders throughout the day if it thinks I have been sitting at my desk too long without taking a break to stand up, which happens more often than I would like to admit. I even have GPS devices on my dogs' collars that let me know when the dog walker has come, where they are going, and if they are getting in enough steps for the day. When I come home at night, my home lights turn on automatically before I get to the door, which makes it easier to find my keys. And when I lay my head down before I go to bed, all I need to say is "Alexa, turn off all the lights" to get a good night's rest before I start the process all over again.

Digital technologies have become so engrained in my life that I hardly realize that they are there. But I recognize the tremendous amount of privilege I have to be able to use and rely on them.

Need for universal access to broadband

Many people in the US are not as fortunate as I am. In fact, some people do not have access to even the most basic technologies such as computers, tablets, or other mobile phones that have become essential to modern-day living. Moreover, many Americans still lack the high-speed connectivity required to use those devices.

Indeed, according to the Pew Research Center¹, some studies have found that 50 percent or more of Americans living in rural areas lack access to a broadband connection. It notes that when race and ethnicity are factored in, the disparities are even more stark. For example, 34 percent of American Indian households with children and 31 percent of Black and Hispanic households with children were found to lack access to home broadband, compared to 21 percent of white households with children.

This lack of access to broadband services is particularly detrimental in a post-COVID world, which has become increasingly virtual. US consumers are now routinely engaging in telework, telehealth, and distance learning, all of which require broadband internet access services. And the promise of virtual and augmented reality as well as the proliferation of new AI technologies makes the need for both fixed and mobile broadband services all the more important. Recent studies from Open Vault² confirm that Americans are consuming bandwidth at exponential rates, with the percentage of individuals consuming more than 1 TB per month now nearly eight times greater than it was five years ago. With no end to this trend in sight, it is vital that all efforts are made to close the digital divide.

US Federal actions thus far

The US Congress and Federal Communications Commission ("FCC") have already taken several actions to support the deployment of broadband services. Through the Rural Digital Opportunity Fund, and its predecessor the Connect America Fund, the FCC has made up to \$20.4 billion in federal funding to support the deployment of fixed broadband and voice services to millions of unserved homes and businesses in rural America. The FCC is also in the process of implementing its 5G Fund for Rural America, which will make available up to \$9 billion in

¹ <https://www.brookings.edu/articles/why-the-federal-government-needs-to-step-up-their-efforts-to-close-the-rural-broadband-divide/>

² https://openvault.com/wp-content/uploads/2023/07/OVBI_2Q23_Report_v4_FINAL.pdf

federal funding to bring voice and 5G mobile broadband services to rural areas.

To ensure that broadband services are not only available, but also accessible to all individuals, the FCC has further established, through funding from Congress, the Affordable Connectivity Program (“ACP”). The ACP provides \$14 billion in federal funding to allow providers of both fixed and mobile broadband services to offer eligible households a discount of up to \$30 per month for broadband services or \$75 per month for households on Tribal lands. It also allows providers to offer eligible households discounts of up to \$50 for connected devices. The FCC recently reported³ that more than 20 million households are now enrolled in the ACP.

In addition to the FCC’s efforts, Congress has allocated a whopping \$42 billion in federal funding to support the deployment of broadband services. These funds will be disbursed under the Broadband, Equity, Access, and Deployment (or BEAD) program, which is currently being administered by the National Telecommunications and Information Administration (“NTIA”). NTIA will distribute the funding to all US states and territories, which, in turn, will partner with broadband service providers to deploy broadband infrastructure and offer affordable high-speed broadband internet access services to all Americans. This historic program is expected to make substantial strides in closing the digital divide.

Preparing for the future

Because these programs, particularly the BEAD program, provide an unprecedented opportunity for the Nation to ensure that all Americans can get connected, it is critical that US policymakers get the rules and policies for implementing the programs right.

- *First*, agencies must ensure that funding will go only to those locations that truly lack high-speed broadband services and avoid overbuilding to locations that already have competitive broadband services. Towards that end, agencies must ensure that their broadband maps are continually updated and remain accurate.
- *Second*, any rules and policies adopted for these funding programs must encourage widespread participation. That means they should be flexible without overly burdensome requirements that could discourage providers from applying.
- *Finally*, they must include safeguards to protect against waste, fraud, and abuse. In particular, agencies must ensure that those entities that receive funding are sufficiently qualified to provide service and use the funding only for its intended purpose.

Moreover, both Congress and agencies must carefully craft long-term solutions to support broadband affordability once

broadband services are deployed. Affordability programs such as the ACP have been crucial to getting individuals online. But funding for the ACP is estimated to run out in the first half of 2024. US policymakers must act swiftly to appropriate additional funding so that the millions of households relying on this program can continue to do so as broadband networks and services are being deployed nationwide.

Without ubiquitous and affordable high-speed internet access services, millions of Americans may not only fall further behind in the digital divide, but they may never get the opportunity to catch up and take advantage of all the benefits that digital technologies have to offer.



Angela Kung is Co-Chair of the Technology, Communications & Media (“TechComm”) Section at Mintz, Levin, Cohn, Ferris, Glovsky and Popeo, P.C. (“Mintz”), where she advises clients on a wide range of wireless issues, including licensed and unlicensed spectrum use policies. She has particular expertise on FCC spectrum auctions as well as broadband funding programs. Earlier in her career, Angela worked in the FCC’s Wireless Telecommunications Bureau and served as a lead attorney for the FCC’s Connect America Fund Phase II Auction. She also served as a member of the General Counsel team charged with oversight of the FCC’s 800 MHz reconfiguration process. Angela received her B.A. in Economics from the University of Michigan and her J.D. from American University Washington College of Law.

3 <https://docs.fcc.gov/public/attachments/DOC-395990A1.pdf>

Digital tech in Pakistan: Advancing gender diversity and inclusion

Saira Faisal Syed, Country Lead Digital Transformation, Pakistan,
GSMA Asia Pacific



The Kaghan Valley, KPK, Pakistan¹

I proudly hail from the beautiful region of Khyber Pakhtunkhwa (KPK), where our Pashtun culture is rich with tradition and warmth. Yet, like many, I too am familiar with the stereotypes that have often been associated with Pashtun families, particularly when it comes to the roles and rules assigned to daughters. My journey in the world of technology started with a decision to break away from the norms of my time. In an era when few girls pursued careers in IT, I defied expectations and completed my university degree in Information Technology.

As my final year project, I automated a franchise, showcasing my determination and passion for innovation.

My career path underwent a significant shift necessitated by the absence of affordable daycare options. Transitioning from a role as a Mathematics and Statistics lecturer at a renowned public university, I embarked on a diverse journey, managing web content for an Italian organization and sharing my knowledge as a Montessori teacher at a leading private school. These transitions underscored my adaptability and determination to embrace new challenges, ultimately enriching my professional and personal growth and also proving that dedication and technology can bridge any gap.

¹ https://www.google.com/search?q=kpk+pakistan&rlz=1C1CHBF_en-GBAU923AU923&oq=KPK+Pakistan&aqs=chrome.0.0i355i512j46i512j0i512l8.4769j0j7&sourceid=chrome&ie=UTF-8

When I made the decision to transition into a conventional 9-5 job, there have been moments when people questioned whether I was the “corporate type.” To be honest, I wasn’t entirely sure what that meant, but it didn’t deter me. I led various technology projects in collaboration with the mobile operators in Pakistan. From leading projects on call center solution implementation to various applications development, my journey continued, propelling me forward to become the Head of Projects in a prominent local company. In this role, I had the privilege of working on projects with industry giants such as Avaya, Cisco, Oracle, and more.

I was then fortunate enough to become known more broadly in the tech sector when I joined GSMA in Sept 2016 as a Project Manager. I was driven to create a nurturing and empowering community for young girls and women with technology as an enabler.

Pakistan’s progress towards a digital economy

Pakistan has made considerable progress in its digital transformation journey, with the rapid expansion of mobile broadband networks over the last decade. Today, nearly 80% of the adult population live in areas served by a mobile broadband (3G or 4G) network with rising smartphone adoption. In Pakistan, mobile has become a vital platform for citizens to interact with society and for government and businesses to deliver services. Pakistan’s mobile operators have expanded access to digital connectivity and rolled out digital solutions across key sectors such as agriculture, education, health and utilities. These have helped extend essential services to citizens across the country, including those in vulnerable groups, such as women, rural communities and people with disabilities.

Why we need greater diversity and inclusion in the industry

Just as the technology landscape in Pakistan is rapidly evolving, so is the call for greater gender diversity and inclusion in the industry. In Pakistan, recent initiatives and collaborations are making significant strides in this direction, breaking barriers and empowering women in technology.

The GSMA’s latest report on the Mobile Gender Gap¹ sheds light on the current status of gender diversity in Pakistan’s tech landscape. While progress has been made, gender disparities persist, especially in technical roles and leadership positions. This report serves as a vital benchmark for understanding the challenges ahead.

1 https://www.gsma.com/r/wp-content/uploads/2023/07/The-Mobile-Gender-Gap-Report-2023.pdf?utm_source=website&utm_medium=download-button&utm_campaign=gender-gap-2023

Highlighting some groundbreaking efforts, in 2022, GSMA APAC set the stage for a meaningful change and partnered with Ministry of IT & Telecom and Kistpay to make a substantial leap forward by launching the Smartphone4All initiative², with gender inclusivity at its core. The program aims to bridge the digital gender divide by ensuring women’s equal access to smartphones and digital resources. It’s a significant step toward empowering women through technology.

GSMA has been using advocacy as a pivotal tool in driving change. In Pakistan, tech leaders and organizations are actively advocating for gender inclusivity across all tech-related policies and regulations. These efforts aim to create an equitable tech ecosystem where women’s contributions are recognized and valued.

In 2023, GSMA APAC launched a call for papers³, further emphasizing the importance of gender diversity and inclusion in the tech sector. May 2023 marked a significant moment in Pakistan’s tech scene with the launch of the GSMA APAC Diversity for Tech Community⁴. This vibrant community brings together dynamic and talented women from various verticals within the tech industry. The community’s strength lies in its diversity, with women contributing to digital and financial inclusion for their fellow women and girls. In this case, a WhatsApp group became the catalyst for connecting women in tech in Pakistan. It’s a testament to the power of digital tools in fostering collaboration, support and empowerment.

The Diversity for Tech Community’s primary goal is to foster partnerships, highlight the work of every member, and collectively make a positive impact in encouraging more women to pursue careers in tech.

Women’s Leadership Awards

At the M360 APAC event in Seoul in Sept 2023, GSMA hosted the Women Leadership Awards to celebrate outstanding achievements in the tech industry. These awards recognize and honor the exceptional leadership and impact of women in shaping the future of technology.



2 <https://www.gsma.com/publicpolicy/making-digital-pakistan-a-reality-an-opportunity-for-growth-and-development>

3 <https://www.gsma.com/asia-pacific/whats-new/d4t-call4writeup/>

4 <https://moit.gov.pk/NewsDetail/>

OTNkZmE4MGYtYWxMS00YjNjLWE4ZDQ0YTYyYUWU1ODk1MzEw

The winners were:

- Dr Archana Gulati, Former Civil Servant, Professor of Practice, and Expert in Digital Policy and Law for her article on: "My Experience as a Civil Servant & Digitally Empowering Rural Women in India";
- Gulalai Khan, Faculty Internet Governance and Technology Policy, Founder Pakistan Professional Women Forum for her paper on: "SMALL STEPS MAKE ALL THE DIFFERENCE – Meaningful work for a holistic digital future; and
- Samina Rizwan, Founder and Partner, The CalmKaaj Network for her paper: "My Story and Lessons Learned".

A diverse and inclusive future

In Pakistan, gender diversity and inclusion in tech are not just buzzwords; they are becoming a reality. Initiatives like Smartphone4All, tireless advocacy for gender-inclusive policies, and the vibrant Diversity for Tech Community are paving the way for a future where women are equal contributors to the ever-evolving world of technology. The journey has begun, and the tech industry in Pakistan is committed to reaching new heights of inclusivity and empowerment.

The GSMA family nurtured my talents, encouraged my growth, and believed in my capabilities. Today, I am proud to be the Country Lead for GSMA in Pakistan, a position I've earned through dedication and resilience. My ultimate goal is to serve as a powerful inspiration for my daughters, showing them that with determination and vision, they can break through any barrier. Working with my amazing colleagues at the GSMA and other leaders in the industry, such as the GTWN, I hope to inspire others to shatter the confines of preconceived notions and embrace their full potential. Our roots may shape us, but they do not define us.



Saira Faisal Syed is the Country Lead Digital Transformation for GSMA in Pakistan. She focuses on the promotion and execution of the GSMA's global programmes and advocacy initiatives at the country level, as well as managing and delivering regional priorities defined by its members through GSMA governance bodies. Her focus is to advance the impact, growth, and sustainability of digital economies by collaboration between the mobile industry, policymakers, and ecosystem.

Saira is a telecommunication & project management executive with around 17 years of experience in Technology, Project Management, Regulatory, Policy & Digital Transformation. Before joining the GSMA, Saira was working as Head of Projects at Apollo Telecom leading various technology projects with the telecom industry. Saira has also worked with UNAIDS & Cure2Children Foundation Italy. Saira has a degree in Information Technology.



Saira and family at the Kaghan Valley.

Connecting the unconnected

Mea Thompson, COO, unconnected.org

In the dynamic digital inclusion landscape, unconnected.org, a non-governmental organisation (NGO) brings to the fore the profound concept of ‘meaningful connectivity.’

unconnected.org views connectivity as more than just internet access; it’s a transformative force driving equality and offering opportunities to the 3 billion people globally still without this crucial link. In the digital age, internet access has become a cornerstone for financial inclusion, education, healthcare, safety for vulnerable groups, job accessibility, trade efficiency, and support for various life challenges.

Recognising that digital skills are key to breaking the chains of poverty and marginalisation, unconnected.org strives to equip individuals with the tools they need to thrive in today’s interconnected world.



They achieve this through collaborative partnerships with stakeholders spanning diverse sectors, including telecommunications, fintech, commerce, education, healthcare, and more. It’s crucial to recognise that this challenge transcends industry boundaries, necessitating cross-industry cooperation to effectively address it. Importantly, it’s a challenge within our capacity to resolve.



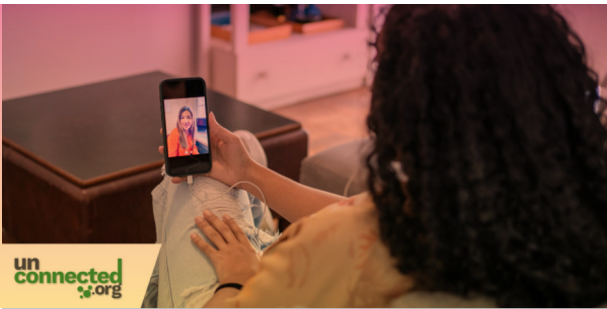
Bridging the digital divide isn’t just about providing internet access; it’s about empowering people with the skills and knowledge to leverage the vast opportunities the digital age offers.

Take Rwandan student Eric Tuyizere for example; as part of unconnected.org’s connectENTREPRENEURS theme, the NGO has supported the 25-year-old to not only gain academic and professional advantages through MIT ReACT’s Emerging Talent program but also experience a cultural exchange that broadened his horizons. Eric’s exposure to different cultures has shaped his entrepreneurial vision, aiming to integrate technology into construction security and contribute to his community.

unconnected.org acknowledges the stark reality that huge portions of the globe lack meaningful internet access – perhaps most worryingly, children who will instantly fall behind without the internet not being integrated into their education.

The volunteer-led NGO’s collaborations with sponsors has enabled hardware, digital skills training, and internet access to underprivileged children in 16 community schools for undocumented students in Eastern Malaysia, who otherwise would be unable to get the focused care and attention they deserve from their already overstretched teachers.

The organisation firmly believes that internet access is a catalyst for equal opportunities in life and this is at the root of their connectED theme that seeks to level the playing field for the next generation.



By addressing the disparities in access, unconnected.org aims to not just uplift entire communities but even make a difference in people's lives on a person-by-person basis.

One poignant example of unconnected.org's impact lies in its collaboration with Vodafone's charities.connected scheme, distributing thousands of SIM cards in the UK. Among the beneficiaries was a 30-year-old mother who had endured years of coercive control and violent threats. Through the support of unconnected.org and Jigsaw4U, she received a Vodafone SIM card, granting her vital access to support, facilitating her divorce, and enabling her to reconnect with her daughters.

Reconnection with one's daughters is certainly not a story that remains exclusive to connectWOMEN, but so too as part of unconnected.org's connectREFUGEES theme. Ana María, a single mother who fled El Salvador to Mexico in search of safety, faced numerous challenges; perhaps hardest of all was being separated from her daughters. With the support of Ding, unconnected.org, provided Ana María with a SIM card, enabling her to stay in constant communication with her four daughters through video calls on a daily basis. This simple yet powerful solution has made a profound impact on Ana María's psychological wellbeing and in her efforts to have her children repatriated.

This truly global organisation already does impactful work in 17 countries to actively address the primary barriers to digital inclusion:

- Affordability
- Coverage
- Culture
- Digital literacy

unconnected.org understands that meaningful connectivity encompasses various aspects of life, and though we have highlighted just four of their themes, there are many others in the pipeline from connectAGRICULTURE to connectHEALTHCARE.

Looking ahead, unconnected.org envisions an expanded footprint with increased projects and an even greater impact. The organisation recognizes that the journey to bridge the digital divide requires collaborative efforts and as such relies on the donations and sponsorship of partners that include Vodafone, Internet Society Foundation and City Bridge Foundation.

In 2023 perhaps their greatest achievement would not have been possible without one of their key partners. Thanks to the help of Starlink they were able to provide over 100 schools, namely in Malawi and in Kenya, with meaningful connectivity that reached remote communities that were previously entirely underserved.

unconnected.org is constantly seeking further support to address the broader issue of billions who remain unconnected. In its commitment to meaningful connectivity, unconnected.org collaborates with device manufacturers to distribute large volumes of refurbished smartphones and laptops to those in need.

unconnected.org continually seeks opportunities to acquire devices, understanding their crucial role in ensuring that individuals have the tools necessary for digital inclusion. In 2024 the team will continue to work tirelessly to try to bridge the digital divide.

The question is - could you help too?



Mea Thompson is a leader within the telecommunication market dedicated to bridging the digital divide and ensuring equitable access to education and opportunity for all. As the Co-Founder of unconnected.org, she has been instrumental in driving meaningful change in the lives of underserved communities around the world. She is also a dynamic leader in the tech industry, with a wealth of experience and expertise in connectivity with a focus on operators and eSIM.

GENERATING CHANGE



Driving meaningful diversity in communications

Leticia Latino-van Splunteren, CEO Neptuno USA Corp

In 2002 my father and I embarked on a journey to the US to explore the possibility of incorporating our family business, Neptuno, a 30-year-old internationally based tower manufacturing company. During this process, we sought guidance from a consultant who, rather tactlessly, advised my father: *“Well Mr. Latino, if you are serious about wanting your daughter to run the US business, you have GOLD in your hands, because you can incorporate as a Women minority owned business, and that can be extremely beneficial for you.”* Despite the suggestion, which was made to my father without even acknowledging my presence, we chose not to pursue this possibility. We were committed to establishing our presence in the US market with the same principles that had proven successful elsewhere – outstanding products, top-notch services, and unwavering corporate ethics.

Over the past two decades, Neptuno USA, Corp has faced numerous challenges, which are familiar to minority-owned small businesses. These include difficulties accessing capital at competitive rates, exclusion from requests for proposal, demanding requirements from large corporations, particularly in insurance and workforce training, and a struggle to discover federal incentives and programs that could aid our participation. In 2017, I made the decision to obtain the Women’s Owned Business Certification (WBENC) to see if I had, in fact, greatly hindered the company’s growth potential, as a result of our decision not to pursue WBENC status at incorporation.

Re-evaluating business diversity programs

Even though we are now listed in various customer databases as an approved minority-owned business, I can confidently state that after 5 years, our certification hasn’t contributed yet to a specific project. What some have dubbed “diversity washing” means that some companies are just going through the motions and just ticking the checkbox, and not genuinely engaging. What good are ‘diversity programs’ that are only focused on growing the number of minority-owned companies in a database, instead of truly measuring how many of these “new” vendors are given

an honest shot at contracting new business, while consistently measuring that instead?

Our story is not unique. Conversations among minority-owned vendors at telecom diversity conferences often center around the question: “Did anything change for you after last year’s event?” Unfortunately, the predominant answer is “NO,” creating a hesitancy to speak up due to the fear of ending up on a “blacklist” somewhere. But the idealistic side of me refuses to remain silent in the face of realities like these. It’s disheartening to witness large companies receiving accolades for their purported support of smaller, underrepresented entities, only to discover a stark contrast with the actual situation.

Pursuing real diversity and inclusion

The need for a more genuine commitment to diversity and inclusion in business practices remains a critical conversation, so a few years ago and fueled by this uncomfortable truth, I made the conscious decision to actively engage in initiatives that could bring about genuine and impactful change in this regard.

Among the myriad opportunities I embraced, two stand out as particularly significant. Firstly, I became a member of the International Board of the Global Telecom Women’s Network (GWTN), driven by the conviction that change could be instigated on a global scale. Additionally, I accepted an appointment to the Federal Communications Commission (FCC) Equity and Diversity Council (CEDC).

Within this council, I assumed the role of a member in the Innovation and Access Working Group from 2021 to 2023. This Committee was chartered by FCC’s Chairwoman Jessica Rosenworcel, and was tasked with formulating recommendations on:

- How to advance equity in the provision of and access to digital communication services and products for all people of the United States, without discrimination on the basis of race, color, religion, national origin, sex, or disability.



- How to accelerate the deployment of high-speed Internet access, or “broadband,” in all communities by reducing and/or removing regulatory barriers to infrastructure and investment, and by making recommendations on how to strengthen existing broadband networks and develop new ones.
- How to accelerate the entry of small businesses, including those owned by women and minorities, into the media, digital news and information, and audio and video programming industries, including as owners, suppliers, and employees.
- How to create effective means for stakeholders to exchange ideas to create better access to capital, stronger small business mentoring, upskilling vehicles for employment in media and technology industries, media ownership diversity, and procurement opportunities.
- “*The Future of Work and Non-traditional Anchor Institutions*” submitted by the Diversity and Equity Working Group.
- “*Enhancing Media Ownership and Entrepreneurial Opportunities for Minorities and Women*” submitted by the Diversity and Equity Working Group.

Stepping into the new FCC Building in DC on June 15, 2023, for the final meeting of the Committee and voting on the adoption of the issued recommendations, I couldn’t help but reflect on the significance and scale of the work we had accomplished. I found myself particularly inspired by FCC Chairwoman Jessica Rosenworcel’s opening remarks. She compared the event’s celebratory atmosphere to that of a graduation day, drawing attention to the coincidental timing with her favorite graduation speech by Steve Jobs at Stanford University, which happened exactly 18 years prior, which he concluded with the famous phrase “Follow your heart.”

The Committee’s objectives were directly related to the FCC’s statutory responsibility regarding broadband deployment, set out in the US Infrastructure Investment and Jobs Act 2021 (IIJA), also known as the “Bipartisan Infrastructure Law”, which authorized \$1.2 Trillion in funding, the largest long-term investment in infrastructure and economy in US history.

An inspirational legacy

I take immense pride in, and am filled with hope and inspiration by, the dedicated efforts of the entire committee during its two-year existence. With over 60 committed industry stakeholders, we collectively shared a passion to exhaustively examine challenges and formulate recommendations, as detailed in the following reports¹:

- “*Connecting Communities to Broadband During the COVID-19 Pandemic: Lessons Learned and Recommendations*”, submitted by the Digital Empowerment and Inclusion Working Group.
- “*Access to Capital Report and Recommendations*”, submitted by the Innovation and Access Working Group.
- “*America’s Digital Transformation Urgent National Priority and Opportunity: Digital Upskilling*” submitted by the Innovation and Access Working Group.

“You’ve lived this cliché. You’ve spent the past two years working on this committee you’ve put your heart and soul into and I know that and I appreciate it”, she said, continuing with: “When people, and especially young people, venture out into the world, we always tell them you should go follow your hearts, just like Steve Jobs did that day. Follow your passion. Now, implicit in that message are a few things, but it’s really the idea that if you work hard, persevere, play by the rules, that is just the path to happiness and success. See, there’s a catch. That path is not the same for everyone. Where some find open doors, others are going to be met with obstacles. Because, let’s face it, no matter who you are and what your aspirations are, it’s not always easy out there, but it’s even harder if you don’t have the same access to capital as others who are trying to start a business. It’s even harder to believe you can do great things when you look at others who are out there and you don’t see too many success stories like you. It’s even harder if you don’t have the same access to broadband because you just don’t live in the right zip code. That’s why the CEDC exists, to help us level the playing field, to make sure that following your heart isn’t a false promise if you don’t fit in the right demographic profile. And as the first woman to lead this agency, confirmed to do so after 87 years, believe me, I know something about not fitting the demographic profile.”

¹ Reports can be accessed and downloaded at: <https://www.fcc.gov/communications-equity-and-diversity-council>

My gender may have been GOLD in your mind, Mr. Consultant, but it's crucial for you and others to recognize that there's still a significant need to really 'level the playing field' if we genuinely aspire to challenge and transcend the existing paradigms of diversity, equity, and inclusion and bring about lasting change.



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 Lifecycles, and is taking an active role in the Smart Cities movement through their innovative multi-host, multipurpose Smart Pole, branded as SmartTecPort.

Leticia was included in the 2023 Most connected Women in Telecom by Conecta Latam, and is a recipient of multiple recognitions, including 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 was also an appointed Working Group Member to the FCC Diversity and Equity Council and to the FCC's Broadband Development Advisory Committee. She is a member of the Board of Governors of the National Wireless Safety Alliance 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

Nicola Palmer: Portrait of a digital tech pioneer

A TMC Interview

TMC: Nicola, you have provided inspiration to many women and men over your stellar career in digital technology, as a pioneer and trailblazer for the role and contribution of women in what was traditionally considered a male domain. How did it all begin?

Nicola: I began my career at Bell Atlantic in 1990, immediately after graduating from college. Over time, Bell Atlantic transitioned into Verizon and I remained with the company for over 33 years. It's unlikely that graduates today will be with one company for so long but I think in my case the longevity was really due to the pace of innovation over the years - my job changed frequently and the work never got boring.

TMC: Nowadays, young women are encouraged to study STEM subjects and to focus on engineering or IT degrees as a prerequisite for digital technology-based roles. What drew you to STEM?

Nicola: My father was a mechanical engineer and my mother believed nothing was off limits for her children if they kept at it. I always loved math and science and figuring out how things worked, but it's the support I had and the role models around me that led me to Penn State where I completed the engineering program, following in my father's footsteps. I later rounded out my formal education with an MBA from UPenn's Wharton School.

TMC: So how did you gravitate towards communications?

Nicola: I found the idea of connecting people through technology more intriguing than other lines of work available to me at the time. And the landscape was completely different in 1990. It was the dawn of the digital age, with the internet still in its infancy and mobile phones virtually non-existent. Little did I know what the next three decades would hold, as we witnessed remarkable transformations in all areas of business and society driven in large part by communications technologies.

TMC: Starting your career at the beginning of the digital revolution, you must have had some incredibly exciting and challenging roles throughout your career, helping to build a new

industry from the ground up. Can you tell us a bit more about some of these highlights?

Nicola: I can certainly attest to the incredible technological and network transformations over 30 years. I feel privileged and proud that I was a small part of such enrichment in the way we live, work, and play. I held interesting jobs in operations, engineering, planning, program management, and product development, among other disciplines, but I always tried to stay close to emerging technologies and customer needs and wants. Initially, I was involved in our wireline business, as we transitioned from copper to fiber and began deploying high speed networking services to business and government entities. I worked on Verizon's to fiber-to-the-home services from the start and was proud to see it emerge as an award-winning triple-play home network offering called FiOS. Later, I transitioned to the wireless sector, as we ushered in unprecedented coverage, speed, and utility of Verizon's 4G and 5G networks and services. I served as the Chief Technology Officer of Verizon Wireless, the first female to hold this role.

TMC: This all sounds amazing and incredibly challenging, and enough to fit into anyone's career. But I understand that even more important roles were to follow?

Nicola: After the CTO role, I became responsible for all engineering and performance aspects of the combined wireless and wireline operations as Verizon underwent some significant corporate restructuring. Subsequently, I took charge of product development across all business units within Verizon. This involved overseeing our well-known wireless services for both consumers and businesses, as well as our wireline based products such as FiOS and large-scale, mission critical enterprise solutions. An important part of that role was developing a robust ecosystem of partners for our newly deployed 5G network. The interplay among devices, network elements, applications and systems had never been greater and only through close collaboration were we able to ensure the best customer experience.

TMC: I understand that your career took on a new dimension over recent years, one that has a direct correlation to the GTWN's interest in the digital generation and the future of the digital tech sector. Can you explain to us what this entailed?

Nicola: The last year and half of my time at Verizon I embarked on a new strategic role that we called the Chief Technology Ambassador. The primary objective was to ensure Verizon had the right mix of technical talent to fill today's jobs and to fuel tomorrow's growth ambition. The context is the current shortage of technical talent, unprecedented pace of technology change, and rapidly evolving post-covid work norms. The focus of this role lies in inspiring, attracting, developing, and retaining the right technical talent, with a strong emphasis on diversity. Diversity is severely lagging in tech, and it is critical that we attract individuals with the right skills, in the right numbers, and with the desired diversity mix. Not doing so, suboptimizes (at best) the potential of the digital age.

TMC: Could you elaborate on some of the significant challenges that you faced over your career?

Nicola: I am extremely fortunate to have been in the industry at a time when the landscape underwent such dramatic transformations, particularly in wireless connectivity. I recall in particular the evolution from 2G to 3G and eventually to 4G and 5G, with each new "G" representing new capabilities, new opportunities, and new challenges. Young people who use their smartphones to run their lives today are amazed when I tell them that in the early days of 2G, mobile phones were limited to essential functions only, often humorously described as having only two buttons: SEND and END. With the advent of 3G, we began to experience limited internet access and early applications that expanded the phone's utility beyond mere calls. The widespread adoption of 4G revolutionized the mobile experience, offering consumers and businesses many new capabilities and providing a launchpad for entire business models. Throughout, I always found it helpful to ground our teams in the essential mission of each new generation of network – to deploy the newest technologies reliably and at scale while ensuring customer satisfaction and value.

Skills for the future

TMC: As a trained engineer yourself, and after a lengthy career in the communications industry, what is your view now about the skillset companies need for the future? And how can we better align the skillset of today with the needs of tomorrow?

Nicola: All CIOs, CTOs and CEOs must concern themselves with equipping their current workforce with the skills necessary for the future... and it's harder than ever to keep up with the rapid pace of change. This challenge extends beyond technical roles and impacts all aspects of the workforce, including sales, marketing, HR, legal and more. As technology evolves, having a

degree of tech-savviness across the entire workforce becomes increasingly vital, as it can yield unexpected benefits in terms of insights, utility, and efficiency. The demand for STEM graduates is growing at 25% to 35% per year while colleges and universities are growing the STEM grad supply by about 10%. This shortage of skilled professionals necessitates efforts to retrain and upskill existing employees while deliberately planning to increase entry into these important fields.

The importance of diversity

TMC: What is your view of the business value of diversity and inclusion programs? Should the communications sector put more emphasis on recruiting and retaining more diverse talent, and if so how should they do this?

Nicola: Numerous studies have shown that diverse teams yield superior outcomes. However, diversity in the computer science and engineering fields is stagnant at best. This crisis demands focused interventions, including targeted initiatives to inspire the next generation, spanning elementary, middle, and high school education. Collaborations with colleges and universities are essential to ensure that the academic curriculum aligns with the evolving requirements of the workplace. Upskilling the current workforce is paramount to address the current tech talent shortage and ensure workers obtain the necessary skills to participate in the new digital economy. If done strategically, as opposed to a one-size-fits-all approach, gender diversity can actually be improved through upskilling. Above all, companies must be intentional and purposeful throughout the talent life cycle.

TMC: As a pioneer female leader in the digital communications industry, how much progress do you think has been made in 'normalising' the role of women in STEM related jobs?

Nicola: While the number of jobs in computing and other STEM related fields continues to expand, women still only fill a small percentage of them, especially at senior levels. However, technical aptitude will be increasingly required to fully partake in the digital age in which we live. I often tell young girls that whether they want to be a farmer or a fashion designer, technology will make them a better one. So while we can certainly point to female leaders and role models in tech, the answer is that it's not enough, the stakes have never been higher, and #weneedmore.

TMC: When do you think that this gender stereotyping begins? And what can we do about it?

Nicola: Gender stereotypes around STEM fields persist from grade school all the way up through our adult careers. A survey commissioned by Microsoft across 12 countries in Europe a few years ago now found that young girls start to lose interest in STEM topics by the age of 15. The study found that girls are falling out of the sciences because STEM classes simply aren't

cool in their schools' social ecosystem for a variety of reasons, and institutions don't sufficiently intervene to change girls' perceptions. This is a trend that hasn't really changed since the survey was performed, or even since I was 15, walking the halls of Union-Endicott High School in upstate New York. This is why it is so important to publicise the many interesting jobs that are available in the digital tech sector - they are rewarding, lucrative, and purposeful. And, as they say, you can't be what you can't see – girls need to see role models that look like them. The work of GTWN and others is vital to ensure gender parity in tech. It's through diversity that we will realize the full potential of this exciting digital age.

The role of mentors

TMC: We all need a little help along the way in our careers. Who have been some of your mentors?

Nicola: As I've mentioned, my parents played a vital role in helping me throughout my journey, both professionally and personally. Their unflagging support and the fact that they really listened and backed me every step of the way, was critical in the early years. In addition, I was fortunate to have a few special math teachers and coaches who offered guidance at a time when girls weren't generally encouraged to pursue careers in science, technology, engineering and math. At work, some very key leaders took an interest in my abilities as well and their advice and feedback helped me immeasurably. Last, but far from least, would be my husband. I'm known to joke with young women that the most important decision they can make for their career is to choose the right mate. The truth is that careers involve tough life decisions and life in general is unpredictable... best to have some partnership along the way. So I've been extremely fortunate — it's one reason I try to pay it forward by helping others.

Words of advice

TMC: Can you share 3 of the best words of advice you've received along your journey?

Nicola: First and foremost, take care of yourself. Nothing else matters in your career if you are not "fit to compete" and it's far too easy to lose sight of this fact when you're engrossed in work. Second, the most meaningful accomplishments have two key elements: hard work and teamwork. And last, know yourself and how you want your work to make a difference. Aligning your aspirations with your skills and how you want to contribute will help shape your career and guide you to satisfaction.

TMC: Thank you, Nicola, for your insights into your career and for your advice to the digital generation.



Nicola (Nicki) Palmer is a distinguished technology executive with over 30 years of experience in various leadership positions at Verizon. Most recently, Nicki was Verizon's Chief Technology Ambassador where she worked with business leaders, industry partners and consortiums, nonprofits and universities to ensure Verizon remains at the forefront of technology and innovation. She also served 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.

Nicki began her career at Bell Atlantic, a Verizon predecessor company, in 1990 and has held a number of leadership positions in engineering, operations, and technology supporting advanced data and wireless products across customer segments. She has served as Verizon's Chief Engineering Officer as well as the Chief Technology Officer of Verizon Wireless where she led the 4G and 5G network deployments. She 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 Women in Telcom, a Top 10 5G People to Watch, a Top 100 CIO/CTO Leader in STEM, a Top 10 Leader in Mobile Diversity Equity and Inclusion, 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 Science, Technology, Engineering and Math (STEM), especially for women. She serves on the board of directors for the National Academy Foundation and chairs its STEM Advisory Committee with the mission of providing more opportunities for high school students to be college, career, and future ready. She also serves on the advisory board of BreakThroughTech, an initiative of Cornell Tech that works at the intersection of academia and industry 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.

Building a US-India Tech Alliance

GTWN Board Member and CEO of 114ai and 3rdiTech, Vrinda Kapoor was invited in June 2023 to join a delegation of Indian entrepreneurs who accompanied Indian PM Narendra Modi for trade talks at the White House.

Indian-American astronaut Sunita Williams is also well known for her spacewalks. Vrinda Kapoor was, however, less known to the general public, that is before her inclusion in this important trade delegation last year. Since then, her public profile as a tech entrepreneur and tech leader has had a massive boost in both India and the US.

While in Washington, Vrinda was a guest along with Mahindra and Ambani at the State Dinner hosted by US President Joe Biden for PM Modi. The next morning, she was seated next to Microsoft CEO Satya Nadella during the India-US Hi-Tech Handshake, which was also attended by the US Secretary of Commerce Gina



Anand Mahindra with Mukesh Ambani (far left), Sunita Williams and Vrinda Kapoor (right) | Photo: Twitter/@anandmahindra

The above selfie¹ was taken on 26 June 2023 by Anand Mahindra with Mukesh Ambani, Sunita Williams and Vrinda Kapoor in Washington DC. It shows the well-known figures of Chairman of the Mahindra Group, Anand Mahindra and Chairman of Reliance Industries Mukesh Ambani, who are instantly recognised both in India and around the world for their successful business empires.

Raimondo. The thematic focus of the forum was on 'AI for All' and 'Manufacturing for Mankind'.

We are very proud that since joining the International Board of the GTWN she has played an important role as a thought leader, contributing to our ongoing discussion about how humanity can

¹ <https://www.narendramodi.in/prime-minister-narendra-modi-s-participation-in-the-india-us-hi-tech-handshake-event-571472>

reap the full benefits and overcome the challenges of Artificial Intelligence.²

Vrinda is an AI expert as the CEO of 114ai, 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.

Vrinda is in fact a deep-tech entrepreneur with an impressive list of achievements to her name. She works at the intersection of national security and technology and has grown prominently in the technology industry in the past few years. In addition to 114ai, she is also the CEO of semiconductor company 3rdiTech (pronounced third-eye tech), which was incubated in IIT Delhi in 2018 and was part of the Berkeley SkyDeck accelerator programme in 2020. The company designs application-specific integrated circuits (ASICs), or customised chips for intelligence, surveillance, and reconnaissance (ISR). It entered into a strategic partnership in 2022 with US defence major General Atomics Aeronautical Systems (GA-ASI) and has emerged as one of the key players in the aerospace and semiconductor sectors in India after Prime Minister Narendra Modi's visit to the US last June.

GTWN wishes Vrinda and her team all the best as she continues to build her profile as a leading global tech entrepreneur and visionary.



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.

² <https://themobilecentury.com/unlocking-the-promise-of-ai-building-a-human-machine-team/>

Inclusion beyond the numbers

Dr Mike Short, CBE FREng FIET FBCS FITP

When I attended Connected Britain 2023 held in London on 20-21 September 2023, I was struck by the different ways inclusion was discussed, starting with the Nokia keynote plea to be “inclusive and collaborative”. Many interpreted this from a fibre perspective as “homes passed”. This alone is not enough to address this matter fully or collaboratively.

GSM Association also published their annual report on UN SDGs which offered some great international data points to guide us.

ensures that the WWW is not closed to anyone and providing the ease of use to maximise collaboration and the sharing of ideas. Language, ability and gender should not become new barriers either.

So how should we think about inclusion?

- *Key inclusion factors:* By age, gender, accessibility, ability, geography, language, sector.



The GSMA's eighth SDG impact report, published at the halfway point to the 2030 Agenda, spotlights the mobile industry's impact and recommends action points to help realise the UN Goals

Since 2015, almost 2 billion people have gained access to the internet through a mobile device, with some 4.5 billion people – or 57% of the world's population connected by the end of 2022.¹

But that leaves a lot of people who are still not connected to the Internet or the benefits of the World Wide Web. Connectivity is a key reason, but not the only reason.

We need to think differently - nationally and internationally, about Connectivity and Internet access. It is more than cost - it is also about devices, convenience and coverage. It is Inclusion that

- *Locations:* Homes; offices; major venues and stadia; remote and rural connectivity; mobility including transport links, automotive, rail, marine and air based requirements.
- *User requirements:* voice/data/video; customer service (including physical and online; support and self-service; mobility; capacity; security and resilience; cost effectiveness; appropriate billing and accounting; social tariffs; devices and machine connectivity; applications and mapping; streaming; connected transport; health / energy requirements; net zero.
- *Capability:* voice quality; data speeds; access to the Internet; access to content – download and upload; interactivity;

¹ <https://sdgreport2023.gsma.com/>

latency; security; data storage and data trust; ease of use; network choice and portability; international roaming; private networks.

- *Technology choices and differentiated capability:* wireline and wireless capabilities with appropriate systems integration and collaboration based on international standards; legacy networks with switchover plans. All key digital technologies such as Fibre , Wifi , Cellular, FWA and Satellite should be included; ideally standards based to attract maximum choice, and the best solutions support.
- *Distribution channels:* choice and support, sometimes tailored and often with solutions or systems bundling.

Let's be truly inclusive and show what the Communications industry can really do.



Dr Mike Short, CBE is the Chair of the UK Telecomms Innovation Network Advisory Board (UKTIN AB) and Chief Architect - Satellite Applications Catapult. He was Chief Scientific Advisory at the UK Department for International Trade (DIT) from November 2017 to February 2023.

He has over 40 years of experience in the electronics and telecommunications industry, latterly as Vice President of Telefonica for 17 years to December 2016. In that post, he managed the launch of 2G (GSM) and 3G mobile technologies in the UK, established an office in Brussels and went on to lead international research, innovation and standards for Telefonica Europe.

His career includes the promotion of international technical standards in mobile and digital technology. He is a former chairman of the GSM Association, the UK Mobile Data Association, and was president of the Institution of Engineering and Technology in 2011 to 2012.

He was honoured with a CBE in 2012 for his services to the mobile industry.

Digital tech in Saudi Arabia

Dr Mona AlFedily, Senior executive, strategy and digital technology policy expert, Saudi Arabia

My involvement in the domains of the digital economy, technology and communication has provided me with remarkable insights into the pivotal role of digital technology in transforming both the global economy and social fabric.

Throughout my journey working in these domains and engaging with global organizations, leading international collaborations, and understanding policy issues at the G20 level, I have witnessed firsthand the profound impact of digital innovation and technology. This impact ranges from fostering entrepreneurship and job creation to enhancing productivity and efficiency.

Furthermore, the influence of digital technology extends to societal interactions, communication, and access to information, fundamentally reshaping the way we engage with the world around us. This has inspired me to go deeper in understanding the pivotal role of policies to empower such transformation in a safe and sustainable way. It has also fueled and informed my understanding and brought to light how we can work together to harness the transformative power of digital technology to drive a positive change for generations to come.

Inclusivity and innovation

Having the right environment and ecosystem for individuals and particularly for women is extremely important. I consider myself fortunate to be within an environment that considers digital and technology innovation a top priority, as well as focusing on maximizing the potential participation of women and youth.

The Kingdom of Saudi Arabia's ambitious economic and social development projects demonstrate the kingdom's emphasis on innovation, technology, and sustainability to embrace a positive change not only at organizational level but deeper at the social and individual levels. Making sure that everyone can have access to its enormous benefits and be part of its development. If we take a closer look at any of the vision 2030 programs or any of the Kingdom mega projects, we will realize that creating a thriving ecosystem to promote cutting-edge technology research and development, attracting top talent, and fostering entrepreneurship, are fundamental aspects of various industries within the Kingdom.



On an individual level, there is no doubt that we all have experienced the positive impact of the ethical use of data and AI. The quality of our life has improved by simply having easy access to information and services at any time. The digital platforms have made it easy for anyone to not only access services, but also to start a business or acquire new skills in an efficient, affordable, and trusted way. It has allowed us to expand our understanding of how we potentially can experience more, engage more, and give back more. On a different level, I believe data and AI will continue to serve as powerful drivers, fueling innovation and transforming industries. They can significantly advance healthcare innovation, sustainable energy management, urban planning, transportation optimization, environmental monitoring and conservation, advanced logistics and supply chain management, as well as safety and security optimization.

Tech programs for women in Saudi Arabia

The ambitious plans for Saudi Arabia present an opportunity to inspire women to get involved in digital technology. A great effort has been made to foster a culture of inclusion and diversity, emphasizing the value of inclusive workplaces, which inspire more women to pursue opportunities in the field and contribute to the creation of a supportive and inclusive ecosystem. This approach stands to not only benefit women but also contribute to the advancement of the digital ecosystem by harnessing the diverse talents and perspectives of all individuals.

It is also important to mention the impact of several programs and initiatives that have been introduced as part of broader national strategies to promote women's participation. Some have been introduced by the Saudi government, including scholarships, internships, and mentorship programs aimed at fostering women's participation in STEM fields as well as several tech-focused incubators and accelerators designed to provide hands-on experience and tailored to support and mentor female entrepreneurs and tech professionals. Others are led by organizations and companies designed to empower and inspire women to pursue careers in the tech industry. Collectively, all of them aim to address the gender gap in the technology sector and create a more inclusive and diverse workforce in Saudi Arabia. For example, one of the ICT sector strategy major targets for 2023 was to increase women's participation to 50%.

There are several inspiring success stories of women making significant contribution to the digital and technology sectors in Saudi Arabia. Here are two notable examples:

- *Dr Hayat Sindi* is a renowned Saudi scientist and inventor who has made significant contributions to the field of biotechnology. She holds a Ph.D. in biotechnology from Cambridge University and is the co-founder of Diagnostics for All, a nonprofit organization focused on developing low-cost diagnostic devices for underserved communities. Dr Sindi has been a catalyst in the field of science and

technology, breaking barriers, and inspiring others including women and youth through her innovative work.

- *Deemah AlYahya* is a pioneering figure in the digital and technology industry, known for her significant contributions to the advancement of these fields, as well as for her leadership, visionary approach, and transformative impact. As the General Secretary for the Digital Cooperation Organization, AlYahya plays a pivotal role in fostering international collaboration and synergies in the digital domain. Her leadership and strategic vision guide the organization in addressing critical issues such as digital inclusion, cybersecurity, and the ethical use of technology such as AI on a global scale. AlYahya's commitment to promoting digital cooperation to drive positive societal impact has contributed to shaping the organization as a leading force in advancing digital governance and policy. Her role exemplifies her dedication to leveraging technology for the collective betterment of diverse communities and economies worldwide.

These two women have not only achieved remarkable success in their respective fields but have also become influential figures who inspire and motivate others, especially women, to pursue careers in technology and entrepreneurship.

Collaboration drives innovation

The importance of collaboration and partnership is not to be forgotten, given its breadth of benefits and opportunities in addressing our ideas for change as well as strengthening our response to it. How we can strengthen our collaboration to contribute and empower each other is a permanent question for us as individuals, organizations, or international communities. For example, collaboration and partnership is a critical factor for any organization to reach its goals.

Not only can it enable access to a diverse range of expertise and resources, but collaboration can also accelerate innovation by forging partnerships, creating platforms for sharing best practices and research findings across various domains. It helps attract global talent and investment, fostering sustainable development, and enhancing social impact by engaging with diverse communities, NGOs, and social enterprises. This will enable creating multiple environments that not only attract pioneering minds and ideas, but also accelerates the transformation of those ideas into tangible solutions and economic opportunities.

Global initiatives such as the Global Telecom Women's Network (GTWN) play a pivotal role in mentoring and providing role models for women around the world, particularly in the fields of technology, telecommunications, and digital innovation. These initiatives contribute to women's empowerment and advancement in several ways. For example, they facilitate networking opportunities, offering a space for sharing

experiences, best practices, and insights while fostering a sense of community and solidarity among women in the tech and telecommunications sectors, in addition to providing role model visibility to inspire and empower the next generation of women.

My hopes for the future

As we move forward, celebrating what we have achieved is as important as acknowledging our shared interest in working together to achieve greater benefit. Personally, my hopes and dreams for the future of digital technology are deeply rooted in the potential for technology to drive a positive change for generations to come and foster inclusive growth across the globe.

I hope that digital technology becomes more accessible and provides opportunities for all. For example, I want to see digital technology facilitate widespread access to quality education, empowering learners of all ages to acquire new skills, pursue lifelong learning, and unleash their full potential. This will have a huge impact on inclusive economic growth, provide more opportunities for entrepreneurship, job creation, and financial inclusion, particularly for marginalized communities and underrepresented groups. I want above all to experience how digital technology can help us preserve and celebrate cultural diversity, languages, and heritage, fostering an inclusive global society, and enabling seamless collaboration across borders for the betterment of humanity. More importantly, I want to see this transformation happen ethically and responsibly, with a focus on data privacy and the ethical use of AI, to ensure that technology is developed and used with the best interests of individuals and societies in mind.

In the pursuit of these hopes and dreams, we must continue working together to ensure that digital technology becomes a force for good. By embracing innovation, inclusive policies and ethical practices, we can collectively contribute our best efforts to steering digital technology toward a future that benefits us all.



Dr Mona AlFedily is a senior executive driven by a strong passion for personal and professional development. She has extensive experience in strategy development, policy development, and international cooperation in the digital domain. Her professional journey has taken her across diverse organizations, enabling her to collaborate effectively with various groups and enhanced her ability to adapt and thrive in diverse and complex ecosystems. She greatly contributed and achieved successful outcomes in the Digital Economy Working Group in 2020 G20 Saudi Presidency. She led the development of the National Digital Economy Policy, the National Digital Transformation Strategy, and several ICT sector policies. She graduated from the University of Manchester in 2015. In 2021 she successfully completed the Minister leadership program in collaboration with Harvard Business School and is currently enrolled at MIT Sloan Executive General Management Program.

New digital frontiers

Sustainable data centers

Eva Talmacsi, co-head of TMT Practice in CEE, CMS

In today's digital age, data infrastructure, including data centers and cloud solutions, plays a pivotal role in supporting efficient service delivery.

Demands for more data, and therefore ever more powerful data center capacity, are growing exponentially around the world.

According to the International Energy Agency (IEA), for every bit of data that travels the network from a data center to end users, another five bits of data are transmitted within and among data centers. Data centers have, therefore, a vital role in facilitating the current and forecasted data usage and generation as data centers are used to host networked computer servers that store, process, and distribute large amounts of data¹. Mobile data traffic is projected to continue growing quickly, *quadrupling by 2028 hence data center demand is huge*.

Data center workloads have already increased 340% between 2015 and 2022², and data center energy demand is forecasted to increase by about 15x by 2030 to reach 8% of total projected electricity demand. The rapid growth of artificial intelligence, along with other modern technologies, such as streaming, gaming and self-driving cars, are some of the reasons behind this continued growth.

We have already seen the number of data centers grow globally. For example, Brazil's data center inventory has grown by 127% from 2020 to 2022, meanwhile Sydney's has jumped 30% year on year³. In Europe, it is estimated that by 2025, the number of data centers needs to increase nearly 2.5 times to more than

3,000 data centres (approximately 20,750 Mw). However, this assumption does not take into account future technological developments that will likely increase the efficiency of data centers and increase their power capacity⁴.

Datacenters, however are energy-intensive, consume valuable resources and contribute to greenhouse gas emissions. Sustainable digital transformation requires efforts to migrate to green digital infrastructure and reduce environmental footprints.

Estimated global data center electricity consumption in 2022 was 240-340 TWh, or around 1-1.3% of global final electricity demand, of which about 90 TWh are directly attributable to the three largest hyperscalers: Amazon, Microsoft, and Google. This excludes energy used for cryptocurrency mining, which was estimated to be around 110 TWh in 2022⁵, accounting for 0.4% of annual global electricity demand. Data centers and data transmission networks are responsible for 1% of energy-related GHG emissions. Despite strong gains in efficiency, the rapid growth in workloads handled by large data centers has resulted in a substantial increase in energy use in this segment over the past several years, growing by 20-40% annually.

Overall data center energy use (excluding crypto) appears likely to continue growing moderately over the next few years, but longer-term trends are highly uncertain.

However, Apple, Google, Meta and Microsoft purchased or generated enough renewable electricity to match 100% of their operational electricity consumption in recent years (primarily

1 https://www.savills.co.uk/research_articles/229130/335882-0

2 <https://www.iea.org/energy-system/buildings/data-centres-and-data-transmission-networks>

3 <https://mediaassets.cbre.com/-/media/project/cbre/shared-site/insights/reports/2023-report-media-folder/global-data-center-trends-2023-media-folder/global-data-center-trends.pdf?rev=3d3310b22390450fa449d0950215494d.p.5>

4 https://www.savills.co.uk/research_articles/229130/335882-0

5 <https://ccaf.io/cbnsi/cbeci>



in data centers). To reach carbon-free energy goals, data center owners are signing power purchase agreements (PPAs) with suppliers of renewable energy. Meanwhile, hyperscalers are starting to fund the building of renewable-energy plants in the face of soaring prices caused by supply shortages.⁶ In the United Kingdom, for example, Amazon has supported Scottish Power's wind farm and is purchasing its entire 50-megawatt (MW) output.

On the other hand, matching 100% of annual demand with renewable energy purchases or certificates does not mean that data centers and data transmission networks are powered exclusively by renewable sources. The variability of wind and solar sources may not match a data center's demand profile, and the renewable energy may be purchased from projects in a different grid or region from where demand is located.

Making digital transformation more sustainable

The International Telecommunication Union and the World Bank⁶ have identified six critical pillars towards sustainable digital transformation. These pillars not only promote climate mitigation but also contribute to environmental sustainability. The first pillar addresses climate risks associated with data centers, while the other five pillars aim to mitigate the climate and environmental footprint from data centers.

Climate-resilient data center location

The single most effective — not to mention least costly — way to make data centers resilient against climate change is simply to place them in locations where they are less prone to the negative impacts of a changing climate. The ideal data center location in the age of climate change is one that:

- enables sourcing of clean energy under any climate conditions. Data centers that can rely on a combination of solar and wind power are well-positioned in this regard;
- is not prone to flooding, even with higher sea levels; and is not in a region where insurers are likely to charge higher rates or refuse coverage altogether.

Sustainable design and buildings

With the ultimate target to reach net zero, an energy efficient design must deploy renewable and circular solutions (e.g. using recycled materials in servers and using treated wastewater for cooling). The re-use of treated wastewater or rainwater harvesting features, such as blue roofs to collect and store rainwater are also increasingly common examples of ways to cut water consumption in data centers.

Sustainable ICT

ICT equipment in data centers requires power and cooling. Purchasing energy-efficient equipment, implementing virtualization technology to ensure efficient server management, ensuring timely upgrades and refreshes, and leveraging real-time monitoring of equipment performance are strategies for sustainable ICT use in data centers.

Sustainable energy

The use of renewable energy sources such as hydropower and wind is a critical element of green datacenters. One notable example of datacentres run by renewable energy is the Scala Data Centers (a sustainable hyperscale data center operator in Latin America) that was the first to use 100 percent certified renewable energy. They have also received Carbon Neutral certification and demonstrate that it is viable to effectively use renewable energy to run a data center effectively.

Sustainable cooling

Climate conscious cooling – data driven approach to understanding local hydrology, geography, energy and emissions factors - is playing a big role in the future of data center designs. Using water responsibly, using alternatives to freshwater (e.g. wastewater, industrial water or seawater) or using liquid-cooling technologies are becoming an integral part of future strategies and a valuable alternative to air-cooling for existing and new data centers.

E-waste management

A data center can decrease e-waste by selecting components that have long lifespans and are easy to process at their natural end-of-life cycle. Using recycled materials and making equipment easy to repair can also decrease the environmental toll. These actions reduce the frequency a data center needs to discard hazardous electrical or electronic goods.

⁶ 'Green Data Centers: towards a sustainable digital transformation: A Practitioners Guide' Report by The World Bank Group by Rosie McDonald and Sara Ballan. Dated 29 November 2023. – The 'Original Report'

How policy-making is reshaping the data center landscape

These dimensions of green data centers should also be considered as part of public procurement strategies and requirements, and in wider policies and regulations to encourage investment in green data centers and increased resilience and efficiency of existing data center infrastructure.

Europe has long been at the forefront of efforts to reduce energy use and emissions. To accomplish this, the European Union ('EU') passed an updated Energy Efficiency Directive (EED) in the summer of 2023.

The European Commission is also exploring measures to improve the energy efficiency and circular economy performance in data centers. Data centers need to become more energy efficient, reuse waste energy such as heat and use more renewable energy sources, with a view to becoming carbon-neutral by 2030. To meet this goal, the Commission will rely on a mix of existing instruments such as the *Ecodesign Regulation on Servers and Data Storage Products*, reviews of existing legislation and new initiatives such as the *Proposal for a Directive on energy efficiency (recast)* introducing new elements to improve the energy efficiency and sustainability monitoring of data centers.⁷ Under the recast directive, data centers in the EU with installed IT power of more than 100 kilowatts will need to publicly report energy performance. Once baseline data is collected, the EU will then incentivize further reductions through subsidies or penalties.

The Corporate Social Responsibility Directive (CSRD) is also important legislation which will require companies to report on the environment-related risks they face. According to the directive, this will include 'reporting on social and environmental factors with a view to identifying sustainability risks and increasing investor and consumer trust.' The directive also prompts companies to report on diversity, and 'social and employee-related matters, respect for human rights, anti-corruption, and bribery matters,' among others.

Other regions still have a long way to go in regulatory changes in this space. Following droughts in some countries in Latin-America such as Uruguay and Chile, local communities have become frustrated at the likes of Google hub data centres that they blame for consuming large amounts of the local water supply. Google's plans to build a second data centre in Chile has been stalled since 2020 due to local communities filing environmental complaints. Despite this, few regulatory changes have been made in these countries to impose certain regulations on these new data centers.⁸

⁷ <https://digital-strategy.ec.europa.eu/en/policies/green-cloud> (European Commission Official Website)

⁸ <https://telecom.economicstimes.indiatimes.com/news/internet/in-latin-america-data-center-plans-fuel-water-worries/103974724>

The US has also taken initial steps to address the impact of data centers. Several US states are also implementing stricter regulations. In Virginia, pending laws focus on carbon reduction and sustainability through more stringent requirements. Similarly, Oregon has proposed reducing carbon emissions 60% by 2027 for data centers and cryptocurrency mining, imposing fines for noncompliance.

Business opportunities for sustainable and resilient data centers

The shift to renewable energy sources enables data centers to tap into a constant supply of clean energy which provides an attractive market for investors in sustainable power-supply and other relevant projects. Green data centres will play a wider role in the global energy transition. The data center industry can contribute to a more stable and cost-efficient energy system and cost reductions. For example, batteries can capture surplus energy during periods of low demand and release it during peak hours or grid outages to ensure uninterrupted operations.

Data centers also need to connect to a fiber-transport network, so proximity to infrastructure and subsea landing points as well as to renewable energy plants or having access to industrial land are of critical importance.

Governments, investors and other stakeholders are all incentivised to collaborate in the interest of decarbonisation of energy systems and to implement alternative solutions such as updated power grids and infrastructure networks as well as energy-storage solutions.



Eva Talmaci is an English and US (NY)-qualified Corporate/ M&A partner of CMS based in London. She advises clients on a broad range of complex cross-border transactions across EMEA and beyond with a particular focus on the TMC sector. She co-heads the firm's TMT Practice in CEE and is a member of the Global Digital Infrastructure and M&A Transactional Steering Committees of CMS TMC.

Collaboration is key to effective technology policy

Sunita Bose, Managing Director of the Digital Industry Group Inc. (DIGI) in Australia, former Head of Global Policy for Change.org

Technology captures our imagination because it taps into some of humanity's best qualities: connection, creativity, and the desire for equality. Personally, I was drawn to a career in technology because of its democratising power to level the playing field, and its potential to give people a voice. Technology can make our lives better and easier, open up access to information, resources and new efficiencies, or bring people together across divides.

Human-centred technology policy

To keep these qualities at the centre of technological developments, our vision needs to be of a world where humans are shaping technology, rather than one where it's negatively shaping us. The guardrails we set around technology are therefore extremely important, at a personal, corporate and national level.

The organisation I run, the Digital Industry Group Inc. (DIGI) has a unique and important role to play toward that vision. We're an industry association for the digital industry in Australia, working with the world's leading technology companies and the Australian government, on policy and regulatory solutions to address the challenges and opportunities of growing the digital economy. Recent advancements in artificial intelligence (AI) have brought technology policy front and centre in national and global conversations. Governments around the world are grappling with how to regulate a frontier technology, seizing its socio-economic opportunities, but mitigating potential risks.

While AI might have brought these questions into renewed public focus, similar themes have been the source of intense debate in the world of technology policy. But how do we go beyond debating different perspectives, and arrive at the right solutions?

A multi-stakeholder approach

Best practice in technology policy development requires adopting a truly multi-stakeholder approach that deeply involves consumers, civil society, industry and governments in the policy-making process. At DIGI, we believe the companies in our membership are working towards the same objectives as governments around the world: protecting people from online harms, strong consumer protections online, data privacy and cyber security, and a thriving digital-enabled economy. As new policy proposals in these areas emerge, the expertise from within the tech companies must be shared with the Government in order to deliver policies that work, and that are effective in achieving those objectives. The companies' expertise also reflects what they are hearing from their users, and how people are actually using technology.

Consultation and collaboration across diverse groups is not an easy feat, but they're skills I've reflected on and developed over the years through various roles. DIGI has a consensus-based decision-making model, which means that our founding members – who are otherwise competitors as the world's leading technology companies – must agree on all of our strategic decisions and policy positions.

It's also a skill I practised when I was Head of Global Policy for Change.org, where I established and led the policy team that developed the rules for users including the company's Privacy Policy, Terms of Service, Community Guidelines, and the infrastructure to manage harmful user-generated content, in areas such as bullying, hate speech, defamation, misinformation, data privacy and child protection. This involved navigating the vastly different cultural approaches, regulation and political dynamics in issues like hate speech to find common ground, in order to develop a broadly consistent global policy.

Building trust is essential

I've learned that the foundation of any consensus-building is trust. Trust is established through genuine listening. It's important to foster environments that encourage stakeholders to be forthright in their views in a meeting, or outside of it. That environment is helped by how you connect with and build relationships with your stakeholders. Clearly signpost regular opportunities for feedback and influence with developed (but not finalised) ideas so that you're providing leadership toward a destination and enabling everyone to help build the path.

While these are some of my personal reflections working specifically with industry policies and policy positions, strong consultation needs to be a part of any policy development process, particularly those that are government-led.

Seeing the bigger picture

In technology policy specifically, consultation doesn't just help us reconcile different views, it helps us see the big picture. When I'm evaluating proposed technology regulation, one of the questions I will often ask is whether the approach is holistic in solving the policy problem. This question is relevant across the range of policy issues DIGI works across whether in consumer protection, privacy or online safety. DIGI is supportive of smart regulation for the online world, but you'll often see us advocate for effective digital policy alongside economy-wide or systemic approaches.

For example, DIGI has a role in developing industry codes of practice that have formed an integral part of the Australian Government's policy approach to addressing various online harms. One of those codes is the *Australian Code of Practice on Disinformation and Misinformation*, that commits major technology companies to safeguards against harmful misinformation and disinformation. We've worked to continually strengthen the code and see it a significant step forward; but while major technology companies have critically important levers to pull, sustained shifts in the fight against mis- and disinformation rely on a multi-stakeholder approach across digital platforms, media, governments and the community. For example, media and digital literacy initiatives are critically important interventions in bolstering resilience to misinformation. We need to pull more than one lever to make a real difference; another reason why bringing diverse groups together is so important.

Think laterally and globally

Returning to the example of AI, take a moment to consider just how many stakeholders have a role to play in accessing its significant socio-economic benefits, while addressing any potential risks. It's a complex map. AI is relevant for every sector from banking to healthcare, education, entertainment and

everything in between. We need to consider upstream designers of AI models and downstream deployers of the technology and assess both application of the technology on a use case basis, as well as the broader impacts on innovation, industry, and trade. To add another layer of complexity, AI technologies are being developed at a global scale. Any domestic regulation proposals have potential ripple effects across global supply chains, international relations, trade, research, security, and more. To embrace the full picture, consultation with a range of industries is essential to ensure that any regulation that is developed addresses the right risks and opportunities in their sector, potential use cases, applications, and potential associated harms.

Keeping technology safe, secure and equitable is one of the important challenges of our time. It is also a complex endeavour and, if oversimplified or developed in a vacuum, the laws proposed to rise to that challenge will be ineffective. Getting technology policy right relies on innovative and best-in-class processes to ensure civil society, consumers, industry and Governments are all deeply engaged in the policy problem and are empowered to contribute all of their expertise to the solution.



Sunita is Managing Director of the Digital Industry Group Inc. (DIGI), the non-profit tech industry peak body that advocates for a thriving digital economy in Australia, where online safety and privacy are protected. DIGI's founding members are Apple, Discord, eBay, Google, Linktree, Meta, Microsoft, Snap, Spotify, TikTok, Twitch, X (f.k.a Twitter) and Yahoo. Sunita was previously Head of Global Policy for the online petition platform Change.org, based in San Francisco, and policy infrastructure to manage harmful user-generated content, in areas such as bullying, hate speech, defamation, misinformation, data privacy and child protection. Before that, Sunita spent seven years working in a range of international and Australian advocacy and strategic communications roles at humanitarian aid agencies Oxfam and UNICEF, and has a Masters of Policy from the University of New South Wales.

GTWN Call to Action for digital inclusion for all and *digital generation*

Ana Tavares Lattibeaudiere and Candace Johnson

The GTWN's Call to Action for Digital Inclusion for All, which we issued in February 2023, goes to the very essence of the theme of the 2024 edition of *The Mobile Century*, *digital generation*.

In a world that is becoming increasingly digital, it is important that no-one be left behind, regardless of gender, age, geography, or social-economic standing. This includes in particular those who remain underserved by digital technology.

In issuing the Call to Action (CTA), the GTWN wished to inspire and celebrate individuals, organizations, and corporations who were taking positive action to bring about digital inclusion for all. In so doing, we built on the studies that mainly highlighted gaps in digital coverage, such as the excellent GSMA, United Nations and ITU reports, but wanted to go a step further by focusing on concrete actions and highlighting positive endeavors. We were not disappointed!

As a first step, over the twelve months since issuing the CTA, we surveyed what our GTWN International Board members were doing through their own personal initiatives to help bring about digital connectivity projects in places such as Pakistan, the Philippines, Indonesia, the United States, the UK, Sierra Leone, Cameroon, and Afghanistan.

We are proud of all our GTWN International Board Members' initiatives which are detailed on the GTWN website¹.

In particular, we would like to highlight the ongoing contribution of the GTWN's Global President Emeritus, *Keri Gilder, CEO of Colt*, who has been leading the change across the TMT industry by pioneering the industry's first ever inclusion and diversity score with the tmforum. The score sets the gold standard for measurement of diversity at the CEO -2 management level

enabling a true understanding of not only overall diversity within a company but whether those diverse employees are being promoted into senior level positions. It also is the first score to measure inclusion through employee sentiment questions. The insights and enablement of real actions through the IDS scoring tool can help address the "talent problem" that we have as an industry. She has also partnered with other standards bodies such as the MEF to help drive further understanding of how to build Inclusion and Diversity into the high tech and innovation areas of the industry.

The CTA is an ongoing priority of GTWN and the list of digital inclusion projects and achievements will continue to expand throughout 2024.

Reaching out to GTWN's global network

Following this initial review, we then reached out to our global network to continue our work to progress our CTA and engage with digital technology corporations and international agencies working in digital inclusion. This includes the ITU, the United Nations, the ICC (International Chamber of Commerce), and unconnected.org. We also continued our ongoing cooperation with the GSMA and their ground-breaking initiative with CARE and the GDIP², sponsored by the Bill and Melinda Gates Foundation³.

These initiatives range from individual contributions to large, corporate and nationwide programs. The ultimate goal of the GTWN's CTA is to help inspire everyone to engage and contribute to making our world, planet, and universe socially responsible for enabling Universal Meaningful Connectivity as laid out by

¹ <https://www.gtnw.org/gtnw-call-to-action-to-ensure-digital-inclusion-for-all/>

² <https://globaldigitalinclusion.org/>

³ <https://www.gsma.com/mobilefordevelopment/blog/the-gsma-care-and-gdip-consortium-selected-to-accelerate-closure-of-the-gender-digital-divide/>

our partners at the ITU in their far-reaching program on UMC⁴, and the joint UN/ITU Broadband Commission⁵, which is bringing public and private players together to deliver practical and fact-based solutions.

In reaching out to our global network to find inspiration and partners, here again, we were not disappointed! So many individuals, corporations and organizations are doing truly amazing and meaningful activities that are making a difference in closing the digital divide and helping to ensure meaningful digital connectivity for all.

This point is highlighted by the World Benchmarking Alliance group which annually publishes digital inclusion ranking of two hundred keystone digital companies, benchmarked across four measurement areas: access, skills, use and innovation⁶. The leading 20 companies who comprehensively demonstrate best practices are Telefonica, Orange, Deutsche Telekom, Apple, Cisco, Microsoft, Dell, HP, Verizon, Telstra, Telia, Singtel, SK Telecom, IBM, Qualcomm, AIS, Ericsson, Vodafone and Intel. In addition to this impressive list of digital companies, the GTWN would like to highlight the following initiatives and programs which impress us by their scope and comprehensive and cooperative nature:

1. S.H.E. - School of Hope and Empowerment by TATA together with Better India to promote entrepreneurship education, gender equality and wellbeing of women⁷;
2. MTN's remarkable achievement in surpassing connectivity milestones in the Free State and Northern Cape Region in Africa⁸;
3. Vodafone's results-based Plan and Results on delivering "Digital Inclusion for All"⁹; and
4. Mastercard has created numerous partnerships with telecom operators around the world to bring both financial and digital inclusion for all. Be it via their MasterCard Center for Inclusive Growth¹⁰ or their multiple partnerships with Samsung, Airtel and Asante in Africa, Mastercard leverages their financial clout to bring about tangible results in the campaign for digital inclusion for all.

The next generation takes up the cause

We are also very pleased and proud to see that the call to ensure digital inclusion for all is being answered by our younger colleagues and mentees in the next generation of digital natives, who understand that access to digital technologies is vital to

ensure full economic and social participation. We highlight a couple of examples here of this inspiring work, which bodes well for the future of the industry.

Saira Faisal Syed

- helped start the GSMA Diversity for Tech Community whose primary goal is to foster partnerships, highlight the work of every member, and collectively make a positive impact in encouraging more women to pursue careers in tech.
- The GSMA APAC team set the stage for a meaningful change and partnered with Ministry of IT & Telecom in Pakistan and Kistpay to make a substantial leap forward by launching the Smartphone4All initiative, with gender inclusivity at its core. The program continues to work to bridge the digital gender divide by ensuring women's equal access to smartphones and digital resources. It's a significant step towards empowering women through technology.¹¹

Blanca Villanueva

- Blanca is the daughter of GTWN International Board member and GTWN Asia Pacific President, Myla Villanueva. Blanca has in her own right contributed significantly to the work of the GTWN - as an author for The Mobile Century and also for our 20th Anniversary publication in 2022. She is an early expert in AI, which she has been involved in for more than 10 years. Blanca has grown up in the digital tech sector, so to speak, and we are delighted that she has chosen to make her career as a major player in AI and digital tech related fields.
- Blanca co-authored an article entitled Human mobility networks reveal increased segregation in large cities, which was published in Nature magazine in November 2023.¹²
- In this study mobile phone mobility data was used to represent 1.6 billion real-world exposures among 9.6 million people in the US. While a long-standing expectation is that large, dense and cosmopolitan areas support socioeconomic mixing and exposure among diverse individuals, the data shows that residents of large cosmopolitan areas have less exposure to a diverse range of individuals. Secondly, increased segregation in large cities arises because they offer greater choice of differentiated spaces targeted to specific groups. Thirdly, this effect is countered when a city's hubs (such as shopping centres) are positioned to bridge diverse neighbourhoods and therefore attract people of all socioeconomic statuses. These findings challenge a long-standing conjecture in human geography and highlight how urban design can both prevent and facilitate encounters among diverse individuals.

4 <https://www.itu.int/itu-d/sites/projectumc/home/aboutumc/>

5 <https://www.broadbandcommission.org/commissioners/>

6 <https://www.worldbenchmarkingalliance.org/digital-inclusion-benchmark/>

7 <https://www.tataworld.com/news/openinside/tata-communications-unveils-project-she>

8 <https://techreviewafrica.com/news/1117/mtn-south-africa-surpasses-connectivity-milestones-in-the-free-state-and-northern-cape-regions>

9 <https://www.vodafone.com/news/inclusion/serpil-timuray-delivering-inclusion-for-all-vision>

10 <https://www.mastercardcenter.org/>

11 <https://www.gsma.com/publicpolicy/making-digital-pakistan-a-reality-an-opportunity-for-growth-and-development>

12 https://www.researchgate.net/publication/376043711_Human_mobility_networks_reveal_increased_segregation_in_large_cities

Best practices and conclusion

During this past year since the launch of the CTA, the GTWN has discerned that best practices to achieve digital inclusion for all revolve very much around providing access (be it by ensuring devices and connectivity packages) and education, (packages which include not only how to use digital devices, but also providing meaningful education programs in teaching people about finance, health, economic livelihood, etc.). We observed from many projects that the combination of financial inclusion and digital inclusion produces very concrete results.

Importantly, we have also learned that providing digital access devices is not enough to ensure digital inclusion. Key to truly bringing about digital inclusion for all is education.

Finally, it is important as we move forward that we remain aware that focusing on digital generation can be a way to bridge gaps between generations while also encouraging everyone to work together to ensure that no-one is left behind on this digital journey.

It is clear that our work is not done, BUT by adopting a can-do approach to bringing digital inclusion for all, we firmly believe that our goals will be met. In so doing, we hope to achieve peace and health for our world, the planet and the universe.



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 10T Tech 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.

Contact: Ana.lattibeaudiere@globalplatform.org.



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.

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Design and layout by:
Marge Salem-Galvez

www.linkedin.com/in/marjorie-salem-galvez