

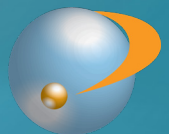
THE MOBILE CENTURY

LIFE AND WORK IN THE DIGITAL ERA

2022

REFLECTIONS

Celebrating 30 years
GTWN



REFLECTIONS

Celebrating 30 Years



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The purpose of the GTWN is to provide a forum for executive women active in telecommunications to get together and “network”; to provide a role model to younger women managers active in telecommunications; and to contribute to the evolving global information society in a positive manner.

DISCLAIMER

The opinions expressed herein are purely those of the authors and should not be construed as representing those of GTWN, nor of any of the organisations with which the authors are affiliated.

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Foreword

On the thirtieth anniversary of the founding of the GTWN, in 1992, we are taking the opportunity to reflect on where we started, how far we have come, and the journey ahead.

We could not have imagined the scope of the truly amazing transformation that telecommunications and digital technologies in general would unleash on the world over the coming decades. In fact, as GTWN Co-Founder Janice Hughes recalls, her predictions about the growth of the mobile sector, which were considered at the time by many to be wildly optimistic, proved to be far too conservative. The world has changed immeasurably since those early days – not least in the number of female entrepreneurs and executives who have chosen, and still are choosing, to make this exciting industry their future.

Remembering those heady days in the early nineties, when everything seemed possible (as it can do to the young), there are however aspects of the digital transformation of society and the economy which we also could not have imagined and which we cannot condone. Ransomware, online harassment, child pornography, phishing, spoofing, denial of service, and other forms of malware and attacks, have demonstrated that some negative aspects of human nature continue despite, or indeed because they are amplified by, technological change. But far from discouraging us, this has made the GTWN members and their colleagues and supporters all the more determined to persevere in their work to ensure that digital

technologies are used, not just for their own sake, but in order to improve the lives of people around the world.

We are immensely grateful for the time and effort that our contributors have dedicated to making this, our 30th Anniversary publication, such a diverse, interesting and informative read. Thank you all. The spirit behind your words is a truly amazing legacy that will live on as the GTWN story continues.

As some of our GTWN colleagues begin a new phase of their careers, we are excited to welcome our new GTWN Global President, Keri Gilder and several new members of the Board from around the world, thus ensuring the next generation will carry on the tradition that has been crafted over the past three decades. Their diverse backgrounds and achievements will, we are sure, inspire everyone to continue our work well into the future.

Many thanks to global law firm CMS, leaders in ESG business practice, who have generously sponsored The Mobile Century for the past two years; and also to our 30th Anniversary Gala Dinner major sponsor, Spanish financial and banking group CaixaBank.

Vicki MacLeod

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Platinum Sponsor of The Mobile Century – CMS

 CMS is proud to support the GTWN through our sponsorship of The Mobile Century. We hope that this 30th Anniversary edition will inspire you, as it does us, to continue to recognise and celebrate the extraordinary work done by women in the digital space. We are honoured that we were chosen by the GTWN to enable this unique publication, which provides a global platform for sharing the diverse perspectives, experiences and wisdom of senior female leaders in the communications ecosystem.

This sponsorship is a natural extension of our work at CMS. We strive to build a culture of trust, respect and support embracing all aspects of diversity and inclusion, leading the legal sector in social impact and sustainability. Our aim is to inspire, impact and support our clients, networks and our people, helping them to maximise their potential and thrive. We value our partnership with the GTWN - whose commitment to being pioneers and first movers echoes our own ambitions.

Putting ESG first

ESG now has the full attention of many boards and shareholders sparked by the financial markets which have been driving progress. It is more common to see companies entirely re-evaluating their ESG agendas, improving their internal governance as regards to ESG oversight and building on their external engagement to ensure that ESG is considered throughout their supply chains. However, this is no small undertaking. It is a seismic shift in approach.

We are proud to say that since the 2021 edition of *The Mobile Century*, when we commenced our partnership with the GTWN, CMS has made enormous strides in the field of ESG. As a future facing legal firm we are taking a bold, dynamic and agile approach to help clients of every size face the future with confidence. We are also aligning our strategic objectives with ESG by addressing our own impact on the environment and strengthening our approach to sustainability. We are extending these goals into every aspect of our practice, by advising clients with their related legal, regulatory, commercial and disputes issues arising from climate change and ESG.

Embracing the evolution of finance

There is now greater recognition that the entire economy needs to evolve. The financial sector, as a key driver of the economy, now has the responsibility to move away from traditional investments and either seek sustainable alternatives or actively engage in the greening of their portfolios. Just as every company with a future is a tech company, every company with a future is now also an ESG company. CMS has created a formally integrated and multidisciplinary ESG taskforce, to help clients across all sectors to carefully plan how to meet the demands of climate change, technological disruption, urbanisation, social concerns and other ESG risks and opportunities.

When fundamental market changes occur, regulation will surely follow. Over the last two years, there has been a rapid rise of regulation in the ESG space – led by the EU – and the pace of change in the legal landscape is a direct reflection of that. Without a consistent international approach to ESG-related regulation, the consequent jigsaw puzzle of different national and regional approaches exposes companies operating across borders to a higher risk of potential breach of rules. The developing minefield of different reporting requirements needs careful attention, as does the process of collation, disclosure and verification of reporting metrics. In this transition period,

there will be inevitable problems, and some companies will not be able to keep up with the pace of change without expert guidance. However, we are confident that a combination of well-designed regulation and market innovation will lead us into a brighter future.

CMS: a global leader in ESG

With a presence in over 40 countries, CMS is recognised as a global leader in its pledge to meet its responsibilities in four areas: human rights, labour, environment and anti-corruption. In our annual Communication of Progress report, issued as part of our commitment to the UN Global Compact, we will continue to detail our efforts to operate responsibly and in support of the best social outcomes.

Over the past year, CMS's UK arm has led the UK's legal sector by setting Science Based Targets for carbon reduction, which have been independently approved, and we have committed to an ambitious goal of net zero by 2025. CMS has also been awarded an impressive score of "A-" by CDP, the highly respected not-for-profit which measures how organisations are reporting and managing their impacts on the environment. This score recognises how effectively we are engaging with suppliers on climate change.

Our Call to Action

Whether we are operating a law firm, a global bank, a real estate developer, a life sciences company or a technology start-up, together we must all recognise our ethical and business obligations to address ESG issues across our own activities. With this in mind, we invite all like-minded members and friends of the GTWN, and readers of this great publication, to engage with us on this important journey. We are willing and prepared to take a leading role, with our GTWN partners and others, in sharing best practice, supporting innovation and ambition, and providing encouragement wherever that may be needed.

We invite you to join with us on this journey, and to become involved in the many plans and projects we are developing, to ensure that together we can create a sustainable and ethical future.

For more information on CMS, visit cms.law



Chris Watson, Global Head of Technology, Media and Communications, CMS

Chris is one of the world's leading communications law experts. He is Global Head of the CMS Technology, Media and Communications group and leads an international team of over 300 lawyers.

He focuses on international commercial matters in TMC, particularly in areas where competition and regulation overlap, and on EU law arising in cross-border and complex transactions.

Chris is included as one of a handful of "Global Elite Thought Leaders" in Who's Who Legal: Data 2020. His recognition as a Who's Who Legal "Global Leader" in the categories of Data - Information Technology, and Data - Telecoms & Media also goes back for several years.

Chris is a sought after speaker and is frequently quoted in the media. He is a past member of the governing Council of the International Bar Association (IBA), chair of its Diversity Council and a past chairman of the Communications Law Committee. Chris's memberships also include Supreme Court of England and Wales, and the Paris Bar.

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Laura Houët, Global Co-Head of ESG, CMS

Laura is a partner in the London Financial Services team and co-leads the global CMS ESG group. She has over 14 years' experience advising the asset management industry. She is a regulated funds specialist with particular expertise on the product side.

Laura has a market leading practice in sustainable investment, advising both the investment industry and companies who are indirectly impacted by ESG changes within the investment industry. Laura advises in particular on the impact of EU and UK regulation in relation to sustainable finance, including all elements of the EU's Sustainable Finance Action Plan, the implementation of the Task Force on Climate-related Financial Disclosures (TCFD) and the UK's approach under its Green Finance Strategy.

Laura advises clients across Europe and the US on sustainability issues, is a frequent industry and media speaker on the topic, and is a member of the Financial Market Law Commission's ESG Scoping Forum.

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Congratulations to the GTWN on their 30th Anniversary

Thirty years of the Global Telecom Women's Network, what an incredible achievement. I am delighted that we are celebrating the GTWN's 30 years here in Barcelona, at MWC22.

Let's take a moment to look back at just a few of the women that have played a fundamental role in the very early development of our industry.

From Ada Lovelace, in the 1800s, a remarkable mathematician, and the first computer programmer; to Sarah Bagley, the first woman telegraph operator, who also campaigned for equal pay; to Hedy Lamar, the Austrian actress, who pioneered the technology that would pave the way for WiFi. These are just three of the early women leaders who shaped our industry, and the world as we know it today.

Our industry has already come a long way, but there is much more that we need to do. There are three priority areas we need to focus on in 2022.

Firstly, the increasingly **central partnership role** that we are playing with other sectors ranging from manufacturing to healthcare.

Today doing business is a much wider term than it was even 10 years ago. There is no doubt that climate action is business, that sustainability is business, and that mobile can have a massive enablement effect across all sectors. In fact, our research shows that connected technologies could contribute

40% of the required carbon emissions savings for the world's net zero goals. These technologies already exist, but they are still very underused by energy-intensive industries. So the opportunities are enormous, especially as the 5G era begins to take off.

Which brings us to the second theme – **5G and intelligent connectivity.**

By the end of 2021, 176 mobile operators had launched 5G services in 70 markets around the world. And by 2025, we expect 5G to account for a quarter of total mobile connections. So, there is absolutely no doubt that 5G is the future, and that the leaders of tomorrow, the people that are innovating today, stand to gain the most from understanding and mobilizing all of its possibilities. And, of course, as this future begins to take shape, there is a very important group of people that we must not forget. The people who are not yet using mobile.

Which is the third theme – digital inclusion and in particular the **usage gap.**

Today, half of the world's people are connected online, but half are not. 3.8 billion people globally are still not connected to the internet. This is made up of 450 million people – who live outside areas covered by mobile broadband, the coverage gap, and 3.4 billion people – who live in areas covered by mobile broadband but who do not yet use mobile internet, the usage gap.

In the last 5 years, 1.4 billion more people have been covered by mobile broadband, reducing the coverage gap. But the usage gap, the 3.4 billion people, remains. And we find that women are most affected by this. Across low- and middle-income countries, women are 7% less likely than men to own a mobile phone, and 15% less likely to use mobile internet. As we emerge from the pandemic, with renewed energy and ideas, now is the time for action.

Through the GSMA's Connected Women Commitment Initiative, 40 mobile operators have made formal commitments to accelerate digital and financial inclusion for women, and to date, we have reached over 55 million additional women with mobile money and mobile internet services. The numbers show us that it really is possible to work together to close the usage gap.

At the GSMA, we also recognise that we have a responsibility to set standards and lead by example when it comes to diversity and inclusion. The GTWN has been an important part of this process, providing valuable thought leadership, and for that I thank you. They say that when women gather, great things happen. And I could not agree more. The GTWN has shown this time and again.

Congratulations again on 30 incredible years. Here's to many more!



Mats Granryd
Director General
GSMA

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Reflections on “The Changing Culture of Communications... from Generation to Generation”

Janice Hughes CBE

The communications industry has changed at an accelerating pace over the past three decades in terms of both technology and devices. The underlying culture of the sector has changed even more. Less often spoken about but equally important, women have played a fundamental and increasing role in changing the way that the companies operate and interact with their users. Women, after all, make up half of the customers, and in many parts of the world, they also run micro and small businesses using this technology. The shift in technology and culture in telecoms and mobile has in fact been greater than the shift from black and white television to colour and much greater than the move from analogue to digital.

As I reflect on my own career journey, I am struck by how dramatic this shift has been, as I leapt from working in aid and development in Africa from the late eighties into the heart of telecommunications deregulation and competition in Europe and Asia. I should also like to acknowledge the parallel evolution of the GTWN, following a chance meeting that I had with Candace Johnson, and a shared realisation of the role that women could play in this industry.

The pre-mobile era

In the mid-eighties I was working for the UN High Commission for Refugees during the famine in Ethiopia and the wars in the



An original dial telephone

Telecommunications was run by civil servants, usually male engineers.

Congo. I worked from a tent, an office without glass windows and from a dilapidated vehicle. I worked for months on end, hundreds of miles from the nearest phone, light years away from the ever-present digital media of today. In those days we communicated internationally via telex and facsimile while in the home the hard-wired fixed telephone use was infrequent and expensive, and phone operators mostly worked for the Post Office.

As government owned monopolies were replaced by duopolies, women were largely confined to supporting roles, including the scantily clad women gracing exhibitions at technology and telecoms exhibitions. In the UK, the newly created British Telecom experienced limited competition from its new rival, Mercury which was launched in 1981 in the City of London, offering corporate clients a (slightly) cheaper alternative to BT. Yet Mercury, far from being a new entrant, was part of the old international Post Office system, known as Cable & Wireless that was founded in 1869. C & W owned telephone operators across Africa, the Caribbean and Pacific Islands, and in the lucrative market of Hong Kong.

My telecom journey begins

I fell into telecommunications by chance from being the MD of the Economist's Advisory Group and working closely on competition and pricing issues with Sir Bryan Carsberg, who became the first Director General of Oftel, the UK telecommunications regulator. The privatisation of British Telecom (BT) in 1984 and the formation of Oftel was an historic

moment; the advent of competition in the telecoms sector thrust regulation into the limelight. Sir Bryan proposed that I specialise in telecoms and media, a great piece of personal advice and mentoring that I followed wholeheartedly.

Regulation and competition were at the heart of change and evolution in communications. In 1988, I worked on the Beesley/Laidlaw IEA Review¹, which judged that not enough had been done to maximise competition, nor to spur BT into greater efficiency. The inadequate framework that was set up then, lies at the root of why the UK today has one of the lowest gigabit fibre uptake rates of all the OECD countries, at just 20%. BT's effective monopoly of the fixed copper network was never seriously challenged, nor was it pressed by Ofcom in later years to invest in full fibre.²

Promoting the benefits of competition

For many years fixed telecoms remained an engineering led culture where everything was about trying to keep the old system running rather than innovate and improve. I recall many meetings at BT as the only woman present in a room of 25 or more, where we discussed fixed managed systems for corporate clients and new satellite services. In sharp contrast today one at least sees several women even in the more technical meetings in most phone operators. In 1989 the global study I prepared for IBM on the benefits of competition in telecommunications, landed on the desk of the Economics Minister of Hong Kong, Anson Chan CBE, and former Chief Secretary to the Administration. She invited me to quantify the benefits that would accrue to the Territory from introducing competition and breaking the Cable & Wireless monopoly, which

1 'The Future of Telecommunications, An Assessment of the Role of Competition in UK Policy', by Michael E. Beesley and Bruce Laidlaw, published by the Institute of Economic Affairs, 1989.

2 'What's the Point of Ofcom?' Edited by John Mair and contributions from Rt.Hon Sir Alan Moses, Judge, Former Head Independent Press Standards Organisation, Steve Barnett, Professor of Communications, University of Westminster, Mark Thompson, Former BBC DG/New York Times CEO and Janice Hughes CBE, CEO of Graphite Strategy and Founder and Director of Spring Fibre.



I estimated to run into billions of dollars. We then had to try to persuade the governing body, the Executive Committee, ExCo, to end the long-cherished pole position held by C & W, no easy task given its privileged incumbent position. I was alternately wined and dined and ostracised by government and business leaders for promoting competition. Change came however in the form of a new regulatory body, Ofca that I helped to set up, with multiple licences for new cable and telecoms operators.

Hong Kong became one of the most innovative and cheapest communications markets in the world.

The mobile revolution

It was while working in Hong Kong in the Post Office building on deregulation that I came to use the very first



Photo of an original car phone

cellular phones. These phones were so large and heavy they were installed in a cradle in cars. We were at the dawn of the mobile revolution. It was to usher in hundreds of GSM, PCN and 2/3G licensees and a proliferation of new cellular devices. Some of the early minnows of the Mobile Age included the operators such as Racal-Vodafone, Hutchison, Orange, MTN, Telstra and Telenor in Norway, amongst many others who were real innovators and who gained momentum throughout the nineties.

Drivers of change

Two major developments led to the epic changes that have occurred over the past three decades. Firstly, the launch of GSM networks across Europe in France, Germany, and the UK. Racal Vodafone in 1991 targeted high-flying businessmen. At that time, I worked for John Carrington, CEO of Cable & Wireless on a project aptly named 'Mobile 2000'. I was asked to forecast the growth of mobile devices for the UK from 1991 to 2000. My forecast of 2m mobile phone users in the UK by 2000 was met with surprise and disbelief. My expectations were vastly surpassed, as there were more than 12m new phones by the Millennium. We all underestimated the sheer growth and scale of the rapidly evolving mobile phone market.

The second critical feature of the mobile revolution was the launch of content services with the Wireless Application Protocol, WAP. Prior to that, mobile phones were restricted to calling and SMS texting. Nokia brought in the first WAP phones for browsing the internet, the 7110, in 1999, while the first camera phone, the Sharp J-SH04, only arrived in November 2000. Telecommunications changed exponentially however when Apple burst onto the market with the first iPhone in 2007. Now, it's hard to imagine a world without cameras, gaming, social media, and all manner of content on a handset. Many doubted that people would use their phones for watching TV, sports and films, yet it is common practice today. Their superfast chips and microprocessors mean that they are

often much faster at downloading a film without buffering and smartphones, like the canals and railways of former centuries, are rewriting history.³

Multichannel viewing

While the fixed telephone companies were slowly crawling out of the Dark Ages, television was entering into an enlightened moment of multichannel viewing delivered via cable and satellite. During the famous Wapping strike at News International in 1988, I was invited by Rupert Murdoch to advise which satellite he should adopt for delivering his growing strand of television channels in the UK. Without having met Candace at this point, I chose the SES Astra satellite. It was a far better option than PanAmSat or others in the queue. Astra founded by Candace was a transformative platform that changed the face of European broadcasting and long before we saw any convergence, it ushered in channel bundling and subscription television on a massive scale.

The changing culture of communications

It was not long after this that Candace and I properly got together to help bring more young women into telecommunications and link together those who were already there, through the creation of the GTWN. We are intertwined in the history of the industry, and we were bound together even before we met.

The culture within the mobile industry was different. Mobile phone companies were engaged in a struggle to lure new customers onto their networks. They had to have a much stronger marketing focus, not just an engineering one, and this is where women could find a more significant role, although they were still very much a minority and confined to the marketing and HR departments.

3

e-Britannia: the communications revolution published by the Luton Press 2000.

Sadly, the migration of women into leading positions in both fixed and mobile was still somewhat slower than the proliferation of new telecoms operators and hundreds of new mobile licensees. In the early nineties I only came across one female CEO of a fixed telecoms operator and that was the head of Telecom Argentina. A decade later in 2001 Carla Cico was the CEO of Brasil Telecom, in 2007 Sally Davies became the CEO of BT Wholesale and today amongst a few others we have Philisiwe Sibiya, CEO of MTN Cameroon and Rhonda Cook, President and CEO of PS Lightwave a fibre company she founded in 2010. Women were and still are woefully underrepresented in CEO and top leadership positions in the telecoms and mobile industries. Even today, we are only able to identify a handful of female group CEOs in places such as Scandinavia and Asia with Allison Kirkby at Telia and Chua Sock Koong former CEO of Singtel. With more than 800 mobile operators worldwide, gender parity is not even close at any level in the industry. I am delighted that the CEO of the fibre company that I have helped to create, Spring Fibre, is a woman, Rosalind Singleton.

Mobile technology has driven economic and social development

Ever since my aid work in Africa in the 1980s, I have tracked and promoted the adoption of mobile telecommunications, which has become a major driver of economic and social development, especially for women.

Over 80% of Africans now have cell phones, and the area of coverage is growing at a faster rate than any other region in the world. The growth in the uptake of mobile technology is helping to transform the commercial landscape, especially for women entrepreneurs who run their microbusinesses using their mobiles. Experts believe that by the year 2025, Africa's iGDP, the measurement of the Internet's contribution to overall gross domestic product (GDP), will grow from the 1.1% it is currently to at least 5% or 6%.



Working in Lesotho pre mobile technology



African women walking to market, pre mobile phones

Content is king

All the talk at the Millennium was about convergence between media and telecoms, digital television and the rapid emergence of online services. People were demanding much faster connectivity and welcomed the growth and dominance of the new online media developed by the world's largest tech groups: Amazon, Apple, Facebook, Google and YouTube, which transformed their social and working lives. The media playing field started tipping firmly against the traditional broadcasters, the cable and satellite multichannels and the mobile and telecoms operators that had become content players. Viewers opted in their tens of millions to download and watch the new and expensive TV series such as Game of Thrones, Fleabag and Breaking Bad and the big budget movies with subscription services, from the streamers such as Netflix, Disney, Amazon Prime, HBO and Apple TV.



<https://www.borgenmagazine.com/growth-cell-phone-use-among-african-female-entrepreneurs/>

Some of the global media groups had already merged with telecoms operators. They were caught off guard in this rapidly emerging streaming market. AT & T who acquired Time Warner for \$85bn in 2018, then felt compelled to unwind the deal and offload \$43bn of their content treasure trove into a separate business with Discovery. Fixed and mobile operators had spent billions bidding for films, TV series and sports rights in a bid to become content players, including AT & T, Rogers, Astro in Malaysia, Telefonica, Verizon and Vodafone. It was challenging for them to keep pace with the new content platforms and now some have reverted to their traditional mobile and wholesale businesses. This ‘content is king’ strategy brought more women into the communications operators as women were already running TV and film production companies. Will this trend now be reversed as many of the operators sweep back to their “pipes” and focus on delivery and distribution?



Expensive TV series Game of Thrones

Perhaps the broadcasters and telecoms operators can be forgiven for not foreseeing Netflix’s astonishing strategic vision and determined execution in implementing their first £5bn plus content strategy. It’s hard today to recall that Netflix only started investing in original programming at any scale, in 2013. It is also a pity that many regulators were well behind the internet and digital wave, hindering the public service and commercial broadcasters from even adopting streaming and subscription services, while sidestepping regulation for the big tech groups. In the UK, the regulator actually ruled against the major broadcasters from setting up a joint streaming and subscription service, Project Kangaroo to compete against Netflix and Disney. How wrong they were.

It is strange how things go round in full circle. In the late nineties fixed telecoms seemed stranded while mobile grew exponentially. Then the mobile operators moved into a period of maturity with slower growth while broadband and fibre became the growth engine of the last ten years. Today it is a massive industry searching for the next growth vector and there are some 8 billion mobile phones worldwide with the mobile and telecoms sectors contributing more than \$3tn to global GDP. ⁴

Women leaders: from generation to generation

Mobile and telecoms operators are in yet another era of innovation and creativity, although it is tainted by uncertainty, fraud with internet crime on a massive scale, which represent real dangers for young people. Governments everywhere are embarking on a fundamental reset of their relationship with global tech players. How will this unfold and how will it affect the fixed and mobile operators? Australia is one of the first of many governments that are attempting to assert a measure of control over the new media platforms, by compelling the tech giants to reflect local needs and concerns, control egregiously harmful content and support healthy local media ecosystems. Ironically, all the things that public service broadcasting was originally set up to deliver.

While the convergent technologies have brought fantastic economic benefits to hundreds of millions of people in all corners of the earth, we still face many risks. As we race headlong into a dystopian world of AI and robotics, we risk being hard wired to a human neural network complete with subliminal submission to the supercomputers whose algorithms will be controlled by good and bad people, in equal measure. This could easily morph into a world that only a few people understand and control. In the same way that we have ignored climate change, until it is almost too late, we could

4

IDC expects the global telecoms market to exceed USD2tn in 2022

equally sleepwalk into an uncontrolled digital crisis. Now more than ever we need to inject integrity, ethics and control over the platforms that perpetrate and promote extremism and the dissolution of democracy.



Since the early days of engineering led networks that were manned by men, we now find ourselves in a communications and technology web of interrelated industries that demand a broader set of cultural and social skills and people who can understand and unravel the complex extremes and chaos within our superfast gigabit world. Now more than ever, we need more women to step into senior positions across the board, mentor younger women and ensure that there is a changing culture of communications from generation to generation that also ensures social and racial justice, greater equality and

a platform world that curbs the excesses of AI algorithms. The latter could take us down a road of no return with people being moved “to vote” or “to like” without knowing who or what has prompted them to do so. We need women to stand up and to lead us away from any negatives of the AI and digital forces that will otherwise drive us toward an undemocratic digital century.

The past, present and future of IoT: collaborative action to eliminate barriers

Ana Tavares Lattibeaudiere
Executive Director, GlobalPlatform

The birth of IoT

The Internet of Things (IoT) has grown from a concept to become a catalyst for enterprise and industrial transformation. From our homes to our cars and our cities, IoT connectivity is transforming the very fabric of the world around us and it's interesting to reflect on just how far we have come.



IoT devices and applications have become ingrained in our daily lives – fitness trackers, smart speakers, wireless printers, connected cars, the list goes on. When did it all start? Some claim that it was in 1982 when David Nichols, a graduate student in Carnegie Mellon University's computer science

department, developed a way to track whether the soda bottles in the department's vending machine were cold. Others suggest 1990 as the start date, with the development of the first connected 'thing' by John Romkey – a toaster that could be turned on and off over the Internet.

Either way, it wasn't until the late 1990's and early 2000's that we began to hear the term 'Internet of Things'. I recall seeing 'IoT' for the first time in publications like the Boston Globe, and the excitement that surrounded LG's announcement of the first internet-enabled refrigerator. IoT really exploded onto the scene in 2005 with the publication of the UN's International Telecommunications Union (ITU) first IoT report, demonstrating global acceptance of this new technology and paving the way for manufacturers and Mobile Network Operators (MNOs) to unlock the opportunities it presented to increase productivity, overcome inefficiencies, and innovate their offerings.

Overcoming early obstacles to IoT adoption

My own journey in IoT began at GSMA in 2007 examining barriers to growth and delivering initiatives to eliminate them. In the early days, fragmentation, high total cost of ownership of connected devices, and a lack of understanding about how to deploy IoT solutions to realize the promised benefits, were significant hurdles to progress. Competition between service providers started to move beyond national borders and permanent roaming became a hotly debated topic. Fragmentation in local regulations and tax systems was another large barrier to growth. Operators struggled to justify their investment, as IoT brought a very cost sensitive business model to life that was largely based on volume rather than revenue per device.

I worked on many exciting projects during my time at GSMA, demonstrating how the IoT could be applied in real life through use cases like connected homes, automotive, healthcare, education and smart grids, and helping bring solutions to

market. We successfully brought down the cost of IoT modules by typifying use cases and streamlining the number of form factors, and collaborated with global Government bodies to eliminate SIM taxes blocking the deployment of Machine-to-Machine (M2M) services.

Our IoT ambitions went further than delivering business-benefits, though. We recognized that IoT had huge potential to address economic challenges in developing markets, such as promoting inclusion and breaking down barriers to education. As part of this effort, we helped MNOs deploy solutions that offered remote learning to children who were unable to attend school, and enabled women to work remotely in countries where they could not come into the workplace.

Stimulating innovation was another priority. I remember working with healthcare experts and device makers to accelerate the development of a connected stethoscope that allowed patients and doctors remote access to healthcare specialists. At the time this was really at the cutting-edge of IoT.

Understanding new challenges to address

IoT reached a tipping point in 2010 when the number of connected devices surpassed the world's population and has continued to grow with increasing speed ever since. As we look ahead, 5G, edge and cloud computing, big data and Artificial Intelligence (AI) are key technologies powering the next-generation of IoT applications and sensor-driven analytics. They will enable faster and more intelligent data processing, improved latency and energy efficiency and be the catalyst for a whole new wave of innovation.

Digital identity is another major trend. Although still in its relative infancy, we are starting to hear the term 'Identity of Things (IDoT)' more frequently, which involves assigning unique identifiers and authorization to devices and objects to communicate, share data and transact.

However, analysts and major enterprises predicted there would be 50 billion Internet of Things (IoT) devices connected by 2020¹, yet today the true figure stands closer to 12.2 billion². Clearly, there are significant challenges that still need addressing.

Security threats are evolving

The inconvenient truth is that security and privacy challenges are still one of the biggest barriers to IoT adoption. We are seeing that as manufacturers race to connect and innovate, security and privacy considerations are overlooked, under-prioritized or not well understood.

This has resulted in years of high-profile hacks and breaches. I'm sure we've all heard of botnets like Mirai that have caused major internet problems worldwide. And hackers are always becoming more sophisticated. A good example of this is from 2017 when criminals stole 10GB of high-roller data from a Las Vegas casino by attacking a fish tank's connected temperature sensor.

A myriad of IoT regulations and requirements

Furthermore, many of us are still not practising basic internet security rules, like setting strong passwords and performing software updates, that we need to protect our data. The smart light bulb in your living room might look innocuous, but any connected device can become a target for hackers to steal data or launch a wide-scale network attack.

As a result of growing risks and attack surfaces, international and regional regulations are tightening. For example, manufacturers are now requested to give information about the implementation of security provisions. This is also being

1 <https://www.iot-now.com/2020/01/16/100722-missing-41bn-iot-devices-biggest-prediction-miss-history/>

2 <https://iot-analytics.com/number-connected-iot-devices/>

mandated by cybersecurity regulations which are under review on a global scale. In Europe, ETSI EN 303 645 is one regulation widely referenced in IoT consumer product development. Elsewhere in the US, the Software Bill of Materials (S-BOM) is high on the agenda for industry bodies, as well as US-focused MNOs and system integrators.

What's more, reliable connectivity is fundamental for any IoT environment but, again, challenges remain. Requirements vary wildly for different use-cases and there are multiple connectivity standards to accommodate them, some of which are proprietary and need cost-intensive gateways to allow for customization. This is creating significant hurdles to adoption, particularly in the M2M market where manufacturers need cost-effective solutions that deliver reliable connectivity without compromising security.

In fact, we are seeing that cellular connectivity and the use of M2M eSIM has yet to grow to the level of expectations that were created many years ago. From the 300 million M2M eSIM enabled devices in the market, fewer than 20% are using the eSIM to connect to data services. A key issue is that technology architectures are still very complex and involve high deployment and integration costs. Technology has evolved so quickly that many device manufacturers and service providers are still unclear about the path to deployment.

Who should be responsible for IoT security?

If the latest predictions are right, there could be 75.4 billion IoT connections by 2025³. If the challenges of the past have taught us anything, though, it's that to unlock the potential of connectivity, the user experience and underlying security and compliance must be simple and seamless.

3 <https://www.statista.com/statistics/471264/iot-number-of-connected-devices-worldwide/>

Responsibility falls largely to device manufacturers, MNOs and cloud platform providers, yet each has their own specific needs and challenges to contend with.

- Manufacturers have to ensure a device meets a set baseline level of security when it is first deployed, it must also be possible to securely manage a solution throughout its lifecycle, updating and fixing bugs to ensure protection against evolving threats.
- MNOs want to maximize their investments in existing infrastructure and generate new sources of revenue by innovating beyond their current offerings. At the same time, they must maintain control over the security of their networks and services to protect brand, intellectual property (IP) and subscribers from attacks.
- IoT cloud platform providers need to build customized applications and services to support as many markets and devices as possible, while reducing costs. They must also ensure secure and consistent user experiences such as device onboarding, and the integrity of the data they receive and transact.

The device onboarding process can be particularly complex. To connect the dots of IoT and streamline device connectivity, the industry needs to review the entire flow – from primary keys loaded in the device to network protocols. Public key infrastructure (PKI) holds some of the answers, yet the current device enrolment process is not fully automated and doesn't support the billions of connected devices which have no user interface, like Bluetooth earphones for example.

Supporting the mobile ecosystem to realize IoT benefits

Throughout my career I have enjoyed working collaboratively with industry stakeholders to achieve impactful results for the mobile ecosystem.

A key reason for joining GlobalPlatform as Executive Director in 2021 was the opportunity to continue this work, by addressing existing IoT barriers and being at the forefront of IoT security. For over 20 years, GlobalPlatform has supported connected industries with standardized technologies and certifications that enable innovative, secure-by-design digital services and devices to be developed. More than 62 billion GlobalPlatform-certified components are used in devices across market sectors, including government and enterprise ID, payments, smart cities, smart home, telecoms, transportation and utilities.

In recent years, GlobalPlatform has moved to support the IoT ecosystem with various initiatives including a Device Trust Architecture for accessing secure services within a device, and the IoTopia Framework⁴ for secure launch and management of connected devices (including the launch of a free MUD File Service⁵ to simplify and secure IoT device network onboarding and management).

GlobalPlatform is also supporting the Security Evaluation Standard for IoT Platforms (SESIP) methodology⁶. SESIP delivers a flexible and efficient security evaluation methodology that addresses the complexities of IoT security, supports a broad range of regulatory and security frameworks and is accessible to developers who are not security experts. Certification is essential to facilitate trust, confidence and collaboration between stakeholders as well as foster market stability and growth, and we are constantly evolving and expanding our schemes to keep pace with evolving requirements and technologies.

Another important area is ensuring trusted digital identities can be effectively managed across a broad range of use cases, which has become a critical priority as the number and type of connected devices expands. The European Commission

4 <https://globalplatform.org/iotopia/>
5 <https://globalplatform.org/iotopia/mud-file-service/>
6 <https://globalplatform.org/sesip/>

recently proposed a framework for the introduction of a European Digital Identity Wallet. GSMA's Secure Application for Mobile (SAM) is a good candidate for the technical architecture, and once again I am looking forward to working with the industry to define how these requirements can be implemented to bring together key verticals, address different use cases and overcome potential business blockers.

Some barriers will only be resolved with collective action

Competition is key to innovation. But only through collaboration can true scale and affordability be achieved. Developing standards that can accelerate the adoption of new technologies requires innovative thinking, grounded in knowledge and experience, and realized through energetic and effective industry collaboration. As Henry Ford once said "Coming together is a beginning, staying together is progress and working together is success".

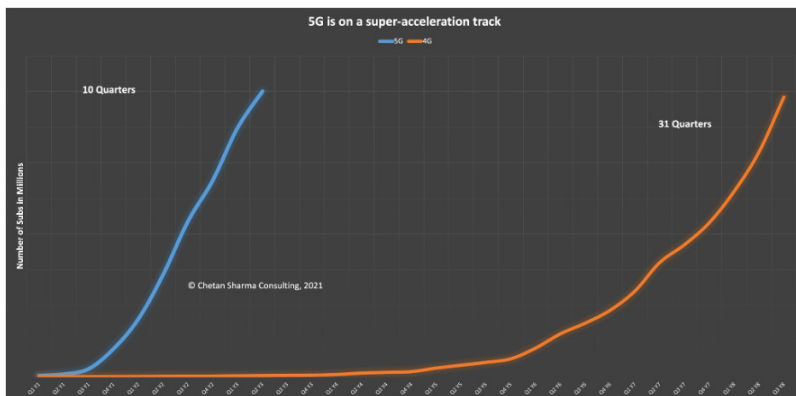
Delivering the promise of 5G will take all of us

Nicki Palmer
Verizon Chief Product Development Officer

5G is here and everything seems to be moving faster and with more intensity than ever. From the speed of networks, to deployment timelines, to the fight for talent. It is worth taking a step back to understand the scope of the promise of 5G and what it will take from all of us to realize that promise. The tech industry has come a long way since I was one of a small handful of female engineering students at Penn State University and the only way to make calls on the go was to find a payphone on campus. So much has changed, and yet, there is so much still ahead of us.

Since the first deployments of 5G networks in 2019, 5G has been on a super acceleration track. According to data from Omdia¹ and Chetan Sharma Consulting, 5G adoption is outpacing 4G at a breakneck pace. The total number of 5G subscribers leapt from 15.4 million to 401 million between 2019 and 2020. It took 4G LTE five years to reach the same level of adoption that 5G had attained in its first 12-18 months. This data is consistent with what we are seeing inside Verizon, where 25% of the handsets on our network today are 5G capable and customers are enjoying the faster speeds and lower latency of this new generation of technology.

¹ <https://www.telecompetitor.com/report-5g-sees-much-faster-adoption-than-4g-lte/>



Now that 5G has been widely deployed, the challenge before our industry is to push the innovations that take advantage of the massive capacity, super-fast speeds and ultra-low latency that 5G enables and prove the business case for this rapid adoption.

This is occurring at the same time that we are experiencing an accelerated pace of innovation globally. The COVID-19 pandemic has advanced digital transformation by 5 to 7 years, fueling the need for technologies to enable remote learning, digital collaboration and telemedicine. Innovation in connected intelligence technologies like 5G, artificial intelligence, AR/VR, blockchain and quantum computing, to name a few, is redefining what we thought was possible. But it's tough for anyone to predict how these technologies will change society in the years to come.

In the 1980's, a McKinsey² study predicted that the total addressable market for cell phones by the year 2000 would be 900,000. As it happened, by the turn of the century there were close to 110 million cell phones in the US market. This begs the question as to our capacity to predict exactly how 5G will be

2 <https://www.economist.com/special-report/1999/10/07/cutting-the-cord>

the truly transformational, disruptor technology that will serve as the foundation for 21st century innovation.

It is worthwhile to look back at what each generation of mobile technology offered and just how far we have come from both a technological aspect as well as how the tech is impacting how we live, learn, work and play. The role of women in developing these technologies is an important part of the tech evolution story.

In the 1940s, Hedy Lamarr, an Austrian-American actress and inventor pioneered the technology that would one day form the basis for today's WiFi, GPS, and Bluetooth communication systems. While cellular networks didn't come to fruition until the launch of 1G introduced in the U.S. in 1983, her work was foundational.

During the 1980's for the first time consumers could carry a phone disconnected from wires and stay in touch, close business deals, and call for help on the road. 1G offered voice calling from heavy phones that often needed an accompanying bag. It was expensive, there was not a whole lot of security protecting your calls. During this time, female telecom trailblazers included Arlene Harris who founded the company Cellular Pay Phone where she invented the first unique application of cellular services via a patented custom designed cellular phone and management system. She later led the development and market introduction of the SOS phone, helped create the first prepaid cellular service, and was the first female inductee of the Wireless Hall of Fame in 2007.

In the 90s, 2G networks and devices launched offering significant advances. Voice quality was improved and calls began to be encrypted. The ability to transfer bits of data from the phone enabled SMS and MMS messages. This was our first look at the mobile data capabilities that would go on to revolutionize mobile devices. 2G represented the beginning of mass adoption of cell phones by regular people due in great

part to the first generation with affordable handsets. During this time, I began my career in telecom at Bell Atlantic and while there were female executives in leadership positions, many of them were in the wireline business.

In 2001, 3G was born and represented the blossoming of the mobile internet. With data speeds taking off, email was the communication platform of choice, often on a Blackberry, and you could stream music, surf the internet and get limited video content anywhere. International roaming also became widely available. Around this same time, I started my career at Verizon which was created by Bell Atlantic Corp. and GTE Corp., in one of the largest mergers in U.S. business history. At this time in the industry, female engineers were still few and far between.

The advent of 4G offered fast mobile browsing, online gaming and HD video. The speed capabilities of 4G networks are what allowed for the building of the app economy we all embrace today. From ride hail and grocery/restaurant deliveries to the massive social media networks, it was 4G networks that began our digital lives. It was during this era that women began to climb the corporate ladder in roles that impacted how networks were being built. In 2014, we saw Lucy Quist break barriers in the telecom world becoming the industry's first-ever female at Airtel Ghana. At this same time, I was among the first female technical executives at Verizon overseeing the design and deployment of our 4G network in the US.

Now we've entered the 5G era which represents a huge step change compared to 4G. It will eventually be able to support up to 1 million connected devices per square kilometer and handle 10 to 100 times more connected devices than 4G. It will also eventually allow 10 to 100 times better throughput, 10 times lower latency, and 1,000 times larger data volumes than any previous mobile technology. Women in the industry are now a force to be reckoned with. At Verizon, women now make up 50 percent of the leadership team. As an industry, we finally have enough women in top leadership roles that

FierceWireless launched its “Fiercest Women in Telecom³” contest highlighting 24 trailblazing leaders in the industry.

Evolution of technology



<https://www.cengn.ca/information-centre/innovation/timeline-from-1g-to-5g-a-brief-history-on-cell-phones/>

While the 4G cycle created 160+ new billion-dollar revenue streams, 5G has been hailed as the network cycle that will create over \$13 trillion in new growth by 2035, according to Chetan Sharma Consulting. Handset sales alone won't usher in all of the positive change that we anticipate will come with 5G network ubiquity. We're seeing enterprise revenue opportunities in fields like healthcare, manufacturing, public safety, and media and entertainment, to name a few. Consider applications that leverage machine learning inference such as smart factories, smart cars, smart cities, IoT, and Augmented and Virtual Reality, they often can't afford the latency that's associated with the round trip from a device to the cloud and back. 5G and mobile edge compute (MEC) will take those applications to the next level.

5G will transform everything from the way you play video games to the way you watch sports. And in conjunction with

3 <https://www.fiercewireless.com/wireless/fiercewireless-2021-fiercest-women-telecom>

MEC, it provides a platform to run applications that support real-time decision-making control allowing businesses to get things done more quickly and easily.

For the true promise of 5G to be realized, it will take collaboration across all sectors as well as embracing innovative ideas from all those that have something to contribute. Without our active engagement to include women and others that have traditionally been left out in the development of technologies, we will fall short in realizing the potential of the technology.

Talent shortages in the tech sector are a hot topic. It is also a self-inflicted wound caused by years of excluding women and people of color from the education and employment pipeline that provides employees to our sector. The percentage of employed women, for example, across all jobs sectors in the United States, has grown to about 47%, but the five largest tech companies only have a workforce of less than 35% women. This isn't a problem that will be solved overnight, because it isn't simply about changing hiring practices. We need to zoom out and look at the entire talent pipeline.

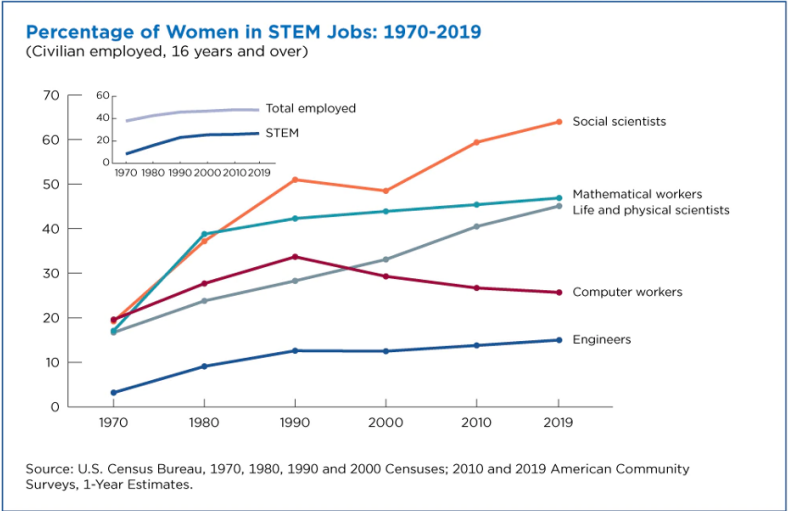
Sometimes it's not about the job itself, but it's about supporting women and other individuals from underrepresented groups in accessing opportunities for upward economic mobility. It is providing the training necessary to enter the fields and supporting them during their career in terms of their advancement and being able to thrive. The pandemic has set us back with women being impacted 20% more than their male counterparts. Suddenly, we had to take on homeschooling responsibilities in addition to our full-time jobs. 68% of women that left the workforce in the last 18 months cite burnout as a driving factor. Even as we've seen jobs bounce back since the beginning of the pandemic, recovery for black and hispanic women is happening far slower⁴ than for other groups.

4 <https://www.cnn.com/2021/03/05/black-and-hispanic-women-arent-sharing-in-the-job-market-recovery.html>

We as an industry need to embrace diversity and personal development not only because it's the right thing to do, but also because it's smart business. Gender diversity in firms increases innovation by 6Xs more than non-diverse firms. Further, our customer base is diverse, so we have to reflect that diversity in order for our businesses to succeed. Diversity of thought is an important component in the ideation and realization of big network advances. I've seen it from my seat at the table over the last 30 years, and we can't let the fourth industrial revolution occur without having the whole population take part in its development.

I've never been more excited about the opportunity that lies ahead. When you hear that 5G will "Change Everything," what we're really talking about is being active catalysts of change – not passive bystanders. It's about knowing that we human beings of the 21st century have the ability and the responsibility to build a better future.

That ability – and that responsibility – has never been more critical, because 5G WILL have a massive impact on our lives and pave the way for unprecedented innovations. It will enable



applications like connected cars, smart communities, the industrial Internet of Things (IoT), immersive entertainment, and education. We are the stewards of that progress and it is our collective work throughout the tech ecosystem that will deliver the promise of 5G.

The future of computing: why we need a new mindset

Corinne Versini
Founder and CEO GenesInk

Looking back at the past few decades of the development of computing, there are some clear stages that can be identified, and some issues that need to be addressed before we can unleash its next level of potential.

Until around the 1990s, electronics and processors were not miniaturized enough, nor could they be miniaturized, to allow the emergence of personal computers, while the cell phones we know today were not even dreamed of. This was the era of the mainframe, the unchallenged dominance of companies such as IBM, while government “national champion” policies enabled the birth of Bull, Olivetti and others.

The most widely used semiconductor technology is still bipolar. This is despite its many disadvantages, including power consumption and thermal dissipation. Indeed, the need for heat dissipation is becoming so important that computer cooling circuits are no longer “water-based”, but with oil-type fluids with much higher heat transfer coefficients. The problem is that this approach cannot be applied to a personal computer or a simple smartphone, so that battery technology is now the main obstacle holding back developments in these two areas.

However, the replacement technology already exists. It was invented almost twenty years ago, by two Intel engineers - one of whom had previously worked for SGS in Italy, one of the two

European companies that later will become STMicroelectronics - in Palo Alto. MOS - metal oxide semiconductor - was born. This evolutionary process started back when the famous Moore's Law was coined.

1990s: Moore's law and beyond

Moore's Law is a prediction that was made in 1965 by engineer Gordon Moore, that the number of transistors that can be integrated on a chip with an equal silicon surface would double every two years due to the continuous advancement of semiconductor manufacturing technology.

By 1990 this prediction started to be viewed, not just as a predictor of the future of computing, but also as a potential upper limit. Apple was 15 years' old and the Mac was only 6 years' old, but the first transformation of the electronics world had already begun.

In 1990 the size of the wafers - silicon plates on which the components are engraved - was 150 mm, or 6 inches. It was quickly increased to 200 mm, or 8 inches. The production process was still largely manual. The fineness of the etching on the chip determines the number of transistors that can be engraved on a single component. At the time, it was one micron. So the maximum number of components that could be on an Intel processor was about 1 million; today they are counted in billions.

The challenge which faces computer chip technology today is still in the reduction of the size of engraving. The other technologies used for photolithography, the wavelengths, are not yet a problem. Indeed, what is called a printed circuit is manufactured as a succession of negatives stacked on top of each other.

How a silicon chip is produced

To understand the technical challenges we face, we need to understand how a silicon chip is currently produced. The silicon plate is blank at the beginning, a first design is engraved, for that a layer of photoresistor is applied on all the surface, a mask is positioned above the plate and the light passing through dissolves the photoresistor at the place it needs to be removed. The plate is then passed through an acid bath which will remove the unwanted resin and will engrave the silicon in those lines. For 1 micron lines, light with a wavelength of about 500 nm is perfectly suitable. A succession of a few masks will be drawn on the wafer, using chemical etching, a process which has obvious environmental drawbacks.

Today, miniaturization has enabled us to produce wafer sizes of 450 mm - 18 inches - even if 300 mm ones are the only ones currently used in industry; the fineness of engraving is 3 nanometers - 3 billionth of a meter – which is a thousand times less than a few years ago.

New challenges are emerging

The challenge for chip production is no longer in its size, the challenge is now in energy consumption, and even more in energy efficiency. The new generation components are more and more expensive and consume more and more energy. Therefore, they need more and more thermal dissipation. We still have the same issue as we did thirty years ago.

Thankfully we are now at the threshold of a new era! We believe that the future will ultimately be quantum computing, but the technology is not yet sufficiently proven. In the meantime, the new metal oxide semiconductor (MOS) itself presents significant technical challenges. We have to produce special components, assemble them, make them communicate with

each other. All while we as consumers are demanding devices that are lighter, thinner, smaller, more flexible and more transparent.

The next stage of innovation: SiP¹

While component technology is still evolving, a new revolution in electronics is starting, in terms of the packaging and the system in package - SiP - which is becoming more complex, more compact and more competitive. This is an area that has long been neglected in the semiconductor industry because it was not very complex technologically speaking. However, it is gaining much more attention as the challenges we have to face from now on are many.

Importantly, the substrates of SiPs can no longer be rigid, they must bend to the shape of the object, or even to the human being who will wear it, so they can no longer be made of resin but must be made of some type of flexible material.

This may seem at first glance to be trivial, however, it is vital that the different components can communicate with each other. Conductive tracks have been made of copper because of its ease of oxidation. This cheap metal was deposited in a thick, inflexible layer, so that this medium must now also be replaced. It must be replaced with a more conductive and less oxidizable material. Only 2 metals could be used for this: they are gold and silver. For obvious reasons of cost and availability, gold must be excluded.

As both of these metals are limited in availability, we will have to increase our efforts to recapture and recycle them. We will also need to use less and less of them, because the best approach to recycling is not to consume something in

¹ A system in a package (SiP) or system-in-package is a number of integrated circuits enclosed in one or more chip carrier packages that may be stacked using package on package. The SiP performs all or most of the functions of an electronic system, and is typically used inside a mobile phone, digital music player, etc.

the first place. This will be a major challenge, as we continue into a world of IoT, where people will want to be connected to everyone and everything.

And because there will be more and more connected objects and applications, they will have to be light, flexible and transparent to blend into our everyday lives and the landscape.

A human centric evolution

Nowadays consumers will not accept the need to adapt themselves to connected objects. They demand that the object or service adapts itself to human needs and lifestyles. This is the dawn of a new era of computing, when new skills and design expertise will need to be developed to use these new materials in an environmentally sensitive way. We need to train the next generation of designers ready to think out of the box, to imagine tomorrow, create a new world and meet these new challenges. The hardest part, technically speaking, has been done. What remains is to create a shift in mindset, but this is often the most complicated part to achieve.

Reflections of an ICT Pioneer

Ambassador Diana Lady Dougan

When the Global Telecom Women's Network was formally founded thirty years ago, the word "telecom" had already become the de facto catch-all term for the explosion of cross-over synergies ignited in the early 1980s. They were created by the competitive forces of deregulation that were unleashed by the breakup of AT&T and the mashup with the "free-for-all" unregulated cultures, technologies and software already spewing out of the computer and IT industries.

It was within this exciting, burgeoning environment that GTWN was established, giving women in telecom a platform to not only share in, but celebrate one another's creativity, innovation, accomplishments, challenges, and opportunities. Moreover, GTWN members are especially well-positioned to mentor others. I am a great believer in the value and importance of mentoring. I think it was because I had no real mentors in my own professional journeys that mentoring remains especially dear to my heart. I have particularly fond memories from the 1980s while serving as the inaugural statutory US Ambassador and Coordinator for International Communications and Information Policy. This included chairing a lot of bilateral and international initiatives. I began mentoring young (and not so young) women from other countries.

Some of my mentoring experiences were just small but meaningful gestures. For example, back in the late 1980s when I happened to be chairing a plenary panel at a big international telecom conclave in Geneva, I received an invitation to a formal

luncheon for women telecom leaders and executives attending the conference. I immediately told my staff assistant to call the hosts to accept, but also let them know I would like to bring a guest. In fact, I'd already thought of a very bright young Singaporean lady I had just met who had impressed with me with her sophisticated grasp of telecom policy dynamics. Her name was Laina Raveendran (Greene). I'm pleased to say that when GTWN was created a few years later, Laina became an early GTWN member and now serves on its board and has established several flourishing telecom related enterprises over the years.

There were precious few senior women in telecom back in the 80's. But two movers and shakers I particularly enjoyed getting to know and was inspired by were Neelie Kroes and Marisa Bellisario. When Neelie and I first met, she was the low key, but powerfully strategic Dutch Minister for Transport and Telecom and shaking up European telecom privatization and liberalization. She subsequently became EU Competition Commissioner. My first memory of Marisa was as CEO of Italtel. She came to a meeting in my very formal office at the State Department in Washington wearing spectacularly bright red high-top tennis shoes. I loved her immediately. Among her many amazing accomplishments, she was credited with transforming Italtel from a deeply debt-ridden company into a profitable one under her watch. Neelie and Marisa and other inspiring women from different parts of the world forged paths of ingenuity, innovation, and great accomplishments for other women to benefit from for years to come.

It was back in the problematical 1960's when I first dipped my toes into what was back then considered the backwaters of communications technology. I had packed in some zany and challenging, unrelated jobs during college. I graduated early before I decided to move to what was then admirably referred to as the BIG APPLE (aka: New York City). I was beyond thrilled when I was offered a job at TIME Magazine. It was not only one of the most prestigious magazines in the world, but TIME's

sister magazines: FORTUNE, SPORTS ILLUSTRATED, and LIFE MAGAZINE were also international icons. Even to my own surprise, I decided instead to take a very amorphous job in the little-known broadcast division of Time, Inc. and initially only as an “outside consultant” to “help out” with a handful of CATV franchises.

I had never even heard of CATV, “community antenna television,” much less Cable TV. I knew I had always been drawn to what I liked to call: the “science of change” -especially the unknown and unproven. Since the Internet wasn’t even a concept back then, I found a nice librarian at the NYC public library who finally found me a small book on “community antenna television.” Not very helpful. I resorted to learning and asking questions of the people I worked with and for out in the few towns and cities where we had franchises.

No one in TIME’s elegant executive offices gazing out over Rockefeller Center seemed to know or care about Cable TV.

It was beyond fantasy that in little over a year, I would be overseeing and developing marketing plans for their whole expanding Cable TV systems and developing and writing franchise proposals, much less successfully securing new Cable TV franchises for them. I was even more surprised when I was told I had become the youngest executive (male or female) in the whole TIME Empire.

Back then, like so many others, I learned from the people I worked for or with – especially the ones who didn’t mind my “why” or “what if” questions.

In college I had majored in Industrial Psychology. I realized too late it was a mistake. Much more captivating for me was what I called the “science of possibilities,” including the potential to become a catalyst for long-term positive change. It is only recently that I’ve started to fully realize that other than wanting to be a cowgirl nurse when I was three, my long unarticulated

ambitions and very diverse careers stemmed (subconsciously) from my indelible experiences living in Asia as a child in Korea when it was still digging out from the rubble of WWII and subsequently the Korean War. We also spent chunks of time living on relatively grubby cargo ships wending their ways to what were then some of the poorest developing country ports in Asia, the Middle East, and East Africa.

For me and my brother, those parts of our childhoods were filled with unforgettable adventure -but also almost constant challenges of change and uncertainty. First, I learned very early in life: "Don't take anything for granted." Second, I was blessed with parents who both taught us and showed us the world when countries and cultures were still very distinct and different. Equally significant, my parents believed strongly in the importance of helping others to help themselves. Consequently, during my careers, I realized I was constantly trying to envision ways for individuals to directly access interactive information, learning, and inspiration, not just shared information, and entertainment.

My second major career turned out to be in educational television and Public Broadcasting. During the decade I chaired the independent board of the leading PBS station in Utah, it gained the distinction



With Former US Secretary of State, James Baker

of providing programming services into five western states. I produced TV specials in those days as well. I also got personally involved with, alas with only limited success, in promoting broader utility and use of ITFS (Instructional TV Fixed Services) and FM subchannels to read to the blind and the elderly.

Starting in the late 1970s I took on three Presidentially appointed and Senate confirmed positions first as a Director of the Corporation for Public Broadcasting and subsequently US Ambassador and Statutory Coordinator for International Communications and Information Policy. I ended up becoming increasingly embroiled in the intricacies of the politics of media and economics of trade and regulatory agendas as well as the technologies and services involved. These days, by contrast, the demands for detailed regulations and legislation are substantially more proscriptive and prescriptive, with government, instead of individuals and businesses, more responsible for the decisions to protect, define, restrict, expand the access, use and manipulation of technology now and in the future.



At the 2017 Toronto International Film Festival where Diana's film *The Judge* premiered
<https://www.thejudgefilm.com/about>

Time and space do not permit a thoughtful and detailed discussion of key issues and challenges of how people and institutions and technology can or should interact or benefit in the future but following are a few purposely eclectic “treetop” observations and recommendations for consideration.

First, we must recognize, no matter how soon the COVID pandemic defuses, it has irrevocably altered and escalated the roles and uses of communications technologies and services

going forward. This decade is truly a major inflection point. Among other things, both individuals and businesses need to be proactive in fostering and contributing to the development of more user friendly and adaptable software programs and algorithms. Individuals working from home, including those with special needs, including those with increased hearing and sight limitations, and the elderly should demand this.

Second, the impact and utility of mobile devices will continue to grow and expand. But the rollout internationally of the speed and ubiquity of 5G telephony will likely be slower than anticipated. Moreover, depending on costs and technological frequency 6G standards now already in development are poised to turn 5G into a hybrid system by the 2030s.

Third, energy consumption in technology is already becoming an increasingly contentious issue beyond the dramatic blackouts caused by cryptocurrency miners. As digital currencies evolve and increase, they further add to economic and energy consumption concerns. Moreover, quantum computing, poised to be a centerpiece of cyber security, will likely exacerbate the problem.

Fourth, though in its infancy, cryptocurrencies are poised to substantially increase their presence in the technology context. The whole digital currency phenomenon triggered by blockchain ledgers are taking hold even as a potential substitute for traditional banking and financial transactions. It is anyone's guess where cryptocurrencies will be in another decade, but they are certainly not going away. Moreover, several countries beyond China are already working on developing their own national digital currency systems.

Fifth, with the increasing proclivity of government intervention in all matters of technology, well intentioned as it may be, we must be wary of stifling critical ingenuity, innovation, and initiative, not to mention of undercutting individual rights and responsibilities.

Sixth, as a matter of practicality, cost, and efficiency, companies and governments should look to well-reasoned and generally enforceable laws already in place rather than pushing granular new laws to address the many unintended or perceived consequences of technology. An example is the 2021 proposed legislation in Washington DC where the government, rather than the individual, must pre-emptively define and decide what individuals should be protected from, even if it is not illegal. It is proposed that companies and websites would be required to routinely file extensive reports on how specific algorithms are used. Individuals, not governments, should be able to choose what they may find offensive, hurtful or make the decision to opt out or stay in, not governments.

Seventh, teachers and parents, not just school districts, should carefully review the already measurable pluses and minuses of reliance on computer technology, rather than teachers, to teach and inspire the next generation – regardless of COVID. **Eighth**, clearly the world of telecom and IT will only escalate in its far-reaching importance in all aspects of life. These industries will benefit greatly from the new tools of quantum computing, AI, VR, and “meta” and other “beyond” initiatives. Companies should be applauded when they use even a small percentage of their resources and talents to improve and inspire the outlooks and education of our next generations.

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Ninth, it has long been asserted that we are in an INFORMATION REVOLUTION. I believe that is no longer the case, but we are in another one that receives too little attention, the ALGORITHM REVOLUTION. Increasingly, machines rather than individuals,

are creating algorithms that make overly sweeping or unduly narrow and sometimes even flawed or false assumptions. Unfortunately, more and more these assumptions are carried forward and built upon, knowingly or inadvertently. This doesn't just contribute to unintended consequences, but complicates outcomes, narrows choices, and unfairly biases thought. Like papers in a drawer, algorithms should be periodically reviewed and sometimes tossed. Especially now, as AI becomes more sophisticated and dominant in writing or building on code, the human element is being overridden. The "Algo Revolution" is here.

Tenth: "THE INFORMATION REVOLUTION IS OVER: INFORMATION WON!" - *Diana Lady Dougan, Wired Magazine (1990s)*

On this occasion of GTWN's 30th Anniversary, I know we all send extended—even if virtual—toasts and applause to Candace Johnson for her tireless inspiration and leadership throughout the years. She continues to be a uniquely ebullient, thoughtful, and captivating force of nature, technology, and humanity. A special note of gratitude for the indefatigable Vicki MacLeod for her own leadership and management contributions as Secretary General of GTWN and as the guiding and patient light for this memorial publication.

02

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The Future of Telecommunications: Inspiring the Next Generation of Entrepreneurs, CEOs, and Investors for the Next 30 years

Lauren R. Cook
Executive TMTS Adviser, Extelcon Consulting

The Digital Economy via 5G is currently on track to become the dominant mobile technology worldwide from 2025 and beyond. The future of Mobile will be an all immersive, high definition, user experience, taking us seamlessly from Gigabytes GB = 10⁹ of data to Zettabytes ZB = 10²¹. 5G offers an efficient mobile network which delivers a higher performance in terms of throughput at a reduced investment cost, increased energy efficiency, with the capability of supporting 10 –100x connected devices and 1000x bandwidth per unit area simultaneously. 5G provides a superfast network comprised of next generation Wi-Fi like Small Cells, offering contiguous wide-area coverage.

From the customer's perspective, 5G offers a truly converged fiber-wireless user experience, accessing sub 1GHz, 3.3GHz – 4.2GHz and prime (26GHz & 40GHz) mmWave bands, with spectral efficiency significantly enhanced to that of 4G, that can support nomadic data access speeds of up to 10Gbps. 5G Wireless consists of a myriad of wireless links connected to a Fiber Optic Cable and/or connected to a mix of application dependent LEO/MEO/GEO Satellites, providing latency of 1 - 10ms on the air interface, limited only by the speed of light.

The Continuously Connected Consumer (CCC)

The underlying drivers for all future Network Operators, both Wired and Wireless, will be the seamless delivery of services from device to device that will truly support the Continuously Connected Consumer (CCC). In order to enable on-demand services anytime, anywhere, with ubiquitous connectivity, there will be a quantum leap in technology advancements and investment opportunities in the following sectors; Cloud Services, Cyber Security, Connected and Autonomous Vehicles, Battery Design, Software Defined Networks (SDN), Network Function Virtualization (NFV), Artificial Intelligence (AI) and Machine to Machine (M2M), Smart Homes & Cities, Wind/Solar Power Solutions, Green Data Centers, and LEO Satellites for Climate & Space Situational Awareness (SSA) related applications and Mobile backhaul interoperability. These technology subsectors will be required to effectively deliver, manage, store, and parse our personal and professional, high bandwidth content across multiple devices.

Digital tech essential to pandemic management and recovery

As we have seen throughout the pandemic, the internet has become an essential part of our daily lives. According to the Pew Research Organization, www.pewresearch.org, 90% of Americans polled stated that the internet became an essential lifeline, and that 40% used the internet for new and different purposes related to social and economic activities. The Pandemic has and will continue to foster an explosion of Business to Business (BtB) and Business to Consumer (BtC) applications in the areas of eHealth, eAgriculture, eEducation, eUtilities, eMfg, eGov't, eCommerce, Fintech and future IoT scenarios, where network services or applications will be dynamically defined and managed by the client interface.

Since the start of the pandemic in March of 2020, it has been the Mobile and Communication Networks across all

technologies that have kept the world connected; all of which continue to operate astonishingly well under extremely adverse conditions, which are well beyond their initial network design. The Covid Pandemic has brought to the forefront the critical importance of 5G and the role that leading-edge telecommunication technologies play in keeping societies, economies, and governments functioning during a global crisis.

Governments worldwide have now placed digital technologies at the center of their recovery plans to rebuild their economies in a post pandemic world. As an example, the EU has established a 750B Euro recovery fund to improve economic resiliency and deliver green, digital advancements. Additionally, the USA has recently allocated \$65B USD of its new Infrastructure Bill to funding the deployment of internet access services to unserved and underserved areas in the US and its territories. The issues hindering private sector investment in 4G and 5G Mobile have now become of mutual concern to governments, fostering a dialog regarding Public – Private Partnerships, where it makes economic sense, in both developed and developing markets which include topics such as network redundancy, artificial competition, spectrum fees, cost efficient spectrum allocations, and revenue generation through excessive fees and taxes. Governments and the private sector are now jointly working together on a global basis in order to remove the barriers to 4G and 5G network deployment by harmonizing regulatory issues involving planning procedures, site acquisition, site co-location and the upgrade of base stations.

Positive outlook for mobile in developing markets

In 2025 there will be 5.7B or 70% worldwide penetration rate of Unique Mobile Subscribers (UMS), representing +5M more UMS's than the 5.2B or 67% of those using mobile in 2020, with two thirds of the growth coming from under penetrated markets in Asia and Sub-Saharan Africa. Sim Card Connections will grow from 8.1B or 103% in 2020 to 8.8B or 107% penetration in 2025. Mobile Broadband Penetration will grow from 4.0B or

51% in 2020 to 5.0B or 60% worldwide in 2025, according to the GSMA. Additionally, the ITU estimates that approximately 4.9 billion people or 63% of the world's population are using the Internet in 2021, leaving 2.9B people offline worldwide. Of the roughly half billion subscriber adds by 2025, there will be a rebalancing of consumer purchasing power, technology, and innovation towards the developing world as Asia adds (188M subs), Sub-Saharan Africa (120M), MENA (54M), Latin America (47M), and Greater China (43M) become the dominant engines of subscriber growth, far outpacing North America adds (15M), Europe (8M) and the CIS (6m).

Developing Markets will foster the rise of entrepreneurship and the engineering required to create new business models and opportunities in these countries. Many of these technology solutions will be developed out of necessity and will then be exported to Developed Markets worldwide. (A classic example is the advent of the Mobile Money industry in Africa, which has now been implemented in most Developed Markets.) This allows for enterprise innovation, increased earnings, improved education, health, and welfare to families in the developing world.

The drivers of a cultural shift in the TMT sector

It has been estimated by the TMT industry that the pandemic has fast forwarded consumer acceptance worldwide of online innovative technology-based solutions by 10 years, as seen with mass adoption of applications such as Teledoc, Zoom and DocuSign. The demand for connected technology solutions across a plethora of devices and enterprise verticals equates to an increased demand for a skilled & technically oriented labor force, regardless of race, gender, or sexual orientation.

The Telecoms, Media, Technology and Satellite (TMTS) industries offers unbridled Science, Technology, Engineering, & Math (STEM) opportunities for young entrepreneurs, especially women, which were not available 30 years ago primarily due to

the advent of the internet, and prevailing social and cultural norms.

While new opportunities exist within TMTS, there is still a long road ahead to achieve parity for women and minorities in the executive tech workplace. The Institutional Share Holders Services (ISS) produced a study of the 2019 boards of directors of 2175 of the Russell 3000 companies and found that 45% of all new board seats were awarded to women that year, yet women only occupied a total of 19% of all board seats. The study also found that only 15% of new directors were ethnically diverse, while 39.9% of all Americans are non-white. The Carlyle Group conducted a study of their portfolio companies and found that boards with 2 or more directors that identified as Black, Hispanic, Asian, or Female, experienced average earnings of 12.3% over the previous 3-year period, while portfolio companies with no diverse directors experienced an average of 0.5% earnings growth over the same period. MSCI, a leading investment research firm, conducted an Environment, Social, and Governance (ESG) study, which determined that boards with a higher percentage of women had fewer instances of fraud, accounting controversy, bribery, and corruption. Studies from McKinsey, Citi, and Deloitte all reported comparable results when analyzing the profitability, work culture and competitive strength of their clients who have ethnically diverse boards. These findings all allude to the same conclusion, that gender diverse boards may equate to stronger financial performance of their respective firms.

Diversity means good business

Increased profitability is something that all TMTS Industry Leaders strive to achieve, in this highly competitive and capital-intensive industry. It is up to us as the Investors, Board Members and C level leaders of this fast-paced industry to consciously embrace the positive economic impact that women and minorities bring to leadership roles. To do so, tech companies need to embrace the multi-cultural perspectives

in our shifting global mobile workplace and remain focused on the target market for the industry vertical. Telecoms, Media, Technology and Satellite (TMTS) companies of today must embrace diversity and be cognizant of the ESG issues impacting their sectors if they wish to raise funding from Venture Capital, Private Equity or Commercial Markets in the future and become or remain industry icons in the next 30 years to come.

Ethical Fintech: the Future of Banking

Victoria Hernandez
Board Member (NED) CaixaBank Payments and Consumer

The banking industry is undergoing a major transformation. The industry faces challenges and opportunities on many fronts - from the pandemic recovery, the growing competition from technology companies, the call to respond to the threats of climate change, to the increasing request of regulation.

This presents the sector with both challenges and opportunities. It also makes the role of risk managers extremely complex. But there are ways that banks can ensure they make the most of this upheaval and come out of this transformation as leaders in sustainable financial services. I believe the way forward is for banks to build on their existing customer relationships and knowledge, to join with policymakers and businesses in setting the agenda to solve the biggest issues facing Europe's, and the global economy. By getting out on the front foot, taking on their new competitors in a responsible way, banks will renew their sense of purpose, ensure their ongoing relevance, grow the bottom line, and reap the benefits of demonstrating a real commitment to ESGs. I would like to highlight some of the many issues that banks are now facing and offer some thoughts on how a new banking culture based on diversity, transparency and ethics, can provide the solutions and the way forward.

Digital transformation of financial services

The banking sector is facing the most competitive and challenging business environment it has ever seen, due to the

rapid digital transformation of financial services and the entry of non-traditional financial services providers into the market. At the same time, the highly regulated sector is facing the new demands of strict privacy and data regulation, coupled with the increasing expectations of consumers.

The barriers to entry into financial services have been considerably lowered because of digital technology, which has enabled the list of new financial services providers to grow exponentially in recent times. Neobanks, Fintechs, BigTechs, cryptocurrency exchanges – each one of them is disrupting the concept of banking and traditional financial institutions are either competing with them or in some cases investing and/or cooperating with them to improve their customer experience.

While many of Europe's banks have lagged behind their international counterparts in adopting digital technologies, being driven by prudence and attention to detail and therefore culturally resistant to change. Nevertheless, banks are aware that they must respond to their changing business environment by keeping pace with technological change and deploying it in their own organisations, while also adapting their skillsets and mindsets through a conscious program to be more diverse and inclusive.

Balancing the banking needs of the generations

The major advance which has been changing the customer's banking experience in recent times has been the switch to online and mobile banking. This started well before the pandemic but has accelerated over the last two years. In today's era of unprecedented convenience and speed, and the need to be kept socially distanced where possible, many consumers don't want to go to a physical bank branch to handle their transactions. This is especially true of Millennials and the older members of Gen Z, who have started to become the dominant players in the workforce (and the biggest earners).

Critically for banks, many studies show that at least 60% of mobile banking users research a bank's mobile capabilities before opening an account, and a similar number say they would change banks if their bank offered a poor mobile banking experience. On the other hand, the Baby Boomer generation disproportionately prefers a traditional banking experience. To satisfy all of these customer requirements, banks face a delicate balancing act – offering fulfilling and responsive online experiences while also maintaining sufficiently well-staffed physical bank branches too.



But more than just a change from real to virtual banking, we've now reached the point where simply having a mobile app isn't enough for banks to attract and keep customers. Additional tools and features – such as two-factor or one-time authentication processes, the ability to put temporary holds on cards, view recurring charges, or

scanning a fingerprint to log into an account – are becoming increasingly necessary and expected.

From my many years of experience in both the finance and telecommunications industries, I know that digital transformation of the banking sector is inevitable, but I also recognise that its success will rely largely on the degree of cultural change and renewal that the banks are able to achieve. The leading banks are learning how to embrace a new way of thinking and are adopting a range of approaches which seek to manage all of these risks, while at the same time, refocussing their efforts on their customers.

Providing customer-first services

The pandemic has accelerated banks' digital agendas and has prompted them to rethink their transformation journeys with

the goal of capturing new growth opportunities and creating more intelligent customer experiences. But regardless of their level of digital transformation, banks should be making better use of data to build out their ecosystem and create superior offerings for customers.

Banks will have to compete in new ways as finance becomes embedded in customer-first services. The pandemic has accelerated changes in the way banking products are delivered, moving them closer than ever to customers' point of need. Payments, lending and other banking products are increasingly being delivered in ecosystems that serve a wider set of customer requirements. If banks can't create new ecosystems themselves, they can serve as providers of finance to existing networks. If they do not respond, banks will see more market share shifting to fintechs and big tech companies.

Banks have a key advantage over new fintechs and purely online financial services. They already have deep relationships with their customers and can apply automated systems which maximise profit. They are well placed to assist their customers in managing their funds and their expenditure, as a trusted, reliable partner in the financial world. For example, if unexpected expenditure occurs, outside the normal pattern of the customer's daily life and routine, the bank can recognise this automatically and alert the customer of a potential fraud, or partner with the customer to ensure that spending limits on certain items or activities are not exceeded.

In contrast, some newer fintech companies lack these insights into customer behaviour and expectations and may not be seen as putting the needs of the customer first. Buy Now, Pay Later (BNPL) services provide a type of credit in the guise of a payment mechanism, which could potentially trap an unwary consumer into high interest rate payments that can become difficult to pay off. Banks need to ensure that they differentiate themselves and behave in a way that is transparent in terms of their fees and payment options, and that they remain ready

to assist customers who may have difficulty paying bills during unexpected life changes, such as recent pandemic lockdowns.

Driving innovation



Banks are increasingly supporting the innovation economy through special products and programs aimed at encouraging tech start-ups and SMEs, especially those who are working in sustainable industries. For example, CaixaBank has partnered with the European Innovation Council in a new pilot, the first of its kind in Europe, that calls for the most innovative European startups to respond to the main challenges of the agricultural sector and bring solutions to final consumers with the specific support, expertise and selling channels of the largest bank in Spain and one of the largest in Europe.

Banks are also responding to the needs of their eco-conscious clients by becoming more aware of their environmental footprint and the importance of sustainable practices. Banks are estimated to issue over 6 billion plastic cards annually, so switching customers to mobile payment methods will reduce the environmental impact of financial services. I am pleased to say that CaixaBank was the first financial institution in Spain and one of the first banks in the world to issue its cards in alternative materials, with less impact on the environment. It is also a market leader in digital payments.

Banks are also recognising the importance of small-to-medium enterprises (SMEs) to the global economy and are developing new products and services tailored at the needs of

this underserved market. SMEs are often hit with late payment for services and long invoice maturity, which can hamper both short-term agility and long-term growth and investment. Agile banks are developing solutions that would help raise finance against already-issued – but as yet unpaid – invoices, better management of SMEs' cashflow capabilities.

Banks should evolve their existing technology and platforms to ones that use advanced machine learning models, to generate tailored insights in real-time, within context. Banks can harness the power of advanced analytics and robotic process automation to transform the way trade finance teams identify and control risk, including by detecting patterns of illicit trade finance activity. Many are now partnering with telecom operators to share data and to deploy the latest risk analytics tools, leveraging natural language processing, text analytics and third-party data to underpin a risk analytics scoring engine which can support the analysis of large volumes of trade transactions. In adopting these new technologies, banks should also ensure that their use of data and AI is transparent and explainable to the customer, who can weigh up the benefits against any concerns they may have. Banks must also, of course, in all handling of customer data, adhere strictly to the GDPR in Europe, and any other regulatory or legal obligations on privacy and data security where they operate.

A new culture of banking – ethical fintech

Digital technology has transformed the banking sector, and for many more traditional banks, they are facing a need to reinvent themselves and their culture – to embrace diversity and inclusion, to foster innovation and new ways of thinking, and to encourage transparency and new levels of trust with their customers. As regulated entities, banks must also strictly adhere to 'responsible lending' practices, in accordance with the current legal framework, to guarantee an adequate level of protection for their customers. This combination of innovation and risk management is ultimately their main competitive

advantage, and one which sets many banks apart from new fintech entrants.

Bank executives also have a clear opportunity to lead the creation of an authentic, differentiated identity that embeds an ethical purpose. This is important, as many banks have yet to turn their commitments to environmental, social, and governance (ESG) concerns into concrete action. The UN Principles of Responsible Banking¹, to which CaixaBank is a founding signatory, are a unique framework for ensuring that banks' strategy and practice align with the vision that society has set out for its future in the Sustainable Development Goals and the Paris Climate Agreement. Every customer should check if their own bank adheres to this UN Charter. In the same way that we avoid buying goods manufactured by children, consumers should become part of this ethical movement to ensure that banks are working for the common good.

In summary, banks must move quickly toward developing digitally advanced products and customer engagement practices. Banks must view disruption as an opportunity to phase out legacy systems in favour of new operating models. Now, more than ever, banks need to play to their strengths and embrace change at the pace and scale that will drive the best results for both their shareholders and their customers. I am convinced they can do this best through a clear focus on ethics, sustainability, trust and personalised customer service.

1 <https://www.unepfi.org/banking/bankingprinciples/>

Creating A Different Future

Jennifer L. Schenker
Editor-in-Chief, The Innovator¹

Millions of people in Africa, Asia and Latin America make a living collecting, sorting and selling materials foraged from landfills, along streets and waterways or dumpsters. In some counties these waste pickers provide the only form of solid waste collection, helping to achieve high recycling rates. Yet, they often face low social status, deplorable living and working conditions, and get little support from local governments. The same holds true for women who grow crops like cassava on smallholder farms. Both groups are among the invisible hands serving the global economy. Despite advances in technology over the past 30 years they have no way to prove how much revenue they earn, making it difficult, if not impossible, for them to open bank accounts, obtain working capital at reasonable rates and lift themselves out of poverty.

That's starting to change. BanQu is using blockchain technology and partnerships with mobile phone companies like MTN and Airtel, governments, and large corporates such as Coca-Cola, Anheuser-Busch InBev, Solvay, Raia Drogasil, and Islamic Development Bank, to help break the cycle. It is just one example of how large corporates and young tech companies can team to create solutions to some of the world's biggest problems.

1

<https://theinnovator.news/>

CEO and co-founder Ashish Gadnis set up BanQu after witnessing a woman farmer in the Democratic Republic of Congo who had been selling cassava and maize crops to global brands for decades being denied a bank account because the only proof she had of her role in the supply chain was a paper receipt. “I can’t bank her,” the banker said to Gadnis. “But I can bank you.” This prompted him to create BanQu – “bank you” – to ensure that everyone along the supply chain is visible in the global economy by recording them on a digital ledger, or blockchain. “People in our supply chains are unbankable because they can’t prove they exist,” says Gadnis. The company’s slogan is “dignity through identity.” Its stated aim is to eradicate cyclical poverty and create a circular economy that gives economic equality to all participants. “By putting a human lens on the circular economy, we can solve both inequality and climate change,” he says.

BanQu is one of 17 start-ups that participated in the World Economic Forum’s The Circulars Accelerator Cohort 2021. The accelerator is a collaboration with UpLink, the Forum’s innovation crowdsourcing platform, and is led by professional services company Accenture in partnership with Anglo American, Ecolab and Schneider Electric.

BanQu’s blockchain technology ensures that everyone in the supply chain who participates in a transaction gets a fixed, reliable, transparent, and secure copy. The software-as-a-serve app is live in more than 50 countries and some 2.5 million household members, including waste pickers, small landholder farmers, workers and refugees, are active on the platform. “It is an ecosystem play,” says Gadnis. The system helps corporates with their sustainability goals. Mobile phone companies can integrate with supply chains to offer mobile money payments in local currencies, expanding their customer base. Independent waste pickers and small landholder farmers can prove their income, allowing them to open banking accounts, obtain loans and pay bills via their mobile phones, giving families the needed stability to keep their kids in school. “My dream is to

get 100 million people on the platform and help lift them out of poverty,” he says.

Blockchain is a Game-Changer

Gadnis has a deep understanding of what it takes to break the cycle of poverty. He grew up poor in India and found a way out by learning to code. When he came to the U.S. in 1994, he was able to get a bank account for the time “and the heavens parted for me,” he says. He created several startups, selling one to a large consulting firm. Wanting to give back he got involved with a Haiti earthquake relief effort and later did volunteer work with the United States Agency For International Development (USAid) in the Democratic Republic of Congo. He quickly realized that charity did not solve fundamental deep-rooted issues that keep people trapped in poverty. “It made me realize these people were invisible,” he says. Gadnis quit his volunteer role and started investigating how he could use his knowledge of supply chains to help people at the bottom of the pyramid and came up with a solution based on blockchain, an immutable digital ledger.

“Blockchain is a game-changer for people at the bottom of the pyramid,” says David Drew, Coca-Cola’s Sustainability Director, Africa. Coca-Cola started working with BanQu in January 2021 and “we are innovating as we go,” he says. More than 1,000,000 kilos of recyclables have been recorded since the partnership began.

BanQu’s approach gives Coca-Cola a solution to a tough problem. “Informal collectors are the backbone of collection and recycling in many economies, but their contribution is generally misunderstood and under-appreciated.” says Drew. As part of its global World Without Waste strategy, Coca-Cola is looking to step change the rates of collection of the bottles and cans it sells and, in particular in developing markets that don’t have the benefit of formal waste management systems. “Our goal was not only to understand the informal collection

environment better and in doing so help to increase collection and recycling, but also to empower both collectors and small businesses trading in recyclables,” he says. It has proved challenging because in many cases transactions between waste pickers and buy-back recycling centers are not recorded or are being recorded by hand. The BanQu system offered a simple solution to securely record these transactions, not only giving waste pickers proof of income, but also serving as a kind of simple enterprise resource planning (ERP) system for buy-back centers. “Bringing transactions into a cloud-based system that provides small business owners with a new level of understanding of their businesses is incredibly powerful”, says Drew. “Ultimately to achieve our goals we need these small businesses to be successful”.

The BanQu system will also assist Producer Responsibility Organizations like PETCO, a project partner, better understand and support the buy-back centers. For example, during the COVID lockdown, South Africa placed a ban on alcohol. The absence of aluminum beer cans, a valuable recycling commodity, caused an enormous drop in liquidity in the informal trade. To address this, Coca-Cola ultimately contributed \$200,000 in working capital to support to buy-back centers through PETCO. Without funds to trade, buy-back centers had insufficient funds to pay waste pickers and were turning them away, significantly reducing recycling rates. “We knew COVID was causing a massive interruption in the recycling value chain,” says Drew, but it took months to fully understand the impact. “What we realized is that if we had been using BanQu at scale we would have been able to see within a matter of days that something was going incredibly wrong and reacted more quickly.” he says. “Ultimately, through BanQu, we should be able to support the value chain financially both in times of crisis and even incentivize collection of certain materials in certain areas to improve collection rates.”

PETCO/Coca-Cola are currently using BanQu’s system in 30 buy-back centers in South Africa, with the goal of operating 100

by the end of 2022 and getting 10,000 waste pickers online. Coca-Cola is now entering the second phase of the project, piloting the use of safe cashless payment systems. This will not only enable cashless payment between waste pickers and buy-back centers but provide waste pickers with the equivalent of a bank account. Coca-Cola is also investigating how BanQu might integrate with a South African government program to develop and maintain a national register of active waste pickers, in order to recognize their contribution in a more formal manner.

If the South Africa experiment to integrate BanQu into the informal collection and recycling sector is successful, Coca-Cola may consider rolling it out in other developing markets within Africa as well as potentially in Southeast Asia and Latin America, says Drew.

Giving Farmers a Fair Shake

Like Coca-Cola, AB InBev has started using BanQu's technology to integrate waste pickers into the global supply chain. (It is using the system in Colombia and Zambia). AB InBev is also using the system to work with small landholder farmers. The company, which operates in over 50 countries, has agricultural development programs in 13 countries, working with large commercial farmers in countries like the U.S. and Argentina and small landholder farmers in countries such as Zambia, Uganda and India. "We have set an ambition to skill, connect



and financially empower 100% of the direct farmers in our supply chain by 2025, and BanQu is a key enabler to achieving financial empowerment with smallholder farmers,” says Katie Hoard, AB InBev’s Global Director of Agricultural Innovation and Sustainability. The company first tested BanQu’s technology in Zambia in 2018 and “we were really impressed with BanQu’s ability to scale and the level of adoption,” she says.

In Zambia AB InBev agreed on a crop price for farmers with aggregators only to find out from farmers that this was not what they were being paid. “BanQu helped us ensure the price the farmers were being paid and also allowed us visibility into when they were being paid,” says Hoard. It also helped the company better manage the quality and volume of crop inventory. In 2019 mobile money services operated by Airtel and MTN were added into the mix. The first woman to use the system, a cassava farmer, received a text message saying that she had been paid in mobile money for her crop and a few moments later got a second message telling her she could now pay her solar energy bill using her mobile money account. While there are clear advantages of no longer stashing money under mattresses and having to use cash to pay bills there are still barriers to digital economies in some African countries, says Hoard. Challenges include cash out fees, network access, phone ownership and availability of banks and agents in rural communities. “We need to look at how we address these challenges collaboratively, but BanQu has proven the benefits of this model,” she says. The company has rolled out the technology to other agricultural supply chains in Uganda, Tanzania and Brazil and is looking to expand globally.

With the help of BanQu’s technology and mobile services operated by M-Pesa and Vodacom in Tanzania, some 5000 small landholder farmers – about 50% of them women - have identities and are now officially part of the global supply chain. BanQu just rolled out its first service in India in partnership with international chemical company Solvay: a transactional platform based on blockchain for guar supply. The aim is to

ensure full transparency for 2000 farmers on the prices and volumes of guar. The platform will soon enable direct payment and also record program actions such as training in sustainable farming practices, school attendance for children, and programs dedicated to empowerment of women farmers.

Serving small landholder farms and waste pickers is just the start, says Gadnis. He is hoping to convince more mobile phone companies and multinationals to use BanQu's technology. The system can be applied to any kind of sourcing in emerging markets. By expanding supply chain information to include everyone who contributes raw materials – whether it be crops or mined resources – companies can not only ensure everyone is being paid equitably, they can prove no child labor is involved. “Some CEOs may be afraid to find out,” says Gadnis, “but we need companies to step up and make their supply chains more transparent, more equitable and more humane.”

The Need for Systems Transformation

Lifting people out of poverty requires systems transformation. A low pain user interface is nice but is not enough. Using mobile service to establish identity is essential but that too is not enough. If people at the bottom of the pyramid are to be truly integrated into the global economy they need more than just mobile money. They need to establish their identity and they must be able to access their own data so they can prove their income. “Mobile money without transaction data is useless,” says Gadnis. “You need to pair the mobile money to the supply chain transaction. There is a blind spot in the supply chain that needs fixing.”

Another thing that needs fixing is giving people the ability to spend the digital money they are paid without having to cash out. It is great if people can pay school fees and energy bills but they should also be able to buy food or single packets of shampoo digitally, says Gadnis. This is possible in many African countries but not necessarily in other parts of the world, like

India, where ecosystems for accepting mobile money do not yet exist.

No one company can fix these problems but the impact of collaborations that use tech for good is huge. In mid-December 2021 BanQu partnered with Raia Drogasil, the largest drugstore company in Latin America by revenue and market capitalization, to help combat “period poverty” in Brazil. “No girl anywhere ever should have to miss school just because her family cannot afford basic menstrual hygiene,” says Gadnis. “Girls staying in school transforms communities, countries and the world.” BanQu gave not-for-profit organizations access to excess inventory of tampons and sanitary napkins that would otherwise be incinerated after 30, 60 or 90 days, via a secured reverse logistics supply chain that is 100% traceable and transparent.

Turning Waste into Wealth

It is just one example of what could be done if our current economy was designed to be circular. The way we create and



dispose of our products is not set up that way nor is our legislation, financial system, and the current accounting framework. Luckily, startups and large corporates are working to change this. For example, Excess Materials Exchange, a Dutch startup, has created a marketplace where companies can buy and sell any type of excess material and/or product. The EME works to reduce waste by actively matching supply and demand of materials that would otherwise be

considered waste and create continuous material loops. Maayke-Aimée Damen, (pictured) EME's founder, won various prizes and awards for her work with the EME, including making the MIT Innovator under 35 list and being named an Emerging Innovator by the Ellen MacArthur Foundation CE100 network. Her notable accomplishments include inventing the Resources Passport which works almost like a regular passport. It gives resources an identity and it provides a location where data of a product can be collected through every step of its life cycle.

“The business case for all of this is just incredible and much bigger than one might think,” says Damen. “In EME's pilot we investigated 17 waste streams from 10 companies in the Netherlands, including things like sludge and plastic, and found that by finding a higher value reuse option we created an additional value of €64 million. Companies' waste is an actual goldmine. One way to start mining this is writing down what products and materials companies have (in the resources passport), rather than writing them off. The moment they realize that there is wealth in waste they can start taking steps to log it, digitize it, trace it and actualize it.”

To help scale this approach Damen recently left EME to take on the role of Director, Circular Economy, at The World Business Council for Sustainable Development, a global CEO-led community of over 200 businesses working collectively to accelerate the system transformations needed for a net zero, nature positive, and more equitable future.

Under pressure to cut their carbon footprint, large companies are increasingly taking concrete actions, including teaming with startups and scale-ups, to meet sustainability goals. That trend is likely to become even more prevalent in 2022. For example, in December 2021 Zara launched a limited line of black dresses made from carbon emissions, with the help of LanzaTech, a U.S.-based scale-up creating a circular economy system that turns pollution from steel mills and other greenhouse gases into textiles, household cleaners, laundry detergent,



sustainable aviation fuel, perfume and more. Other large corporates working with LanzaTech include Migros, L'Oreal, Total, British Airways, Shell, Unilever, Coty and ArcelorMittal.

The fashion industry is responsible for four to ten percent of global emissions and is the second biggest industry consumer of water, but LanzaTech's innovations go well beyond apparel and footwear. On December 9 steelmaker ArcelorMittal announced it had made a \$30 million investment in LanzaTech. The steelmaker's relationship with LanzaTech began in 2015 when the company first announced plans to

utilize LanzaTech's carbon capture and re-use technology at its plant in Ghent, Belgium. The €180 million Carbalyst plant – ArcelorMittal's flagship carbon capture and re-use technology project – is currently under construction, with commissioning expected before the end of 2022. Using LanzaTech's gas fermentation technology, which captures carbon-rich waste gases from the steel making process and converts them into sustainable fuels and chemicals, the plant is expected to reduce ArcelorMittal Ghent's CO₂ emissions by 125,000 tons a year. It will also produce 80 million liters of bio-ethanol annually, which can be blended with traditional gasoline and used as a low-carbon alternative fuel for the transport sector.

LanzaTech's technology is already touching many other industries. LanzaJet, a subsidiary of LanzaTech launched in 2020, is building a commercial scale plant in the U.S. state of Georgia to produce sustainable aviation fuel (SAF), attracting investments from Shell and British Airways. The plant will convert sustainable ethanol (a chemical compound widely blended with petrol to reduce its carbon intensity) into sustainable aviation fuel using a patented chemical process.

Fuel produced at the plant promises to deliver a reduction of more than 70% in greenhouse gas emissions compared to conventional fossil jet fuel, the equivalent to taking almost 27,000 petrol or diesel cars off the road each year.

Meanwhile, earlier in 2021 L'Oréal produced the first cosmetics bottle made from industrial emission; the result of a collaboration between the French cosmetics giant, LanzaTech, and energy company TotalEnergies that began in 2016. Coty, a multinational beauty care company, is turning to LanzaTech as a new source of ethanol for its fragrances.

LanzaTech is also partnering with Unilever and green chemical maker India Glycols to produce a surfactant made from industrial carbon emissions instead of from fossil fuels. The shift in production uses biotechnologies and a newly configured supply chain between the three partners, who are working together for the first time. LanzaTech captures waste emissions and turns them into ethanol; India Glycols takes that ethanol and turn it into ethylene oxide, a feedstock to make surfactants. which Unilever then uses in a laundry detergent called OMO.

Changing the World

Technology has evolved so much since I started writing about it in the 1980s. I chronicled the introduction of new means of communications from SMS to Skype, Facebook, WhatsApp and Zoom. I wrote stories about phone companies putting mobile devices into the hands of billions of people, the entrepreneurs that came up with technologies that have reduced the cost of phone and video calls to zero, and the introduction of mobile money, a technology that allows people without bank accounts to receive, store and spend money using a mobile phone.

As amazing as these developments are, there is still so much to be done. The World Bank estimates that 1.7 billion people, or 31% of all adults, are “unbanked,” and in some developing

economies, it's as high as 61%. Women are at an even further disadvantage, making up 55 % of the unbanked. Despite all of our advances, people are still shut out of the global economy, suffer from inequality and are invisible.

Every time a new technology is introduced it promises to change the world. Many have, but not everyone has benefited, and our planet is in peril. Let's commit to using cutting-edge technology to eradicate poverty, reduce inequality and fight climate change. Startups like BanQu, EME and LanzaTech are giving us the tools to get there. Now we just need to collectively move to scale their use.

NewsMedia4Good: it's all about Information Ethics and Algorithms

Maria Pia Rossignaud
Vice President
Osservatorio TuttiMedia and Director Media Duemila

Derrick de Kerckhove
Scientific Director
Osservatorio TuttiMedia and Media Duemila

Donner un sens plus pur aux mots de la tribu¹

Stéphane Mallarmé, Le tombeau d'Egard Poe

In his translation of the work of Edgar Allen Poe, the French poet Stéphane Mallarmé attributes the same purpose to Poe's work as we do to our work in promoting a new ethical and inclusive future for news media. In this current period of "Sturm und Drang", of turmoil, stress and harrowing emotionality that we are all experiencing, there is an urgent need to reignite meaning and value in language.

There was a time when social cohesion depended entirely on news media. At that time, despite different newspapers supporting different agendas, everyone agreed to disagree under the same umbrella of news. It was easy to distinguish between pure journalism and other more sensationalist popular papers, sometimes referred to as the 'yellow' press. Then social cohesion moved from the press to TV, with the creation

1

To give a purer meaning to the words of the tribe.

of what Richard Nixon called the ‘silent majority’. Dominated by the power of advertising, that is by ‘good news’, TV reflected a time of prosperity and relative cohesion, with the result that the majority remained largely silent.

Public discourse has broken down

Today, there is no majority and no silence. Instead, we now have minorities screaming from their echo chambers, and the reasons are becoming obvious. Jack Dorsey, co-founder of Twitter who stepped down from his position as CEO of the platform in November 2021, explained the issues behind Twitter’s decision to ban Trump from the platform after the attack on the Capitol: *“It was the right decision but I’m not proud of it because, ultimately, it was a failure of ours to promote healthy conversation. They divide us, they limit the potential for clarification, redemption, and learning. And sets a precedent I feel is dangerous: the power an individual or corporation has over a part of the global public conversation”*.

The digital platforms have provided the opportunity to anybody, whether genuinely informed or not, to take over the creation and especially the distribution of news, with the result that there has been a rapid breakdown of social cohesion.

We aim to re-establish ethical news and social cohesion



The NewsMedia4Good project, created by the Osservatorio TuttiMedia (AllMedia Observatory Association) based in Italy, aims to support media that recognize the problem and want to find solutions. There are already many news media for good, including Ted Talks, Good docs, Wikipedia, Public Good, Adbusters, etc. But we

need more. And we need social cohesion among the media themselves. NewsMedia4Good wants to start a movement in that direction.

The goal is not just to ensure peace in a profoundly fragmented world, but also to avoid mainstream media losing their relevance.

We are following a long media tradition

With NewsMedia4Good we are launching a strong and innovative idea, but one that has deep roots in the history of the media. Founder of the Association, Giovanni Giovannini, has been working for many years towards this goal with vision and intelligence. We are creating the conditions for bringing together journalists, professors, researchers, politicians, institutional representatives and students in an interdisciplinary and influential group, a pool of collective and connective intelligence. This group intends to work on a new media ethics, including the use of algorithms.

Origin of algorithms

It is often thought that algorithms are a recent invention uniquely related to digital transformation, but, in fact, the term itself goes back to the 9th-century Persian mathematician Muhammad ibn Mūsā al-Khwārizmī, and the concept... to Adam and Eve. By standard definition, an algorithm is a sequence of instructions, typically used to solve a class of specific problems or to perform a computation. By extension, it also means information that prompts to action, so words can conceivably qualify ‘loosely’ as algorithms.

“In the beginning was the word, and the word was made flesh.” Words were the first human algorithms. In his seminal work *New Science*, published in 1725, Italian philosopher Giambattista Vico provides the most reliable and simple explanation of how words were born from utterances, shouts, and grunts that accompanied and extended gestures and movements. But before the appearance and development of words, the senses were the main algorithms that guided humans and all other animals. Words introduced a separation between

experience and interpretation (from signifier to signified), but words remained subordinate to the senses until they were written, as Vico also noted. By formalizing and stabilizing the relationships between words and meaning, writing narrowed the range of possible interpretations. And the words thus took on the algorithmic function of the senses.

Digitization is stripping language of deep meaning

Today, however digitization threatens to eliminate interpretation altogether, focusing not on the meaning but only on the shapes of the written words as, for example, is the case for automatic translation. One of the most ironic effects of digitization is that it can translate all the languages of the world without ever understanding one. Therefore, digital transformation and the artificial intelligence that is driving it, are dethroning meaning, making it unnecessary to make things work.

For digital operations, meaning is just an accessory, occasionally useful but generally not indispensable. AI may not be infallible, but overall, it seems to work better than the chaotic world of words online. Fake news and the denial of science are destroying objectivity and common sense. We have gone from disintermediation to the mediation by machines: human communication carried in algorithms no longer needs the meaning associated with words, but only orders. Here cometh the “post-truth” era where reference and verification have lost their bearings, so we are forced to trust machines because they are more efficient than human experts. The epistemological crisis in progress affects all cultures of the world. This is the basis of the crisis that everyone underestimates.

Alphabet and digital are in conflict

Today the problem has changed again. We are in the middle of a computer and information chaos because the alphabet and the digital do not get along. And this, for the good reason that they do two different things: the alphabet is attached to

language and produces meaning, while the digital is detached from language to produce order. Hence, by dint of accumulating parameters, algorithms decide better than the best doctors, the best scientists, and the best judges, and therefore the greatest arbiters of our survival, how to treat, find or judge. The digital transformation is taking over our literate past and that generates a widespread informational disorder.

So, it follows logically in this time of transition that the pandemic that has disrupted everybody's life and made many people angry has led to an infodemic, which doesn't help anybody and doesn't make things progress. This is clear in the industrialization of fake news and deep fakes which have been encouraged by the rampant myth of 'alternative truth' and post truth. Secondly, which depends in part on the first, is the questioning of the very concept of objectivity supported by scientific evidence, which has led deniers in general to support all kinds of incredible claims: a person with or without authority can assert facts that contradict simple common sense, and it will be believed.

We will get out of this only when we understand everywhere that the real danger, to which we will have to respond with many more sacrifices than for the pandemic, is climate change for which we humans are responsible in spite of all denials.

The problem is compounded by the fact that technology doesn't concern values. Humanism, on the other hand, is basically a system of values that is told and handed down through information that today more than ever needs responsibility. Ethics and Media are our primary focus. Introducing ethics into the functioning of algorithms is one of the biggest challenges humans need to face, but it will take time and considerable effort, but we cannot wait too long for it to happen.



The Innovation & Communication Award 2021 was conferred at the launch of the NewsMedia4Good project during the 2021 Nostalgia di Futuro. (L to R: winner Prof Lello Savonardo, University of Naples; Derrick de Kerckhove and Maria Pia Rossignaud.)

A call to action

At the 13th meeting of Nostalgia di Futuro² we launched a call to action addressed to all involved in journalism and information. In recognition of the shift to on-line information, which is weakening journalism and traditional publishing, we need to find a united spirit to remind everyone of the importance of the role of journalists in a democratic society. It is time to reiterate that news media have always been both products and promoters of democracy, of social cohesion and

2 <https://www.youtube.com/watch?v=aClebuYYyys>

awareness, fostering common knowledge and above all critical thinking. Especially today that we find ourselves in a phase of transformation between the old literate and the new digital world, we need to have the ability to bring aspects of the past with us because by understanding our history we will be able to orient ourselves in the present and future.

Ethics is the milestone to guide change. We do not want to impose bans, but we want to spread good practices that start from the foundations of language, that is the word. The intelligent and careful use of words considers the meaning of every word in every context and not just the 'sensational effect' it can produce. We must look beyond the "likes" that seem to guide online communication and find a common denominator capable of engaging vision confronting the grave social issues at hand, not just the pandemic, but looming large behind it, a change of planetary climate that is not only threatening but already destroying survival in many parts of the world. It is time to reappraise public information. What's more, the digitization of everyday life increasingly transforms processes that until a few years ago we believed were very rock solid. "Digital twins" and "Metaverses" are becoming realities that progressively appropriate virtual spaces in our stead.

Our aim is to bring this message to the G20: We need a new ethics including the algorithmic dimension in which the economic and social sustainability of the entire media system is a priority.

For this reason, we must not limit our research and study activities to a virtual free-for-all where there are no borders or where the law of the strongest is in force, which often coincides with the wealthiest. There must be a line drawn between fact and gossip, between truth and fake news, between disclosure and propaganda. Therefore, we must create real borders between what is information and what is not. In this sense, the greatest commitment lies in the fact that information must be supported by public institutions both at a legislative and

an economic level to maintain its independence and have the opportunity to always do the work of reporting and assessing facts in the best possible way.

Constructing the new infosphere

NewsMedia4Good supports information that is not shouted but is preserved in every word. We want to stop the sensationalism that divides, the polarization that imprisons. We want to contribute to the construction of the new infosphere because it is time to rediscover the meaning of news and to restore value to the words that interpret reality. To achieve this goal, we need the help of everyone, with particular focus on the vision of women who, as was demonstrated in the pandemic, are the ones who overwhelmingly take care of others and the world.

We need to find a way to achieve a new social cohesion. NewsMedia4Good has the ambition to promote and support a cultural project, a new reference point for the third millennium infosphere on issues related to the world of communication. The world is underestimating the epistemological crisis in progress; we must act before words lose their meaning. The social goal is to recover social cohesion via the media; create culture on the need for reliable information; and promote interpretation as essential for balance and sustainability. We need to bring back to the center of the global village the narrative that will enable the construction of our best possible future.

Journalism versus Social Networks: *Je t'aime, moi non plus*¹

Laurence Bottero
Editor-in-Chief, La Tribune

When on January 8, 2021, Donald Trump announced that he would not attend the inauguration of the new president-elect, Joe Biden, he made his last act of communication on Twitter. Since then, the former president of the United States of America has been banned from twittering on the social network in the shape of the little blue bird.

Fifteen years ago, this same message would have reached journalists and thus, the world, through a classic press release. REUTERS would have issued a broadcast. "The radio announces the event, the television shows it, the press explains it", said Hubert Beuve-Méry, the founder of Le Monde (a French newspaper). Today, social networks are a bit of all of this at the same time. A new axis of communication in its most extensive sense, which has significantly changed the relationship of information between the sender and the receiver, the politician/business leader/sportsman and the journalist.

This small revolution - for it is indeed one - is very recent but it is powerful. Twitter is probably the social network that has the most influence on the practice of journalism. And it is now the

¹ Phrase attributed to Salvador Dali and later Serge Gainsbourg. Roughly translates to "I love you; me neither", and describes the conflict between two opposites who are attracted to each other.

REUTERS 2.0 channel. It disrupts the codes and sometimes even the deontology, or ethics of journalism. Because by definition, Twitter requires reactivity. Journalism too. Except that the race for the like, for the retweet sometimes makes us forget - and one time is already too much - that journalism is based on a fundamental rule: the verification of information.

What are the facts?

Of course, the race for scoops is not new. In fact, it is the very essence of the profession. What could be more galvanizing than investigating, cross-checking data, questioning, getting lost in circumnavigation, verifying, verifying again and then, sure of oneself and of the sources that have reinforced one's conviction, delivering exclusive information.

By its hyper-reactivity, Twitter makes us forget the very foundation of journalism: we only deliver information when we are certain of its truthfulness. We should not be surprised then by the avalanche of fake news. This false information, which can be disinformation as well as misinformation (true information, diverted to harm), but which deprives the profession of journalist of its credibility.

Many professions have equipped themselves with a fact-checking service. The term *information audit* has passed into common language. And it was born ten years ago, already, on the occasion of another American presidential campaign.

Fact-checking is a return to journalism basics, so to speak. Libération, El Pais, BFM, CNN, 20 minutes... all types of media - written press, television press... - have rushed into this space of valuing the verification of information. Clearing up erroneous information, validating what is the right information, explaining, decrypting... This is the quality that is at the basis of the job. And that values it.

Finding the right balance

This is exactly what should enable it to be clearly distinguished from mere communication. For if journalism has been discredited, it is largely itself to blame. Yes, there has been a tendency to want to be beyond reproach with regard to the transmitters of information. To accept proofreading of articles before they are published is to put a finger in the wheel. It means accepting a certain pressure. A certain submission too. But journalism is not just communication.

Finally, if Twitter has become a main channel of expression for journalists, it is also because it has come to fill a need. That of finding a certain form of free expression. A signal - or a symptom - that a return to the basics, to the foundations, was necessary.

But too much is always the enemy of good. And as Twitter became a platform without limits, it didn't take long to raise another issue: should we stop tweeting? Yes, some editors said. One such publication is Business Insider, the New York-based news site, which has asked its journalists to stop using the social network in order to be more productive and develop their own ideas. A way to remove the influence of tweets. To get away from "trending" topics.

So should we prohibit the use of social networks? Probably not. But we can only hope that the pendulum effect will create a kind of balance between journalism and social media. And that's where the tipping point is. To use everything with the right equilibrium...

Focus on ESG: Transforming the culture and business of the communications industry

Vicky Sleight
Vice President, Human Factor and Diversity and Inclusion
TM Forum

I believe diversity and inclusion are essential and business critical to a healthy, happy, creative and effective business. They boost innovation, empathy and empower employees from under-represented or marginalised communities. Importantly, with today's business focus on ESG, (environmental, social and governance), diversity and inclusion are actually the most important 'S' in ESG. Shareholders and investors are increasingly using ESG criteria as their benchmark for assessing future success, and this includes how companies are ensuring a diverse and inclusive workplace and workforce.

Of course, looking back over my more than twenty-year career in the communications industry, I am proud that I have always been striving towards the achievement of cultural change and inclusivity. Now, as I lead the TM Forum's global industry Inclusion and Diversity Council, as well as the Digital Organization Transformation and Culture (DOT) program, I have found a welcoming environment to not only promote and drive an inclusive cultural model throughout the industry, but to collaboratively build the tools to make real change happen.

Being the change you want to see

When I joined the mobile industry at Motorola in the early 2000s, I was immediately struck by the male and engineering-

based culture of the industry. At that time, it was still unusual to find a senior woman executive leading discussion at meetings, in Board rooms, or on conference platforms. It was clear to me that the lack of a diverse and inclusive culture was reflective of a mindset and also a business perspective that was restricting innovation at a time when tech companies needed to take full advantage of the rapid changes that were happening, and all of the minds and ideas of their workforce.

As a Senior Director in the GSMA in 2007, I took advantage of every opportunity to lead, influence and drive change at the international level in terms of what we would now call ESG - culture, equality, diversity and inclusion. I created the GSMA's first program to advance the role of senior women in the mobile industry, (then known as Connected Women) which was developed with the support and help of my colleagues at the GSMA as well as the GTWN, and others dedicated to increasing diversity in the digital tech sector.

I remember well the inaugural meeting of Connected Women in Brussels in October 2010 <https://www.gsma.com/gsmaeurope/positions-and-publications/gsma-calls-for-more-women-in-mobile-communications-industry/> and the palpable feeling of inclusion and acceptance amongst the group of women present. It was clear that there was a strong appetite amongst women in the tech sector to find a voice and a means of supporting other women colleagues to progress in their careers and to represent the rarely heard voice of women as users of technology.

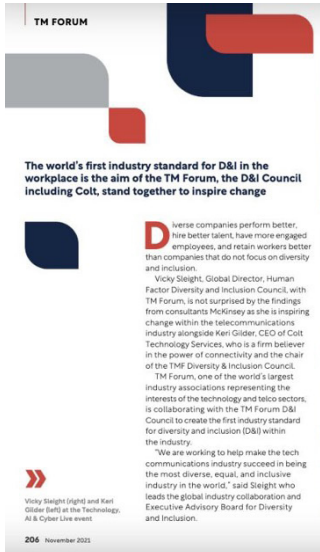
There followed many meetings of Connected Women around the world – in Hong Kong, London, New York, Barcelona, Atlanta, Shanghai and South Africa. With each of these meetings, the depth of the discussion and engagement by attendees including male allies, grew, as did the realization that a focus on inclusion and diversity – not just for women, but for all – was not just nice to have but was fundamental to every successful business.

Taking diversity mainstream

The biggest areas where things have changed is in our understanding of bias and discrimination and the way people are thinking about diversity, equality and inclusion, and the very reasons organizations are doing DE&I work in the first place. A decade ago, most organizations were approaching DE&I from a compliance-driven approach that focused on ensuring the company was meeting all requirements it was legally obligated to. It was about attaining a minimum, not adding value. As social consciousness around DE&I increased, many organizations recognized that consumer markets look very different than they might have even 10 years ago, and that consumers and prospective employees want to respect the values of the organizations they buy from and work with.

It is clear that a focus on inclusive and equitable employment policies is a much higher priority in the majority of tech companies today, thanks to growing awareness worldwide about the devastating negative effects of systemic racism, bias, and inequality. Companies are now often required to comply with regulatory ESG obligations, which has given renewed focus and attention to this vital business area. They are seeking expert insights and knowledge about how to translate these obligations into real world, sustainable solutions.

When in 2019 I began working with the TM Forum and its members, I was looking to drive a deeper understanding of diversity in the tech industry – to take it from a peripheral issue to a central focus of leadership. This led to the establishment of the global industry Inclusion and Diversity Council, alongside the existing Digital Organization Transformation and Culture program. The mission of both initiatives is to accelerate digital transformation and drive success in the digital economy through ensuring tech communications is the most diverse industry in the world.



The TM Forum's Diversity & Inclusion Council is chaired by Keri Gilder, CEO, Colt and our Council members are working to provide a safe space for industry leaders to explore diversity and inclusion issues, understand best practices and obtain practical guidance as a connected community to help optimize performance, drive business transformation and build the workforce for the future.

Our founding members¹ consist of thought leaders within the industry who are joining forces to drive impact and change. Working collaboratively, council members are delivering tools, frameworks, knowledge and research aimed at not just improving awareness of the business critical, strategic imperative of diversity and inclusion but the difference is that we are focused on making real change happen. Together these initiatives ensure that all industry players can advance on their inclusion journey together.

¹ They include Accenture, Accedian, Amdocs, Bain & Co., BT, Colt, Ciena, Deutsche Telekom, Nokia, Rostelecom and Verizon, CSG and Salesforce
<https://www.tmforum.org/diversity-inclusion-council/>

In addition to conducting a survey, we also interviewed survey respondents and executives from the member companies that are leading this effort. It is clear that a company-wide approach to attracting, recruiting, retaining, retraining, and developing the best talent must be coupled with strategic initiatives to create an inclusive, innovative culture where diverse skills and viewpoints are combined for maximum impact on business results.

We released an in-depth report² in which we take a closer look at the state of diversity and inclusion in the industry and the discussion around how focusing on a diverse culture can help fuel innovation and attract the best talent. The report is designed for senior members in the tech sector to understand:

- What we mean by diversity
- An objective view of the skills shortage within the ICT industry
- The state of diversity and inclusion in the industry
- How focusing on a diverse culture can help attract the best talent
- How diversity fuels innovation
- How partnering with higher education can raise a company's profile as a top employer.

Winning the War on Talent

Despite the fact more women graduate from tertiary studies each year compared to men, the technology and telco sector is losing the war on talent into more traditional industries such as pharmaceutical and health, as they are now asking for the same skill sets such as software developers and data scientists.

When we talk to CEOs and telcos, they will say to us, I want to benchmark against not just my own industry and my own

² <https://inform.tmforum.org/research-reports/inspiring-innovative-teams-through-diversity-and-inclusion/>

competitors, but I want to benchmark where I'm losing this war on talent. They recognize that the brand is not enough nowadays to attract the best talent. . The culture has got to be right. But it's not just about attracting staff, it is also about retaining them. You may have a diverse board but if your employees don't feel it's an inclusive culture, then you're not retaining that diverse talent. The war for talent is one thing we want to win.

At the center of all this transformation is human centered design, which is what we have also focused on. The pandemic has highlighted that even more. 80% of Millennials see inclusion as a very important factor when choosing an employer and 39% of them will leave if it is not inclusive.³ We also recognize that diversity and inclusion is a business critical and strategic imperative and is not just a gender issue, societal or CSR. And diversity exists beyond gender, LGBTQ, and ethnicity, it should be equal for all including accessibility neurodiversity and can all be a key differentiator. Figures from the Office of National Statistics show people with disabilities are suffering more during the round of redundancies during the pandemic, a total of 22.1 in every 1000 people that have been made redundant have a disability, as opposed to 13 people per 1000 without a disability. That's a real challenge we're having to face.

Many initiatives focus on visible diversity, yet we believe inclusion is more important in order to attract and retain diverse talent. There are only six women CEOs leading 31 companies within the top global telco space, and only 60 of the 330 top management positions are held by women. What we need is to get these diverse employees in leadership positions where they own the technology direction and own a very strategic part of the business.

The reality is, if we don't start paying attention to this, then we won't be able to attract the talent that we need to drive

³ <https://www2.deloitte.com/content/dam/Deloitte/us/Documents/about-deloitte/us-about-deloitte-unleashing-power-of-inclusion.pdf>

the innovation that's required in order to build resilience in a post COVID world. We're going to lose out to other industries because they're now asking for the same skills.

Measuring and benchmarking success: the IDS (Inclusion and Diversity Score)

Working with the inspiring and committed members of the Diversity and Inclusion Council of TM Forum has reinforced to me how essential this work is. We believe diversity, equality and inclusion is now a strategic imperative our industry must address to remain competitive, relevant and sustainable over the next decade. We are coming together to make real change happen and as a key part of this, and to convince others in the industry of its importance to their business, we are creating a standard industry metric to measure diversity and inclusion – the Inclusion and Diversity Score (IDS).

In 2021 along with Bain & Co, we launched an alpha trial to deliver an industry-adopted global benchmark, much like NPS for customer experience, but this time for our people. We want to achieve the bold ambition of how we make real change happen. At TM Forum, we believe Diversity, Equality and Inclusion is now a business-critical issue that the Telecoms industry must address. Today the net promoter score (NPS) is the benchmark against which many communications service providers (CSPs) measure customer experience. Yet no similar gauge exists for DE&I, despite its importance in helping the communications industry attract the talent it needs for future growth.

Launching the IDS, Keri Gilder, CEO of Colt and Chair of TM Forum's Diversity and Inclusion Council, said: "If we're going to build the foundation for the digital economy and drive Industry 4.0 the only way to do this is to put DE&I, at the center of our strategy. We must include it in our operational reviews; we must start measuring what matters."

IDS is designed to be a simple measurement that is equally weighted between inclusion and diversity giving CSPs the tools they need to assess the maturity of their DE&I across intersectional characteristics, compare their maturity score with others, make innervations and set baselines to monitor growth and evaluate the effectiveness of their current D&I initiatives.

The second stage of the IDS trial, launching early 2022, will provide enough data for a final validation of the scoring questions, as well as the pain points and the categorization of those. In addition to benefiting employees, data suggests successful DE&I programs increase profitability and innovation. I encourage leaders to support and participate in this trial as a commitment to making this change happen. If we don't measure how inclusive our organizations are, we can't change. Recent McKinsey data reveals that diverse organizations achieve 83% more engagement from employees, experience 20% more innovation, perform 35% better on financial return and generate 38% more revenue on average.

As an industry we can do this, but not alone. We must collaborate to make this real change happen.



03

TECH SAFETY

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Go Viral!

Online Safety by Design

Julie Inman Grant
eSafety Commissioner, Australia

"I am delighted to share my insights on eSafety's Safety by Design initiative with readers of The Mobile Century. eSafety has a unique vantage point as the first government agency in the world dedicated exclusively to online safety, including the regulation of tech companies to help minimise online harms.

We want to see tech companies of all size and structure be successful at raising their safety standards and practices. Online services need to be upholding their terms of service and be putting in safeguards from the outset to ensure their platforms are not being weaponised. We call this 'Safety By Design' – assessing risk and embedding those safety measures up front - and industry have a key responsibility in keeping their users safe.

The 'Safety by Design' initiative is one we hope will serve as a real catalyst for the change we all want – and need – to see. We are fast approaching Big Tech's 'seatbelt moment' where safety measures will be the default. Alongside that, and regulation, we also need to find ways to talk about how we improve the overall ecosystem through global systemic changes in which we can all play our part." – Julie Inman Grant, eSafety Commissioner.

eSafety is Australia's national online safety regulator – the first one of its kind in the world. We lead, co-ordinate and advise on a range of safety issues to ensure that all Australians have safer and more positive experiences online.¹ We approach our work through three different lenses – prevention, protection and proactive change.

It is the third “P” that I would like to focus on. If we are truly going to make the online world a safer place for the future, we have to minimise the threat surface. We must do better in terms of anticipating, detecting and eliminating the proliferation of online abuse. We also need to make our digital spaces safer and more inclusive, by protecting those most at-risk.

At eSafety, we strongly believe that the answer lies in Safety by Design. Safe design principles and standards are commonplace in the physical world, but that was not always the case. It is hard to believe that it has been over 50 years since the campaign to put seatbelts into every car first began. But now when we get into our cars, we almost take for granted that seatbelt, airbags, anti-lock brakes and other protections, guided by international standards, will help keep us safer on the road. Safety is built in – by design.

But we know that the online world was not built for safety. It was built for speed.

We need to alter the design ethos that takes us from moving fast and breaking things, and profits at all costs, to one that focuses on moving thoughtfully, investing in risk mitigation at the front end, and in embedding user protections from the get-go. The expectation of user safety should be as much a priority for technology companies as it is for the food, toy and automotive industries. Prioritising the rights and dignity of users in product design and development will engender a culture of innovation, will motivate workforces, and ultimately

1 For more information see <https://www.esafety.gov.au/>

will positively impact bottom-lines. It just makes good business sense.

At eSafety, we've been working with industry since 2018 on the Safety by Design Initiative. We knew that to effect cultural change, and for Safety by Design to be taken on and led from the top, industry genuinely needed to be at the heart of this process. We also understood that we needed to pay to industry's strengths by encouraging both investment and innovation in product development and innovation that prioritises safety. It was also vitally important that Safety by Design reflected the diverse needs of the technology ecosystem. We also consulted with NGOs, advocates, parents and young people. This truly collaborative effort yielded 3 over-arching Safety by Design principles.

Safety by Design Principle 1: Service Provider responsibility

The burden of safety should never fall solely upon the user. And every attempt must be made to ensure that online harms are understood, assessed and addressed in service design and provision. This involves assessing the potential risks of online interactions upfront and taking active steps to engineer out potential misuse, reducing people's exposure to harm. It's really great to see many technology companies investing in and employing innovative hybrids of human moderation alongside advanced machine learning and AI tools, helping to minimise exposure to traumatic material.

Safety by Design Principle 2: User empowerment and autonomy

This speaks to the dignity of users and the need to design features and functionality that preserve fundamental consumer and human rights. This means understanding that abuse is intersectional, and that technology can exacerbate and entrench societal inequalities. To combat this, we need

to engage in meaningful consultation with diverse and at-risk groups, to ensure that platform features and functions are accessible to all. But when things do go wrong, having easily discoverable and seamless reporting pathways and features, like blocking, muting and conversation controls that empower users to regulate their online experiences, is ever more critical. This includes setting default privacy and safety settings at the highest possible levels, at the point of sign up and registration, so that users are safeguarded from the start.

Safety by Design Principle 3: Transparency and accountability

These are hallmarks of a robust approach to user safety and should act as a catalyst in seeing a race to the top in terms of user safety. At the moment, we largely see what could be defined as selective transparency, rather than radical transparency. But, the tide is definitely turning. The publication of information about how companies are enforcing their own policies, and data on the impact and efficacy of safety features and innovations, will allow us to truly assess what is working. If interventions are improving safety outcomes for users and deterring online abuse, they should be shared and more widely adopted.

A collaborative effort

Principles by themselves will not, however, lead to tangible change. This is why we have spent considerable effort working with industry, service providers, parents and carers, and young people, to devise resources that assist in a broad range of sectors to make the Safety by Design principles actionable, achievable and effective. There are important inflection points and players across the technology ecosystem that need to be leveraged to enable real change. We have worked with investors, venture capitalists, and the start-up and incubation communities, to develop an investment toolkit for financial entities. Investors and VCs play a pivotal role in nurturing

tech ventures and founders. They are often much more experienced about what leads to business success, and they can help put safety and ethical considerations at the heart of their investment decisions and to help minimise their own risk in the process. We are also trying to shape a new generation of engineers, computer scientists and technologists and are seeking to help embed Safety by Design throughout university curricula around the world.

Safety by Design assessment tools

We have developed a set of dynamic and interactive assessment tools for early-stage start-ups as well as for mid-tier and enterprise companies. The purpose of these safety risk assessment tools is to guide, support and assist industry to truly embed safety into the culture, ethos and operations of the businesses, from the ground up. We are proud of these tools, which have been developed with industry, for industry. They have been built to be educative and informative, and to inspire – and have already garnered awards from the likes of AmCham Australia and InnovationAus.

The tools guide participants through sets of questions covering areas from leadership to internal policies, to moderation practices, to accountability measures, by asking about what systems, policies and practices are currently in place. The responses culminated in a tailored report that acts as both a safety health check and as a learning resource, pointing to areas that could be bolstered or strengthened, so that the bar of online safety can be continually raised. Importantly, the Safety by Design tools also showcase current good practice from across online industries and evidence-based resources, and templates. This is what makes the tools truly distinct. Companies are provided with tangible examples, workflows and videos from tech company leaders, to help actively address areas that may need bolstering or strengthening, guiding them on ways to improve and innovate.

The work continues

Our work does not stop here. We know from experience that online safety is a journey, rather than a destination. We will continue to develop and refine our Safety by Design resources as technologies and the digital ecosystem evolves – including considerations for online safety in the metaverse and Web 3.0. We believe that technology is a critical enabler for the future, but we simply need to make the online world a safer and less toxic place for all of us to yield its full benefits. Safety by Design sets a positive and clear pathway for industry to develop more responsible products and safe digital services. Our hope is that one day we will all be able to take the provision of online safety standards for granted, just as we do today with our cars.

The Age of Data: Vision and Reality

María González Gordon
Partner and Head of the Industrial Property,
Intellectual Property and Digital Business,
CMS

Jules Verne's *Paris in the 20th century*, written in 1863, was not published until 1994 because Verne considered its tone to be excessively pessimistic. It is the story of a man who lives in a city with glass skyscrapers, high-speed trains, and gas-powered cars, where there is an international communications network, which he describes as a kind of global telegraph that connects different regions to share information, something akin to today's internet.

In 1950 Isaac Asimov published *I, Robot*, a collection of nine stories describing intelligent robots created to assist humanity by respecting the famous three laws of robotics. In *Futuredays: A Nineteenth-Century Vision of the Year 2000*, Asimov presented a series of illustrations shown at the Universal Exhibition in Paris in 1900 by Jean-Marc Côté and other French artists. This group of visionaries made predictions that still seem surreal, such as a machine to change the weather or aerial firemen, but others are now commonplace, such as video calls or smart home appliances.

Both Verne and Asimov were science fiction writers, famous for ideas that were considered far-fetched and dystopian at the time, but which have in some cases been realised. On the other hand, many of the technological advances over the

past thirty years are far removed from what was imagined. In the 1980s the Internet was born as were the first personal computers and Motorola's DynaTAC 8000X, a predecessor to mobile phones. The Digital Age had begun. The 1990's then welcomed new inventions such as mp3, DVD and Google.

In the last two decades science has advanced at an ever-increasing pace, giving rise to new technologies such as Wi-Fi and 4G and 5G, Bluetooth, Artificial Intelligence (AI), 3D printing and augmented and virtual reality (AR/VR). Built on those technologies, social networks (Facebook, Twitter, Instagram or TikTok), YouTube, Google Maps, Amazon and video platforms like Skype (now Teams) have been launched.

My brother-in-law released the short film "*The APP*" five years ago. The tech behind the plot led to it being awarded more than eighty times and presented in up to 200 film festivals¹. "*The APP*" pictures the dilemma of a grey man who is offered a tech app that turned him into a "success" in life in exchange for surrendering his human freedom to decide. Described as "the short that foretold the future"² this film lays out some risks associated with technology when taken to the extreme and emphasizes the need for a balance between individual rights, such as the need for safety and privacy, and the advancement of technology.

We have entered the Age of Data

While we are still in the *Digital Age*, we are also in the *Data Age*, since these new digital technologies use data as their driving force and business driver and are what might be called *data centric*. This raises several important questions about the future of the industry.

1 YAQ DISTRIBUCIÓN (2021). "The APP". YAQ Distribución, available at <https://www.yaqdistribucion.com/cortos/the_app>. Date of reference: November 29, 2021.

2 MERINO, J. (2016). "The APP". Cortos De Metraje, available at < <https://cortosdemetraje.com/the-app/>>. Date of reference: November 29, 2021.

Google Maps, for example, may tell you how long it will take to get to the office (having learned by your daily activity where your home and your office are and whether you are running late because you stayed up watching videos late at night!). Or the highly customized marketing in social networks and e-comm platforms may suggest that you need to buy groceries because it has learned how often you go shopping, your favorite brands (perhaps tempting you with competitor offers), or how much you usually spend (or you can afford to spend because you have gone over budget that month). Think of enjoying your morning coffee while reading news items tailored to your interest, with the list of items magically adjusting to the time you have allowed for your break. (You probably did not even consider what might be missing from the list). How many of us have suspected that our phones are listening to us, when they make suggestions to us apparently out of the blue?

Industry 4.0 and the Data Economy

While Industry 3.0 drove the enhancement of ICT, Industry 4.0 focuses on the full integration of information to develop applications that enable a fully digitized society. A revolution has been unleashed involving new and disruptive technologies: the fourth industrial revolution or Industry 4.0. This encompasses advanced production and operational techniques powered by smart technologies integrated into business and our daily routine. These data enable individuals and businesses to reduce search and transaction costs and make informed choices. In the Data Economy many of our social and business interactions are datacentric. Technologies such as blockchain, robotics, AR/VR, AI, nanotechnology, and Internet of Things (IoT), among others, are driving this new technological stage. Industry 4.0 will fundamentally impact all economic ecosystems and, particularly, organizations.

On the plus side, it will lead to the optimization of production processes and the improvement of the relationship between business and consumers thanks to the use of smart systems

and the generation, processing and analysis of data. It will also change the workforce, with the requirement for new skills and roles. Forecasts indicate that by 2030 between 400 and 800 million people might be affected by automation of their jobs. The replacement of mechanized tasks by technological systems with great analytical capacity reinforces the need for workers to focus on developing so-called soft skills.

According to www.willrobotstakemyjob.com, I will be keeping my job as a lawyer (which is good news on the personal level...), but when it comes to paralegals and legal assistants, 85% of their current tasks will be automated. But the impact of Industry 4.0 is not limited to the legal profession. Since 2000 Apps based on these new technologies have become part of our everyday lives. We wake up and listen to music on Spotify or Youtube, review the latest posts on Twitter, update our CV on LinkedIn, etc. Decisions assisted by prediction systems are more and more frequent: we may watch what is suggested on Netflix, check our Bitcoin wallet value fluctuating on the stock market or just simply order food on UberEATS. Going to work in an autonomous car, living in an intelligent house, or undergoing a personalized medical treatment based on the analysis of your own data, now all seem to be just around the corner.

Challenges of legislation: under-regulation and over-regulation

While we may all agree that these new technologies make our daily lives easier, there are associated risks to data privacy, lack of transparency of algorithms that might lead to adverse impacts on competition or consumers. There are also many ethical issues with no clear answers.

Discussion about greater protection for privacy grows louder every day. Three years after Mark Zuckerberg appeared before the US Congress regarding the role of Cambridge Analytica, there was a new leak of Facebook documents about internal

policies and practices relating to consumer harms. In Australia, pressure is mounting on social media companies through proposed anti-troll laws that, if they become law, will enable courts to force social media giants to release the details of trolls in defamation cases. At the same time, legislation is being considered to treat platforms as publishers, with liability for illegal content.

We need to adapt our legislative approach to solve the conflicts that will undoubtedly arise in future. Unfortunately, the approach around the world has so far lacked consistency. While in Europe the regulatory framework focusses on the rights of the individual, other countries such as the United States or Japan advocate for more flexible regulation that promotes the development of the economy. This lack of harmonization has a clear impact on regions' competitiveness and organizations' strategic decisions.

When it comes to the US, fragmented regulation has led to many federal legal provisions that contemplate numerous exceptions and, moreover, are proven to have significant loopholes³. This means that companies might develop their business and products in one jurisdiction using large amounts of data where there are fewer regulatory hurdles but may have difficulties translating this to other jurisdictions.

Japan set a goal in 2016 to become the leader in the transition from "Industry 4.0" to "Society 5.0". In 2018, it adopted the Declaration to Become the World's Most Advanced Nation

3 CLARK, K. (2021). "The current state of US state data privacy laws". The Drum News, available at <<https://www.thedrum.com/news/2021/04/26/the-current-state-us-state-data-privacy-laws>>. Date of reference: November 18, 2021; DAVIS, M. (2021). "US must catch up with rest of the world on data privacy". Roll Call, available at <<https://www.rollcall.com/2021/10/14/us-must-catch-up-with-rest-of-the-world-on-data-privacy/>>. Date of reference: November 18, 2021; SALDAÑA, M. (2007). "La protección de la privacidad en la sociedad tecnológica: El derecho constitucional a la privacidad de la información personal en los Estados Unidos". Araucaria: Revista Iberoamericana de filosofía, política y humanidades, N° 18, 2007, ISSN 1575-6823, p. 85-115.

in Information Technology and published the Basic Plan for Advancing the Utilization of Public and Private Sector Data, which outlines the government's policy for promoting technologies such as AI and IoT. To meet these goals several legislative amendments were passed, both to the Personal Information Protection Act -to facilitate the use of Big Data in 2015-, and to the copyright protection regime -by creating exceptions to facilitate text and data mining in 2009.

New technologies, new values?

The EU began the process of developing a new framework to regulate new technologies in 2018 with the General Data Protection Regulation (GDPR), followed recently by the approval of the Data Package driven by the European strategic framework including the draft of the Data Governance Act, the Free Flow Regulation and the amendment to the Public Sector Information Directive, that became the Open Data Directive.⁴

In 2020 the EU launched its initiative “A Europe fit for the Digital Age”⁵, with the aim of striking a balance between competitiveness and the protection of individual human rights. One of the key instruments of this project, “*Shaping Europe’s Digital Future*”⁶, aims to address three challenges: (i) technology that works for people, (ii) a fair and competitive digital economy; and (iii) an open, democratic, and sustainable society.

It is no coincidence that Margrethe Vestager, the EU Commissioner for Competition, was appointed as Executive VP for Europe fit for a Digital Age. In Vestager’s own words:

4 Directive (EU) 2019/1024 of the European Parliament and of the Council of 20 June 2019 on open data and the re-use of public sector information.

5 EUROPEAN COMMISSION. (2020). “A Europe fit for the Digital Age”. European Commission Factsheets: A Europe fit for the Digital Age, available at <https://ec.europa.eu/info/publications/factsheets-europe-fit-digital-age_es>. Date of reference: November 29, 2021.

6 EUROPEAN COMMISSION. (2020). “Shaping’s Europe’s digital future”. European Commission Press Corner: Shaping’s Europe’s digital future, available at <https://ec.europa.eu/commission/presscorner/detail/en/fs_20_278>. Date of reference: November 29, 2021.

“Ensuring a global playing field in terms of competition is of the utmost importance, in particular when our competitors are not subject to the same rules as regards State subsidies. This is why I will work on developing the appropriate tools to guarantee fair competition both in the Single Market and at the global level.”⁷ This implies that setting boundaries around the use of data from third States can benefit the European Union and its citizens.

Ursula von der Leyen, President of the European Parliament, in her Mission letter to Margrethe Vestager declared “Over the next five years, Europe must focus on maintaining our digital leadership where we have it, catching up where we lag behind and moving first on new-generation technologies. This must cut across all our work, from industry to innovation. At the same time, we must ensure that the European way is characterized by our human and ethical approach. New technologies can never mean new values.”

The EU has recently begun to adapt its existing regulatory framework after a thorough discussion of the general and ethical principles on which it will be based with the aim of creating a legislative package that enables the use of technology while ensuring a level playing field.

Advances in digital technologies are clearly progressing much faster than legislation, resulting in unpredictability and legal loopholes. Legal uncertainty always generates a risk that can manifest itself in two ways: under-regulation and over-regulation. Under-regulation usually means that top-tier tech companies are subject to light touch restrictions, with the aim of stimulating innovation. While this may seem beneficial to the consumer, the use of datasets employed in AI systems

7 EUROPEAN COMMISSION. (2020). “Answers To The European Parliament Questionnaire To The Commissioner-Designate Margrethe Vestager”. European Commission, available at <https://ec.europa.eu/commission/commissioners/sites/default/files/commissioner_ep_hearings/answers-ep-questionnaire-vestager.pdf>. Date of reference: November 30, 2021.

may adversely impact individuals' fundamental rights, such as privacy, intimacy or safety. Additional regulation may then be needed to overcome any potential negative effects. On the other hand, over-regulation can constrain R&D activity and competitiveness. There should be flexibility to allow for the development or inclusion of future technologies and applications, avoiding legislation that quickly becomes obsolete.

Regulation enables a balance to be struck between connectivity and users' rights (including but not limited to privacy and safety). While it may be difficult to determine a legislative framework appropriate to all relevant stakeholders, setting some key principles that enable clear responsibility and governance should enable us to move forward in the right direction. In addition, the following principles should apply: i) standardized regulatory frameworks that allow for new guidelines to be developed when new technologies emerge, (ii) proactive collaboration between the private sector and civil society (NGOs, think tanks) to identify and address emerging risks as quickly and effectively as possible; and (iii) a thorough analysis of all the different sort risks that may arise from innovation. So, can new technologies mean new values? It is all about finding the right balance.

Ethical dilemmas

As philosopher David Wong once said: "New technology is not good or bad, it has to do with how people choose to use it." Technology ethics encompass the respect for employees and customers, the moral use of data and resources, the responsible adoption of disruptive tech and the creation of a culture of responsibility. In other words, the focus should be on whether particular uses of technology are ethically acceptable, and what restrictions should be placed on those uses to protect individuals' rights and a competitive market.

The tech industry and some institutions are trying to establish specific best practices and guidelines to guide tech ethics, but this is not new territory for business, with many companies now struggling with ethical dilemmas around the use of AI driven technologies, and the need to set and promote their ESG credentials.

Autonomous decision-making systems can lead to biased decisions in processes such as tenant selection and mortgage qualifications, as well as hiring and financial lending discrimination. Bias is often found in the outcomes predicted by black-box machine-learning systems, because of the inherent biases in data used to train them⁸. Disagreement remains on how to globally address this problem, with some proposing the creation of public-private oversight committees, with the aim of increasing transparency in algorithms, in addition to government regulation.

Autonomous vehicles also pose a cybersecurity risk. Self-driving cars might fail in their predictions and decisions due to a technical mistake or because of the loss of a connection. But even if the AI does not actually fail, it could make decisions that might be considered morally wrong one. Autonomous vehicles could also be vulnerable to cyberattacks or even manipulation of the navigation system by adding paint on the road for example. These types of alterations can lead to the algorithm wrongly classifying objects, and subsequently to the autonomous vehicle behaving in a way that could be dangerous.

Different countries will probably develop their own guidelines to reduce the risks in human-robot interactions and the possibility of using these AI based technologies to manipulate and abuse humans in sensitive circumstances, such as in health care, care of the elderly or persons with disabilities,

⁸ AKSELROD, O. (2021). "How Artificial Intelligence Can Deepen Racial and Economic Inequities". ACLU News, available at <<https://www.aclu.org/news/privacy-technology/how-artificial-intelligence-can-deepen-racial-and-economic-inequities/>>.

in education, or as used by children in toy robots, chatbots and companion robots. Similar ethical concerns exist for AR/VR. When designing a simulation, there needs to be careful consideration of what to include, prioritizing user's safety and balancing the freedom to create with ethically valid content restrictions.

Internet governance also remains a highly contested topic, brought on by the power of social networks and other gatekeepers. There has been a focus on internet governance in some very specific areas, under the ITU (International Telecommunications Union), WIPO (World Intellectual Property Organization) and ICANN (Internet Corporation for Assigned Names and Numbers). Nonetheless, there is a gap when it comes to certain aspects such as freedom of speech or users' privacy. The Internet Governance Forum (IGF) seeks to promote a "healthy balance between States, society and companies", but there is remaining uncertainty about how to deal with some aspects and the lack of legislation makes it difficult to achieve an effective standard of internet governance.

UNESCO has declared internet governance to be a key issue, acknowledging *the potential of the Internet for fostering sustainable human development and building inclusive knowledge societies and for enhancing the free flow of information and ideas throughout the world. It advocates an open, transparent and inclusive approach to internet governance based on (and guided by) the principle of openness, encompassing the freedom of expression, respect for privacy, universal access and technical interoperability.*⁹

The Spanish Data Protection Agency (SDPA) has been a pioneer in attempting to address these ethical dilemmas and has issued a Digital Pact for the Protection of People¹⁰. This is

9 <https://en.unesco.org/themes/internet-governance>

10 AGENCIA ESPAÑOLA DE PROTECCIÓN DE DATOS (2021). "Digital Pact for the Protection of People". AEPD: Pacto Digital, available at <<https://www.aepd.es/es/pactodigital>>. Date of reference: November 22, 2021.

considered an instrument to encourage signatories to put in place sustainability policies and respectful business models, based on (i) the greatest possible transparency for users, which implies users' knowledge of what data are being collected, when they are registered and what they are used for; (ii) the promotion of gender equality, protection of children and women victims of gender-based violence and other people in situations of vulnerability; (iii) the prevention of biased decisions made by algorithms on grounds of race, origin, beliefs, religion or gender, among others; and (iv) the endorsement of values like dignity, freedom, democracy, equality, individual autonomy and justice and insert them within the governance of mechanical reasoning. This list of best practices constitutes a tool for protecting individuals' fundamental rights and also an asset and a distinctive element of competitiveness for both public and private sectors. As an example, Telefónica has released in 2021 its own Digital Pact.

Trust is key to overcome this ethical dilemma. In fact, trust is the cornerstone of the European Union's digital strategy. Trustworthy technology should allow science to progress without most relevant rights of the individual being seriously affected. Trustworthy technology involves users understanding how the technology works, its risks and benefits, allowing them to make a responsible use of the technology.

Guidance for the future

When Internet and Web pioneers devised the foundations of the digital technologies we use today, they were trying to create a global network of knowledge accessible to all. Most experts at the time could not imagine where their vision would lead: to a complex parallel virtual world, driven by economic interests and in which people carry out most of their daily lives. Rights and freedoms that individuals and societies have fought for and won have been brought into play: equality, physical and moral integrity, honor, reputation, intimacy and privacy, property, image, free expression, dignity, freedom of opinion,

circulation, assembly, association. As in the physical world, the all-encompassing nature of life in the digital world has led nations and legislators to try to establish boundaries to avoid the most perverse and damaging uses of these technologies.

How we adapt to this change will be fundamental. No one can anticipate how technologies will develop further. By 2030 experts predict that space trips will become commonplace, and advances such as 3D printed organs or mind-controlled prosthetics will be considered normal. Advances in technology will continue to rewrite the rules for business behavior, whose leaders are eager to use these technologies to drive growth, for fear of missing out.

We need to move from a “data centric” to a “people centric” approach. Big data analytics have a positive impact on people’s lives, but they also have real consequences for the safety and privacy of individuals. Technological advances must still respect fundamental rights. Companies should be encouraged to continue R&D; regulation should not hold back technological progress where risks have been mitigated.

We must find a balance between over-regulation and under-regulation. A comprehensive, transparent, and efficient framework should enable future innovations while protecting users’ rights. We also need harmonized regulation. The size and importance of the EU internal market (and population) means that the EU’s more restrictive regulatory frameworks, in comparison to the US, might become a de facto global standard. This could lead to a ratcheting up of regulation, as non-EU corporations might advocate for similar restrictions in their countries of origin to harmonize their products and services as much as possible to make them globally competitive.

We need an ethical level playing field. Corporations should be obliged to guarantee the ethical standards of their products from the very moment of their design (ethics by design). Monitoring of this ethical approval should be based on

public-private collaboration to establish moral principles and technological progress for the common good. We need to face the challenges that science and technology bring, addressing our (cybersecurity) fears, and managing ethical questions.

The solution is awareness and trust. Real issues and real risks need to be known and understood by users, especially minors or vulnerable people. The burden of raising awareness cannot only be placed on platforms or the tech creators. Users must do their part. By understanding the potential positive and negative consequences of the use of a given technology, we can (best) ensure trust.

The pioneers of digital technology understood the impact it would have in the context of their goals of enhancing global communication and knowledge. Let us achieve a similar level of awareness and trust for the nearly five billion users of the internet and emerging technologies today and we will ensure that they will make our lives better, as their visionary creators intended.

Protect what matters

Anna Borgström
CEO NetClean

The internet is rapidly becoming the predominant gateway to information but also a hub for many illegal activities. When traditional offline crimes become cybercrime, they increase in scale with the use of computers and networks, reaching and affecting far more people than previously possible.

One crime that has found a dark home online is child sexual abuse crime, which is disseminated through the many layers and services online.

My understanding is that most people know about the problem of child sexual abuse material in relation to the internet, but they are underestimating the risk to businesses. But there is hope, with technology, awareness, and the right actors in play, we can prevent online child sexual abuse and reduce the harm to victimized children.

Awareness is high, but risk to businesses is underestimated

In 2021 NetClean did a first of its kind survey targeting more than 1000 senior IT professionals globally assessing the threat that organizations and companies face from child sexual abuse material (CSAM). I must say that I was taken by the numbers that were revealed, but I'm not at all surprised. The survey showcases that most respondents have had an incident of CSAM over the past five years, and a large amount have had several repeat cases.

To add an extra level to it, the pandemic has accelerated remote-work and weakened human connections, which in turn have exposed companies to an even higher risk that their company devices are used to spread and consume child sexual abuse material.

Over the years when I have spoken to IT security directors and managers in medium to large companies, they often disclose that they have stumbled across suspected child sexual abuse material on company computers. The images or videos are often discovered when the computer has caught a virus and is taken to the IT department for a clean-up.

Child sexual abuse material is often accessed or downloaded from risky environments, and employees using their work computer to commit this crime often expose their computer or device to different types of security threats, such as malware, trojans and viruses. The employees can also leave traces that could lead back to the company.

Some of the IT professionals I have talked to have touched on the risk of blackmail. Accidental exposure to child sexual abuse material is another risk, particularly to the IT personnel who must cope with what he or she has seen. If you are exposed to child sexual abuse material and not trained for it, it can be very traumatizing.

Businesses must have a solid action plan

What surprises me the most, is that 64% of all organizations have experienced a case of child sexual abuse material in the past five years and 57% of the respondents have had repeat incidents in the same organization. That is a lot.

It is vital that businesses have an action plan in place to secure evidence correctly, ensure the welfare of employees who might have seen the content, and manage the offender who has downloaded child sexual abuse material to the IT

environment. Next, notifying Law Enforcement is crucial. It is only when incidents are investigated that more material can be found, and children can be safeguarded.

Words are not enough

There are many business-critical reasons for companies to take clear actions on child sexual abuse material. Keeping their IT environment clean and secure will protect the company, the reputation, the brand, and the employees and ultimately reduce real-world harm to children. It's the companies that not only dare to take a stand, but also act according to their values that attract the brightest minds, something that I can see becoming increasingly important when recruiting the next gen of employees. And I think that most business leaders can agree with me, attracting and retaining the right people is key when driving a successful business.

I'm content to see that the awareness is rising around the issue and risk of child sexual abuse material. But it is not enough. Every business leader needs to step up, take ownership and realize that this is not someone else's issue. There are ways forward, where technology and collaboration are fundamental.

For me, 2022 is the year when we together turn awareness and words into actions and create a real impact – protecting what matters.

Misinformation: The New Weapon of Mass Destruction

Caroline Logan
Manager, CollaborateUp

In early 2020 dozens of 5G towers were set on fire throughout Europe.¹ The cause? False information spread online claiming that the millimeter wave spectrum used by 5G technology causes COVID-19. The falsehoods were backed with the fact that Wuhan had installed 5G towers before the COVID outbreak. The claims spread online like a wildfire motivating many to burn down the towers meant to boost connectivity.

The destructive nature of mis- and disinformation extends far beyond the well meaning aunt or uncle sharing conspiracy theories on Facebook. The threat posed by misinformation (an untruth) and disinformation (an untruth, deliberately spread) is growing in scope and scale. Mis- and disinformation erode trust in public institutions, exacerbate class conflict, cultivate fear and hatred, embolden hostile actors, and jeopardize democracy.

Impact of misinformation

Similar to a nuclear weapon, there are some big boom impacts resulting from misinformation that are easy to see and understand. However, floating under the surface are countless invisible and insidious effects that continue to spread and unleash harm on the population.

¹ <https://apnews.com/article/health-ap-top-news-wireless-technology-international-news-virus-outbreak-4ac3679b6f39e8bd2561c1c8eeafd855>

Consequences manifest in the realm of politics, public health, the environment, and technology - causing harm, and even death. If individuals are misinformed, they may make decisions for themselves or their families which are not in their best interest. When you compound misinformed decisions across the globe, it is clear the magnitude of consequences and subsequent ripple effects on society have yet to be realized.

The spread of misinformation is not a new phenomenon. In 1622, London Printer Nathaniel Butter started the first British Newspaper, garnering rapid popularity. However, the paper was embellished with inaccurate details and in some cases, included stories that were simply made up. By the 19th century, members of the British parliament lamented that they no longer had much power given the influence of the newspapers on British subjects.²

While misinformation has been around for centuries, the technologies and platforms that now connect billions of people globally have magnified the threat. The acceleration of digital technologies has made information more accessible and shareable, increasing the speed at which lies spread. To make matters worse, a well-constructed lie often spreads faster than a complicated truth.

We have more information at our fingertips than ever before, and yet in the swirl of abundant noise it is increasingly challenging to delineate fact from fiction. The internet does not have conventional gatekeepers such as professional editors and fact-checkers, making us our brothers' and sisters' keepers when it comes to sharing news and information on social networks.

² A very Short History of Mis- and Disinformation, John Maxwell and Heidi Twarek in <https://collaborateup.com/news-literacy-and-misinformation-disinformation-in-the-era-of-covid-19/>

Defining the issues

In order to explore the impacts and potential solutions to mitigating the spread of mis- and disinformation, CollaborateUp convened a series of consultative roundtables in regions all over the world to better understand how governments, companies, and civil societies in these geographies experience and approach this growing phenomenon. The report³ published following our research identified trends and recommended solutions outlining how we might understand and combat the effects of misinformation.

One of the most profound trends resulting from our research highlighted our continuing inability to address human psychology in the technology platforms and regulatory frameworks. Our brains are built for an analog world with instincts, autonomic responses, and cognitive coping mechanisms ill-suited for a digital world. Social platforms intentionally take advantage of these features, manipulating our own human wiring. As a species we have not yet had time to adapt to the way information is shared and exchanged in a digital world.

Studies show that social media can be as addictive as gambling or drugs.⁴ Social media platforms track individual behavior, creating a tailored experience – engineered with feedback loops that promote addictive use of the platform. Unfortunately, negative or inflammatory content is more memorable than objective, fact-based content, which reinforces greater use of the platform and results in more frequent sharing of content that may not be supported by data or grounded in facts.

Content that appears on tech platforms is tailored with algorithms that intentionally aim to consume our attention and

3 <https://collaborateup.com/news-literacy-and-misinformation-disinformation-in-the-era-of-covid-19/>. The study was supported by Philip Morris International (PMI). CollaborateUp retained full independence in the research, writing, and editorial and peer review phases of the study.

4 Busby, M. (2018, May 8). Social media copies gambling methods “to create psychological cravings.” The Guardian.

are largely based on individual exposure to and interaction with content. As a result, algorithms are not objective sources of balanced information, but custom designed by virtue of the user's interaction – and therefore biased. Exacerbating the problem, in many cases reporters are incentivized based on the number of clicks their articles receive, reinforcing the use of inflammatory and misleading headlines.

Tech platforms are ripe for the spread of mis- and disinformation for a number of reasons. Information can now be more easily manipulated than ever before with digital tools. Studies show that “shallow fakes” created by amateurs compared to “deep fakes” created by sophisticated malign actors are more common and impactful in the spread of mis- and disinformation.⁵ New mediums such as memes which capture an emotion in a simple moving picture have redefined the way a message can spread through powerful sentiment.

Inside the echochamber

As information consumers and platform users, we are collectively impulsive and inattentive. After conducting a study on the impact of a “like” or “retweet,” researchers at the University of Notre Dame found that many social media users will share content based on only partial information, such as a title, without actually clicking on a link or reading its content.⁶ Research shows that while people claim to value accuracy first and foremost when sharing information, the most significant factor that contributes to sharing is signaling our group belonging.⁷ As a result, social media has quietly and effectively become a form of tribalism.

5 Yankoski, Michael, Walter Scheirer, and Tim Weneringer. “Meme Warfare: AI Countermeasures to Disinformation Should Focus on Popular, Not Perfect, Fakes.” *Bulletin of the Atomic Scientists* 77, no. 3 (May 4, 2021): 119–23. <https://doi.org/10.1080/00963402.2021.1912093>.

6 Glenski, Maria, Corey Pennycuff, and Tim Weneringer. “Consumers and Curators: Browsing and Voting Patterns on Reddit.” *IEEE Transactions on Computational Social Systems* 4, no. 4 (December 2017): 196–206. <https://doi.org/10.1109/TCSS.2017.2742242>.

7 Kim, Grace. “Fake News: Analyzing News Sources.” Notre Dame de Namur University, n.d. <https://library.ndnu.edu/fakenews/identifying>.

We process information the most fluently and are more likely to believe it when it feels familiar. Whether we process something analytically or intuitively, our mental models favor the acceptance of messages that are compatible with pre-existing beliefs as the message does not contradict current knowledge and as a result “feels right.”⁸ Whether conscious or not, people are drawn to social media because it often reconfirms their pre-existing beliefs and many find themselves in an echochamber, where sources of information feel familiar.⁹ Before the birth of the internet, most people got their news from their neighbors and familiar faces in their community. The “Metaverse” intentionally simulates this same sense of community, tricking our brains into believing we are chatting with familiar neighbors when in many cases we are online with an infinite network of strangers all over the globe. The result is we are more likely to believe misinformation if these sources feel familiar, rather than approaching information with a skeptical eye.

Can we correct misinformation?

Although there has been a significant emphasis placed on fact-checking misinformation and disinformation in traditional media, on social media platforms, and in closed networks – and these efforts should continue – it is essential that we focus more heavily on producing and distributing fact-based information in the first instance.

This is critical as we possess cognitive factors that often render misinformation resistant to correction.¹⁰ Research has shown that once individuals read, hear, or see false information, it is impossible to erase its influence. Further, many correction attempts repeat the false information in the process of debunking it, heightening the visibility of the myth,

8 <https://journals.sagepub.com/doi/pdf/10.1177/1529100612451018>

9 GCFGlobal. “Digital Media Literacy: How Filter Bubbles Isolate You,” n.d. <https://edu.gcfglobal.org/en/digital-media-literacy/how-filter-bubbles-isolate-you/1/>.

10 Lewandowsky, S., Ecker, U. K. H., Seifert, C., Schwarz, N., & Cook, J. (2012). “Misinformation and its correction: Continued influence and successful debiasing.”

and possibly spreading it to people who might otherwise have never seen it.¹¹ In this way, even if false information is corrected and we believe the correction, the human psyche is forever reconfigured.

A study conducted by Schwartz et al examined our memory for misinformation, seeking to explore why retractions of misinformation are so ineffective. His study showed that efforts to retract misinformation in some cases backfire and, ironically, increase misbelief. Schwartz makes an important distinction between ignorance and misinformation, noting that ignorance rarely leads to strong support for a cause. In contrast, false beliefs based on misinformation are often held with strong and infectious conviction. For example those who vigorously reject the scientific evidence for climate change also believe they are the best informed about the subject.¹²

Misinformation retractions can also be ineffective because of our innate reactions to certain sources.¹³ People generally do not like to be told what to think and how to act, so they may reject particular retractions. Considerable research has been dedicated to the impact of misinformation effects in a courtroom setting wherein mock jurors are presented with a piece of evidence that is later ruled inadmissible. When the jurors are asked to disregard the tainted evidence, their conviction rates are higher when an “inadmissible” ruling was accompanied by a judge’s extensive legal explanations, thick with legal jargon, than when the s/he left the inadmissibility unexplained.¹⁴ Under this “continued influence effect,” people will continue to rely on the misinformation to which they have been exposed, even after retractions or corrections.¹⁵

11 Schwarz, N., Newman, E.J., & Leach, W. (2016). “Making the truth stick and the myths fade: Lessons from cognitive psychology.” *Behavioral Science & Policy*, 2(1), 85-95.

12 (Leiserowitz, Maibach, Roser-Renouf, & Hmielowski, 2011).

13 Brehm & Brehm, 1981

14 Pickel, 1995, Wolf & Montgomery, 1977

15 Lewandowsky, S., Ecker, U. K. H., Seifert, C., Schwarz, N., & Cook, J. (2012). “Misinformation and its correction: Continued influence and successful debiasing.” *Psychological Science in the Public Interest*, 13, 106-131. — DOI 10.1177/1529100612451018

How might we begin to make strides in countering misinformation when our human wiring is stacked against us? One promising tactic is to train fact-checkers on the best way to correct false claims while avoiding unintended consequences that may actually reinforce the “stickiness” or believability of false information. Correction strategies should focus on emphasizing what’s true without repeating the details of the false information. Furthermore, fact checkers should provide a simple brief rebuttal in order to retain the attention of information consumers. In order to create common ground and avoid patronizing consumers, it is also useful to frame evidence in a worldview affirming manner by enforcing the values of the audience when correcting misinformation.¹⁶

A plan to tackle online misinformation

To make information more useful, it needs to be interoperable, usable by multiple institutions regardless of origin. In addition, information needs to be verifiable by independent sources so that more people can rely upon it. Governments can play a role in ensuring that information is gathered according to commonly agreed-upon standards and establish processes for verification and oversight to reduce misinformation.

While social media companies have started taking greater responsibility, as currently constructed, their platforms play to the worst of the human psyche and legislators and regulators lag in their ability to provide guidance and oversight. Left alone, social media companies will continue to prioritize profit over the public good. Just as tech platforms have leveraged human behavioral science to increase their user base, they have the opportunity to apply that same science to mitigate the spread of mis- and disinformation. Exploring this potential connection has not yet received significant traction, overburdening the individual user with responsibility for making judgments on the accuracy of information.

There have, however, been some encouraging initial experiments and proposals for how to tackle this problem:

- Twitter has responded by piloting a “**pause button**” that encourages people to click and read before sharing. This approach could be scaled, as could other “autonomic nudges” that cause us to make different choices. These “nudges” add an extra step in the process of sharing to disrupt the instinctive behavior of sharing immediately. Such “strategically introduced friction” might be the interruption needed to punctuate the dopamine-seeking reward loop and our addiction to share mis- and disinformation.
- Experts recommend some form of **media literacy education**, coupled with tech-enabled nudges to encourage people to have more unconscious and automatic responses to misinformation. News or media literacy is defined as “the ability to determine what is credible and what is not, to identify different types of information, and to use the standards of authoritative, fact-based journalism as an aspirational measure in determining what to trust.”¹⁷
- **Local journalism and CSOs** can play a key role in supporting fact-checking, media literacy, and the spreading of accurate information at a more local level. This can be useful in communities where organizations have credibility and are rooted in the fabric of the local ecosystem. Local journalists and CSOs can become the conveyors of truth, correcting misinformation when it arises.
- **Regulators** have an opportunity to intervene, introducing different incentives to influence the behavior of information consumers, providers, and distributors. Platforms need to strike a balance between meeting their business needs and answering to the public and its concerns without stifling freedoms of expression. The development of technology should not be hindered, but rules and guidelines can help create incentives that will help these companies better protect users and make the internet a safer place to be.

17 <https://www.edsurge.com/news/2020-11-07-the-u-s-election-underscores-the-need-for-teaching-news-literacy-in-our-schools>

Media outlet leadership needs to be convinced to invest in long-term efforts that will help combat mis- and disinformation. No single entity will be able to eradicate mis- and disinformation alone. Successfully overcoming this formidable challenge requires a global, multi-stakeholder approach – uniting individuals, civil society, business, and government behind this common purpose.

The changing face of cybersecurity

Emma Burnett
Partner and UK Head of Technology and Data Protection
CMS

As a member of Generation X, I moved fairly seamlessly from analog to online, perhaps not noticing how quickly and completely day-to-day tasks were transformed. The next generations, as we all know, have emerged as digital natives and know almost nothing of the rotary phones, payphones, fax machines and dial-up connections that were so central to our lives.

Today, we hold our whole lives on our phones, where we easily complete once onerous tasks such as banking and bill payments, while participating in new areas such as multimedia, social media and cryptocurrency investment. But these phones, and the routes they offer into our lifestyles and our employers, are an attacker's dream come true.

A new criminal opportunity

Looking back at the last 30 years, what's most notable is the rapid development and proliferation of technologies available to individuals including employees of SMEs and large corporations. Against this backdrop, risks and threats - both intended and accidental - have moved to the digital realm. Common criminals and other malicious actors have adapted, following their targets - both small and large entities - online.

During my career as a data protection lawyer for 20 of those 30 years, I've witnessed dramatic changes across the compliance landscape. I've supported clients navigating their way through

ever-increasing and complex legal threats in the cyber world. To do this, I've recruited more and more privacy experts into my team in order to meet client demand for data protection compliance advice. Data law was once obscure, but is now front, right and centre.

Increasingly sophisticated ransomware attacks

Ransomware has become one of the most frequent and disruptive types of cyber incident my clients face. Usually, this consists of a computer virus that disables computers and encrypts systems and files so that the affected entity cannot view or access those files. They then demand a ransom, in exchange for a decryption key to restore systems and restore impacted files. These criminals have become savvier, seeking to extract huge sums from businesses, in some cases using simple tools to exploit vulnerabilities. There is a highly active underground economy that looks very much like legitimate commerce. Some ransomware groups even have customer service and IT support.

Around the millennium, cyber criminals were less prolific, but around 2010, it became cheaper and seemingly easier, leading to blanket attacks on a higher volume of lower-value targets. Now, it is just another form of extortion, one method among many used by organised crime gangs.

Now, an attack on a service - or a denial of service - has evolved into **double extortion**: a target that does not pay ransom will lose their data, which may then be shared with clients, competitors or on the dark web. What's more, the ransomware can propagate and spread, and once caught, require a large clean-up operation.

A **triple extortion**, which could involve healthcare, aircraft or national infrastructure, might comprise a convergence of cyberattacks, in which a first attack lays the grounds for future attacks.

Finally, **quadruple extortion** might see criminals encrypt a target's data, steal and threaten to release it, and then deny service before beginning to harass customers and employees directly or on social media.

However, attacks can also often come in a very basic way, now that the barriers to entry have fallen. It is even possible to purchase ransomware-as-a-service on the internet. Typical vulnerabilities could include legacy systems, or just poor basic security. Any decision to make a ransom payment should only be taken after considering whether all other options have been exhausted; whether or not the payment itself is lawful, and whether it requires consent from, for example, the insurer or another third party. Fortunately, SMEs and corporations have also become savvier, and those that are both knowledgeable and prepared are now equipped to better prevent - or at least overcome - attacks.

Telecoms sector vulnerabilities



While digitisation has many advantages, it also creates more potential entry points for attacks, targeting those who use the technology as well as the providers of that technology. Our communications infrastructure has never before been in such high demand, or of such critical importance.

Smishing, or phishing using SMS, is one of the new simpler techniques I now see. SIM farms enable this type of activity

to be facilitated on a mass scale. These attacks on individuals appear to originate from sources such as government tax and Covid authorities, large logistics companies, the largest tech and social media companies and online marketplaces, as well as major businesses such as insurers and mobile operators.

In 2019, the US had over 100,000 victims of phishing, smishing, vishing and pharming, causing more than \$57 million in losses. Over the same period, there were 2,373 malware and virus attacks, leading to around \$2 million in losses, according to IC3, the FBI's cybercrime complaint division. Over a three-year period (June 2016 - July 2019), the Europe Payments Council reported over 166,000 phishing complaints worldwide, leading to \$26bn in losses.

Critical digital infrastructure

The move to 5G, and concurrent network virtualisation, will further enable devices and machines to communicate with each other, and create platforms for entire companies and industries. While again this is exciting, the sector is particularly attractive to attackers due to the very nature of its critical infrastructure and access to millions of customers' personal data.

In 2015, UK operator TalkTalk suffered a cyberattack that resulted in 157,000 customers' personal details being accessed. Of these, 15,600 saw their bank account numbers and sort codes being stolen, while a further 28,000 credit and debit cards were "obscured," meaning they could not be used. As a result, TalkTalk shares immediately fell by a third, and the company was fined £400,000 by the Information Commissioner's Office (ICO). Four people, three of them teenagers, were arrested in connection with the attack. Many countries are also adopting industry-specific laws for communications network providers and communications network operators, requiring them to take appropriate steps to guarantee the integrity of their networks and to ensure

the continuous availability of the services provided via those networks. This is often also coupled with telecoms-specific data protection regulation and reporting obligations which can, in some countries, mean breach notification deadlines of mere hours.

In December 2021, T-Mobile Polska faced a distributed denial of service (DDoS) attack, in which attackers tried to paralyze a network by flooding it with high volumes of data traffic. The company described this as the largest of its kind across both T-Mobile's regional businesses and on any Polish mobile business. Though its critical systems were not impacted, the company is now analyzing the damage and preparing a report to the relevant agencies.

Building a multi-disciplinary cybersecurity team and strategy

Regardless of industry sector, I always advise my clients to create a team of trusted experts *before* an incident happens - not after - so that they can collectively respond more quickly, more intelligently, and more seamlessly in a time of panic. Resilience must be built into working practices.

Cybercrime is organized crime that often operates just like a business. In order to become more resilient to cyberattacks, you need to match this by setting up a multi-disciplinary team responsible for managing cybersecurity. Representatives from across departments, as well as external advisors, will need to be involved.

Any cybersecurity strategy must be rooted in an understanding of your company's legal obligations. These fall into four broad categories: contractual and intellectual property obligations, privacy laws, cybersecurity laws and industry regulations.

First and foremost, compliance policies and processes must be widely understood and embedded into all operations.

Keep data secure: Your organization will likely be subject to obligations to keep data secure, whether under privacy laws, cybersecurity laws, sector regulation conditions or contractual commitments to third parties. The obligations will depend on the nature of your business and the jurisdictions in which you operate.

Manage third parties: Data laws, as well as contractual commitments, typically require organizations to take responsibility for the people with whom they share data. For example, if you work with a technology vendor and share data with it, you must manage that vendor and ensure they keep data secure. The vendors themselves must demonstrate how their security measures meet the necessary standards. Any cybersecurity strategy is only as strong as the weakest link in the chain. If the partners with whom you share data or content do not have strong security measures, you are exposed.

Communicate and train the team: A strategy is only effective if it is applied. Developing a plan is only the first step, so there must be a culture of security across the business, with top-down support and frequent training for all relevant personnel. This reduces risk, and potentially reduces your exposure if a breach does occur, as regulators will often look at training when assessing whether appropriate measures had been in place. For large organizations, in-person training can be a logistical burden, so advisers such as CMS are increasingly offering eLearning solutions that can be immediately rolled out.

Test it: Just as regular drills are necessary to prepare for a fire, organisations should regularly test their cybersecurity plans to ensure that they are fit for purpose, and that each relevant team member knows their role. As a starting point, I recommend carrying out a cybersecurity incident workshop, based on a rolling breach scenario, with representatives from senior leadership, legal and compliance, HR, PR and communications, IT and operations.

Keep it under review: Each data incident poses new challenges for response teams, and as data regulation evolves, your business' approach to data security and data breach response must also evolve.

Notify if a breach occurs: Data laws increasingly require notification if a breach occurs. For example, the EU's GDPR will require organisations to report certain types of data breaches to regulators, and in some cases to affected individuals, within 72 hours of becoming aware of the breach. At a contractual level, you may also be required to notify affected partners. In the UK, 25,965 incidents were reported to the Information Commissioner's Office (ICO) between 1 July and 30 September 2021, of which 6,452 were cyber. Of the total, 5,000 incidents impacted the health sector, with education & childcare the next most affected.

Penalties and business impacts

Although the financial penalties are potentially large and must be taken seriously (e.g., GDPR carries a maximum fine of 4% of worldwide turnover, or €20 million), the greater concern for many companies will often be:

- an **inability to operate the business** whilst IT systems have been compromised without suitable back-up;
- loss of **valuable intellectual property rights**;
- **contractual and civil exposure** – a cybersecurity incident could place you in breach of contractual obligations to third parties or exposure to claims from data subjects (including the potential for substantial class actions); and
- **reputational fall-out** – breaches often make the news but even when they don't, regulators commonly “name and shame” organisations that fall foul of the rules. The reputational impact of a cybersecurity incident can be difficult to quantify and can range from loss of subscribers to longer-term brand damage.

Consider cybersecurity insurance

Several large insurers offer cyber coverage, which should be considered as part of your overall insurance strategy.

In 2019, Sophos noted that 48% of UK organisations had faced ransomware attacks between 2019 and 2020. Of these, 13% had reportedly paid the ransom - an average of \$840,000. Surprisingly, given these figures, some 32% of UK companies have a cybersecurity insurance policy that does not cover ransomware. Policies used to be quite generous, because insurers hadn't anticipated the enormous increase in ransom attacks, but the cyber insurance market is experiencing a sharp increase in premiums, tighter underwriting and cover for ransomware-related claims is limited.

Looking ahead

Cyber and ransomware attacks are not going to go away anytime soon, and in my view, it is not a question of whether an organisation will be involved in a cyber incident - but when.

Lindy Cameron, CEO of the UK's National Cyber Security Centre, said during a 2021 speech: "Because cyber security is a team sport, and everyone has their role to play - it can't just be a problem for anyone to ignore and assume somebody else is solving." The public and private sectors must work together to educate citizens about how they can protect their own data. Regulators and information security officers must also collaborate to share information about threats, report them as soon as they occur, and learn from attacks. More specifically, reflecting on the increasing risk of a ransomware attack, with its potentially high operational impact, establishing emergency plans and protocols is a critical investment. The more time an organisation saves by setting up incident response teams, the more effectively internal and external lawyers like myself can help support the myriad of legal challenges resulting from any attack.

The Infodemic: Using education and gaming to counter online misinformation

Interview with Melisa Basol

Over recent years, online misinformation has grown exponentially, especially during the COVID-19 pandemic, to become a real threat to public trust in what is available online. Some innovative solutions to the so-called “Infodemic” have been suggested or tried.

The Mobile Century (TMC) spoke to **Melisa-Silem Basol**, a PhD candidate and Gates Scholar at Cambridge University. Melisa is part of a team which developed and launched an online game called Go Viral! to counter online misinformation through educating users about the tricks and motives of creators of online misinformation.

TMC: Melisa, explain what you are studying now, and a brief description of why you became interested in the subject of online misinformation?

Melisa: I study persuasion and resistance to persuasion and apply inoculation theory, often regarded as “the grandfather theory” of persuasion to the context of online misinformation. I was doing my Bachelor’s in Psychology at the time of the Brexit debate and when Donald Trump was elected to the US Presidency. I wanted to understand the role of false news in our attitude formation and political decision-making, as well as the threats it poses to our democratic processes.

TMC: Can you explain how you came to be a Gates scholar at

Cambridge University, and the opportunity that this program has given you?

Melisa: I applied to the Gates Cambridge Scholarship and have been fortunate enough to join a community of brilliant individuals dedicated to using their curiosity and skills for the betterment of societies. I have also met many of my dearest friends through this community and have been able to join efforts such as Laugh4Change, a charitable unincorporated association which raises funds and relief aid for refugees while providing platforms for under-represented groups in comedy.

TMC: We are interested to learn how the research behind Go Viral! was undertaken, how the team worked together, and what your role in this effort was.

Melisa: This was definitely a team effort. We collaborated with DROG¹ and Gusmanson on the development of the game itself and partnered with the UK Cabinet Office to facilitate its dissemination. We were lucky enough to have institutions such as WHO, UNICEF, and UN Verified help us spread “the psychological vaccine”.

Together with my colleagues at the Cambridge Decision-Making Research Lab, I developed the content and the scenarios of Go Viral!. I also helped translate it into German and led our published research on the efficacy of the game. To learn more about our research and methodology, visit: <https://journals.sagepub.com/doi/full/10.1177/20539517211013868>.

TMC: What are you hoping to achieve with this work; what results have there been so far, and ambitions for the Go Viral approach in the future in terms of tackling the “infodemic” and longer-term reduction of online misinformation?

1 <https://drog.group/>

Melisa: We've made some exciting progress with Go Viral!. Additionally, we've developed several other games and continue to adapt to the challenges of misinformation with renewed and optimised intervention strategies. Go Viral! is already available in 10+ languages and continues to attract players. Of course, there is no silver bullet against the threats posed by misinformation. Instead, we will need multi-layered defence mechanisms that, hopefully, pay attention to and leverage psychological insights. By making interventions free, entertaining, and much more scalable we hope that our work contributes to "psychological herd immunity". That is, instead of trying to keep up with the vitality of misinformation, we hope that our pre-bunking intervention will help stop harmful content from going viral in the first place.

TMC: Many thanks for these important insights, Melisa. We wish you every success with your future studies and your continued work in applying psychological insights to address social challenges.

Interview by Vicki MacLeod

Protect Yourself and Others against COVID-19 Misinformation

Play GO VIRAL!

GO VIRAL! is a 5-minute game that helps protect you against COVID-19 misinformation. You'll learn about some of the most common strategies used to spread false and misleading information about the virus. Understanding these tricks allows you to resist them the next time you come across them online. Scientists who worked with us on the development of GO VIRAL! found that playing the game significantly improves people's ability to spot misinformation about COVID-19. Their study was published in the journal *Big Data & Society*.¹

Users are encouraged to fight the spread of misinformation by challenging their friends and family to GO VIRAL!

The recommended age for Go Viral! is 15+. Although the game has received a PEGI-(Pan European Game Information System) age rating of 3 (meaning the game has been deemed for persons age 3 and up), the game does include some themes that may be interpreted as sensitive, especially to people under the age of 15. Parental consent should therefore be sought, where appropriate.

This game is supported by the WORLD HEALTH ORGANIZATION² and is the product of a collaboration between the SOCIAL DECISION-MAKING LAB³ at the University of Cambridge, DROG⁴, BAD NEWS⁵, GUSMANSON, and the UK CABINET OFFICE⁶.

You can find the most common myths about COVID-19 debunked at the WHO COVID-19 website⁷.

1 <https://journals.sagepub.com/doi/full/10.1177/20539517211013868>

2 <https://www.who.int/news/item/23-09-2021-what-is-go-viral>

3 <https://www.sdmlab.psychol.cam.ac.uk/>

4 <https://drog.group/>

5 <http://badnews.eu/>

6 <https://www.gov.uk/government/organisations/cabinet-office>

7 <https://www.who.int/emergencies/diseases/novel-coronavirus-2019/advice-for-public/myth-busters>

04

TECH EQUITY

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How 30 years of internet access have changed everything from healthcare to finance

Madeleine Hillyer
US Media Relations Specialist
World Economic Forum

Isabelle Mauro
Head Digital Communications Industry
World Economic Forum

Just under 30 years ago, the internet became public.¹ Since then, we've seen most aspects of our lives move online. As internet use expanded throughout the 1990s and in the early 2000s both internet and mobile phone use began to expand exponentially.

Many more people are online today than they were at the start of the millennium. Looking at broadband access, in 2000, just half² of Americans had broadband access at home. Today, that number sits at more than 90%³.

This broadband expansion was certainly not just an American phenomenon. This growth can also be seen on a global scale; while less than 7%⁴ of the world was online in 2000, today

1 <https://www.popularmechanics.com/culture/web/a20104417/www-public-domain/>

2 <https://www.washingtonpost.com/graphics/2017/entertainment/tech-generations/>

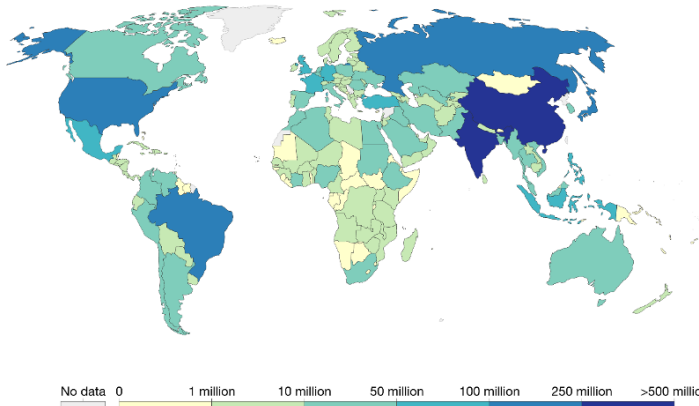
3 <https://www.pewresearch.org/internet/fact-sheet/internet-broadband/>

4 <https://ourworldindata.org/internet>

Number of internet users by country, 2017

Internet users are individuals who have used the Internet (from any location) in the last 3 months. The Internet can be used via a computer, mobile phone, personal digital assistant, games machine, digital TV etc.

Our World
in Data



Source: OVID based on World Bank & UN World Population Prospects (2017)

CC BY

almost two-thirds of the world's population⁵ have used the internet.

While the first cell phone came out a few years before the internet went public, similar trends can be seen there. At the start of the 2000s, there were 740 million⁶ cell phone subscriptions worldwide. Two decades later, that number has surpassed 8 billion, meaning there are now more cellphones⁷ in the world than people.

Despite these decades of growth, the global growth in the **percentage of households connected** to the internet has slowed⁸. As past methods of internet expansion are falling behind, we need to look for new solutions to get the next half of the global population online.

5 <https://www.itu.int/en/ITU-D/Statistics/Documents/facts/FactsFigures2021.pdf>

6 <https://www.statista.com/statistics/262950/global-mobile-subscriptions-since-1993/>

7 <https://qz.com/1608103/there-are-now-more-cellphones-than-people-in-the-world/>

8 <https://en.unesco.org/news/new-report-global-broadband-access-underscores-urgent-need-reach-half-world-still-unconnected>

Although 85% of the world's population lives in areas covered by 4G, only half are online. Cost, not coverage, has become the critical barrier to connectivity. In low-income countries, home to 650 million people, mobile broadband is 18 times more expensive⁹ than in developed countries, as a proportion of average income.

The EDISON Alliance

The World Economic Forum and its partners are responding to this challenge, with The EDISON Alliance¹⁰, a global movement of public-private leaders whose mission is to improve 1 billion lives¹¹ through affordable and accessible digital solutions across the world by 2025, in three sectors that are key for socio-economic recovery: education, financial inclusion and healthcare. We will do this by Building a network of networks to identify and scale cross-sector relationships to drive change and deliver impact.

Education

While investment in online education options had been growing before the pandemic¹², Covid-19 closures emphasized the importance of digital access to education. When closures started in 2020, up to 1.6 billion students were out of school. While those in areas with higher internet access were able to continue schooling online, reaching students without internet access at home became more difficult.

This has increased inequalities in education, as there's a large gap between poor and rich countries when it comes to children without internet access at home. Currently, 87 percent

9 https://www.itu.int/en/ITU-D/Statistics/Documents/publications/prices2020/ITU_A4AI_Price_Briefing_2020.pdf

10 <https://www.weforum.org/the-edison-alliance>

11 <https://www.weforum.org/the-edison-alliance/1-billion-lives>

12 <https://www.globenewswire.com/news-release/2019/12/17/1961785/0/en/Online-Education-Market-Study-2019-World-Market-Projected-to-Reach-350-Billion-by-2025-Dominated-by-the-United-States-and-China.html>

of people¹³ under 25 in high-income countries have internet access at home, in low-income countries this number drops to just 6 percent.

This variance in access to online education during the pandemic has been one of the main factors driving increased¹⁴ education inequality during the pandemic.

Even high-income countries with high rates of internet access, noticeable gaps in internet access exist. The richest households¹⁵ have access levels 97 per cent, in the poorest households only 74 percent have access. These gaps have also been shown to lead to education achievement¹⁶ gap.

Most governments around the world have made digital access to education a priority in order to build a more resilient education system, able to respond to future crises. Several partners of The EDISON Alliance have made commitments to increase access to education via digital solutions, including the GIGA initiative, led by UNICEF and ITU, which hopes to connect 2.8 million schools and over 500 million children by 2030.

Financial inclusion

Financial inclusion is another issue that has been greatly shaped by the expanding internet access.

Fortunately, the number of adults with access to formal financial services, has been steadily increasing¹⁷ over the past decade. Between 2011 and 2017, the percent of adults who had access to a financial account rose from 51 to 69 percent.

13 <https://www.unicef.org/media/88381/file/How-many-children-and-young-people-have-internet-access-at-home-2020.pdf>

14 <https://news.un.org/en/story/2020/10/1076422>

15 <https://www.unicef.org/media/88381/file/How-many-children-and-young-people-have-internet-access-at-home-2020.pdf>

16 <https://www.pewtrusts.org/en/research-and-analysis/articles/2020/12/08/what-covid-19-underscores-about-how-broadband-connectivity-affects-educational-attainment>

17 <https://globalfindex.worldbank.org/basic-page-overview>

Digital access, and in particular mobile access to financial services, have been important drivers of this increasing financial access. This expanded mobile access and financial inclusion is bringing great benefits, with research¹⁸ pointing to its ability to significantly reduce the chances a household falls into poverty.

While financial services accessed through mobile services have greatly enhanced financial inclusion, gaps in mobile network access are hurting groups who need it most.

Currently, women are 15% less likely¹⁹ to have mobile internet access than men globally and this gap only grows in regions where mobile internet access is a main driver of financial inclusion. For example, in sub-Saharan Africa women are 37% less likely to have mobile internet access while in Europe and central Asia that gap falls to 4%.

An important factor in continuing to increase women's financial inclusion globally will be closing the mobile internet access gap around the world.

In support of this, The EDISON Alliance has developed a common vision in a set of **Shared Principles for an Inclusive Financial System**²⁰, which outline the foundations for the inclusive digital marketplaces of the future. These Principles can help us bring together new technologies – like open banking, fintechs, blockchain, artificial intelligence and more – to work for the banked and unbanked alike.

Healthcare

Digital technology and digital connection have also played a

18 <https://www.tandfonline.com/doi/abs/10.1080/15228916.2017.1419332>

19 https://wefcloud-my.sharepoint.com/personal/madeleine_hillyer_weforum_org/Documents/-%09https://www.gsma.com/mobilefordevelopment/blog/the-mobile-gender-gap-report-2021/

20 <https://www.weforum.org/whitepapers/shared-principles-for-an-inclusive-financial-system>

growing role in healthcare in the past decades. The early 2000s saw the culmination of a biotech boom²¹ that had started in the mid-1990s. In recent years, innovations have been increasingly focused on delivering healthcare to patients as well.

The pandemic further accelerated the use of digital technology in healthcare around the world, particularly through the use of Telehealth services.

Telehealth has offered good opportunities to continue patient care during the pandemic, but there are lasting benefits to this offering as well. For example, telehealth has great potential to provide expanded access to specialists, monitor chronic health conditions and many other benefits to health care.

These benefits are particularly important to those living in rural areas who tend to struggle more with health care access than urban ones. In fact, the health benefits of digital access are so strong that some researchers have found that it is a 'super-determinant'²² of health.

Unfortunately, those who would benefit most from expanded telehealth use are less likely to have broadband access than others. Looking at the United States, seniors are over two times less likely to have internet access at home than their younger age groups. In 2019, 95% of Americans²³ under 40 had internet access at home. For those over 65, that number drops to 82%.

Similar disparities are seen with those living in rural areas, a group who already have less healthcare access. Rural areas are also less likely to have quality internet access than their urban counterparts as well.

21 <https://money.cnn.com/2000/02/22/companies/biotech/>

22 <https://journals.sagepub.com/doi/full/10.1177/1073110519857314>

23 <https://www.healthsystemtracker.org/chart-collection/how-might-internet-connectivity-affect-health-care-access/>

Considering at least half of the people²⁴ in the world do not receive the health services they need, we must continue to prioritize bridging divides to ensure that everyone can equally benefit from digital tools. The work of initiatives such as the EDISON Alliance and its partners are key in accelerating access and adoption, two areas that will frame the future of digital health. To this aim, the Shared Guiding Principles for Digital Health Inclusion²⁵ define a framework that will help ensure a responsible, sustainable and inclusive adoption of digital health services by professionals and individuals.

Conclusion

Over the past 30 years, the internet has grown to be a major presence in most aspects of our lives. It has also brought with it the opportunity to decrease inequalities- or create them.

In particularly important areas of our lives, such as finance, education and health, expanded digital access has offered great benefits but also created new inequalities. It's important that as we start to reach the third of the globe that's not yet connected, we develop approaches that increase equity and benefit the most people's lives.

Finding commercially viable solutions to these issues can help us ensure that the next 30 years of the internet brings benefits to all people. The Edison Alliance and its partners will continue working towards this objective by bringing together private sector and government partners in pursuit of this goal.

24 https://www.who.int/health-topics/universal-health-coverage#tab=tab_1

25 <https://www.weforum.org/reports/shared-guiding-principles-for-digital-health-inclusion>

Bridging the Digital Divide – are we there yet?

Laina Raveendran Greene
CEO and Founder of Angels of Impact

It has been more than 30 years since I first started in the telecommunications industry. As an idealistic young girl in 1986, who came from a science education, later studied law and had just left Singapore to study in Geneva Switzerland, I never would have imagined getting into the telecommunications industry. It truly happened just by chance.

I had applied to work at the GATT (now WTO) as an intern while studying at the Graduate Institute of International Studies, only to be told that I had been accepted into the International Telecommunications Union (ITU) Legal Department. “Telecommunications? What is that?” was my first response and I was told that it was a wonderful opportunity, so I kept quiet and went along. I am so grateful that I did, as that opened a whole new world for me.

While at the ITU interning at the legal department, I helped to draft national telecommunication regulations and international treaties. I was able to combine my love of science with my background in law. Then at the ITU World Telecom conference in 1987, I managed to speak to Judge Greene, (who was responsible for the breaking up the AT&T monopoly to competition) and asked him for advice on my future career. “Telecoms is the future,” he told me. I was hooked.

With the support of great mentors at the ITU, I found myself assisting in drafting historic agreements around the Internet and trade liberation at the GATT. Yes, I did end up working at

the GATT but for the ITU. I even met Sir Donald Maitland, the author of the Maitland report, which stressed the importance of telecom for economic development. I left the ITU to go on to work at INTELSAT in Washington DC at the Strategic Planning Unit. I later worked at SingTel put in place regional agreements to help to expand telecoms and Internet in this region via Singapore.

I then shifted focus to the evolution of the Internet. I was right in the middle of Internet Governance issues as Policy Advisor of Asia Pacific Network Information Centre (APNIC) and even helped create another regional Internet organization called the Asia Pacific Internet Association (APIA) as their first Secretary-General working on lobbying US Internet providers to have equitable peering agreements. This included lobbying at OECD, APEC, ASEAN, etc. as APIA's key spokesperson. Truly amazing times. I was in the thick and thin of telecoms and Internet policy and regulations. I slowly moved into tech entrepreneurship, as I ran my own tech business, alongside a tech consultancy, giving me all-rounded exposure to the industry.

The more things change...

When I first started off in telecoms in 1986, the focus of most conversations was on bridging the digital divide for developing countries. Today, while the focus is more on the application layer such as social media, AI, cybersecurity, smart cities, etc, for most users in developing countries especially in a rural setting, the conversation remains about bridging the digital divide. Sure, more people in the developing world have better access than 30 years ago, and even own cell phones or even smartphones. But owning a phone doesn't mean getting access to the varied digital applications that abound, let alone getting a reliable signal.

Back in the 1990s, when I ran an eLearning business regionally, we found that the higher the bandwidth required to support

the application the fewer the countries that could access it. We always had to ensure a lower bandwidth version of our application to ensure countries such as Cambodia did not get left out. I would have expected this to be solved given 3G, 4G, and even 5G rollouts in the region, but apparently not.

...the more they stay the same

As more of my time today is focused on funding women and indigenous-led community-based enterprises in developing countries tackling sustainability and poverty alleviation, I find much of this conversation about bridging the digital divide hasn't changed much. Angels of Impact, a social enterprise I founded five years ago, focuses on funding and incubating women and indigenous-led community-based enterprises that face similar challenges. We incubated 17 community-based enterprises in 9 ASEAN countries using simple applications such as Zoom, Mighty Networks, and Hubilo for our final event and sadly, access to telecom and the Internet was still a key challenge for them. It wasn't a breeze at all.

Lack of bandwidth is the new divide

This experience showed that a new type of digital divide has developed, with many enterprises, such as from remote areas in the Philippines, in Brunei, and in Cambodia, not being able to turn on their videos during Zoom calls, or just being able to access Zoom via phone call only. We had to negotiate with telecom operators to help give them discounted access to Wi-Fi hotspots to enable our applications, as higher bandwidth wasn't cheap. In fact, Globe Telecom in the Philippines graciously donated high bandwidth hot spots for these enterprises, which helped them greatly. These are all women who had access to cell phones and smartphones but just didn't have access to the bandwidth necessary to maximize the use of their smartphones.

Clearly, we haven't achieved bridging the digital divide for

everyone, whether it be for reasons of lack of access or high costs to access higher bandwidth. While developed country users play with avatars, machine learning, ai.bots, and many more cool applications, developing country users still struggle to jump on the bandwagon of an application as simple as zoom. It is key therefore to remember that bridging the digital divide is not dissimilar to having the goal post moved just as you are about to hit a goal. As we develop more and more bandwidth-intensive applications, the more and more we will be far from ever being able to bridge the divide. I was so surprised when I was living in Jakarta in 2012-2015, which is a big city, that I couldn't attend an MIT online course from the USA because of the limited bandwidth. The connection kept dropping and I had to give up. So, is this only an issue with respect to the use of higher bandwidth applications?

While one can be tempted to say that it is, can we really accept this and say that well, at least people have connectivity for simple applications such as making a phone call or sending an SMS? Sadly, even that isn't available to everyone. This type of access divide is not new of course, it has just taken on a new dimension. When I tried funding a group of women in Malang, Indonesia, in 2014, just to use an SMS-based application, we found that many of them still had issues getting even a single bar of telephone connectivity. They had to work hard to find a higher ground or use bamboo poles to stick their phone on and lift to just get a single bar sometimes. Ironically, another woman we work with in the rural mountains in Sulawesi must do the opposite. She must drive down the mountain to get a proper signal for us to get a decent call, so we have to schedule calls with her, in time for her to drive down the mountain just to take the call.

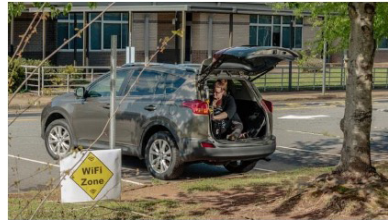
The issue still boils down to who drives the most profits for infrastructure service providers. Rural areas have too few users to justify bringing operators from offering better bandwidth, and in urban settings, it is often too crowded to keep up with bandwidth requirements. Will we ever reach a world (as



envisioned by a succession of ITU Secretaries General), where everyone has access to bandwidth to plug into what then US Vice President Al Gore in the 1990s called the Information Superhighway? We can't afford to leave anyone behind – we need a

world where access to communications is considered a basic human right and we need to enable new business models to emerge to solve this issue.

The pandemic has really pushed us to see how necessary digital connectivity is. Those with proper access could continue studying from home, sell products and services online, work from home, etc, while those who didn't struggled to



make a living. It was not uncommon even in the USA during the pandemic to see pictures of children sitting outside a MacDonald's trying to access Wi-fi from their parents' cars or sitting on the sidewalk to do their homework. This was the kind of image we used to see from developing countries, with kids sitting under streetlights doing their homework at night.

While throughout my career, I have seen so many new technologies give the promise of bridging the digital divide at low costs for all. From Iridium, Teledesic, to Google's Balloon Internet, Elon Musk's Starlink, etc they all give the promise of connectivity for all but in the end it all boils down still to who can pay for this access. Even if given for free, however, would it come at a cost of loss of privacy or ownership of one's own data. Many of these promising solutions have come and gone, without any commercial viability or sustainability. What we need also is the right policies, regulations, and financial incentives

for all providers to offer ethical and affordable connectivity. We need regulations that allow for community based social enterprises to offer last mile solutions. I have seen many such initiatives such as Air Jaldi in India work as it definitely lowers the cost of providing access.

Green ICT and the energy divide

The other interesting thing I have discovered is that the digital divide is intricately linked to the energy divide. To ensure connectivity in rural areas, energy access is equally important: energy access to run the telecom base stations as much as to charge users' mobile phones. From 2008 onwards, I became involved in helping promote the use of green energy for rural telecoms. In 2008, I helped put together a documentary on Green ICT with TELECOM TV in London to create awareness of the issue. At ITU World Telecom 2009 I helped curate and organize the Green ICT Pavilion and conference discussions and while working for a telecom operator in Indonesia I brought in GSMA and other players to help implement Green ICT in the telcos' rural operations.

After all these years, however, we are still making slow progress. If we do more on Green ICT, not just green energy for telecoms but also energy-efficient equipment and ensuring recycling of e-waste, we can do more to bridge the divide in emerging markets and rural settings even in developed countries. As before, we need the right financial incentives, policies, and regulations to make this happen. And as before, we need to enable new business models for energy access as well, and last mile community-based solutions such as Selco have proven effective.

How to make a better world for all

I would say that most of my life's work has been driven by the goal to bridge the digital divide. At the ITU and INTELSAT, I worked hard to lobby to get connectivity to developing

countries, at Singtel I helped connect 14 countries in the region to the Internet via VSAT connectivity, and while running my own eLearning company, GETIT, I always insisted that we took on projects that also helped bring e-learning to developing countries in Southeast Asia. I know we have come a long way, but we have much left to do.

Access to proper communications to be plugged into the global economy is key to alleviating poverty, and really should be a human right for all. We live in a world today that not having proper access could lead you to be disconnected and “poor” in all aspects of that word. Will we ever see a world where everyone has proper access but within ethical and affordable access? Will we finally have the foresight to make this happen for all? We have great models from social entrepreneurship and community-based enterprises, if only we are willing to allow new models to thrive.

Looking back on what I have learned over the past thirty years, I would like to encourage everyone not to get carried away with the bells and whistles of new technologies such as AI, smart homes, virtual realities, etc and what they can do for you. Please don't forget about those who still struggle with basic connectivity. Let's think about renewing the commitments made by Sir Donald Maitland and the many ITU Secretaries-General over past years, to bridge the divide and make the right to communicate a basic human right for all. Each of us benefits when everyone benefits, so hoarding by some at the expense of the rest doesn't lead to a better world for us all, and today with new technologies, new business models and even new financing models, the answers are even closer.

Even though I am realistic about how ICT can be just a tool and not the end all for humanity, I also see its power to unite and create a better world for all. That's why I remain committed to bridging the digital divide.

The role of women in the ICT sector and their future in Afghanistan

Masooma Khawari
Former Minister of Communications and IT, Afghanistan



Masooma Khawari receiving congratulations on her appointment as the first female Minister of Communications and IT, Afghanistan

Information Technology is a rapidly evolving industry that plays a significant role in national development. Although there are many highly skilled women in the IT field, there is still a considerable gender gap in the leadership of the sector. This is also true in Afghanistan, where women make up 48.68% of the population. I am therefore passionate about advocating for and empowering Afghan women to become involved in technology.

Gender inequality has been recognised for the past two decades as one of the biggest challenges facing the Afghan government; however, an even more challenging issue is

the underestimation of women and not enabling them to be involved in the IT industry.

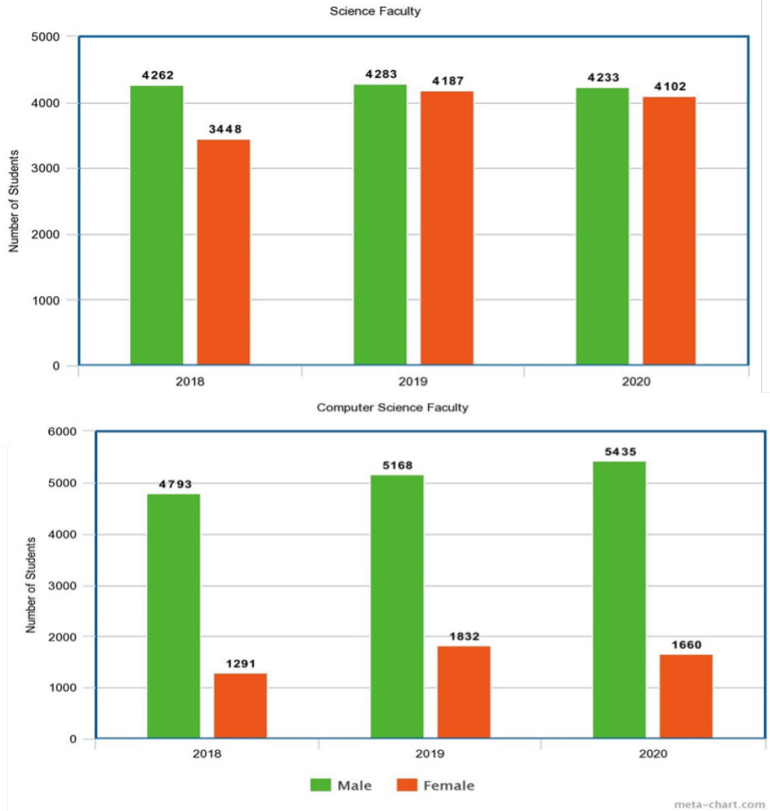
Extensive research has confirmed that appointing women to leadership positions leads to significantly improved performance and business outcomes in the ICT industry; but despite this digital gender inequality persists. One of the main reasons is that fewer women obtain a higher degree in ICT. UNESCO research shows that worldwide women make up only 35% of STEM students. According to this research, as only a few female students study ICT, it is not enough to forge a path for other women to follow in these fields.

Despite considerable security, economic and cultural barriers for Afghan women, in 2020 31% of enrolled students in Afghan universities were female, which was a significant improvement on 2018 and 2019, particularly in science and technology. This was considered by the Afghan government of which I was a member as one of its achievements.

The efforts of the Ministry of Telecommunications, Science and Technology to empower women to become involved in ICT have resulted in a number of benefits including facilitation of internship, part time jobs, career counselling and many more opportunities for female students to help them establish their career after graduation.

Unfortunately, as I expected, the new Afghan Government has not paid much attention to these achievements. I believe that if the new regime cannot improve the involvement of women in ICT, they should at least strive to maintain what we have achieved over many years, as today's students will be Afghanistan's future workforce.

The charts below compare male and female students' enrolments in the faculty of science and of computer science over three consecutive years.



The transformation journey

When I was appointed in late 2020 as Afghanistan's first female Minister of Communications and IT (MCIT), I had a dream and a vision of the future development of the economy and society through digital technology, and the central role that women could play in realising that vision.

I recognised the significant task ahead of me in transforming the Ministry and its activities, and the many challenges that I would need to overcome to achieve these goals. Firstly, it will

come as no surprise that many men in Afghanistan, including in the former Government, have a set view of what they see as the different roles of men and women in society. It was hard for me, as the first female Minister, to confront this type of prejudice in my work, but this just made me more determined to show that I, and many other women, could make a significant contribution for the benefit of all Afghans.

I also faced a challenge in terms of the lack of confidence and experience of some of my staff members, who had not been provided with appropriate opportunities to grow and demonstrate their talents in a meaningful way in the past. I decided that my first priority was to choose and build up a team of trustworthy, reliable technical experts, who would form the backbone of the new organisation. I needed a team who could focus on co-ordinating their work with all relevant agencies. The Ministry required a reorganisation based on its new terms of reference and government priorities, as well as a new organisational structure to match.

Moreover, I started on this transformation journey with a detailed analysis of the current structure, the staff, their skills and abilities, and the roles that they would need to play to achieve our new goals. I knew it would be very important to set out clear performance objectives for the new teams, and for each individual, as well as clear deadlines and the results that I expect each one of them to achieve. For many this was an entirely new approach, with which they were unfamiliar, but within a few short months, I was able to bring into the Ministry many trusted and highly qualified new team members.

With such a major change to the organisation and its way of operating, I realised that it would be important for me to gain everyone's trust, and to remain available to all who needed to have their views and concerns heard.

To ensure a greater emphasis on cross agency co-ordination, I tasked specific staff members with bridging the gaps with

relevant stakeholder agencies such as the Afghanistan Telecom Regulatory Authority (ATRA), the National Procurement Agency, the Ministry of Finance, donor agencies and the mobile network operators.

After 11 months, in August 2021, the new team were ready to launch some major projects, including:

- the establishment of a National Data Center as per the international standards, which will be able to address the country's needs for the next 15 to 20 years;
- a number of new projects to promote regional connectivity and data transfer;
- enhancement of National Internet Exchange Points, the digitalization of Afghan Government offices and its activities, and many more.

We also developed a 3-year strategy, so that the vision and mission of the ministry would be clear for our staff and outside agencies as well.

Initiatives for women and girls in ICT

As well as achieving a fundamental transformation of the Ministry, I knew that one of our key objectives would have to be to encourage young girls and women to consider a career in ICT, and in so doing to overcome the lack of women in the ICT industry which limits innovation in Afghanistan's future.

We were supported in these aims by a range of international organisations, both government and industry, and I acknowledge the efforts of all of those who were involved. With their help we embarked on a range of initiatives.

- With the support of the World Bank, we established a program to enable 80 young female graduates from ICT faculties to be hired and supported as interns in the Ministry for nine months.
- We signed an MoU with several universities so that

students, especially female students, could participate in free seminars and workshops with our experienced technical staff members, who would also help the students in their research projects for the Bachelor's and Master's Program.

- With the French Embassy in Kabul, we were planning to establish a coding school to help young girls learn coding in the most effective way.
- We were also in the middle of a project to connect more than 400 schools to the internet, so that girls in remote areas can have access to online learning.
- Along with the Ministry of Women and the Human Rights Commission, we established a call center to receive complaints from women who face violence or harassment at home or at work, with reports to be directed to the Ministry of Interior Affairs for priority action.
- We established separate divisions to promote digital literacy and science & innovation, and I was working on plans to build a center of excellence, to become a home for various training programs and supporting activities furthering science and innovation.
- Along with the Ministry of Education and Ministry of Higher Education we lobbied to establish a course on digital literacy and the basics of ICT, so that young students could attain basic knowledge on these vital subjects, which would also help to encourage their interest in working in the ICT sector.
- We managed to get a new Cyber Security law approved by the Government's Judicial Committee, which was enacted, and we finalized a law aimed at assuring the security of women and their identity in cyberspace.

Finding a new way forward

Although I am no longer the Minister for ICT in Afghanistan, I plan to keep working through any means available to me to achieve the goals I set myself as Minister.

My purpose and goals will remain, irrespective of whichever government is in power in Afghanistan. My mission is about serving the people of Afghanistan in any capacity that I can. I still have many colleagues who remain in Kabul and in the provinces of Afghanistan, with whom I remain connected. There are still many talented Afghans in the country who are totally dedicated to pursuing economic and social development through ICT.

Together we are committed to establishing an organisation which can support the agenda we set out for the Ministry, and we aim to complete those projects which can be implemented without the need for direct involvement or approval of the Government. For example, we plan to establish training centers to promote digital literacy amongst Afghan women.

Since the change of Government and my move to Turkey, I have often been asked about the future of girls and women in Afghanistan. I must point out that Afghan women have overcome many limitations and restrictions placed on them



Masooma Khawari at the GSMA Conference, Barcelona – Spain, July 2021

in the past, and that we will find ways to overcome these new setbacks too. There are many women who remain committed to breaking their shackles once again and achieving the promise of a new future. They just need to have both the platform and the resources to help them continue on the path that we have begun.

ICT will play an important role in enabling our work to continue, as we are planning to connect Afghan girls and women who are no longer

allowed to go to school or university to gain access to online education. We will also work with the private sector and entrepreneurs, supported by those outside the country, to help them develop their skills and their businesses, so they can provide services across Afghanistan.

I know there are many people of goodwill around the world, especially in the ICT and digital tech sectors, who want to know how they can continue to support the women and girls in Afghanistan. Above all we need technical assistance, as well as support in terms of human resources and finances, so that we can develop and implement targeted programs. We call on all in the international community to assist us in continuing this ambitious journey.

Why We Must End the Worldwide Digital Divide

Michele Merrell

**Member of the Board and North American President GTWN
and Member of the Board, Cable Bahamas and Aliv**

***The worldwide Digital Divide in society must end.
We must implement an inclusive, digital ecosystem
for all in the digital economy.***

If there is any lesson we have learned from the pandemic, it is that the full-speed digitization of society is here to stay, and that all people - regardless of ethnicity, geography, or income - must have proper computing equipment, tablets and other devices, as well as access to digital platforms and high-speed internet to compete on an equal basis in the modern world.

Disparity between the “haves” and “have nots” has placed a glaring light on this devastating technology gap, as U.S. school children and others around the world were forced to suddenly participate in “in-home” learning versus in-person learning. And with that, we saw the homework gap of children who did not have laptops, tablets, or basic high-speed internet or even the ability to get online due to lockdowns. This has placed millions of children at a learning disadvantage from which they may not recover. School districts scrambled to deploy online learning platforms – something that many universities and colleges had implemented years ago. In some cases, schools offered live “Zoom” learning sessions, and in others, children were expected to find posted assignments and then access

the content, complete assignments, and take tests, all with extremely poor learning results.

Adults, who were suddenly forced to work from home and conduct online business meetings and conference calls, found themselves in nearly impossible situations with slow internet service, cyber security concerns, and frustrating reliance on landline phones due to disparity in connectivity from cell towers. For individuals and companies to remain at pace with peers and society, access must be guaranteed, not only to the internet, but to crucial services including e-commerce platforms, digital payment methodologies and banking platforms and connected citizen services, including healthcare administration. With all this, there are ongoing cybersecurity issues that must be addressed to protect personal and workforce information. Additionally, digitization must take into consideration disabilities, language differences and many other important factors in how communities and individuals will interact with their devices, as well as the internet and broadband.

A lot of money has already been allocated...

Billions of dollars have now been funneled into school systems to aid in distance learning. In response to the economic and social fallout of the COVID-19 pandemic, the U.S. Congress passed on March 27, 2020, a \$2.2 trillion economic stimulus bill, the Coronavirus Aid, Relief and Economic Security Act, also known as the CARES Act. \$1.5 billion alone was allocated to American school systems. Funds were made available to help schools purchase devices for students who didn't have them, and to help pay for broadband services. Little consideration was given to teaching disadvantaged students how to use these new devices or even how to access the new technology platforms they were required to now use! In the proposed \$2 trillion dollar infrastructure plan now being debated in the United States in 2022, even more money is being allocated to close the Digital Divide and address massive broadband disparity in

the U.S. Of this proposed amount, nearly \$100 billion has been earmarked to expand broadband in rural communities. Sadly, this is not a one-stop fix for this situation – it will take ongoing efforts and additional spending in the billions for years to come to catch up on the disparity in devices, improved networks, and high-speed data delivery.

...but much more remains to be done

And despite all this money flowing in, children in the United States are still simply not ready for a newly connected digital economy. In a June 2020 study by Common Sense Education Superhighway and Boston Consulting Group cited that between 15 to 16 million students, or 30% of all public-school students live in households that do not have an internet connection, or an adequate device for distance learning, and in some cases, both. In the United States, roughly half of unconnected students come from families with annual incomes of less than \$50,000. Students without a device or broadband were cut off almost entirely from their education. Because this issue resides mostly with students from lower income families, students of color, and those living in more rural communities, this failure to address the growing Digital Divide will continue to widen as students fall further and further behind.

Many advocacy groups and organizations are pushing for action as tens of millions still do not have proper access to affordable broadband, and even more, perhaps upward of 120 million, do not have internet at broadband speeds. Kajeet is sending Wi-Fi-enabled buses into neighborhoods that lack proper Wi-Fi. zSpace is delivering laptops with built-in 3-D capabilities so students can perform lab experiments from home. EveryoneOn is a non-profit that connects low-income families to affordable internet service and computers. Even the free app CloudCheck helps people find the strongest internet signal in their homes.

Why does resolving the digital divide matter?

Worldwide, it is essential that all people have equal access to distance learning because it prepares and ensures for proper workforce development and readiness for the next generation. Many studies also show that receiving a quality education breaks the cycle of poverty. Overcoming the Digital Divide gives greater access to employment opportunities, job training and other benefits including proper healthcare. With the pandemic surging on and off, with no clear end in sight so far, the ability to pivot back and forth between in-person and distance learning is essential. The same applies to those who were suddenly - and now consistently - forced to flex between onsite working and remote working from home due to ongoing pandemic surges.

Showing the way: digitalization of schools in The Bahamas



Technology has become one of the greatest drivers in social and economic development worldwide. Technology-enabled learning is a must to reform the educational curriculum and to promote sustainable development. There are many

projects being developed in smaller, poor communities around the globe, which demonstrate how industry can work with governments, public companies, and not-for-profits to speed up the digitalization of the school system, and thus vastly improve the prospects for the next generation.

One such example is The Bahamas, where I am proud to be working with Aliv, the newest mobile telecommunications company in The Bahamas, and a technology-driven incubation hub for enterprises and expanding start-ups in the Caribbean region. Aliv is a fully Bahamian company rooted in local culture, with Bahamian talent, innovation, and tenacity at its forefront. Overcoming the Digital Divide in The Bahamas is a key objective of newly appointed Aliv CEO John Gomez, who has set out his main objectives for ensuring digital inclusion:

“Aliv exists to push forward the fastest mobile telecom data speeds for the archipelagic island nation, and to champion innovation and entrepreneurship by creating a tech-hungry and tech-confident Bahamas. We are acting together in partnership with the government, the education system on the islands, other technology partners and our customers to bridge the education gap and digital divide. We are aiming to help transform the teaching and learning experience in The Bahamas and help ensure that all Bahamian children have access to digital infrastructure and content so that they can fully participate in the digital economy.” - John Gomez, Chief Executive Officer & Group Head Consumer Business.

In November 2019, the Department of Transformation and Digitization (DTD) was officially launched by the Government of The Bahamas. It is an initiative to make all major government services accessible on online platforms for their citizens, thereby creating a more effective and seamless process for business to be conducted both locally and internationally

with the government. Funded by a \$30 million loan by the Inter-American Development Bank (IDB), the project will be completed within phases over the course of 6 years. The project's goal is to foster the competitiveness of The Bahamas. Indeed, Grand Bahama has attracted international call centers and business process outsourcing and has the infrastructure to host data centers and security services, including cyber security. The Bahamas recently accelerated efforts to promote Grand Bahama as a technology and innovation hub to attract technology incubators, labs and research facilities with the support of U.S. company Cisco. This will create a plethora of new job opportunities and push the education system in The Bahamas to embrace more technical skills for students who will eventually benefit from jobs in technology.

A call to action

The private and public sectors must come together to deepen investments in high-speed broadband networks. In the U.S., the House and Senate must work together to bring this important first step for affordable, reliable broadband and digital skills to every American. Investing in future-proof scalable technology like fiber, and partnering with smaller, community-based local exchange providers, municipalities need to focus on delivering affordable services.

Fiber has been very successful bringing connectivity to urban and suburban areas, but what about the continuing challenge of the last mile to rural settings? For many years now, satellites have provided backhaul and trunking services for telecommunications and Internet Service Providers. Now, a new generation of direct-to-home satellites are being touted as the solution for remote areas. Indeed, several operators are having remarkable success in bringing high through-put broadband internet to remote areas and islands. Companies such as Kacific which practice one of the new business models of bringing together the private and public sectors through dedicated island and country-specific Ka-Band spot

beams are overcoming challenges regarding cost and speed of satellite-based broadband services in the Pacific. Elon Musk's Starlink venture is launching thousands of satellites in clusters to deliver connectivity in rural areas, but there are now questions about the long-term viability, efficiency, and impact of this approach.

In my view, a much more coordinated and concerted effort is needed from the tech industry, to ensure that there is an efficient use of resources and talent to overcome the Digital Divide wherever it exists. If we are to set our objectives for the next 30 years of the digital tech industry, we should take our example from places such as The Bahamas and show the type of determination and tenacity that is needed to the cause of overcoming the Digital Divide.

Beyond Connectivity: Lessons from the Field

**Dr Heather Hudson
Professor Emerita, University of San Francisco, and Affiliate
Professor and Former Director, Institute of Social and
Economic Research (ISER), University of Alaska Anchorage**

I have been engaged with efforts to bridge what we have come to call the “digital divide” for most of my professional life. At first, it was to get basic two-way voice communication to remote regions in Canada and Alaska. Then upgrades from two-way radio in Canada and a single VHF circuit on a NASA satellite in Alaska to reliable telephony. Then to add data as well as voice communications, and now to broadband, so that connectivity is sufficient for Internet services including voice, data, and video, and whatever comes next. I have also worked on projects to bring connectivity for distance education to the South Pacific and the Caribbean, and internet to rural areas in sub-Saharan Africa.

“We had no clinic. We went from house to house taking care of the sick...Our tools consisted of a thermometer, a stethoscope, and a blood pressure cuff...We had no phones, no radios, but used the school’s radio to report our patients. There was no nonsense about confidentiality.” Alaska Community Health aide, 1960s.

From Hudson, Heather E: When Telephones Reach the Village (1984)

The other focus of my career has been on research and policy. Much of the research has been in evaluation of telemedicine, distance education and community networks – to try to answer the question “what difference does connectivity make?” After all, we need to understand how networking can make a difference in people’s lives, for both social and economic development. My policy and advocacy activity began when I realized that even well-designed projects that made a difference might not be continued or expanded unless there were changes in policy to extend access and improve affordability.

“How close they sound!” Woman participating in an audio teleconference among villages in Alaska.
From Hudson, Heather E: **Communication Satellites: Their Development and Impact.** (1990)

Funding is not sufficient to ensure affordable access

The good news is that there has been a dramatic increase in funding for rural broadband in many countries, including those in developing regions, as governments provide more funding for infrastructure, and operators extend their broadband networks to smaller markets. Yet often funding is the only issue that government and development agencies consider, although there are many other factors that may influence the provision of affordable access for users and a sustainable business model for providers.

Consultation and engagement with users is vital

There are countless examples of failure to adequately consult with local communities about their own communication needs.

- In the 1980s, Australia extended telephone service to many small Indigenous communities in the Outback. While much of the demand was for calls between these communities and the central outback town of Alice Springs and onward to major cities, the planners failed to consider

that Indigenous people in the region also wanted to talk to each other! The result was “trombone trunking” – a call from one outback community to another went all the way to Alice Springs for switching, and then back to the other community, using up two circuits of the already limited capacity.

- Similarly, early satellite systems were designed with switching only at major hubs, so that calls between two isolated communities had to be transmitted to the hub and back to the second community – known as a “double hop”, causing very noticeable delays as well as doubling the number of circuits required.
- In the Arctic, a submarine cable now links Greenland and Newfoundland, with onward connectivity to the Canadian and U.S. mainland. But no one installed a branching point so that a submarine link could also be extended to Iqaluit, the capital of Nunavut and largest town in the eastern Canadian Arctic.
- In Tanzania, foreign aid paid for a fiber backbone linking the key regional centres, but with no branching points included to serve district headquarters and market towns.
- In the Pacific, submarine cables built to carry traffic between Australia/New Zealand and North America bypassed Pacific Island nations with limited connectivity. The recent volcanic eruption that inundated Tongan islands with a tsunami and covered them with ash demonstrated how important communications can be for emergency services to Pacific islands.

These oversights are finally starting to be addressed, with investments in more regional and sub-regional fiber and satellite networks, but at much higher costs and with longer delays in obtaining service for the smaller communities than was necessary.

Many of these examples could have been prevented if there had been participation of community and/or regional representatives (residents and institutions) in planning

the networks. These groups could have explained their requirements and their communities of interest (such as locations with shared personal or organizational connections).

*“Now I can sell my art to people all over the world”.
Artist who returned from the city to live in his home
village of Bario in remote Sarawak (Borneo) after a
satellite link was installed.*

**“Beyond Infrastructure: Broadband for
Development in Remote and Indigenous
Regions.” Journal of Rural and Community
Development, 2013.**

Consultation must be meaningful

Thus, in addition to funding, consultation with prospective users is essential. This may be critically important for Indigenous regions and Tribal lands where various jurisdictions and cultural sensitivities may be involved. Indigenous groups in the U.S. and Canada have found that so-called “consultation” has too often taken the form of letters not received, or unanswered phone calls. The need is for *meaningful consultation*, which may require significant efforts to inform communities and engage with them about projects intended to serve them. This consultation can also benefit providers by contributing relevant information about existing facilities and local conditions and sensitivities.

To address the need for meaningful consultation, the U.S. Federal Communications Commission (FCC) has implemented a Tribal Government Engagement Obligation for carriers receiving subsidies to provide services on Tribal lands. These operators must demonstrate that they have coordinated with the Tribal government and provide a report documenting their compliance. Indigenous groups in North America have also pointed out that the United Nations Declaration on the Rights of Indigenous People (UNDRIP) specifies the right to consultation.

Access to existing networks

Extending broadband may require access to existing networks, but incumbent facilities owners have little incentive to expedite access to their networks for potential competitors. Such access may not be regulated in some jurisdictions. Difficulties and delays in access to transport networks and to existing infrastructure such as poles and conduit should be reviewed to minimize delays.

“This is about needs, not wants” – Canadian regulator at a hearing on new definitions for basic service after Indigenous participants pointed out to him that broadband wasn’t only for entertainment, and that their communities need bandwidth to share training videos, access online classes to complete high school, market crafts and art, etc.

Testimony by the First Mile Connectivity Consortium, Ottawa, 2015

In some cases, accommodating additional providers on existing facilities may need upgrades or minor modifications, which may also be subject to delays in approval from incumbents. In the U.S., the FCC has adopted an innovative “One Touch Make Ready” (OTMR) principle to help expedite extension of broadband “whereby the attachor, who has the incentive to move quickly, is able to perform simple make-ready work in the telecommunications space on a pole, subject to notice requirements and other safeguards” Incumbents may also set prices for access and leasing capacity so high that innovative newcomers are unable to provide affordable services. Charges that small and competitive ISPs pay to lease capacity and connect to existing infrastructure will be passed on to subscribers.

Training and hiring local residents

Unfortunately, in many cases, local people are hired only for unskilled labor, such as to dig trenches for fiber in Africa, or to unload equipment shipped to the community in North America. Rural broadband projects should be designed not only to provide connectivity to communities, but to contribute to their development. Training and hiring local people creates jobs but also is likely to reduce costs incurred by providers rather than depending on outside employees and contractors.

The need for better rural data

Government and/or operator data on rural coverage, transmission speeds, and service quality may be inaccurate or incomplete. Government data should be regularly updated and checked for accuracy. Additional sources may be able to contribute more accurate or granular data for broadband planning and funding. Local residents can be asked to contribute by crowd-sourcing data, such as signal strength and bandwidth availability.

Opportunities for small and indigenous providers

While new funding sources to extend broadband and other services can help to bridge connectivity gaps, it is important to ensure that the terms of eligibility do not exclude potential competitors including small, Indigenous, and community providers, and that requirements for participation are appropriate for smaller providers.

Participation in the policy process

Small and Indigenous providers should be encouraged to participate in hearings and other proceedings by regulators and policy makers. They can provide testimony and examples based on firsthand experience that would not otherwise be available to decision makers. In Canada and the U.S.,

Indigenous providers have contributed testimony that led to adoption of regulations and policies more appropriate for Indigenous regions.

Regulatory flexibility

Waivers may be needed to modify funding and service criteria designed for urban networks. Waivers may also be appropriate to allow hiring of local contractors rather than those certified by incumbents that would have to make multiple expensive trips from urban centers.

Enforcement

License conditions such as local consultation, rollout deadlines, and quality of service metrics must include explicit means of enforcement.

“In the industrial age, children went to school. In the information age, school will come to children”.

Alaska Department of Education.

From Hudson, Heather E. 2015. Connecting Alaskans: Telecommunications in Alaska from Telegraph to Broadband.

Access to information is the key!

As a local woman wrote after accessing the internet at a community telecentre in Timbuktu (Mali): “L’information est la clé de toutes les portes” – information is the key to all doors.

It’s a lesson that we all need to bear in mind, regardless of what technologies and services the future may bring.

GSMA: Accelerating digital and financial inclusion for women

Claire Sibthorpe
Head of Digital Inclusion, M4D, GSMA

There has been significant growth in connectivity, with more people digitally included than ever before. Mobile continues to be the primary and, in some cases only, way most people access the Internet, particularly in low- and middle-income countries. Six years ago, about a third of the world's population were using mobile internet. Today, it is more than half.

Despite this progress more needs to be done to bridge the digital divide. Of the 3.8 billion people who remain unconnected, there are now only 450 million people who live in areas without mobile broadband coverage. The far bigger challenge is the 3.4 billion people who live in areas that are already covered by mobile broadband but are not using it¹. The unconnected are more likely to be poorer, less educated, older, rural and women. The COVID-19 pandemic has highlighted the importance of mobile internet access to people's lives and livelihoods and of addressing this digital divide.

Addressing the Mobile Gender Gap

While the gender gap in mobile internet use continues to reduce, it remains substantial. Women in low- and middle-income countries are 15 per cent less likely to use mobile

¹ GSMA (2021). The State of Mobile Internet Connectivity Report 2021. <https://www.gsma.com/r/somic/>

internet than men, meaning that there are still 234 million fewer women than men accessing mobile internet. In 2020 the gender gap in smartphone ownership also declined for the first time since 2017. Women are now 15 per cent less likely to own a smartphone than men, down from 20 per cent in 2019. This is important since when a woman owns a smartphone she is almost as likely as a man to use mobile internet and use a similar range of services.

However, the underlying gender gap in mobile ownership remains largely unchanged since 2017 highlighting it is proving difficult to address. Across low- and middle income countries, women are seven per cent less likely to own a mobile phone, which translates into 143 million fewer women mobile owners than men. In addition, the reduction in the gender gap in mobile internet and smartphone ownership was driven primarily by South Asia and remained largely unchanged in the other regions.

While COVID-19 restrictions and lockdowns during the first year of the pandemic increased the need for connectivity, in some countries, there were also early signs that the pandemic may be disproportionately negatively impacting women's handset ownership. With the pandemic disproportionately negatively impacting women it is important to continue to take targeted action to ensure women are not being left behind in an increasingly connected world.

The Mobile Gender Gap Report 2021²

Women's access to mobile internet continues to increase across low- and middle-income countries with 112 million additional female users starting to use mobile internet in 2020. Despite this, the gender gap remains substantial. Women are 7% less likely than men to own a mobile phone and 15% less likely to use mobile internet. There are still

2 <https://www.gsma.com/r/gender-gap/>

234 million fewer women than men accessing mobile internet. With the COVID-19 pandemic evolving across the world, there has never been a more urgent time to address this issue.

Mobile has the power to transform lives. It can help empower women, making them more connected and safer, and providing access to information, services and life-enhancing opportunities, such as health information and guidance, financial services and employment opportunities, often for the first time. These opportunities are even more critical as the COVID-19 pandemic evolves and impacts health, livelihoods and economies around the world, disproportionately affecting women.

Addressing the mobile gender gap is not just a significant opportunity for women but also their families, society and businesses. The GSMA has estimated that, over five years, closing the gender gap in mobile internet use in LMICs could deliver an additional USD 700 billion in GDP growth, while closing the gender gap in mobile ownership and use in LMICs could deliver \$140 billion in additional revenue to the mobile industry.

The mobile gender gap is driven by social, economic and cultural factors, which result in women experiencing barriers to mobile ownership and use. To close the mobile gender gap, we need to address these issues and focus on access, affordability, knowledge and skills, safety and security, and relevance.

These barriers are also experienced by men, however, women tend to experience some of them more acutely due to structural inequalities and underlying social norms, including disparities between men and women in terms of education and income. Analysis by GSMA, for instance, has shown that there would still be a mobile gender gap in Africa and Asia even if women had the same levels of education, income, literacy and

employment as men; suggesting that other issues that are hard to measure, such as discrimination and social norms, are at play.³

The GSMA's Connected Women program works with mobile operators and their partners to address the barriers to women accessing and using mobile internet and mobile money services⁴. Through the GSMA Connected Women Commitment Initiative mobile operators have made formal commitments to reduce the gender gap in their mobile money and/or mobile internet services customer base and have already reached over 55 million additional women highlighting that informed, targeted action can make a substantial impact.⁵

The GSMA Connected Women Commitment Initiative⁶

Mobile operators are driving an effort to accelerate digital and financial inclusion for women across Africa, Asia and Latin America. As part of the GSMA Connected Women Commitment Initiative which launched in 2016, they are making formal commitments to reduce the gender gap in the customer base of their mobile internet or mobile money services in their markets. Since 2016, 40 mobile operators have made formal commitments to accelerate digital and financial inclusion for women and have collectively reached over 55 million additional women with these services so far.

Their efforts include offering low-cost internet-enabled handsets to address women's price sensitivity; savings and loans products aimed at women; emergency balance and alerts to help women feel safer when using mobile phones;

3 <https://www.gsma.com/mobilefordevelopment/blog/does-just-being-a-woman-reduce-the-likelihood-of-using-mobile/>

4 GSMA Connected Women is currently funded by the UK Foreign, Commonwealth & Development Office (FCDO), and supported by the GSMA and its members.

5 GSMA (2020). Reaching 50 Million Women with Mobile: A Practical Guide. <https://www.gsma.com/mobilefordevelopment/reaching-women-with-mobile/>

6 GSMA Connected Women Commitment Initiative: <https://www.gsma.com/mobilefordevelopment/connected-women/the-commitment/>

recruiting female agents and merchants; improving digital literacy among women through educational programmes and interactive content; helping women's agricultural groups see the benefits of mobile money for payments; improving the data top-up process to be safer and more appealing to women; creating mobile financial products for traditional women's savings groups; developing and marketing use cases which appeal to women; among others.

Women's lower levels of mobile ownership and use not only reflect existing gender inequalities, but also threaten to compound them. The mobile gender gap is also not going to close on its own and requires concerted action by stakeholders working together to address women's needs and barriers to mobile access and use. Together we can unlock this substantial market opportunity for the mobile industry, deliver significant socio-economic benefits and transform women's lives. When women thrive, societies, businesses and economies thrive.

Connected Women Life Stories: Video Series⁷

Mobile technology is transforming the lives of women across low- and middle-income countries. We asked women from around the world to share their stories and the difference that access to mobile services has had on their day to day lives. Hear their stories.

⁷ Connected Women life stories. <https://www.gsma.com/mobilefordevelopment/m4d-connected-women-life-stories/>

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UNESCO's Recommendation on the Ethics of Artificial Intelligence

Gabriela Ramos
Assistant Director-General
for the Social and Human Sciences, UNESCO

New technologies are at the cutting edge of transforming the world and the way we live. Maximising the positive impact of AI technologies is high on the international agenda.¹

Today, artificial intelligence plays a role in billions of people's lives. Sometimes unnoticed but often with profound consequences, it transforms our societies and challenges what it means to be human. AI can provide millions of students with support to complete secondary education, fill an additional 3.3 million jobs, and, more urgently, help us tackle the spread and the aftermath of the COVID-19 pandemic. It is estimated that the use of artificial intelligence technologies can generate nearly four trillion dollars in added value for global markets by 2022, an increase of 70 percent from 2017.

Along with multiple advantages, however, these technologies also generate downside risks and challenges, derived from the malicious use of technology or deepening inequalities and divides. Would you trust a machine to decide whether or not you should have access to a bank loan, for example?

We need international and national policies and regulatory frameworks to ensure that these emerging technologies benefit humanity as a whole.

1

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

We need a human-centred AI. AI must be for the greater interest of the people, not the other way around.

Today the international community has no truly global instrument to channel benefits and tackle the risks of AI technologies. This is what UNESCO wants to support through our work on the Recommendation on the Ethics of Artificial Intelligence. This is a truly grand endeavour, because ethics is everything. This moral basis has been translated into developing solutions for AI aligned with human goals, and with full respect of human dignity and human rights and all the values and principles that we believe in, and that have proven so important in these torrid times that we are altogether facing and trying to cope with.

On 24 November 2021, UNESCO adopted a comprehensive global standard-setting instrument² to provide AI with a strong ethical basis. It will not only protect but also promote human rights and human dignity and will be an ethical guiding compass and a global normative bedrock allowing to build strong respect for the rule of law in the digital world.

Key Principles in the UNESCO Recommendation on AI:³

- Respect, protection and promotion of human rights and fundamental freedoms and human dignity.
- Protection of the environment and ecosystem should be recognized and promoted throughout the life cycle of AI systems.
- Respect, protection and promotion of diversity and inclusiveness should be ensured throughout the life cycle of AI systems.
- AI actors should play a participative and enabling role to ensure peaceful and just societies, which is based on an interconnected future for the benefit of all, consistent with human rights and fundamental freedoms.

² <https://en.unesco.org/artificial-intelligence/ethics#recommendation>

³ For the full text of the Recommendation, please see <https://unesdoc.unesco.org/ark:/48223/pf0000379920.page=14>

- Recognition that AI technologies do not necessarily, per se, ensure the health and protection of human societies, the environment and ecosystems.
- Unwanted harms (safety risks), as well as vulnerabilities to attack (security risks) should be avoided and should be addressed, prevented and eliminated throughout the life cycle of AI systems to ensure human, environmental and ecosystem safety and security.
- AI actors should promote social justice and safeguard fairness and non-discrimination of all kinds in compliance with international law.
- The development of sustainable societies relies on the achievement of a complex set of objectives on a continuum of human, social, cultural, economic and environmental dimensions.
- Privacy, which is a right essential to the protection of human dignity, human autonomy and human agency, must be respected, protected and promoted throughout the life cycle of AI systems.
- Data for AI systems must be collected, used, shared, archived and deleted in ways that are consistent with international law and in line with the values and principles set forth in this Recommendation, while respecting relevant national, regional and international legal frameworks.
- It must always be possible to attribute ethical and legal responsibility for any stage of the life cycle of AI systems, as well as in cases of remedy related to AI systems, to physical persons or to existing legal entities. Human oversight refers thus not only to individual human oversight, but to inclusive public oversight, as appropriate.
- The transparency and explainability of AI systems are essential preconditions to ensure the respect, protection and promotion of human rights, fundamental freedoms and ethical principles.
- Public awareness and understanding of AI technologies and the value of data should be promoted. There should be open and accessible education, civic engagement, digital skills and AI ethics training, media and information literacy led

jointly by governments, intergovernmental organizations, civil society, academia, the media, community leaders and the private sector, and considering the existing linguistic, social and cultural diversity, to ensure all members of society can take informed decisions about their use of AI systems and be protected from undue influence.

- The potential for digital technologies and artificial intelligence to contribute to achieving gender equality should be fully maximized, to ensure that the human rights and fundamental freedoms of girls and women, and their safety and integrity are not violated at any stage of the AI system life cycle.
- AI systems, where appropriate, should be incorporated in the preservation, enrichment, understanding, promotion, management and accessibility of tangible, documentary and intangible cultural heritage.
- There must be credible and transparent monitoring and evaluation of policies, programmes and mechanisms related to ethics of AI, using a combination of quantitative and qualitative approaches.

This Recommendation is the starting point for ensuring that these technologies enhance the quality of our lives. It provides for concrete measures to control the downsides and proposes solutions for current and anticipated problems. We invite everyone to join us in this endeavour, as artificial intelligence is everyone's business.

5 things you need to know about AI

AI has proven its value in confronting the COVID-19 pandemic

It contributes to slowing down the economic impact of the crisis through digital platforms. It also helps researchers crunch huge amounts of data in the race to find a vaccine or treatment. AI has participated to contain the spread of the virus through test, track and trace technologies. Yet, as people are giving access to their data, the use of AI during this pandemic



Only 22%
of all AI professionals
are **WOMEN**

Source: World Economic Forum

110 million
students

could benefit
from AI to complete

SECONDARY EDUCATION

Source: Accenture

AI is expected
to generate
nearly US\$ 4 trillion
in added value by
2022

Source: Gartner

DATA 
EXTRACTION
consumes nearly
10% of energy
globally

Source: Aronov, S.G. Aronov et al.

has reopened concerns regarding privacy, data protection and the use of data beyond the needs of virus-tracking.

AI-driven growth is likely to be highly unequal

AI is expected to generate nearly US\$ 4 trillion in added value by 2022. By 2030, economic gains are expected to be strongest in China and North America, representing 70 % of AI's global economic impact. AI has a "winner takes it all" dynamic that needs to be regulated: concentration of AI in the hands of few high-income countries will likely leave developing countries far behind. The latter will not benefit or very little from AI technologies and will lack ownership of such technologies.

AI contributes to widening existing gender gaps

Only 22 % of all AI professionals are women. Because they are underrepresented in the industry, gender biases and stereotyping are being reproduced in AI technologies. It is not a coincidence that virtual personal assistants such as Siri, Alexa or Cortana are “female” by default. The servility and sometimes submissiveness they express are an example of how AI can (continue to) reinforce and spread gender bias in our societies.

AI can be a powerful tool to address climate change and environmental issues

As the planet continues to warm, climate change impacts are worsening. By gathering and analysing data, AI-powered models could, for example, help to improve ecosystem management and habitat restoration, essential to diminish the decline of fish and wildlife populations. That said, data extraction consumes nearly 10 % of energy globally. So, it is also essential to address the high energy consumption of AI and the consequential impact on carbon emission.

AI cannot be a no law zone

AI is already in our lives, directing our choices, often in ways which can be harmful. There are some legislative vacuums around the industry which needs to be filled fast. The first step is to agree on exactly which values need to be enshrined, and which rules need to be enforced. Many frameworks and guidelines exist, but they are implemented unevenly, and none are truly global. AI is global, which is why we need a global instrument to regulate it.

Artificial Intelligence and its Impact on Society

Anne Bouverot
Former Director General of GSMA, Chairperson
of Technicolor, Co-Founder of Fondation Abeona
“Championing Responsible AI”

Nowadays we hear “AI”, Artificial Intelligence, mentioned in all sorts of ways, in various contexts, sometimes as science fiction, sometimes as a potential solution for health or education problems, sometimes as “big tech evil”... But let’s start with: what is AI?

There is not a single, simple definition of artificial intelligence. Maybe the easiest way to think about this is to view AI as a combination of data (generally lots of data), computers (generally with significant computing power) and algorithms. You can think of algorithms as instructions, like a kitchen recipe, instructions for assembling a product, or programs composed of lines of code.

What experts think of when they speak of AI is very often machine learning, these are programs that actually learn from training data, for example annotated images (of cats and dogs, apples and cupcakes, or whatever...) and on the basis of these images they make predictions or recommendations (“this image looks like that of a cat”). Maybe telling dogs from cats doesn’t seem really useful, but it does when you can start thinking about applications like personalized medicine which have great potential.

There is also a broader definition of AI, which is pretty much everything that computer programs do that seems to reproduce human intelligence, like doing complicated calculations, playing chess, reading medical images or sorting through CVs. The more we get used to using AI tools and the better we understand how it works, the less scary it is of course.

Now is AI purely science fiction, or is it already part of our daily lives?

AI is actually used quite a lot already, in the physical and in the digital world! For example, post offices and mail handlers around the world use handwritten text recognition to automatically read addresses on letters and packages and help direct them to their destination. Also, border control often relies on facial recognition, which in turn uses AI. On a recent trip from Paris to London, I inserted my passport in the automatic control gates, the photo in the passport chip was read and compared to the image captured in real time by the camera, and then I was let through.

There are many examples in the digital world of course. Email systems use AI to automatically detect which emails should be classified as spam, and they also have “smart reply” and “smart compose” functions which propose short sentences to answer messages or suggestions as we are typing a new message. Search engines use AI to index sites and rank them in a relevant order according to the terms used in a search, or even according to a person’s search history (Google Suggest). Machine translation services like Deepl use deep learning to translate text from one language to another and produce good quality texts. Navigation applications such as Waze determine the shortest route, estimate the arrival time according to the traffic in real time, propose an alternative route in case of traffic jams. Merchant sites, such as Amazon, suggest items of potential interest based on the user’s history and/or the browsing history of other visitors.

AI is also starting to be used in health and this is very promising. Modern vaccine design is a hugely information intensive endeavor and machine-learning systems are playing an important role in the development of Covid vaccines. AI is helping researchers understand the virus variants and their structure and predict which of its components will provoke an immune response, as well as the virus genetic mutations over time. It also can help scientists choose the elements of potential vaccines and make sense of experimental data.

AI is also helpful in analyzing medical imaging, for example of tumors and melanomas, and can help predict risks of developing specific types of cancer, for example breast cancer. However, the reality is that few algorithms are currently ready to be deployed at the clinical level, and regulation will be vital to ensure risks and patient's right to privacy are taken into account.

So we already use AI in a number of instances, and there are a number of potential new applications. According to ResearchAndMarkets, less than 20% of companies and organizations use AI systems today, but this should grow to 70% by 2027. This is only the beginning.

But should we be afraid?

There are of course risks associated with AI, as with every new technological development. Let's start with the risk of job losses due to automation. If we look at this more closely, it is not so much about replacing entire jobs but more about automating tasks as part of a particular job, usually rather repetitive tasks (classifying data, sorting and filing items, analyzing medical imagery) and it also allows for things that were not possible before, like the analysis of millions of data points in a few hours. So, yes a number of jobs will be significantly impacted, but it will rather be a transformation of work as we know it today. We need professionals to be able to continuously learn new skills and adapt to new needs and

changes. I also predict that we will see increased focus on emotional intelligence and interpersonal relationships, which remain very human attributes.

Indeed another risk is that AI could dehumanize customer relationships. Gartner estimates that 15% of customer service interactions in the world are handled by AI today, a significant increase since just a few years ago and in constant progression. Benefits include the ability to access customer service information round the clock, but answers and recommendations made by an AI system and communicated by a chatbot are not the same as provided by a human being! We need to train customer service professionals so that they can explain recommendations produced by AI systems and put the emphasis on human decision and human interaction for decisions (versus information).

There is also a real risk of increased inequalities: AI not only reproduces biases that are present in real life data sets but can also amplify human biases and prejudices. There is a well-known example from a few years ago, when Amazon decided to use AI to help recruit computer developers. Since most previous hires had been men the algorithm learned to deprioritize women's resumes (based on apparently innocuous mentions such as "member of women's sailing team" or "winner of women's chess championship"). When Amazon realized this, they of course stopped the project, but this shows that we must test algorithms and systems before use, with real data, and seek out and correct any inherent bias with independently verifiable standards and audits.

As remote work, access to education and health develops, we must be mindful also of inequalities in access to digital technology or digital illiteracy (not knowing how to use digital technology, not understanding how a program will classify a request, etc.). It is critical to provide easy and affordable access to communications, to computers or smartphones, to provide training for people who are not at ease with digital tools, due to

their age, their current job not requiring this, disabilities or just feeling that it is not for them. This is clearly something that the GSMA and its members are well positioned to do!

Then of course whenever data is used there are risks to privacy and protection of personal data. This is an area which is already highly regulated in Europe (by GDPR regulations) and in a number of other places. Maybe because people feel more protected by these regulations, (or just because of a lack of awareness of the risks) a Salesforce study¹ has shown that 62% of consumers are ready to share data with AI systems in order to get a better customer experience.

Last but not least, power intensive calculations linked to AI algorithms cause digital pollution and carbon emissions. We need to ensure we focus on optimizing algorithms, processing data as close as possible to the source and without unnecessary calculations. I think there should be standards associated with this.

What kind of future will AI create?

After two years of a crisis that has revealed all that digital technology can bring to society, people are more and more confident in the ability of technology to have a positive impact. In a recent study in France, 64% said they believe it is an opportunity for the environment, 58% for social issues (inclusion and equal opportunities) and 56% for corporate and institutional governance. After the experience of the pandemic, technology is perhaps viewed by a majority as less scary and just a part of everyday life.

Artificial intelligence systems are tools that allow us to do things that we could not do otherwise, either not at all, or with much more time and effort. Thanks to AI, companies and economies are becoming more efficient and competitive. We

1 <https://www.salesforce.com/blog/consumer-privacy/>

should however be very aware of the risks and ensure we deploy trusted and responsible AI systems. There will very likely be some specific regulations in future, like the AI Act that the EU is currently working on, but we also need standards, audits, tests, a lot of transparency and above all, the human touch.

Lifelong Learning: The key to impactful life and work in the digitally enhanced post-pandemic world

**Professor Gabriele Suder¹
Dean, New Business Accelerator
Federation University Australia**

Covid-19 has brought much human loss and tragedy, physically and mentally. The pandemic has caused significant changes to life and work encompassing new ways of working, teaching and learning with urgent needs for skilling, up-skilling and re-skilling.

Whilst entire industries were down-spinning, others gained unexpected momentum. With this, a 'war on talent' on local level has emerged as barely ever before and that is predicted to continue. Talent could not and will not move as freely any longer as globalisation had made us believe, and we saw the consequences of it in real time - whether in supply chain issues, in a lack of workers in hospitality, overload of work in the medical sector or a huge surge in tech talent needs and upskilling as we all went digital.

When the term 'war for talent' was coined in the late 1990s, competition was becoming global and job-hopping was increasing with an ageing population leaving more jobs. Today, with borders repetitively closed and concurrent phases of

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lockdowns worldwide, migration, travel and expatriation opportunity are limited. Also, many people have changed their priorities towards living closer to their loved ones and have become less mobile.

A great number of previously ‘comfortably employed’ people have also taken the opportunity (or have had to, due to redundancies) to reconsider their career path and aspirations and turned their back to some sectors. For example, the hospitality sector continues to struggle finding and retaining staff. And others have used the monotony of lockdown to take up an early hobby, long forgotten, or passion – most often through digital channels. They have turned to the power of technology, to digitalised learning opportunities, that are accessible, engaging, impactful and often – when leading to more than a punctual distraction – into more formal learning courses, programs, diplomas and certificates.

Covid-19 has also offered a unique, maybe once-in-a-lifetime opportunity to consider and re-consider what one’s future will hold – i.e., a drive to consider what we can control in life whilst the virus was raging, apparently out of control: What could my life and my work, or yours, or theirs, look like if we keep learning? What if we embrace for real that idea of lifelong learning where we can translate our curiosity into a meaningful, purpose-driven mission for ourselves? And if we can do so through personalised learning paths, whilst our adaptability drives personal, social and economic recovery.

Evidence of these developments is the “great resignation”, a phenomenon which was first identified in the US². People have begun to rethink their ambitions and resign or re-focus their careers. This has been accompanied by a severe skill shortage which enables job seekers to be more selective and demand greater perks including tailored personal and professional development.

2 <https://hbr.org/2021/09/who-is-driving-the-great-resignation>

Digital enablement

Lifelong learning and its pathways into resilience (of employment and mental wellbeing) and purpose (serving personal content and social contribution) have become remedies and are here to stay. The acceleration of digital learning and working has brought even the most reluctant on the journey of digital enablement – during the pandemic in many sectors not a choice but a necessity, removing other options. People of all ages and in all sectors have ascertained that fulfilment, productivity and engagement are not a space-bound paradigm as previously assumed. In the post-pandemic world, we (1) learn, recruit, manage and lead in a hybrid world, in which flexibility and agility have become the new normal and (2) in which digitalisation best practice is an expectation, where the user will not accept a poor digital experience. This is combined with 'hybrid' work – life expectation of physical and digital presence, and the individual's desire to customise and personalise what that combination looks like and what development it entails.

In the workplace, digitalisation best practice is also being pushed by both employees as well as employers, who aim to (1) attract and retain talent, and (2) are in dire need of staff that is adaptable and agile. Employers are recognising the value of re- and upskilling accessed through channels that do not require staff to leave their job for a year or more. Skills can be attained through bite-sized learning, available when needed, stackable, inclusive, accessible and impactful for the purpose and context required rather than standardised and static.³

As we reflect on and chart the evolution of the digital tech industry and its impact on society, we recognise that learning and teaching is a key component of what has changed and why, especially during the coronavirus pandemic. Digitalisation

³ https://theconversation.com/what-to-look-for-when-choosing-a-university-as-the-digital-competition-grows-162766?utm_source=linkedin&utm_medium=bylinelinkedinbutton.

has brought the ability to adapt to a comprehensive range of sectors and communities, often as the only model allowing them to sustain livelihoods. Learning (whether through traditional formal or innovative informal teaching and training) has helped society adapt to the fast-tracked digital world faster than anyone could have expected. This is why in the future, we will expect to see an equally unprecedented blend of human interaction, driven by learning, combined with technology. This is a future that spurs enhancement and augmentation of capabilities, rather than the replacement of direct interaction.

We have learnt so much through the pandemic. One of the key learnings though has been brought about by the agility that life and work have assumed in a digitally enhanced world in which we imagine, shape, build, and inspire connectivity in a different way. A world in which we humanise a hybrid future of learning for a productive future of work - a new normal.

The future needs antifragile organizations

Isabelle Paradis
President and Founder, HOT TELECOM

There is no doubt about it, society as a whole is going through one of its most intense phases of transformation and the telecom industry is at the core of this revolution, as it has become an intrinsic part of everything that we do and everything that we touch. This comes with great responsibility, considering that the successful evolution of the telecom world will have a direct impact on our society's future.

The 360° societal impact of the telecom evolution

If we take a step back, we see that different telecom evolutionary waves have affected all of us as human beings, the society we live in and the businesses that support it.

I started in the industry almost 30 years ago and at that time, it was going through two significant evolutionary waves: the market's deregulation and the advent of mobile. These did not only bring a whole suite of new players, technologies and products to our industry, but also changed the way we communicate, live and work forever. It also brought with it a new entrepreneurial spirit and a sense of adventure to what had been a very traditional, slow moving and highly controlled sector. For the first time, women started to join the telecom industry in much greater numbers, seeing the enormous opportunities that would be opening up to them. I was one of those young women, who was excited by the prospect of what the future would bring.

While the first evolutionary wave was kick-started by deregulation and privatisation, the following wave was driven by advances in technology - the introduction of the Internet and IP all the way to the handset. This significantly impacted our society as a whole, as it enabled us, as a collective, to create a global and, in some way, transient people centric society, which is increasingly sharing its ideas and culture. We are becoming one without borders and our views, beliefs and philosophies are becoming a melting pot of all of our combined experiences. It also gave us the power to control our lives in real-time from anywhere.

Finally, the digital wave we are currently riding is bringing accelerated automation and virtualization and the creation of everything in the cloud. This, coupled with the introduction of 5G, is forcing the industry to move away from a one-size-fits-all type environment towards hyper-personalized tailored solutions and business models and is therefore triggering the verticalization of our industry. This is putting intense pressure on businesses globally, as they must themselves transform to generate everything, everywhere, now businesses (a-la-Amazon). Everything is expected at a click of a button, from information to clothing, to content, as well as telecom services. There is no doubt about it, telecom and society's future are inextricably intertwined.

I have seen the future and it will be...

Now wouldn't we all like to know what the future holds! What the next wave will bring and what our society will look like in 20 years' time.

We know 5G is being deployed globally as we speak, and will transform the way telecom services are delivered, by enabling countless numbers of use cases and in some way accelerating the blurring of the lines between enterprises and telecom operators. Consequently, going forward, telecom solutions will primarily be driven by specific business requirements and

outcomes. The 5G wave will definitely be an enterprise and vertical play.

We are also already seeing the blurring of the lines between the physical and virtual space, with holographic presence, synthetic media and the creation of the metaverse, which is on everyone's lips at the moment. Some say that we are already living in a virtual world with the use of the internet, but these technologies will bring us one step closer to it.

Additionally, Artificial Intelligence (AI) and Machine Learning are playing a growing role in improving efficiency at all levels. AI and data-driven decisions are already reshaping the way companies do business. Pushing this concept further, some think that 'Big Brother' could soon exist in the form of AI – for good or bad, making it evermore easy to monitor our actions, both on and offline. This added to facial recognition tech is also beginning to prove useful for businesses and governments, as it holds the potential for better safety, security and personalisation.

But whatever disruptive technology is around the corner, one thing is for sure: innovation is speeding up and each and every new innovation now feels like a revolution. We must therefore get used to the unknown and build organizations that are able to grow despite constant change. Technology companies must be able to foster constant progress, fluid innovation and attract talent capable of thriving in chaos - as chaos is the new normal.

The telecom conundrum

Looking forward, telecom operators therefore have some challenging times ahead, as moving quickly, being agile and constantly innovating is not necessarily in their DNA. The increased pressure on their revenue and margin added to the mix means that operators around the world must address two contradictory objectives and two separate cultures: they

are craving more efficiency and cost savings (in terms of processes, operations, systems and people), while having at the same time to foster the type of organization that brings in new sources of revenue through constant innovation, which demands resources.

As a result of the uncertainty and chaos in which we now live, operators must not only look for efficiency and innovation. They must also make sure that they have a resilient organization. They must aim to nurture resiliency in terms of processes, partners and people and to incorporate a constant state of adapting to change so they are able to work seamlessly without alarm or disruption to the business. The need to balance efficiency, innovation and resilience is the conundrum that they now face.

The need for antifragile organisations

Addressing this conundrum is indeed a constant balancing act and not many will succeed. But, in my view, because of the chaotic nature of our new reality, we cannot stop there. Operators must go one step further to make their organizations antifragile. Antifragility is a concept developed by the well-known philosopher Nassim Nicholas Taleb and is a property of an organization which increases its capability to thrive as a result of chaos, may it be stressors, shocks, volatility, attacks, or failures.

Antifragility is beyond resilience. The resilient organization resists shocks and stays the same; the antifragile organization gets better¹

Resilient organizations are complex adaptive systems that succeed in removing the barriers to enabling four key characteristics: diversity, autonomy, interaction and learning. These organizations must therefore cultivate diversity not only of services, but also of technology and people. They should

¹ Nassim Nicholas Taleb, *Antifragile: Things That Gain From Disorder*, Random House, 2012.

also encourage autonomy by distributing authority to enhance agility. Finally, they must make room for free interaction within the organization and encourage constant experimentation and small mistakes.

An antifragile organization can only exist if a clear vision comes from the top, which aims to build a working environment that fosters intelligent operation, real-time learning and a fluid workforce. Leaders must ensure their organization can be modified quickly to respond to changes in the business or social environment. And this can only happen with a reliable workforce that has imagination and can cope with change.

The power of diversity

So the 1 million dollar question is: How do we transform traditional telecom operators, who are well known to be everything but agile, responsive and innovative, into lean and mean antifragile machines? How do incumbents in the network and mobile space prepare themselves for the uncertain future that lies ahead of us?

I think the first thing we must do is to stop talking and start taking positive action. Industry leaders, if they want to continue to be successful, will need to focus less on the technology and more on the human element. I mean that the industry needs to take the necessary steps to harness the power of young people and diversity to trigger fundamental change. I truly believe that part of the answer lies by empowering the new generation, as sometimes it is sometimes only the young ones who are crazy and bold enough to change the world.

My view is based on my personal experience when, as a young graduate, I was fortunate to be recruited to be a 'catalyst of change' by Teleglobe, the international operator in Canada. Fundamental change always come from the top of an organization, and so it was that Charles Sirois, the new CEO of a recently privatised Teleglobe, took positive action to

bring about 20 young graduates from all disciplines into the company. We were encouraged to be bold, to put forward our views and get involved at the highest level in the transformation process that had to take place. And the result was the creation of an entirely new entity. One that transformed from a slow and traditional monopoly, to one of the most dynamic international operators in our industry within a matter of a few years.

It can be done and it starts with fully engaging with the young. Then, if the industry wants to build the world of tomorrow it must reflect it, not only in terms of age and gender, but also in terms of culture and philosophy. It is essential for the industry's future that we involve women, the older generation and people from all walks of life in creating the type of digitally enabled economy and society that we want to achieve.

I believe in this concept so much that I have created an initiative called the 'Inclusion hub' with the objective of encouraging more young people to join our industry and help them thrive once they do. It is all about connecting, inspiring and supporting the next generation. It is also the reason why I am so delighted to join the Board of the GTWN, and to have the opportunity to work with my colleagues and friends at the GTWN on mentoring younger women who will be the leaders of tomorrow.

If we succeed in becoming truly inclusive, then and only then will the telecom industry be able to play its pivotal role in building all of our futures.

Much More than Apple Pie

**Dr Mike Short CBE FEng
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15 years ago this month (January 2022) the iPhone was launched at Apple MacWorld in San Francisco, and has since gone on to sell globally over 2.5 Billion iPhones based on 33 models to date.¹ The comparisons often look at the price, shape and size of these rectangular devices. But so much more has gone into this modern-day phenomenon offering huge pies or ecosystems that have been created. Taking lessons from the past can offer predictions for the future so what breakthroughs can we still expect? Much of the original Project Purple started in Apple in 2004 but it took a huge collaborative effort with key industry players and close to 1000 Engineers to bring this concept to reality. And then to deliver the first Apple cellphones to the US market in June 2007 and into Europe in Q4 2007.

Apple had the talent and vision, but they may not have had the courage to bring together Multimedia, Internet browsing and Mobile telephony into a single device without a few key ingredients. They had the computing and music industry knowledge and could see the early success of the iPod and PDA markets. But they knew little of the telephony market or mobile wireless in particular, and yet they could see it was changing from Business to Consumer markets. New business models and competition were emerging for connectivity and

¹ This article is reproduced with the author's kind permission. It first appeared on LinkedIn in shortened form in early January 2022.
<https://www.linkedin.com/feed/update/urn:li:activity:6883379422485913600/>

distribution, such as MVNO Virgin Mobile (launched in UK / USA - 1999/2001 respectively) which were showing good progress. They could also see the Electronics industry developments opening up new opportunities for memory, processing, and displays, some of which may have been seen as competition to their IPOD business (launched in 2001). The prospect of working with higher speed networks such as 3G and future Wifi, and lower power RISC based ARM processors added to their confidence. They naturally integrated other technologies when available such as early Camera lenses, GNSS and key sensors.

So with good timing and vision they became known as the pioneer of smartphones but went on to enlarge the Mobile market pie through many key initiatives:

1. **Design** was always at the heart of every iPhone, fully controlled through system software, with key components and accessories designed through build, all the way through to delivery, brand and presentation. The components preferred were all part of a strong systems design which addressed everything associated with functionality and the look, feel and usability of the device. Multitouch screen was not completely new but was a key replacement to the buttons and styluses used in smartphones at the time. Accessories and Colour were all added over time, including new battery charging techniques and airpods. The higher levels of functionality were also added in gradually with subsequent models, strengthening user experience and accessibility features along the way.
2. **Distribution** – originally this was a tailored distribution programme to address markets which were ready and could match Apple's ambition and investment through new partnerships. These changed the economics of the market to ensure devices could be well supported, handle managed market growth and had networks that were ready. This has continued to change with online distribution. The strong push towards SIM card evolution (including E Sim) was to

add new business models, reducing impact on hardware design, and improved provisioning controls and levels of security.

3. **Connectivity** – the very first iPhone model was really advanced 2G. Even though 3G had been around for a few years, international 3G coverage was still limited and Apple had plans for this with a later launch in 2008, coupled into their 1st Apps store. They saw Internet browsing and Apps downloads as a major feature. Later generations of iPhones have not always led with the first 4G or 5G launches, or Wifi functionality, but have generally timed it well for the (later) Consumer volume market. The first 5G phone was launched in Oct 2020.
4. **Cameras** really started in Mobiles around 21 years ago but have been included since the first iPhone. They have evolved rapidly from stills to video, from 2.0 to 12.0 Mega pixels, from single to multiple lenses (front and back), from “nice to have” to key differentiators. They have coupled in sensors and accelerometers from the beginning. Storage options have increased from 4/6/16GB to as much as 128/256/512 GB or 1TB with the latest iPhone 13 Pro Max models, and RAM increased from 128MB to 6GB .
5. **Data traffic** has been booming in recent years and capitalising on this trend has seen the shift to higher G cellular networks and Wifi usage for broadband, including browsing, downloads and streaming. Unlimited pricing plans have helped as well as the growing range of content and apps available for downloads. Data traffic growth continues to be a major driver for the mobile industry as a whole as seen in the recent Ericsson Mobility report for Smartphone average usage 9.1/11.4 GB per month respectively end 2020/2021 and expected to rise 24% CAGR to 41GB by 2027. Higher rates of usage in, for example, Taiwan have already seen on some networks average usage levels of 60GB/ month. Perhaps aware of this growth, it can be seen that concerns over customers’ data privacy and trust are regularly voiced by Apple as part of their public statements.

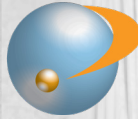
- 6. Internet developments and social media** continue to be major drivers of data usage, and this has become much more interactive with ecommerce, multimedia, games and video streaming. Not all these services were foreseen with the original iPhone, but designs have changed network access choice, processing, storage and battery models all to help cope with these mega trends. When seeing that the US Word of the Year in 2010 was “App” it is perhaps useful to remind ourselves of some of the App hits in the following years were for Mobile: – 2010 Angry Bird; 2012 Google maps / WhatsApp; 2013 Uber/ Candy Crush; 2015 Periscope; 2016 Snapchat/ Pokemon Go; 2017 Musical.ly/ Mario Run; 2018 Fortnite.

Looking forward there is still a lot more to do with barely 50 % of the world's population connected to the Internet, but smartphones are expected to lead the way along with connected things or the Internet of Things (IoT). Business models may continue to change but access to content and services will still be required. With COVID we have seen increased work and education from home, and the widening use of consumer-friendly devices. It is expected that new form factors will augment our various senses for communications, whether through head-worn wearables or other body-worn sensors such as the iWatch. Our environments such as homes, offices and cars will all become smarter and better connected. Digital Health and Wellness also offer huge potential for breakthroughs. Connected clouds continue to displace, store and share data that will need to be accessed. But as yet there is no singular view of what the future will bring.

So as global competition and innovation increases, it will be fascinating to reach the Silver Jubilee of the iPhone in 10 years, and a lot more interesting to see an even bigger pie of ingredients, delivering a more inclusive Digital future. But feel free to look back at the MacWorld Launch 15 years ago on January 9th 2007. <https://www.youtube.com/watch?v=x7qPAY9JqE4>



GTWN



Celebrating 30 years





past
present
future

Candace Johnson: Personal reflections on the power of communications

**Candace Johnson
GTWN Founding President**

It has been 64 years since my father, Brigadier General Harold R. “Johnny” Johnson USAF Ret. and mother gave me a little toy Sputnik to put on the Christmas tree in 1957. Santa Claus was inside and from that day on, I was hooked. At age 5 years old, I was convinced that everything good came from Space. We lived in France and my father, first as a Captain and then as a Major, was working at SHAPE, the Supreme Headquarters Allied Powers Europe of NATO. I remember him telling me about implementing Tropospheric Forward Scatter networks, an early form of sending microwave signals beyond the line of sight.

When I was 10 years old, my father came to talk to my 5th Grade Class on a “Bring your Father Day”. He had now been seconded from the Department of Defense to the White House to work for President Kennedy on the Apollo Mission. At that time, no one brought their mothers to talk to their class, because they were usually not doing what was considered “work”, even though they were bringing up the most important capital of our society and economy - the human capital. My father, who by this time had also already worked on the first satellites for the United States government, told my class that “we would use satellites for communication, education, entertainment and that one day when we had wars, we would have wars with satellites and peace on earth”. He also told us

that many times he had been asked, “What are we going to do with these unwieldy things in space?” He always answered, “Human imagination will find ways that we cannot even fathom today and it always will”.

These were heady times indeed. Because my father was one of the few “telecommunications” officers in the military, now working at the White House during the Kennedy and Johnson years, at home we would be visited by many leading and interesting experts in their fields of communications and space. These included: Wernher von Braun; Paul Baran (the father of X.25 networks); Vinton Cerf; Esterley C. (“PX”) Page, one of the co-founders of Northrop Corp. and an expert in advanced international telecommunications; and Norm Abramson, (the father of the Aloha Protocol). We were also visited by many other company executives who were becoming involved in the new telecommunications and space industries.

These included representatives from ITT (then the world’s largest telecommunications manufacturer and not a hotel real-estate conglomerate); Jerome (“Jerry”) Wiesner” President of MIT and head of President Kennedy’s Science Advisory Committee; and Irwin Jacobs, co-founder of Qualcomm. At the time, I thought nothing of seeing these illustrious dinner guests. While the adults all sat around the table, we children were allowed to sit on the staircase during the cocktail hour and listen in on the conversations between these true pioneers, who together were imagining and creating the future of telecommunications.

Growing up, I did not realise that not everyone knew about the military use of fibre optics, cellular communications, or data networks such as ARPANET, the forerunner of the Internet. Or that not everyone got to go every Sunday and make a call on PX Page’s HAM Radio (the largest in the United States in the 1960’s) to exotic places around the world, such as Peru, or countries behind the Iron Curtain, etc. Mr. Page, as all of us children called him, also had a home cinema even back then

and so afterwards we would sit together and watch Orson Welles' film War of the Worlds and other classic Sci-Fi flicks.

For me, growing up surrounded by this technology and telecommunications ecosystem, taught me one very important thing, though. Technology is not the endgame; it is only a tool to create something good and to serve society and humanity. And throughout it all, there was my incredible Romanian immigrant mother, Maria Baciu Johnson who gave to each of her children – two boys and two girls – unconditional love and the belief in each of us that we could go out and change the world for the better in our chosen professions.

Solutions and Opportunities!

Because of this upbringing, it never occurred to me that I had any “expert knowledge” or that I was a woman in a “man’s world”. I only saw opportunities and solutions to either use technology and telecommunications to solve problems, or to create new worlds and eco-systems for humanity.

Thus, as I embarked on my life in broadcasting, telecommunications, space, and digital technology, I didn’t realise that very often in the early years I was the only woman. I was way too intent on making things happen and following my motto: “Never accept no for an answer, never give up, and never go away even when others want you to”.

Because I had been brought up in a family where technology, space, and telecommunications were a part of daily life, I decided to study classical music as no one in my family knew anything about that and it was said that I had a “natural gift”. As it turned out, the “natural gift” that I had was not so much for playing the piano and singing as it was for “communicating”. I soon learned that I could be much more impactful in helping change the world for the better by combining telecommunications, technology and space with music, literature, and art into the “Power of Communications” or as we say at the GTWN in

the slogan coined by our great co-founder Janice Hughes, “Changing the Culture of Communications... from generation to generation”.

The importance of financial freedom and standing up for what you believe – no matter what

My first entrepreneurial endeavour was “Concerts on the Canal” in 1976 in Washington D.C. Having finished my degrees in renaissance, baroque and computer music at Vassar, the Sorbonne, and Stanford, I embarked on “saving the world” by arranging free classical music concerts in the ghetto of Washington D.C., paid for by the surrounding businesses. It was such a novel idea at the time that it attracted huge attention and Mobil Oil decided to sponsor it to ingratiate themselves with the lawmakers in the nation’s capital. From then on, I was on my way.

Washington D.C.’s classical music radio station WGMS offered me a position for 6 months as “Acting Assistant Music Director”, but I soon became the Executive Producer of the station at age 25, gaining new important sponsorship contracts for the station and putting their programs on satellite for country-wide distribution. Opportunity knocked three years later when Parkway Productions, the largest classical music radio and television syndicate in the US asked me to become their Marketing Director. Up until I came, they had never had any corporate sponsorship sales, nor did they have any satellite distribution. They were “bicycling” the programs on large tapes around the country by FedEx and DHL. Within one year, I obtained 7 corporate sponsorships, put them on satellite for nationwide distribution and sold them to US News & World Report, for which I received at the time a large commission. I believed in my abilities and had opted to be paid a lower salary but also commission and so, as a result I had enough to be able to finance my activities in my next very big venture - co-founding and building the world’s largest satellite system, SES.

The importance of earning the financial freedom to do what you believe in and to not be dependent on anyone, and to “follow your conscience and achieve your goals” cannot be over-estimated. Throughout my career as governments were de-regulating telecommunications, I often upset the “status-quo” (today I would be called “disruptive” although I do not like that word as I prefer to focus on the “creation” of new eco-systems). Having the freedom to fight for what I believed was crucial in my development and I believe this also applies to the telecommunications and space sectors.

Time and time again, I would find myself in situations where I spent or shall we say in today’s jargon “invested” all my money in making new ventures happen. For a number of reasons, sometimes it was not possible for me personally to monetise these ventures and so from time to time, I had to go back to “being employed”. The knowledge however that I really could and always should stand up for what I believed was right is what gets me up for every morning.

The GTWN is created

The 1980s and the 1990s, when we began to think of founding the GTWN, were topsy-turvy times but full of opportunities for those who saw them and wanted to create new eco-systems. Government-owned or financed monopoly telecommunication operators, broadcasters, and manufacturers were still dominant, especially outside of the USA, and this was the norm in Europe, where I had moved in 1983. Many people in Europe accepted this system, but from my experience in the US, I knew we could create a more accessible system of telecommunications and broadcasting. I knew we had to work to create “Freedom of Choice” and “Universal Access”.

One of the most exciting days I experienced in my life was in 1992 when I and five women were speaking at an international telecommunications conference. It was the first time that I had not been the only woman speaker and it was great to discover

wonderful new colleagues. We decided right then and there that we had to create the Global Telecom Women's Network, the GTWN, to provide a global focal point for promoting and celebrating the role of women in the communications sector.

The idea of a "Brains Trust" amongst the GTWN International Board Members is central to our philosophy, operations and beliefs. My GTWN colleagues share the same values and beliefs. They have all fought for freedom of choice and universal access in their respective professional and personal roles. It is this personal responsibility to do things that change the world and today's culture for the better and that from generation to generation that makes each of them so very special. I am thankful that this amazing cadre of women has accompanied and inspired me in some of my biggest challenges. They have given me the courage to carry on, no matter how difficult the task.

Challenges and Achievements

Mahatma Ghandi said: "Happiness is when what you think, what you say, and what you do are in harmony." I have listed some of the challenges and projects below which have informed my life and contributed to "changing the culture of communications from generation to generation", all the while giving me the most beautiful, positive and harmonious life.

SES: The world's largest satellite system which I co-founded in 1983 and helped build over 20 years, despite many challenges, with the goal of providing freedom of choice for television and radio and then for the Internet. SES was a privately financed, market-oriented "New Space" venture 35 years before the term "New Space" was adopted. There were many challenges, including the power and influence of incumbent media owners in Europe who had ambitions to take over SES, thus potentially destroying the freedom of choice that I was trying to achieve. Despite much trenchant opposition, I fought with all my might to keep SES independent and succeeded. That I was successful

is, in no small part, because I was not part of the incumbent “old boy’s network”.

Loral-Teleport Europe: I conceived Teleport Europe after the fall of the wall of Berlin in 1989 to bring telecommunication networks to corporations who wished to create true European networks across what was to become a united Europe using satellite communications. Using satellites to create truly European networks, doing data networks for fax, telephone, and data, etc went against all the incumbent practice at the time. But it enabled corporations across Europe and even in the US to access the new European market and helped the Central and Eastern European countries leapfrog their western counterparts by providing them with digital networks.

VATM: The German Private Telecom Operators Association network which challenged Deutsche Telekom during the 1990s and still today assures “a level playing field” for emerging telecommunication operators. We had to fight the monopoly position of Deutsche Telekom (DT) who was illegally subsidising their data networks and eventually took our case to the German antitrust authorities (the Bundeskartellamt, BKartA). This case informed regulators about how to calculate “cost-based” telecommunication networks, which led to the deregulation of telecommunications networks across Europe. The BKartA initially resisted publishing the results of our study which demonstrated there was a DM 2B subsidy to DT. I called the President of the BKartA and said “either you go to the press or I will go to the press”. The next day he released the results of our and the BKartA’s study. As a result, DT was prohibited from cross-subsidising their data networks from their telephone lines. I believe that, once again, my independent stature and being beholden to no-one was critical to the success of this endeavour.

Europe Online: The world’s first Internet-based online service and the world’s first broadband satellite network in 1993, then in 1997 and then in 2001. I had to start Europe Online three

times and buy it out of bankruptcy twice, but I knew that I had to keep it independent and “net-neutral” even when the large shareholders tried to use it for their own purposes instead of making certain that the Internet would be accessible and universal for all. Europe Online did not make it as a successful commercial venture but it spawned a generation of “Net Pioneers” who went on to create the digital society we know today.

ILS: The world’s first commercial joint venture in launching rockets into space in 1995 between Krunichev of the CIS and Lockheed Martin of the USA. Russia’s superior space technology enabled it to become the lead satellite launcher for 10 years, before Elon Musk commercialised NASA’s technology to create the private company Space X.

Iridium: In 1994, I joined Iridium as Global Vice President. It was the forerunner of all the New Space constellations today and was one of the first companies to commercialise military communications to bring universal access to citizens and corporations around the world.

After years as an entrepreneur, and approaching 50, I decided that I should become a **Venture Capitalist and an Angel Investor**. Little did I realise it, but “The best was yet to come”! During the last 20 years, besides having the enormous satisfaction to see the blossoming of the above ventures and initiatives, I have had the privilege to inspire, invest in, and accompany the following ventures as the world became more and more dependent on digital technology.

OWNSAT/Kacific: In 2012 a group of leading women from the GTWN, Women in Telecommunications and Technology (WITT), private investors and the Pacific Internet Society from countries such as Cooke Islands, Solomon Islands, Australia, Vanuatu, Singapore, etc. came together to form the “Oceania Women’s Network Satellite/OWNSAT” to provide broadband by satellite to all the underserved islands of the Pacific. We

became early and large investors in Kacific, a broadband satellite system (which calls itself “The Heart of Broadband”). By 2017 Kacific was providing High Throughput Broadband Internet to the islands of the Pacific and in 2019, Kacific’s first owned and operated satellite, the largest commercial satellite in the world at the time, was launched on a Space X Rocket. Today, OWNSAT/Kacific is truly connecting island nations throughout the Pacific with dedicated Ka-Band country beams, serving hospitals, schools, companies, governments, and villages. When an undersea cable to Tonga broke in 2019, Kacific was able to provide almost all of the communications for the country. Similarly in early 2022 Kacific was able to provide essential satellite connectivity to Tonga following the volcanic eruptions which severed the cable connection to Fiji.

Raspberry Pi, Youth to Youth and Mamas2Mamas: In 2008 Jack Lang, Director of the Cambridge Computer Lab and Hermann Hauser, co-founder of ARM, decided to create an affordable computer to enable kids to program and code, a skill that was lacking around the world. I asked them for two of the first Raspberry Pi computers to give to Eliane Metni in Lebanon. With USD 5000 from the GTWN, she created the “Youth2Youth” program which she launched at a private school in the Arabic language. 10 year old children learned how to program with Raspberry Pi and were teaching other kids to code and program. It was a huge success, so much so, that UNICEF decided to implement the program in the Syrian Refugee camps in Lebanon. The fact that Raspberry Pi consumed so little electricity, combined with our “Youth to Youth” program, made it easy to implement in the camps. Along with learning how to code and program, these young people were experiencing the basics of education and entrepreneurship. Later, the program evolved into “Coder-Maker” introduced into all Lebanese schools, including the children from the Syrian Refugee Camps who were and are still today included in the Lebanese school system. Despite the ongoing difficulties in Lebanon, the program continues with ongoing financial support which we have been able to obtain.

This success has also inspired several similar programs in Jordan and elsewhere.

One particular Youth2Youth “spin off” which is dear to my heart is “Mamas2Mamas”. A few years ago my friend Selma Prodavonic, founder of 1 Million StartUps, introduced me to a young Kenyan entrepreneur who was selling beaded necklaces and belts, etc. from the “Maasai Mamas”. I was distressed that the prospects for women were still so limited, and I told him that they should learn how to code and program with Raspberry Pi. The GTWN members stepped in with a USD 5k “investment”. Combined with the engagement of our network, we were able to transfer the “Youth2Youth” coding and programming initiative to “Mamas2Mamas”. The Maasai Mamas are now learning how to code and program on Raspberry Pi and have already started working on a project for the Kenyan Ministry of Agriculture gathering data from the fields.

The Golden Era of Space: The last 5 years have seen an absolute explosion in space activities and I, for one, could not be happier that everyone is now understanding the potential that Space has to help us make a better planet. I continue to be very involved in space and enjoy the recognition that my 40-year professional life and my more than 60-year exposure to space technology is bringing me. I will cite just 3 space ventures and initiatives that I am involved in now, as the list could run on forever.

- **Seraphim Space** is the world's largest Space Tech Venture Fund and I am so pleased to be the Chair of the Advisory Board, a member of the Investment Advisory Committee and a Partner. Thanks to Seraphim and my own network (GTWN included) I see about 100 New Space ventures a month. This allows me to be on the leading edge of all that is happening in space and space exploration, which is very exciting. Whereas space ventures by Elon Musk, Richard Branson and Jeff Bezos are creating popular interest, the real value that new space industries can bring to the

world is in solving the “Sustainability, Environment, Climate and Connectivity” challenges facing our planet. Enabling, investing in, and mentoring young New Space companies, which will be the giants of tomorrow, is extremely satisfying and invigorating.

- **NorthStar Earth and Space** is the world’s first space-based Space Situational Awareness, Space Domain and Space Traffic Management System. With the opening up of space, brought about by the miniaturisation of components and IoT (the Internet of Things), space is the new arena for our economy and society. As Vice Chair of the Board, I am working with my colleagues to ensure that we bring order and systems to the domain of Space, so that pollution and colonisation of Space do not occur. NorthStar provides the tools to insure that “Sustainability in Space” will happen.
- **Women in Space:** I strongly believe that Space belongs to all, including to women who bring their ingenuity, innovation, and entrepreneurship to ensuring that Space remains accessible and open to all. I was extremely honoured in 2016 to receive a Lifetime Achievement Award from Women in Space Europe. Recently, I helped inspire a Fortune article by Michel Lev-Ram which focused on everything that women are doing to bring about an equitable, sustainable space domain for all our citizens and living creatures on earth. This is the future and women are creating it.

I am proud of all these ventures and initiatives, not for what they became commercially, but because each of them carved the path for creating new ecosystems and new worlds through telecommunications and technology to bring a better world for the world’s citizens. Of all the ventures however, it is true that the one I hold most dear to my heart is the GTWN, started 30 years ago with the amazing women who brought their dedication and formidable skills to achieve the goals that we set out.

...From Generation to Generation

An important part of the GTWN is indeed the next generation. We owe this part of our GTWN motto to Ingrid Silver, our GTWN President Europe Emeritus, before her recent return to Australia as the General Counsel of the Australian Broadcasting Corporation. She put into words what we had been informally doing all along but which really crystalized by her insistence on it.

At the GTWN, we had found out early on, that whereas we were all incredibly busy with our professional lives and often, all the while being mothers and having life partners, the best things the organisation was good at were a). Being Role Models, b) Facilitating Networking across the industry and world and c) Mentoring.

Being role models

For the GTWN members, being a role model goes beyond having an integral life contributing to the betterment of society. What it really means for us is making certain that young women and girls know that we believe in them and that we are counting on them to achieve their goals. When I first met Ambassador Diana Dougan, one of our co-founders and the inspiration for our mentorship role, I was amazed how welcoming and supportive she was to me. I felt the same way when the first woman Supreme Court Justice of the United States, Sandra Day O'Connor, invited me to attend her first "women's lunch" of 12 women when I was 29 years old at the Supreme Court of the United States. I resolved that I would never let these two great women down and that I would merit their belief in me and make them proud. At the GTWN, it is a huge responsibility to be a role model for others and we take this very seriously.

The value of networking

The same thing goes for networking. Because the members

of the GTWN International Board have all achieved success in their personal and professional lives, they can often help their colleagues and young mentees by opening certain doors or facilitating business relationships. Here again, the concept of networking at the GTWN goes far beyond making contacts. As we celebrate 30 years of the GTWN, many of us have formed long-term professional relationships in the industry and amongst ourselves. If one of our GTWN Members or mentees values accessing one of our long-term business relationships, we try our best to bring this about, hoping this will result in a win-win-win situation for all.

Effective mentoring

The same applies to mentoring. It is not enough to just mentor young women as they embark on their careers. We must make certain that our mentees succeed in their goals. This means making certain that the entire ecosystem is ready to welcome them. Often, this requires ‘mentoring’ men to help them understand the benefits of embracing diversity and helping women to succeed.

A long-time friend of mine and champion of the GTWN as well as recipient in 2017 of our first Lifetime Achievement Award, Viviane Reding, 3 times Commissioner of the European Commission, understands the importance of enabling young women to succeed. She led by example with her Global Board Ready Women initiative, establishing criteria and quotas to get women to the top. We at the GTWN joined her and support this initiative to the hilt.

Conclusion

And so, dear readers, this essay has turned out not only to be the reflections of the last 30 years of the GTWN and our wonderful industry, but actually 60 years! It was important to me to show how the foundation, the pillars, the values and the culture of what has successively been called “the telecommunications

boom”, the Internet Revolution”, the “Next Society”, “the Digital Era’, etc. came about so that we can collectively unleash the “Power of Communications” and bring about positive change.

Going forward, I believe that if we keep true to our inner values and cultures, all the while making certain that we use telecommunications and technology to serve humanity in the most positive sense, we will succeed in conquering the world’s problems and creating beauty and happiness for all, “The Changing Culture of Communications ... from Generation to Generation”.

The GTWN: building the future

Bridget Cosgrave
GTWN Global President
Candace Johnson

GTWN Founding President and Member of the Board¹

Looking towards the future of digital technology, it is timely for the Global Telecom Women's Network (GTWN) to reflect on the contribution of our members to increasing the leadership of women in the sector.

Founded in 1992, by a group of women leaders, the GTWN is something unique, pushing the boundaries for women. The GTWN has followed the trajectory of the industry expanding from telecommunications to everything digital, which is now pervasive in society. When we reflect on the role of women leaders in this journey it is amazing to see how far we have come.

The GTWN inaugural meeting was at the 1992 CeBIT fair in Hanover, Germany with Elke Geising, Dr. Susanne Paech, Janice Hughes, Dr Jessie McLeman, Lillemor Larsson, Susan Dark, Laureen Cook and Candace Johnson. These women were drawn together by a common career in telecommunications where they enabled and witnessed the power of this developing technology to change the world. GTWN founding members were united in a belief that women can achieve great things and wrote their motto up on a blackboard: "The Changing Culture of Communications". Numerous meetings followed, typically on the occasion of industry trade events, in Washington DC,

¹ This article first appeared in the 2021 edition of The Mobile Century. It has been updated.

London, Munich and Cologne, with the founding members growing the movement around the world. In 1995, the GTWN was officially registered as a non-profit association at the Cologne Chamber of Commerce and Industry, in Germany. In the same year, we held our first GTWN “Power Breakfast” based on similar events at ITU meetings, organized by one of our early Board members, Walda Roseman.

The inspiration

In the beginning we were inspired by amazing women such as Ambassador Diana Lady Dougan. Ambassador Lady Dougan was a trailblazer as the first woman appointed to many senior industry roles, notably as US Ambassador to the World Administration Radio Conference, head of the U.S. Federal Communications Commission International division, Director of the Corporation for Public Broadcasting, and Non-Executive Director of Qualcomm. Today, Diana devotes her considerable energies to documentary film making about women facing challenges, with tremendous results. In 2018, she shared the Peabody Award as co-producer for the documentary, “The Judge”.

Another key figure who helped establish the GTWN was Marie-Monique Steckel, then President of France Telecom USA. Marie-Monique was a pioneer in data-transaction networks and joint ventures amongst industry leaders. Today Marie-Monique continues to embrace cultural exchange between nations as the President of the Alliance Française in the US.

Janice Hughes demonstrated the same qualities in co-founding the GTWN as she did in her world leading strategy companies. Janice brought the newest technologies to the GTWN Board meetings, such as in 1997 when she demonstrated her new mobile phone. Janice was awarded a CBE for her services to UK technology exports, charitable healthcare abroad, and her work with the GTWN. Janice continues to find solutions to new challenges, combining technology with the environment, art and

design. She has continued to mentor younger entrepreneurs; for example, the founders of lastminute.com began their careers with Janice before starting their own company.

Walda Roseman, currently Chair of the Arthur C. Clarke Foundation, inspired us, women and men, to go boldly forth and change the world through the power of telecommunications. Walda led the first international communications office of the Federal Communications Commission. She held executive positions with Intelsat and served in many senior executive positions, including as: Director of Public Information and Government Affairs with the former White House Office of Telecommunications Policy; and Chief Operating Officer and Chief Strategic Communication Officer of the Internet Society. Walda created the concept of Women's Breakfasts at the ITU, even before the GTWN's Power Breakfasts. She helped the ITU to rejuvenate its leadership through the International Youth Forum with countries sending one female and one male participant.

As Director of the Cologne Chamber of Commerce and Industry, Elisabeth Slapio was the GTWN's "rock" for more than 25 years. She helped to officially incorporate the GTWN and provided a corporate base. She led our engagement with the Worldwide Chambers of Commerce and their role in the digital transformation of SMEs. Elisabeth is now enjoying her retirement from her position as Managing Director of the Cologne Chamber of Commerce where she led the innovation and environment divisions.

Anne Glover co-founded Amadeus Capital Partners in 1997 with Hermann Hauser and has been a venture capitalist for other thirty years. She has been our guide to understanding innovation and its connection to the world of investment. Anne was appointed as a Non-Executive Director of the Court of the Bank of England in 2018 and in 2019 became a member of the Investment Committee of Yale Corporation, which is responsible for oversight of the Yale University Endowment.

Anne was awarded a CBE in 2006 for services to business and is an honorary fellow of the Royal Academy of Engineering. She has recently been appointed NED of CDC's Investment Committee.

A GTWN Board Member for two decades, Heather Hudson was awarded the prestigious "Pacific Telecommunications Council Richard Barber Award" in 2021 in recognition of her forty years' service to the PTC. Heather 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. Heather has planned and evaluated communication projects in more than 50 developing economies, including the Pacific Island nations. She is the author of numerous articles and several books. Her latest book is *Connecting Alaskans: Telecommunications in Alaska from Telegraph to Broadband*.

Our GTWN Emeriti Board: We also applaud the significant contribution of our many founding members, including Susan Dark, Dr. Jessie McLeman, Dr. Suzanne Paech, Dr. Mina Schachter-Radig, and Elke Geising. Although they have gone



GTWN Board members and guests at the Circulo Liceu on 23 February 2013
(L-R) Candace Johnson, Sarah Crampsie, Laureen Cook, Lori Gonnu, Victoria Hernandez, Vicki MacLeod, Janice Hughes

on to pursue activities in other sectors, be they energy, water conservation, private equity, the arts, politics or media, they contributed mightily to laying the pillars of our organisation.

Building our network

Carla Cico was introduced to the GTWN by Janice Hughes. As President of Brazil Telecom, Carla was named by Forbes as one of the 50 Most Powerful Women in Business in 2002 and 2003. Carla has credited being an athlete with helping her promote a corporate culture of discipline, preparation, focus, and teamwork. She went on to become a member of the Board of Alcatel Lucent, Allegion, and to head one of Italy's largest holdings in China. Throughout it all, Carla has continued to be a leader within the GTWN and to show us the way in Governance, Ethics and Sustainability.

Sallye Clark is a space and satellite attorney and partner at Mintz & Levin and is highly regarded for her ability to negotiate market access around the world and is well known for securing host nation authorizations for US military and government satellite ground networks and unmanned aerial vehicles (UAVs). When the US President boards Air Force One, his communications to the world are possible thanks in no small part to Sallye's ground-breaking work.

Laureen Cook was a Director of Satelindo in 1992, bringing telecommunications to the islands of the Pacific, when she joined the GTWN. She became Vice President 4G/LTE Strategy for Alcatel-Lucent, a critical role for that ground-breaking technology. Later, as a senior member at the World Bank IFC Global TMT Team, she was responsible for technical, commercial and financial due diligence of emerging market TMT & satellite investment. Laureen has recently resumed the helm of Extelcon Consulting and is also a BOD member of Rising Tide III, a European Angel Investment Fund, providing financing to female led start-ups.



L to R: Lauren Cook, former VP of the European Commission Viviane Reding, and GTWN Global President Bridget Cosgrave during the GTWN's 20th Anniversary Gala Dinner at Circulo Equestre on 27 February 2012

Victoria Hernandez has been a C-Level executive of major telcos such as BT, Orange and Proximus, as well as a Business Angel, Board Member and most recently a Member of the Board of Caixa Bank. Catalanian of origin, resident of France and a global citizen, Victoria pushes the boundaries of the cross-sections of telecoms, investment, fintech and payments. Victoria will always be “Our Woman in Barcelona”, calling on her extensive network of high-level contacts, both in her native Spain, in France and abroad, to secure exclusive venues for the GTWN’s events.

Sue Major is a global leader in executive search. As an entrepreneur with her eponymous firm Sue finds the best talent for telecommunication companies, Sue is a relentless supporter of women in technology, having two wireless technology patents herself and a prior star-studded career at Motorola. Sue regularly co-sponsors the annual Women in Wireless event at CTIA and GTWN events at Mobile World Congress.

Australia and New Zealand have a champion of broadband and connectivity in Kate McKenzie, our GTWN regional president. Kate has been instrumental in helping to create the commercial and policy frameworks to accelerate broadband network rollouts in both countries as COO of Telstra in Australia and then CEO of Chorus in New Zealand. Today she is a Non-Executive Director of Australia's National Broadband Network (NBN). Kate has been a steadfast supporter of the GTWN and sponsored our 20th Anniversary, our 25th Anniversary and numerous other events together with other colleagues.



Ingrid Silver (shown above on the left with GTWN Secretary-General Vicki MacLeod at the launch of our 20th Anniversary publication at the Circulo Equestre on 27 February 2012), was our legal and moral conscience for 20 years and our GTWN Regional President Europe for almost as long. She has also been publisher and sponsor of many editions of our GTWN Newsletter, which preceded The Mobile Century, as well as our 20th Anniversary book. A fervent advocate of mentoring the next generation, it was Ingrid who added to our GTWN slogan originally coined by Janice Hughes the words and emphasis “...

from Generation to Generation.” A native Australian and trilingual in English, French and German, she was our perfect GTWN President Europe, before returning to Australia to become General Counsel at the ABC Australia. Before this, Ingrid was a highly-regarded Partner in the Global Entertainment and Media Group at Reed Smith, providing commercial and regulatory advice to the media and entertainment sector. Ingrid is the only lawyer elected to the global board of the Mobile Ecosystem Forum, the leading industry body. She has been voted by the industry as one of the top 50 women in the mobile sector.

It is no wonder that numerous Asian publications have named the GTWN’s Regional President for the Asia Pacific. Myla Vilanueva, amongst Asia’s most influential women. As Chair of MDI Group, and through her many companies and start-up investments in the Philippines, Myla has been a driver of disruptive technological transformation and entrepreneurship. She introduced one of the country’s earliest broadband wireless companies targeting educational institutions and developed software to enable low-cost access to online content on mobile devices, both start-up ventures that were eventually acquired by telecommunications giant Smart Communications. Myla has hosted numerous GTWN events in Asia Myla is the epitome of what the GTWN aims to achieve – bring about global impact via telecommunications to change the world.

It is thanks to Myla Villanueva that Marge Salem joined us at the GTWN more than 20 years ago. A young team member at the MDI Group, Marge came to support the GTWN. Over the years, Marge has become a sought-after ‘Digital Manager’ in the Philippines and Asia. Marge has supported all our online and offline publications and to ensure the image of the GTWN remains fresh and always conforming to our core values.

Vicki MacLeod was Executive Director of the International Institute of Communications when she joined the GTWN and became our Secretary General in 1998, a role she continues to this day. She has edited all the GTWN’s major publications

and is now Editor-in-Chief of The Mobile Century. Vicki is a specialist in innovation and digital transformation with extensive industry and government experience in Australia and internationally. She combines her industry knowledge with her linguistic abilities in German and French, to help the GTWN to be international and globally relevant.

The journey continues

Mosiri Cabezas and Gema Estaban Garrido first began their association with the GTWN in 2014 as colleagues at Telefonica. Mosiri showed early her passion for using digital technology to transform society in a sustainable way. Mosiri left Telefonica to join IKEA as their Chief Digital Officer, where she helped the company through the digital transformation of its business. She now advises on Digital, Innovation, Data Science and Medical Transformation at AstraZeneca. Mosiri has continued her education, at the Harvard Kennedy School of Management and the IE Business School, etc. to always keep ahead of the curve and bring real value to her customers and colleagues.

All of us at the GTWN like to claim that we mentored Gema. Following our meeting in 2014, both she and Mosiri worked hard to enable Telefonica to sponsor the GTWN Welcome Reception at the 2015 GSMA Mobile World Congress. Gema



L to R: At the Opera Liceu on 26 February 2018- Sue Major, Myla Villanueva, Ingrid Silver, Mosiri Cabezas, Janice Hughes, Candace Johnson, Vicki MacLeod, Laureen Cook, Lucy Lombardi, Victoria Hernandez, Michele Merrell and Vicky Sleight

rose quickly through Telefonica, and in 2017 was selected as the Environment, Social and Corporate Governance (ESG) Investor Director for the company. Within three years, Telefonica issued a 1 Bio USD “Green” Bond, establishing them as a global ESG leader. Gema has transitioned from a ‘traditional’ telecoms executive to a global ESG expert. She is now Global Head of ESG at IG4 Capital.

Lucy Lombardi is a technological and innovation guru. For almost 20 years, Lucy has been leading technological innovation for Telecom Italia and has also been an Executive Management Committee Member of the GSMA, together with our President for Asia, Myla Vilanueva. Lucy is now heading up the Subsidiaries Technical Governance in the Telecom Italia CTIO Office. Lucy has always been a firm supporter the GTWN, including hosting events in Rome.

Michele Merrell is our North America President and is active in various regional and global telecommunications companies as a Board Member, an executive, and an advisor. She is a tireless supporter of the GTWN and women’s programs at the GSMA. Michele is a true telecommunications professional with broad experience from wholesale and back-bone networks to mobile and satellite. She is a renowned expert on the power of branding, public relations, digital marketing, and influencer engagement.

Julie Meyer burst on to the European scene in 2000 with Ariadne Capital, bringing the “Entrepreneurs Backing Entrepreneurs” model from her native California to Europe. In her various positions at First Tuesday, Entrepreneur Country, and recently Viva Capital, Julie has built global leading technology-enabled firms, financed entrepreneurship and helped founders build and define their industries. She has advised ground-breaking companies including Monitise, a global leader in mobile money, and has backed many explosive growth companies. Julie was awarded an MBE for her services to entrepreneurship in 2012, a rare UK honour for an American citizen.

Laina Raveendran Greene understood the potential for technology to change lives for the better during her extensive travels and looked for innovative business and financing models to enable remote and poor communities to access technology. When Laina started an e-learning company in 1997, she was one of the very first female techpreneurs in Singapore. In 2000, she founded Silicon Valley-based consultancy GETIT Inc, focused on greening the IT and telecom industry, GHG reduction overall. She has since co-founded Angels of Impact, a tech platform which connects women-led social enterprises working on alleviating poverty with consumers, funders and corporates.

As Vice President and General Manager of AT&T Mexico, Cristina Ruiz De Velasco is a true telecoms professional. Cristina was instrumental in facilitating AT&T Mexico's sponsorship of our Welcome Reception at the Mobile World Congress in Barcelona in 2012. Thanks to this generous sponsorship, we were able to hold a memorable event at the world famous Circulo Liceu. Cristina has successfully transitioned from a paging network executive to a senior telecoms executive and General Manager of AT & T Mexico. In so doing she has demonstrated her talent and determination, as a next generation GTWN Board Member, to bring enhanced broadband connectivity and services to her fellow citizens in Mexico.

Ellen Strickland was first introduced to Candace Johnson and the work of the GTWN at an ITU Women's Breakfast organized by Walda Roseman. Ellen was then based in New Zealand working with the Pacific Internet Society. From that chance encounter "OWNSAT – Oceania Women's Network Satellite" was born. OWNSAT is an early stage investor in Kacific, "the Heart of Broadband" bringing High Through-Put Internet to more than 25 Asian Pacific islands. Ellen has also played a leading role in "The Christchurch Call", a response to the two terrorist attacks on the mosques in that city. Travelling with NZ Prime Minister Jacinda Ardern, Ellen joined a senior governmental and industry meeting in France to secure public

private cooperation to combat violent extremist online content. Ana Tavares Lattibeaudiere (shown below third from right with GTWN Board Members Michele Merrell, Laureen Cook and Myla Vilanueva and GSMA Director General Mats Granryd), was inducted in 2019 as a 'next generation' Member of the GTWN Board at our annual GTWN Mobile World Congress Welcome Reception at the famous House of Silk. Ana was at the time GSMA Head of North America. What better way to honour Ana and her tireless work at the GSMA and for women in the telecoms world, and to herald the start of Ana's new career advising companies on digital transformation. She is now Executive Director of GlobalPlatform.



Our colleagues and supporters

The work of the GTWN in promoting and furthering the role of women in the digital technology sector has been made possible over the years by many organizations and individuals who share our desire to bring about positive change. We are profoundly thankful for the support and encouragement of many women

and men at the helms of the world's largest TMT companies and industry organizations, who have supported us in terms of sponsorship, collaboration, and indeed encouragement.

In particular we appreciate the close cooperation we have enjoyed with the GSMA, through the regular participation of the GSMA Board, executive and senior managers in our annual Welcome Reception at the Mobile World Congress in Barcelona. The Director General of the GSMA, Mats Granryd, has been a keynote speaker at many of our events, continuing a tradition which began with his predecessor Anne Bouverot addressing the 20th Anniversary celebration at the Circulo Ecuestre in Barcelona on 27 February 2012).



L to R: Candace Johnson, Mats Granryd and Bridget Cosgrave during the 25th Anniversary of GTWN at the Circulo Equestre on 27 February 2017

It has been a two-way collaboration, as we have supported the GSMA in its initiatives aimed at furthering the take up of mobile technology in the developing world, including the mWomen program. We have also worked closely with the Connected Women program, developed by then GSMA Senior Memberships Director Vicky Sleight, to encourage more women to develop a career in mobile technology. We continue to support the GSMA in its aims to reduce the gender gap in the mobile industry through the Women4Tech program.



Anne Bouverot, Former CEO, GSMA

Over the past two years, we have been particularly thankful for the support of CMS, who have sponsored the production of the 2021 and 2022 editions of *The Mobile Century* and have helped us to adapt to the changing circumstances during the pandemic by hosting online events.

In summary, we can say that the founding and growth of the GTWN has closely tracked the growth and rise of the telecommunications sector to become the backbone of our digital economy and society. From humble beginnings, the GTWN has continued to expand and evolve and has pursued the aim of promoting the role of women in this industry. We can indeed look back on the past three decades with pride and look forward with immense hope for the future.

Elisabeth Slapio: GTWN Pioneer

Interview by Vicki MacLeod

Elisabeth Slapio has been a member of the GTWN Board since its inception. *The Mobile Century* caught up with her as she retired from her position as the Director Innovation and Environment at the Cologne Chamber of Commerce, Germany and began a new chapter as an innovation consultant.

TMC: *What are your plans for the future now that you have retired from your senior role at the Cologne Chamber of Commerce?*

Elisabeth: In Germany, there are many ways to use professional knowledge even in retirement. With voluntary activities aimed at young self-employed people, there are numerous ideas to help this target group, which is suffering greatly from the effects of the covid pandemic. Because of my contacts with various people at universities and in companies, I have an informal network. Currently, we are noticing a new start-up climate. Many young people have given up their original ideas of working in large corporations. They are hopeful that especially future-oriented areas such as environmental protection, sustainable business and the sharing economy will be successful.

TMC: *How long have you been involved in the ICT/digital media sector, and what was the industry like when you first encountered it, including the role and number of women?*

Elisabeth: From the early days during my studies, I was involved in broadcasting media and experienced the first attempts of cable pilot projects. My involvement with ITC issues started professionally in the early 90s, when Chambers of Commerce were still using telex, screen text and had just started equipping their offices with networked computers. Industrial companies and parts of the retail sector already had basic IT applications, most of which were found in production. The number of women working responsibly in these fields was vanishingly small.

TMC: *Could you describe the major stages of development or major innovations of the ICT industry that you have experienced in your career, and what are the economic and social benefits of these innovations?*

Elisabeth: With the change from mainframe computers to PCs and the use of the internet, the whole development in the digital field took off. In the beginning, women were only the users of PCs, then there were more and more business fields in which they advised, drove developments and also secured a firm place for themselves with innovative business concepts. Through the personal networking of decision-makers, as practised by GTWN over the last thirty years, the importance of women grew. Even though women are still found less often than men in discussion groups today, their visibility is increasing.

TMC: *Looking ahead to the next few years or decades, what do you see as the main challenges facing the industry?*

Elisabeth: I believe that the biggest challenges of the future will be how people will deal with the impact of technological changes. It is not technology that will decide everything. It is people's skills that will determine where we are going. In the changes of the last decades, people have somewhat neglected some of their original skills. Sometimes it seems as if we have lost the joy of being innovative and curious. I fear the fun has been lost in exploring complexity. Convenience instead of

effort, assumptions instead of facts, simplicity of arguments instead of synopses and discourse dominate our behaviour. But the future of our industry depends on people facing up to the unknown, finding the courage and strength to shape the times ahead. Only then will business and civil society have a chance for global peace and equitable adequate prosperity.

TMC: *What actions should leaders in the industry, including the GTWN members and colleagues, do to address these challenges now and into the future?*

Elisabeth: I am convinced that our generation in particular must take responsibility for the effects of global development over the last thirty years. Responsibility for the future means paying close attention to the differences in the world. The gap between healthy and sick, rich and poor, the educated and those who cannot afford education must not be allowed to widen. For especially in the digital age, the positive as well as negative changes are clearly visible. Health and education are important goods for all people, no matter where they live. We need a planet that we must secure together for the future. With mindfulness and a sense of proportion, we need to observe and promote what is good for all of us in the long term. Leaders should reflect on this every day and make it the benchmark for their actions.

TMC: *Do you have a final message which you would like to share with the GTWN Members, colleagues and supporters in the industry?*

Elisabeth: On the occasion of the 30th Anniversary of the GTWN, I would like to extend my congratulations to Candace Johnson, our co-founder of the GTWN, and on her behalf, many thanks to all active members who have made thirty years of the GTWN networking and achievement possible. We experience every day in politics, economy and society how important international contacts are for the global world. We can only shape the future of our planet together. And the role

of women in a digital world of the future can only be shaped together through strong cohesion.

The GTWN has been a home for modern, open-minded thinking based on equality and togetherness from the very beginning. The exchange across countries and continents gives a little hope to contribute to mutual understanding in an increasingly complex world. Pride in the long years of GTWN cooperation, joy in still acting together today and confidence in mastering the future together is the lasting legacy of the GTWN. This is how it is today, and may it continue to be so in the future.

GTWN: The story continues

Interviews by Vicki MacLeod
GTWN Secretary-General

The changing culture of communicationsfrom generation to generation

The motto of the GTWN encapsulates both the spirit and the purpose of the organisation. As a group of senior women in the telecommunications and broader digital media sphere, we believe in using technology in a way that is appropriate to human culture, in all of its forms. We also see our role in the industry as providing mentorship to younger women who are charting their path and careers in this complex modern environment.

We are therefore very pleased and proud to welcome to the GTWN Board in 2022 a number of amazing women entrepreneurs and industry leaders, whose diverse backgrounds and experience will inject new thinking, new perspectives and new energy into the organisation. We are looking forward to working with them over the coming years to address some of the many challenges facing the industry, as well as society at large.

Keri Gilder, CEO Colt

The GTWN is proud to welcome our new Global President, Keri Gilder, CEO of Colt Technology Services. Keri is a highly

experienced and renowned senior executive in the ICT industry and is well known for her work on driving greater inclusivity in the technology sector.

Keri has been involved in ICT for the past 21 years. “When I first entered the industry as a sales Engineer after previously working in the Enterprise space”, explains Keri. “, it was heavily dominated by men. I was in my early 20’s, and my initial thought was – this is an ‘old boys club’ and not very interesting.” She was, however, fortunate at the time to have Pat Russo as her CEO. Pat was a champion of women in tech, but even so, the industry culture felt somewhat alien. “I was one of only two female sales Engineers in my sector”, adds Keri. “I definitely felt like a ‘unicorn’ as one of only two female technical Engineers covering the segment in the USA”. This period in her career convinced her that the industry had to change to reflect the spectrum of human experience and to retain relevance to society as a whole.

Keri has been fortunate to have had a broad experience across the industry. “Throughout my 20 years, I have had the opportunity to see the industry develop from the hardware/software vendor, service and now ICT provider point of view”, says Keri. She has seen the industry making enormous leaps from fixed low bandwidth infrastructure where a 10Mb circuit was considered “high bandwidth” to multi-terabit. “We have moved from hard boxes to software defined, consumption-based infrastructure. We have moved from niche hardware to virtual network functions and software defined wide area networks (SD WAN). Now we are taking a massive leap into the Intelligent network as we start to build the platform infrastructure to support the digital economy.” Keri has recognized that, at each stage of these advancements, we have been able to engage another aspect of our communities – lower bandwidth costs, advanced satellite and FTTX infrastructure now reaching rural communities, enablement of innovation across country borders, which in turn has enabled our populations to live through a major pandemic. “I am really proud of how our

industry enabled us to make some extraordinary connections, enable the world to run, enable women to start businesses, enable doctors to continue to serve customers with remote medical care, enable financial markets to thrive while riding over our networks across multiple exchanges around the world”, remarks Keri. “We have served our communities well and will continue to drive advancement across them.”

Looking ahead to the next few years or decades, Keri believes that one of the industry’s biggest challenges is talent. As Enterprises move to digital infrastructure and engagement with their customer base and COVID continues to accelerate this migration, talent that was only required by the ICT market is now required across multiple Enterprise verticals. “Couple this with the ‘great resignation’, COVID’s effect on female workers and the industry reaching a retirement cliff in five years – we are close to a talent crisis”, says Keri. “It is critical that we imbed ourselves into business cases and case studies for every area of our business, whether engineering, computer science or accounting.” Keri would like to see the industry present in tech schools and universities and build apprentice programs for those who do not have the privilege to go to one of these schools but still have massive talent. “I am working with the tmforum to develop a talent consortia that would have some of these elements: Cohorts, Convocations, Communities, Commencements and even possible Certifications. If we can get the consortia going, it could create a great way for us to bring talent in, keep talent happy and drive the next generation toward ICT”, adds Keri.

As to what actions leaders in the industry should be taking, including the GTWN members and colleagues, to address these challenges now and into the future, Keri has a clear vision. “It comes down to what we have always done and what we are REALLY good at – making connections. We must use our partnerships, relationships and the ecosystem to drive our brand as an industry to the next level.” For Keri, this means taking our learnings from COVID to enable a strong

understanding of cause and effect: on our overall wellbeing associated with things like commuting and isolation; on our overall need to ensure females are enabled to advance in underserved communities as they are the 'life blood'; on our overall privilege of handling our customers' data; on our overall core purpose to connect the world. "If we drive our companies with purpose and truly believe that we can change the world – there is nothing that can stop us."

Rosalia Gitau, CEO Bixie Pte Ltd

From a background in corporate law, Rosalia worked for ten years with the United Nations in crisis management and relief in Asia, Africa and the Middle East. "I felt that I was going from one crisis to another, not making any substantial difference to the lives of the people that I was trying to help", says Rosalia. "Then I started giving small amounts of money to start-ups, with the goal of changing lives and bringing women out of poverty". These efforts were successful, and led her to become interested in how financial literacy and access to capital could improve the lives of women around the world.

"One thing that is a universal challenge is that women, irrespective of education, race, culture or income, are not financially literate and they do not have access to capital, like men do", adds Rosalia. "When I worked in blockchain, I realised that women were missing out on all of the opportunities that men enjoy because of their lack of knowledge, their lack of confidence, their lack of a network, and their lack of the tools to ensure their financial security."

Bixie is an AI enabled platform which empowers women to know their own worth and to grow that worth. "We call it the financial home for women", says Rosalia. "During the pandemic women realised that what really matters is capital- money making money- and that they did not control it. Once again, women around the world suffered the worst impacts of the pandemic, because they were workers, not entrepreneurs or

investors. I want to change that, so that women in future are more resilient.”

Rosalia believes that women need to work together, to create our own reality. “Organisations such as the GTWN are critical to women entrepreneurs and industry leaders, as they enable cross sectoral co-operation and support”. Rosalia believes that blockchain will drive the future of finance, and therefore the whole economy, and women need to be ready to ride the wave. “I would like to see women working together on blockchain initiatives designed by women, for women. Blockchain is the infrastructure of the next 20 or 30 years; we cannot afford for 50% of the world’s population to be locked out of the benefits of this economic transformation.”

Deepa Kalikiri, Vice President, Head of Legal, Boku, Inc

“I was very interested in technology from an early age and joined GE in Paris after completing my legal degree from university and qualifying around twenty years ago now”, says Deepa. “I was attracted by the global nature of the company, and the emphasis on innovation and applying technology to improve businesses and lives around the world, she adds. “I then moved on to work at Visa in London, where I became fascinated by the intersection of law, finance and technology, and the promise of big data and AI”. Deepa then became Head of Legal at Sinch (previously known as mBlox), the mobile messaging and customer engagement platform. “You could say that I was now able to bring all of my experience together, in terms of the legal and regulatory framework, my understanding of mobile platforms, and my commitment to better customer experiences”, comments Deepa.

Deepa is now Vice President and Head of Legal, as well as Company Secretary at Boku Inc, and lives in London. Boku is a leading global mobile payments solutions provider (mobile wallets, direct carrier billing and real-time payment schemes) which was founded in 2008 to enable people to make purchases

using their mobile phones. “In my current position at Boku, my team and I have the opportunity, on a daily basis, to help the company deliver on its promise to create innovative and effective payment solutions to support merchants and carriers around the world”, says Deepa. “Whether consumers are aware or not, they are probably using a Boku-enabled mobile payments service to pay for their purchases”, adds Deepa. “This means that Boku has become an integral part of their daily lives, by facilitating the ease of mobile payments, which is now a vital part of both face to face and online commerce”.

Deepa was born in India, but grew up in Paris, and speaks French fluently. She finds that her global perspective, gained from her legal studies in France and the US, enable her to see the bigger picture and to understand the importance of cultural context when developing solutions for different clients and different countries.

Deepa is above all passionate about ethics and the rule of law, and how she can apply this framework to her work in the field of mobile payments. She is also a strong believer in the importance of mentorship and has been fortunate to have had a great mentor in the earlier part of her career, who supported and inspired her to grow and to achieve. “Because of this experience, I belong to a mentor network, where we support younger women who are entering the legal sector, and who will benefit from having a sounding board, and coach in their early years.”

Deepa is also very aware of the burden often placed on younger women in their careers, when they may be caring for children or for older family members. She is the mother of two little boys under the age of 6 and knows only too well the difficulties of striking a good balance between work and family life. “Women these days are starting to understand that it is not possible, or desirable, to be superwoman and to try to be all things to all people. That is why employers need to ensure that the working environment takes account of the

different circumstances and needs of their staff, and that there are support and encouragement, as well as flexible work options, available. “At Boku we have been very supportive of flexible working throughout the pandemic, and as we begin to return to the office, we want to ensure that gains in flexibility are not lost”, says Deepa. “This has been a lesson for us all – that productivity does not depend on hours spent in a physical space; it is a mindset, and a commitment to being the best you can be in all of the roles in your life”.

Vrinda Kapoor, CEO and Co-founder, 114ai

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. “I realised that the AI aspect of big data was a game changer, enabling the more effective use of pathology to diagnose and treat disease”, says Vrinda. From there she became interested in addressing the challenges of AI systems, which were preventing the promise of AI from being realised.

“At the moment, data scientists, who are highly trained and a limited resource, are using 80% of their time trying to manually clean up data and make it usable, because it is generated from incompatible systems which can’t talk to each other”, says Vrinda. “While everyone champions the benefits of a connected smart home, the reality is that the data from your frig, heater or light, cannot be combined and analysed seamlessly, as proprietary systems are not interoperable. At 114ai we are building a transformation layer, which is completely automated, to solve this problem.” While some companies, such as Uber Tesla or Google, are working towards interoperability across systems, others such as Apple want to retain their proprietary

platforms. This means that the potential gains from smart technologies are either unachievable or can only be achieved in a very inefficient and costly way.

As she works at the intersection of many male-dominated sectors – AI, defence and national security – Vrinda is often the only woman in the room at senior meetings, which can be a challenge. 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. “We need all of the diverse perspectives we can get to work on making AI more explainable and trustworthy to the general public – of which women make up 50%, after all.”

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. Everyone needs to understand the risks associated with these new devices. Having women with a better understanding of the technology will allow them to take a more realistic view of the benefits and potential dangers of AI based systems.

“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. Education is key here – not just in a formal sense, but also in an information, ongoing way, where the industry is more transparent and honest about the risks and benefits of the technology”.

Leticia Latino-van Splunteren, CEO Neptuno USO, Corp

“When I was a very young girl in Venezuela, we used to accompany my father on family outings to see where a new mobile phone tower had been put up”, says Leticia. “I often say that I was really born into the tech industry, as my father founded the mobile tower construction company before I was even born.” Leticia now heads up Neptuno, a tower manufacturer with over 10,000 towers in the Americas. The business has expanded to cover all aspects – from construction to innovation, including software, asset tracking and 3D Tower Mapping.

For Leticia, the main change that she has experienced over the 25 years of her career, has been in the transformation, slow but progressive, of the culture of the digital tech sector from a male, engineering dominated one, where it was not easy to be a senior woman, to a more open, diverse and inclusive one. “But there is much more that needs to be done”, adds Leticia. “One of our main challenges is to create a more diverse and inclusive workforce and to attract and retain many more female STEM graduates. This is why I have devoted a lot of my attention and time to contribute to advance this ongoing issue. In 2019 Leticia was appointed by the FCC Chairman to Chair the BDAC Job Skills and Training Working Group, in 2021 she was appointed to the FCC’s Committee for Equity, Diversity and Inclusion and in January 2022 she was appointed to the FCC’s Telecommunications Interagency Working Group formed as a directive of the US Infrastructure and Jobs Act.

“I am also very committed to overcoming the digital divide and not leaving anyone behind”, adds Leticia. “There are many places now in Florida, where I live, where you can’t park a car if you don’t have a phone payment app. This is very difficult for the elderly or the poor.”

Thinking about the next 25 to 30 years of the industry, Leticia believes that every aspect of our daily lives will be transformed

by digital technology. It is therefore very important that in this process we do not lose who we are as human beings. “There is currently a lot of buzz about SmartCities, IoT, AR, etc. We as industry leaders need to think more of the users as we design and embed technology in our cities. Cities must be accessible to all citizens – from the very young to the very old.” Leticia believes that we need to work together as a matter of urgency to ensure that we make smart cities accessible and equitable for all. “To me the ‘Smart’ in Smart Cities is not about technology, it is about how we, as humans, implement it to make sure that it will better serve our society. What is the point of having a technologically connected city with socially disconnected human beings?”

Isabelle Paradis, President and Founder, HOT TELECOM

Isabelle has been in the digital communications industry for almost 30 years now, starting immediately after completing her engineering degree and an MBA. “When I started, it was a very exciting time, as the industry was on the verge of deregulation and companies were very profitable. There were innovative new players entering what was once a very traditional, highly regulated market. It was a very dynamic and exhilarating time”. Isabelle joined the recently privatised Canadian international telecommunications provider Teleglobe, as one of a group of young graduates referred to as ‘catalysts of change’. “There were lots of firsts, new types of solutions, many new players. It was very buoyant”, says Isabelle. “As Teleglobe was a major international player, there were a good proportion of women, although at that time they were mainly in support roles, including in marketing or HR. There were no women at Board or C-level. Since then so much has changed.”

After the first major wave of innovation, with many new players entering the market, new types of solutions and business models being introduced, the industry went through its second wave of innovation with the introduction of mobile technology. “This brought with it a whole new suite of players, technologies

and products”, recounts Isabelle. “Once again the industry needed to re-invent itself and get used to constant change, but now at a much faster pace than ever before.” After that came what Isabelle refers to as the “IPification” of the digital tech industry, with the introduction of IP all the way to the handset. “This innovation has had a significant impact on our society as a whole”, comments Isabelle. “For the first time, users were given the power to control their experience.”

We are now going through the Digital wave, with everything moving to the cloud, everything being virtualized and automated. This, coupled with the introduction of 5G, is triggering another transformation. “I like to call this stage the “verticalization” of our industry. “This stage will bring about the hyper-personalization of everything”, says Isabelle. “It will give us even more control over our lives at all times.”

Looking ahead, Isabelle sees the main challenge in that we will all have to get used to constant change and to learn to thrive in chaos. Chaos is now the new normal and is here to stay. “We must also learn to foster constant innovation, which is a great challenge for traditional companies such as telecom operators.” In response, industry leaders need to stop talking and start taking the necessary steps to harness the power of everyone to power innovation. “Our industry is building the world of tomorrow and therefore the people involved should be as diverse as possible, in terms of age, gender, culture, philosophy and so on. Then and only then will the telecom industry be able to play its pivotal role in building our future.”

**GTWN
THROUGH
THE YEARS**



1992

First Meeting of GTWN physically and virtually at the CeBIT Fair in Hanover Germany with Janice Hughes (Spectrum Strategy), Dr. Jessie McLeman (BT), Dr. Susanne Pech (Deutsche Telekom), Elke Geising (Deutsche Telekom), Lillemor Larsson (Unisource), Susan Dark (Cable & Wireless), Lauren Cook (Satelindo).

1993

First GTWN Newsletters done by Dr. Susanne Paech of Star Consult featuring profiles of Senior Executive Women in Telecoms throughout the world.

1994

Numerous meetings in Washington D.C., London, Munich, Cologne where the founding members expanded the growing movement throughout the continents.



1995

Official Incorporation of the GTWN as a Non-Profit Association based in Cologne, Germany at the Cologne Chamber of Commerce for Industry and Trade.



First ever "GTWN Power Breakfast" - The idea for the GTWN Power Breakfasts was started by Susan Dark and Elke Geising, following on similar events held by Walda Roseman, all GTWN International Board Members.



First ever Global Assembly of the GTWN at the ITU Telecom'95 with ITU Secretary General Dr. Pekka Tarjanne, Ambassador Diana Dougan, and Marie Monique Steckel, President of France Telecom USA.



1996

GTWN 2nd Annual Power Breakfast: "Managing Change in Converging Worlds" in Rio de Janeiro, Brazil at the "ITU Americas Telecom" sponsored by Global One and Arely Castellon, Vice President Americas (Sprint) with Helene Cholette-Lacasse and Arely Castellon as Keynote Speakers welcomed by Susan Dark, 11 June 1995, together with Tanja Rosenberg as our GTWN Mentoree and Special Guests, Ambassador Vonya McCann (USA) and Dr. Erica Mann, Member of the European Parliament.

GTWN and IIC (International Institute of Communications) enter into Global Secretariat Agreement, 21 May 1996. Our very own Vicki Mcleod was Executive Director of IIC at that time.

GTWN Networking Cocktail in Washington D.C. at The Cosmos Club, 01 October 1996.

GTWN Power Breakfast in Munich at the IIC Annual Conference sponsored by VIAG with Dr. Maximilian Ardelt speaking on "The Next Generation", 19 October 1996.

GTWN Power Breakfast with Keynote by Candace Johnson on “Satellites and the Internet: Let’s Net Together - A Marriage made in CyberSpace” at SuperComms, New Orleans sponsored by Belgacom USA, 03 June 1997.

GTWN Power Breakfast in Sydney Australia sponsored by Telstra with Frank Blount, President and CEO of Telstra as Keynote Speaker, 07 October 1997.

GTWN Power Breakfast at Asia Telecom '97 sponsored by Singapore Telecom with Mr. Jonathan Parapak, Secretary General of Telecoms of Indonesia and Chairman of the GMPCS Policy Forum and Mme. Koesmanhati Sugondo, President Director of Telkomsel, Indonesia, 10 June 1997.

1997



1998

GTWN Power Breakfast: “Global Telecommunications driving Global Economies” in Honolulu Hawaii at the Pacific Telecommunications Conference PTC '98 sponsored by Orion with Judith O'Neill and Neil Bauer as Keynote Speakers, 12 January 1998.

GTWN Power Breakfast at Telecom Africa in Johannesburg, South Africa with Daniella Goldman speaking about “The Coming Continent”, 05 May 1998.

GTWN Power Meeting and Lunch: “The Commercialization of Communications: Is the Message getting through or is it just Signals?” in Cologne Germany sponsored by the Cologne Chamber of Commerce and Industry, moderated by Elike Geising and Elisabeth Slapio.

GTWN First Panel and Discussion on “The World of Telecoms Venture Capital and Finance” sponsored by HSBC and featuring Anne Glover on “Venture Capital in Telecoms, Media and the Internet” and Wendy Richards, on “Financing Telecom Ventures in the Public Markets”, London 07 September 1998.



1999



GTWN Power Breakfast on “Collaborative Competition in Telecommunications” by Sari Baldauf, Executive Vice President of Nokia sponsored by ETSI (European Telecommunications Standards Institute) at the Hotel Majestic, Cannes, France on the occasion of the Mobile World Congress. 29 February 1999.

GTWN collaborates with the ITU on International Women’s Day 1999, Geneva with Candace Johnson giving Keynote Speech, 08 March 1999.

GTWN Newsletter features “The Human Challenge” by Ida Chow and “Women on Boards” by Dona Roche-Tarry, Heidrick & Struggles

2001



GTWN Power Lunch at the “Medien Forum” sponsored by the IHK Koln (Cologne Chamber of Commerce) with Keynote Speaker Christiane zu Salm, Managing Director of TM3 Television speaking about “The Future of Media: Communication and Convergence” 26 June 2001.

2003

GTWN launched its new logo

GTWN 10th Anniversary Celebration during the ITU World Telecom 2003 at the Hotel Intercon in Geneva sponsored by Vodafone.



GTWN Power Breakfast to be held during the upcoming CeBIT on Friday, 19 March with special guest speaker Professor Gertrud Hshler D publicist, top management consultant and the author of many influential books

2004

2005



GTWN Telecoms Lunch sponsored by Taylor Wessing held 24 January 2005



2006

GTWN Power Breakfast
Sponsored by Qualcomm Inc., held
15 February 2006 at the 3GSM World
Congress



GTWN Power Breakfast
Sponsored by France Telecom,
PTC Honolulu, Hawaii on 15 February
2006

GTWN Power Lunch
Hosted by Denton Wilde Sapte on June
29

DentonWildeSapte...

GTWN event sponsored by Intel held
on 14 October 2006 at the 3GSM
World Congress Asia: "Powering 3G
by Enlightened Entrepreneurship for
Developing Communities and making 3G
Pay".

2007

GTWN Asia President Myla Villanueva
spearheaded the "Call to Action" after
keynote presentations by Craig Ehrlich,
Chairman of the GSM Association and
Alexander Izosimov, CEO of Russian
mobile operator VimpelCom



2009

Newsletter
February 2009

Welcome to this edition

Dear GTWN members and friends,

It is a pleasure to present you with this edition of the newsletter. I hope you find it interesting and useful. This issue contains a variety of articles, including a special section on the GSMA Power Breakfast. I also have some news about the network and our upcoming events.

I look forward to hearing from you and to meeting you at our next gathering.

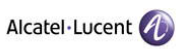
Best regards,
Hilary Clinton

Alcatel-Lucent

Alcatel-Lucent is a leading provider of telecommunications equipment and services. We are committed to innovation and excellence in everything we do.

For more information, visit www.alcatel-lucent.com

GTWN/GSMA Power Breakfast:
“Using Converging Communications
Technologies to Stimulate Innovation
and Economic Recovery” Sponsored
by Alcatel-Lucent at the Palace Baro de
Quadras/Casa Asia, Barcelona during
the GSMA Mobile World Congress



GTWN helps incubate
the GSMA



2010

Newsletter
February 2010

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GTWN/GSMA Power Breakfast:
“Using Converging Communications
Technologies to Stimulate Innovation
and Economic Recovery” Sponsored
by Monitise at The ARTS HOTEL,
Barcelona, Spain during the GSMA
Mobile World Congress



GTWN supported mWomen programme
is launched at State with Hillary Clinton



2011

GTWN/GSMA Power Breakfast: "The Future of Mobile: Transforming the 21st C. Economy and Society" Sponsored by China Mobile at The ARTS HOTEL, Barcelona, Spain during the GSMA Mobile World Congress



The Global Telecom Women's Network

Kelly promoted and supported by SNR DENTON ¹³

Newsletter
February 2011

Dear GTWN Members, Networkers and Friends

It has been 20 years since we first met together in 1991. Over the years we have grown from 12 women to over 1000. It is a testament to the power of women in the industry and the support we have received from our members and sponsors.

We are very grateful to our sponsors for their support of our GTWN Power Breakfast. It is a great opportunity for us to meet and exchange ideas on the latest industry trends.

The theme of the Power Breakfast is "The Future of Mobile: Transforming the 21st Century Economy and Society". We are excited to have such a high level of participation and to have such a diverse group of speakers.

We are looking forward to a very successful event. Please join us for a night of networking, learning and inspiration. We hope you will find it a most enjoyable and productive experience.

Thank you for your continued support and for making GTWN what it is today. We look forward to seeing you at the event.

With best wishes,
Kelly Chen
GTWN Executive Director

GTWN is a 501(c)(3) non-profit organization. All contributions are tax-deductible to the extent allowed by law.

For more information, please contact Kelly Chen at kchen@gtwn.org or 415-435-1234.

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GTWN 20th Anniversary celebrated at the Circulo Equestre during Mobile World Congress Barcelona, with keynote speakers GSMA Dir-Gen Anne Bouverot and EU Commission Vice President Viviane Reding

2012



The GTWN's Welcome Reception at the 2015 Mobile World Congress in Barcelona. Keynote speeches HP CEO, Meg Whitman and Telefonica COO Jose-Maria Alvarez-Palette.

The Mobile Century 2015 Edition was launched through the generous support of Renee Lalonde, CEO of iTalent.

2015



GTWN Welcome Cocktail and the launch of the fourth edition of "The Mobile Century: Life and Work in the Digital Era" sponsored by iTalent held at Palau Guell, Barcelona, Spain with Keynote Speakers Andy Penn, CEO of Telstra and Pierre Guislain, Senior Director, Transport & ICT Global Practice at the World Bank.

Third Edition of The Mobile Century launched November 2016 sponsored by iTalent.



2016



GTWN marked its 25th Anniversary at a special gala dinner on Monday 27 February at the Circulo Equestre, Barcelona.

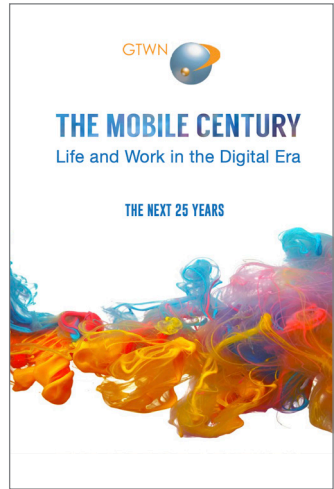
GTWN gave a lifetime achievement award to Viviane Reding, former Vice President of the European Commission and current European Union Member of Parliament.

GTWN launched a commemorative book entitled "The Next 25 Years" featuring articles on or by the women who have shaped our industry for so many years and whose contributions were also recognised that evening.

Special guest, Mats Granryd, GSMA Director General and Board Member paid homage to the GTWN's role in incubating the GSMA mWomen and Connected Women programs as well as Women4Tech.



2017



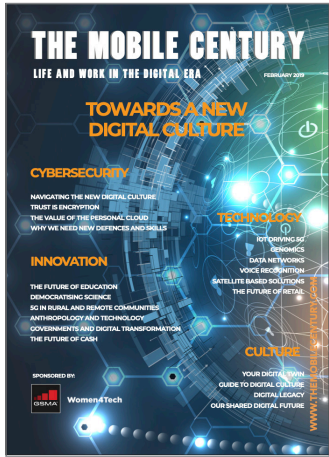
2018



GTWN Welcome Cocktail at the Hall of Mirrors, Opera Liceu, La Rambla, Barcelona, Spain on 26 February 2018 sponsored by Ciena and SES-imagotag.

GTWN also released the 2018 edition of The Mobile Century with the theme of "Solutions for a complex world"





2019

GTWN held its traditional Welcome Reception on the evening of Monday 25 February at the Casa de la Seda (Silk Museum) sponsored by SES-imagotag.



2020

The Mobile Century: Green Tech Revolution. In this edition we focused on the global challenge of our era – climate change and how to ensure a sustainable, green economy and society into the future. Despite the cancellation of Mobile World Congress in Barcelona in 2020, due to the COVID-19 virus, we published this edition as a webzine at www.themobilecentury.com.

AUTHORS' PROFILES



Melisa-Silem Basol

Melisa-Silem Basol is a Gates Scholar and PhD Candidate in Psychology. At the Cambridge Social Decision-Making Lab, her research focuses on attitudes, persuasion, and resistance against misinformation through inoculation theory. Throughout her studies and through her associated work, she has initiated ways to contribute to societally contested issues, such as immigration and vaccinations. She is the Co-Founder of CUBIT, an inter-disciplinary initiative to leverage behavioural insights to tackle pressing societal challenges. Moreover, she won the WhatsApp Research Grant for Misinformation to develop interventions against the spread of harmful misinformation on WhatsApp in India, Brazil, and the UK. Similarly, in collaboration with the UK Cabinet Office (and supported by UNESCO, UN, and WHO), Melisa co-developed Go Viral!, a gamified intervention to combat the threat posed by COVID-19 misinformation. Melisa collaborates with the Stanford Health Communication Initiative and Duke University's efforts to fight vaccine hesitancy. She also enjoys public engagement (e.g., on BBC World) and continues to advise governmental institutions (e.g. EU Commission, NATO) on evidence-based policy-making.



Anna Borgström

Anna Borgström is the CEO of NetClean, a fast-growing Swedish technology company. It creates software to detect and block child sexual abuse material (CSAM) in corporate IT environments. Anna has worked with organisations and governments worldwide since 2009 to combat online child sexual exploitation through introducing and lobbying for the uptake of new and leading technical solutions, which work to save children from harm. Anna has studied Computer Science and Economics and has worked with innovative solutions within the Telco and IT industry for 20 years. She has throughout her career built her leadership skills with the aid of distinctive leadership programs, and she possesses extensive international experience from sales and business development within B2B. She has managed large cross-cultural customer projects with cross-border complexity, and secured quality and delivery to international telecom operators, multinational companies and government organisations. Anna has had a significant impact on NetClean's success and growth and is dedicated to growing the NetClean business in new markets, in order to maximise the impact the company's software can have around the world. In her leisure time, Anna enjoys spending time with her husband, two daughters and their dog Zoe. She loves training and like to spend time outdoors photographing nature.



Laurence Bottero

A journalist for 25 years, Laurence Bottero specializes in economics. After studying in Nice, she began her career in a weekly dealing with politics and economics. She then went freelance for fifteen years, linking collaborations with different media, always on topics of the economy and innovation. In 2008, she joined the editorial staff of La Tribune, a French business daily deeply rooted in the subjects of territories and innovation, first as a correspondent for the South of France then as editor-in-chief of the office based in Marseilles and Nice.



Anne Bouverot

Anne Bouverot is Chairperson of the Board of Technicolor, a world leader in visual effects and animation services. She is also a Senior Advisor to TowerBrook Capital Partners. She spent most of her career in the technology sector, in France and globally, first with Orange, then as Director General of the GSMA (Global Mobile Operators Association) and later as CEO of Morpho (digital security and identity solutions). She is a graduate of Ecole Normale Supérieure in mathematics and holds a PhD in artificial intelligence. She co-founded Fondation Abeona “Championing Responsible AI” on societal impacts of artificial intelligence.



Emma Burnett

Emma Burnett is a partner and UK Head of Technology and Data Protection at CMS. Her practice focuses on data protection, cybersecurity and technology. She regularly advises high profile international clients on her core specialism of data protection and has significant experience in information technology, having previously undertaken secondment to various clients. Emma is known for her proactive, solutions oriented approach and acts for clients across a wide range of industry sectors, including the telecommunications, technology & media, life sciences and financial services sector. Emma regularly advises on large cross-jurisdictional privacy projects and co-ordinates advice within CMS and beyond. Emma sits on the editorial board of Lexis PSL where she advises on data protection, IT and telecoms. Emma has extensive experience in advising organizations on compliance with data protection laws and has advised multiple clients on data breaches and cybersecurity.



Laureen Cook

Laureen is an Alumna of the IFC (World Bank), where she was the Principal TMT Adviser, in the Global Telecoms, Media & Technology Investment Sector. Currently she is the Founder & CEO of Extelcon, LLC, providing technical and commercial oversight to the Investment Banking Community, Regulators, and TMT & Satellite industry sectors as Lender's Technical Adviser for multi-billion USD telecoms & technology companies. Prior to joining the IFC, Laureen was with Alcatel-Lucent (now Nokia), as Vice President 4G/LTE Strategy & Innovation. She is a founding Director and International Board Member of Global Telecommunications Woman's Network (GTWN), and is an Investment Committee member of Rising Tides, a European based Angel Investment Fund, providing financing to female led IoT start-up companies. Additionally, she is a member of the STEM Committee at Rochester Institute of Technology and recipient of the 2021 Distinguished Alumni Award from the College of Engineering Technology. Laureen holds an MSc in Telecommunications Engineering from Rochester Institute of Technology, and an MBA from Long Island University in New York.



Bridget Cosgrave

Bridget Cosgrave is a former Founder Chairman & CEO of BICS, Deputy Director of ETSI (European Telecommunications Standards Institute) and Director General of Digital Europe. Bridget is a pioneer in gender diversity in corporate governance serving as non-executive director for numerous for public and private TMT companies. She is currently on the board of Sinch AB, the world leader CPaaS provider for customer engagement. Bridget is a co-founder of the Global Board Ready Women, a founding member of Rising Tide Europe angel investment fund, and Oceania Women's Network Satellite (OWNSAT). Bridget has been a frequent host and sponsor of GTWN events and has mentored many young women throughout her career.



Derrick de Kerckhove

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.



Ambassador Diana Lady Dougan

Ambassador Diana Lady Dougan has been a long-term pioneer in expanding the horizons of media, information technology applications, access and content globally. For more than four decades, she has served in senior communications technology, strategic and foreign policy leadership positions in industry and government, including appointments by three U.S. Presidents in full Senate confirmed positions. She is a senior advisor at the Center for Strategic and International Studies¹, Chairman of Cyber Century Forum and the Educational Reform Foundation. Ambassador Dougan has been honored for her public service in a wide range of initiatives internationally and domestically. She is an award-winning film and TV producer, including two Peabody's: excellence in broadcast journalism, feature documentary.

1

<https://www.csis.org/people/diana-lady-dougan>



Keri Gilder

Appointed to the role of CEO in May 2020, Keri is responsible for executing Colt's strategy which centres around transforming the way the world works through the power of connectivity.

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, also leading Colt's Diversity Council, to ensure Colt is a business where everyone feels they can bring their true selves to work. Keri brings this passion to the wider industry, also supporting external mentoring and coaching initiatives. Prior to Ciena, Keri worked in multiple roles for Lucent Technologies, and she has also worked for Hughes Aircraft as a Network Engineer. Keri has a Bachelor of Business Administration degree with an emphasis in Management Information Systems (MIS) from New Mexico State University. Keri lives in London with her husband and two children and is based at Colt's head office in London.



Rosalia Gitau

From a background in corporate finance, Rosalia worked for ten years with the United Nations in crisis management and relief in Africa and the Middle East. Started giving small amounts of money to start-ups, with the goal of changing lives and bringing women out of poverty. These efforts led her to become interested in how financial literacy and access to capital could improve the lives of women around the world. Bixie is an AI enabled platform which empowers women to know their own worth and to grow that worth. “During the pandemic women realised that what really matters is capital, and that they did not control it. Once again, women around the world suffered the worst impacts of the pandemic, because they were workers, not entrepreneurs or investors. I want to change that, so that women in future are more resilient.” Rosalia believes that women need to work together, to create our own reality. “Organisations such as the GTWN are critical to women entrepreneurs and industry leaders, as they enable cross sectoral co-operation and support...I would like to see women working together on blockchain initiatives designed by women, for women. Blockchain is the infrastructure of the next 20 or 30 years; we cannot afford for 50% of the world’s population to be locked out of the benefits of this economic transformation.”



María González

María González 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. Maria 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.



Julie Inman Grant

Julie Inman Grant is Australia's eSafety Commissioner. In this role, Julie leads the world's first government regulatory agency committed to keeping its citizens safer online. Julie has extensive experience in the non-profit and government sectors and spent two decades working in senior public policy and safety roles in the tech industry at Microsoft, Twitter and Adobe. The Commissioner's career began in Washington DC, working in the US Congress and the non-profit sector before taking on a role at Microsoft. Julie's experience at Microsoft spanned 17 years, serving as one of the company's first and longest-standing government relations professionals, ultimately in the role of Global Director for Safety & Privacy Policy and Outreach. At Twitter, she set up and drove the company's policy, safety and philanthropy programs across Australia, New Zealand & Southeast Asia. As Commissioner, Julie plays an important global role as Chair of the Child Dignity Alliance's Technical Working Group and as a Board Member of the WePROTECT Global Alliance. She was recently designated one of Australia's most influential women by the Australian Financial Review and a leading Australian in Foreign Affairs by the Sydney Morning Herald. In 2020, the World Economic Forum and Apolitical designated the Commissioner as one of the #Agile50, the world's most influential leaders revolutionising government.



Laina Raveendran Greene

Laina Greene is CEO and Founder of Angels of Impact, and CEO of GetIT, Inc with over three decades of experience in the tech industry and social impact space. She has helped raise hundreds of millions of dollars for organizations of all sizes and is Senior Adjunct Lecturer at the National University of Singapore Business School. Recently, she co-authored a book “Sustainable Impact: How women are key to ending poverty” (2017) and two reports written for Angels of Impact funded by Oxfam and Sasakawa Peace Foundation. Living between Singapore and the US, she thinks of herself as a Global Citizen.



Victoria Hernandez

Victoria Hernandez is non-executive Director (NED) at CaixaBank Payments & Consumer, the top bank in Spain and one of the largest banks in Europe. Judge at the European Commission, in charge of approving EU proposals for the European Innovation Council (EIC) Horizon Europe funding applications. Likewise, she represents the interests of the EIC €10,5bn fund as NED in the Belgian telecommunications company, Tessares. She is also NED of TeamEQ, an AI & ML powered service that offers solutions in the field of human resources, and a member of the advisory board of Cashway, a financial technology company. Previously, she was Alliance's Director British Telecom Europe, Executive Chairman Orange Spain and Senior Vice-President international Proximus. Victoria holds a Bachelor of Engineering in Computing Sciences from UPC, EMBA at INSEAD, a Masters Degree in Digital Marketing from Columbia Business School, and of Financial Technology from Harvard University. Victoria lives in Paris and speaks 5 languages fluently. She has one lovely daughter (Rita).



Madeleine Hillyer

Madeleine Hillyer is a Media Relations and Public Affairs Specialist at the World Economic Forum. As a Public Affairs specialist, Madeleine focuses on the global economy, technology and ESG. She leads strategic communications campaigns for ESG, financial services and mobility platforms at the World Economic Forum. Madeleine has a masters' degree in Diplomacy and International Relations.



Dr Heather Hudson

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.



Janice Hughes CBE

Janice Hughes CBE is a Founding Board Member of the Global Telecom Women's Network, a Founder Director of a new gigabit fibre network company and a Founder Director of Graphite Strategy. She has had a front row seat at the creation and development of the UK's independent regulators Ofcom and Ofcom. She was MD of the Economists Advisory Group, managing a pre-eminent group of academics including Sir Bryan Carsberg, who then moved to become the first Director General of Ofcom, the precursor to Ofcom. She then became a specialist consultant to the telecoms and media sectors, first at CSP, then as lead Partner heading Booz Allen & Hamilton's European Telecoms practice, before founding Spectrum Strategy Consultants and growing it to over 100 consultants in nine countries around the world. She played a leading role within the DCMS's Creative Industries Taskforce alongside Paul Smith, Lord Puttnam and Richard Branson, undertaking the first ever statistical review that demonstrated that the sector was worth more than £100bn, not far behind that of the financial services sector. In 2018 the DCMS announced that these creative sectors were now worth £268bn. She is Chair of Space for Giants a charity focused on conservation, wildlife protection, biodiversity and carbon offsets in perpetuity across Africa and is the new Co-Chair of the cross-party Independent Commission on UK-EU Relations.



Candace Johnson

Candace Johnson is a global infrastructure, network and innovation expert and entrepreneur. Currently, she is Vice Chair of NorthStar Earth and Space, the world's first private satellite constellation dedicated to solving two of the most important issues of our time – space debris and climate change. She is also Chair of the Advisory Board of Seraphim Space Capital, the world's largest venture capital fund dedicated to space and space-related ventures. She is co-initiator of SES/ASTRA for which she was named an Officer of the Luxembourg Oak Leaf Crown and architect of SES Global, one of the world's largest satellite systems for which she was named Commander of the Luxembourg Order of Merit.



Deepa Kalikiri

Deepa is Vice President and Head of Legal at Boku, Inc. She is also Boku's Company Secretary. Boku is provider of the world's most comprehensive mobile operator identity network. Boku streamlines and secures online transactions.

Deepa was previously Head of Legal, EMEA for mobile messaging solutions company Sinch. She studied law at Cergy Paris University (dual degree in French and English Law) and at Chicago-Kent College of Law in the US. She is fluent in both French and English.



Vrinda Kapoor

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.”



Masooma Khawari

Masooma Khawari, the daughter of Mr. Juma Khan, was born in 1985 in an educated and religious family in the Dara-e-Suf upper district of Samangan province. She studied the Turkish language at Ghazi University in Turkey in 2005 and graduated from Ankara University, laboratory of Medical Sciences 2008. She received her Bachelor's degree in law and political science from Payame Noor University Kabul in 2019 and is currently continuing a master's degree in management. After completing her studies, she returned to the country and served as the elected representative of the people of Samangan province in the Afghan Parliament from 2010-2016. She also served as a member and secretary of the "Commission for Justice and Administrative Affairs, Administrative Reform and Combating Administrative and Moral Corruption" in the parliament. She has also been a member of the commission on human rights, civil society, and women's affairs. In 2013, Mrs. Khawari also worked as an advisor to the executive directorate of the National Unity Government of the Islamic Republic of Afghanistan. In 2019, she was a consultant to the office of the Executive Directorate of the National Unity Government. One of her long-standing aspirations, evidenced by her work, is to fight corruption, the campaign to fight for women's rights, and to use her creativity and determination to benefit the people of Afghanistan.



Leticia Latino-van Splunteren

Leticia heads up Neptuno, a tower manufacturer with over 10,000 towers in the Americas. The business, originally started by her father in Venezuela, has expanded to cover all aspects – from construction to innovation, including software, asset tracking and 3D Tower Mapping. For Leticia, the main change that she has experienced over the 25 years of her career, has been in the transformation, slow but progressive, of the culture of the digital tech sector from a male, engineering dominated one, where it was not easy to be a senior woman, to a more open, diverse and inclusive one. In 2019 Leticia was appointed by the FCC Chairman to Chair the BDAC Job Skills and Training Working Group; in 2021 she was appointed to the FCC's Committee for Equity, Diversity and Inclusion; and in January 2022 she was appointed to the FCC's Telecommunications Interagency Working Group formed as a directive of the US Infrastructure and Jobs Act. Leticia believes that we need to work together as a matter of urgency to ensure that we make smart cities accessible and equitable for all.



Caroline Logan

Caroline Logan is a Manager at CollaborateUp where she supports CollaborateUp's portfolio of collective impact programs. In this capacity, she accelerates cooperation among governments, companies, and nonprofits as they tackle some of our world's toughest challenges. Alongside the CollaborateUp team, Caroline has co-created solutions across a wide range of issues, from combating misinformation to combating wildlife crime. She also leads the firm's private sector new business development. Over the last decade, Caroline has led the design and delivery of tailored workshops across industries. Prior to her role with CollaborateUp, she served as a Project Lead with McChrystal Group wherein she designed and delivered leadership development programs for participants across all levels - from corporate executives to emerging leaders. Caroline also served as a staff writer with BORGEM magazine, where she published on international development topics. Caroline is a Board Member of Globally, a nonprofit focused on building communities of impact and developing emerging leaders in global affairs. Caroline graduated with merit from The London School of Economics with a Master of Science in International Relations. She also earned a Bachelor of Arts in Political Science and English Literature from The University of North Carolina Wilmington.



Vicki MacLeod

Vicki MacLeod is an ICT specialist with considerable industry and government experience in Australia and internationally in a variety of telecommunications and digital technology fields. Currently providing independent consultancy services, Vicki is also on the Board of Directors of OWNSAT (Oceania Women's Network Satellite Pty Ltd), a Singapore-based satellite investment arm which was the first investor in satellite broadband startup Kacific. She has been Secretary-General of the Global Telecom Women's Network (GTWN) since 1998 and is the Editor-in-Chief of the GTWN's publications, including its annual magazine *The Mobile Century: Life and Work in the Digital Era*. (www.themobilecentury.com). Vicki is a former Executive Director of the International Institute of Communications in London, and has had a considerable career in the telecommunications industry. After commencing her career with the Australian Government in Canberra, including in the Department of Communications as part of the group opening the telecommunications sector to competition, Vicki spent more than ten years as part of Telstra's regulatory policy group. She went on to represent Telstra as an active member of the OECD's Business and Industry Advisory Committee (BIAC) for more than a decade. She was also Senior Advisor, Innovation Culture in Telstra's Chief Technology Office.



Isabelle Mauro

Isabelle Mauro is Director, Head Digital Communications Industry at the World Economic Forum. She is responsible for leading the agenda of the Digital Communications industry at the World Economic Forum. As part of her role, Isabelle manages the portfolio for the ICT industry and leads initiatives on digital inclusion and transformation, designed to accelerate positive impact on society, the environment and the economy. Prior to this role, Isabelle was Head of International Affairs at the GSMA, where she was responsible for government and institutional Affairs at global level. Isabelle is passionate about inclusion and sustainability. She is Chair of the High-Level Advisory Board of the DigitalGoes.Green Foundation. She is also a member of the Advisory Board of Women in Tech, a member of the UNESCO Advisory Group for the Declaration on Connectivity for Education. Isabelle holds an MSc in European Politics and Policy from the London School of Economics. She is fluent in French, English, Italian and Spanish



Michele Merrell

Michele M. Merrell is a senior level technology and telecommunications executive with 30 years experience in organizations ranging from start-up to mature, private, public and pre-IPO. She is the President of Merrell Consulting Group, a global consulting consortium. She has worked on numerous mergers, acquisitions and joint venture agreements, as well as IPOs during her tenure. Her experience includes companies such as Tyco International, Brightstar, CSPI Technology Solutions, Thales eSecurity, Bellsouth, U.S. Cellular and others. She has held broad global responsibility across APAC, EMEA, LATAM and North America. Since 2014, Michele has served on the Board of Directors for three international corporations, Cable Bahamas, Summit Broadband and Aliv Mobile Telecommunications. She is the head of the Corporate Governance & Nominating Committee for all three organizations, 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 for the Global Telecom Women's Network (GTWN), and is the North America President for GTWN, an organization that actively promotes and mentors women in the global telecommunications and technology industries. Michele was also named to the Board of Directors for the LeMieux Center for Public Policy.



Nicki Palmer

Nicola (Nicki) Palmer is Chief Product Development Officer for Verizon. Nicki oversees the exploration of new technologies and creation of products and platforms that can scale across our various business units to solve problems for individuals, enterprises, and society. Nicki began her career at Bell Atlantic in 1990 and has held a number of leadership positions in engineering, operations, and technology supporting advanced data and wireless products. She was Chief Engineering Officer and Head of Wireless Networks and also served as Chief Technology Officer of Verizon Wireless. She is a passionate advocate for promoting education and careers in Science, Technology, Engineering and Math (STEM), especially for young women. Nicki serves on the board of directors for the National Academy Foundation and chairs its STEM Advisory Committee where she helps provide more opportunities for high school students to be college, career, and future ready. She also serves on the advisory board of Break Through Tech, an initiative of Cornell Tech that supports curriculum innovation in higher education, career opportunities, and community support for women and other underrepresented groups in tech



Isabelle Paradis

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



Gabriela Ramos

Gabriela Ramos is the Assistant Director-General for the Social and Human Sciences of UNESCO, where she oversees the contributions of the institution to build inclusive and peaceful societies. Her agenda includes the achievement of social inclusion and gender equality, advancing youth development; promotion of values through sports; anti-racism and anti-discriminatory agenda and ethics of artificial intelligence. Prior to this position, Ms. Ramos served as the Chief of Staff and Sherpa to the G20/G7/APEC in the OECD, contributing to the global agenda as well as leading the OECD's work on: 1) New Approaches to Economic Challenges; 2) Inclusive Growth Initiative; 3) Gender Strategy ; and 4) well-being and children. In 2019, she launched the Business for Inclusive Growth (B4IG) platform, bringing together 40 major multinational companies committed to reducing inequalities. Previously, she was Director of the OECD Office in Mexico and Latin America and a member of the Mexican foreign service. In 2013, Gabriela was decorated with the Ordre du Merit by the President of France.



Maria Pia Rossignaud

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



Jennifer L. Schenker

Jennifer L. Schenker, an award-winning journalist, has been covering the global tech industry from Europe since 1985, working full-time, at various points in her career for Communications Week International, Wall Street Journal Europe, Time Magazine, International Herald Tribune, Red Herring and BusinessWeek. She is currently the editor-in-chief of The Innovator, a global business publication about digital transformation and sustainability (www.theinnovator.com). Jennifer was voted one of the 50 most inspiring women in technology in Europe in 2015 and 2016 and was named by Forbes Magazine in 2018 as one of the 30 women leaders disrupting tech in France. She was a World Economic Forum Tech Pioneers judge for 20 years. She lives in Paris and has dual U.S. and French citizenship.



Dr Mike Short CBE

Dr Mike Short CBE, after 30 years in telecommunications with Telefonica, joined the Department for International Trade as the Department's first Chief Scientific Adviser in December 2017. Mike leads the science and engineering profession in the department and ensures its policy is informed by the best science, engineering and technical advice. He advises on the technical aspects of future trade deals as DIT looks to create new arrangements following Brexit, and works with the UK's research, development and academic communities to boost scientific and engineering exports. Mike has over 40 years' experience in electronics and telecommunications and served as Vice President of Telefonica, the parent company of the O2 mobile phone network, for 17 years to December 2016. In this post, he managed the launch of 2G (GSM) and 3G mobile technologies in the UK and led research and development for Telefonica Europe. His career also includes the promotion of international technical standards in mobile technology, and he is also a former Chairman of the Global GSM Association, the UK Mobile Data Association, and President of the Institution of Engineering and Technology (IET). He was honoured with a CBE in 2012 for his services to the mobile industry.



Claire Sibthorpe

Claire 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.



Elisabeth Slapio

Elisabeth Slapio was Managing Director of the Cologne Chamber of Industry and Commerce until her retirement. There she headed the Innovation and Environment Department. Her tasks covered the topics of innovation and technology, research and science, energy and environmental economics. On behalf of the 16 North Rhine-Westphalian Chambers of Industry and Commerce, she worked for the digitalisation of the administration, especially in questions of electronic government. Elisabeth Slapio has represented the Cologne Chamber of Commerce and Industry in various national and international committees.

She is currently active in the higher education sector on the University Council of the Ruhr West University of Applied Sciences and is a member of the GTWN Global Telecom Women's Network. She supports various initiatives and projects on a voluntary basis, for example to promote education and social integration.



Vicky Sleight

A cultural diversity and inclusion executive with 20 years' experience in the global tech communication's industry, Vicky is leading, influencing and driving change at the international level in all social aspects of ESG, including culture change, equality, diversity and inclusion. With many years' experience in framing and executing change management initiatives, Vicky is a recognised expert in meeting ESG compliance requirements. At TM Forum, as VP, Human Factor and Diversity and Inclusion, Vicky has built and is leading the global industry collaboration and Executive Advisory Board for Diversity and Inclusion along with the Digital Organization Transformation & Culture program – the mission to accelerate digital transformation and succeed in the digital economy through ensuring tech communications is the most diverse industry in the world. A sought-after speaker, and an active participant in many international networks for promoting inclusion, she has authored and published articles, is a social media commentator on topical D&I issues in the tech sector. A true cultural change expert applying a range of tools and approaches to deliver business transformation – helping organizations radically re-think of how they will identify and nurture key talent in the future using The GC Index®.



Dr Gabriele Suder

Professor Gabriele Suder is Dean at Federation University Australia, leading its New Business Accelerator as part of Global & Engagement, providing new and innovative educational products with industry-focus and regional impact. Prior to this role, she developed Pearson's new Custom Learning product supporting universities, industry and government with leading digital and hybrid learning solutions, across APAC, for Pearson's MD APAC: As Director at Gartner, she led the transformation of its International CEO Forum to bring learning and advisory solutions to the most senior executives and CEOs of subsidiaries of multinationals operating in Australia, New Zealand and across APAC. Prior, Gabriele worked for the University of Melbourne, leading the whole-of-university International Relations portfolio worldwide. She also served as Professor at the Faculty of Business and Economics and Business School, at Melbourne University, as Honorary Professor at RMIT University, and as guest researcher for the Australian National University, University of Delhi, Aalto University, ESCP and others. She serves as expert on state and federal government level, at UNCTAD (Geneva), OECD (Paris) and JETRO/IDE (Tokyo).



Ana Tavares Lattibeaudiere

With over 20 years of experience, Ana is a well recognized leader in the Telecoms and IOT space. She has recently been appointed as Executive Director for Global Platform and is responsible for the organization's overall strategy, marketing and business development across key vertical sectors. Prior to joining GlobalPlatform she 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 a few 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. Strategy and Innovation has been at the core of all of Ana's career having held strategy consulting positions at BCG, Deloitte Consulting and Accenture and in private banking at Merrill Lynch in the area of investments in new technologies. 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.



Corinne Versini

Corinne Versini is the founder and CEO of GenesInk, a leading French company in the development and commercialization of conductive and semi-conductive raw materials for the electronics market. A graduate of the Ecole Centrale de Marseille, Ms. Versini was elected Engineer of the Year in 2016 by the Academy of Science and Engineering, Centralien of the Year as well as Gold Laureate of the “Femmes de l'économie Provence-Alpes-Côte d'Azur & Monaco” International Women's Award. In addition to being a company director, she is involved in the economy and development of the region. As a member of the Foreign Trade Advisors, she participates in the promotion of the region. Founder of BPW France Marseille Métropole, she actively promotes the role of women in the workplace. Ms. Versini is a member of the board of directors of the Comité Richelieu association, Pacte PME and the European association OE-A (Organic and Printed Electronics Association), which is the leading international industry association for the emerging technology of future electronics. In 2019, she received the insignia of the Knight of the National Order of Merit from M. Emmanuel Macron, President of the French Republic.

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Entrepreneur Country
and Viva Capital
Ariadne Capital and
Ariadne Capital Funds



Isabelle Paradis

President and Founder
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Walda Roseman

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Elisabeth Slapio

Former Managing
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