Digital Future Society Summit 2023:

Building Trust in the Digital Sphere

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About
Digital Future Society

Digital Future Society is a programme of **Mobile World Capital Barcelona** and the **State Secretariat for Digitalization and Artificial Intelligence (SEDIA) of the Government of Spain**. The Digital Future Society Summit 2023, held alongside the Mobile World Congress Barcelona 2023, is deeply rooted in the values of human rights, ethics, and security.

The event **aims to offer global insights into the essential steps needed for a digital tran-sition based on the respect of human rights, ethics and security with the objective of building an equitable and sustainable digital era.** Over the course of nearly three hours, numerous experts discussed thought-provoking topics such as neurotech, ethical considera-tions for immersive realities, and sustainable technology for good.

In this era of digital transformation, questions about the future of humanity arise. How do technological disruptions shape our lives? What impact does technology have on democracy and health? Will some individuals be left behind in this digital transition? How can we safeguard human rights and combat environmental challenges? Although we may not have all the answers yet, these fundamental questions serve as the catalyst for **a new revolution.**

The relationship between society and technology is in a perpetual state of evolution that defies conventional temporal boundaries. Both people and the planet are profoundly affected and must remain at the forefront of our strategic thinking. Emerging technologies hold the key to address-ing the increasingly complex problems that our societies face today. They offer us limitless possibilities to enhance our lives and those of future generations.

The Digital Future Society Summit 2023 gathered international thinkers, leaders, experts, and stakeholders to envision the future amidst an uncertain present with a humanistic approach. Together, they explored how we can harness these new technologies and digital innovations to create a better quality of life and a sustainable environment. The Digital Future Society Summit places people and the planet at the heart of technological advancements, striving for a more sus-tainable, equitable, and inclusive world.

Technological humanism encompasses significant **social and ethical implications.** It requires a shared understanding among public and private actors of the meaning and consequences of these transformative changes. **Effective dialogues** are necessary to establish new rules, frameworks, and aspirations, enabling collaboration and cooperation. It is through the col-laborative efforts and dialogues among technology experts, policymakers or social scientists that we can **collectively build a better world.**

Digital Future Society

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Welcome & Acknowledgements

The journalist **Pipo Serrano** opened the Digital Future Society Summit 2023: Building Trust in The Digital Sphere by encouraging the audience to fully engage and participate in the event. He emphasised the interconnectedness of the summit's content, from acknowledgements to key-notes and tiers, highlighting the potential for positive change in our world. Notably, all the music and illustrations were co-created by both human artists and Artificial Intelligence (AI).

Francesc Fajula, CEO of Mobile World Capital Barcelona, started his speech by expressing gratitude to everyone in attendance. He recognized the profound questions posed by the current global crisis, which encompasses health, society, and economic aspects. Fajula stressed the need to shape a digital era that upholds human values, protects the planet, and ensures an in-clusive digital transition that leaves no one behind. He called upon Barcelona to lead the way as a European leader in the digital transformation, combining innovation with human rights and social progress. Fajula concluded his welcome with a quote from the Peter Drucker Forum: "Don't trust a humanist who doesn't care about technology nor a technologist who doesn't care about humanism."

Nadia Calviño, Vice President & Minister of Economic Affairs and Digital Transformation of the Government of Spain, delivered a recorded message in which she asserted that digitalization is an indispensable tool for progress as it plays a crucial role in addressing key topics such as climate change and environmental challenges. She emphasised its indispensable nature for human progress, as it has the power to transform every aspect of our lives. Calviño introduced the con-cept of technological humanism, which aligns with the social and ethical implications previously mentioned by Francesc Fajula.

The Vice President insisted on the importance of ensuring that technological progress is underpinned by democratic values such as diversity, equity, and inclusion. Calviño stressed the need to prevent innovation from creating new forms of inequality and biases. Recognizing that digital transformation is no longer optional, Calviño stated that it is the responsibility of governments to build trust in the digital sphere.

As Calviño specified, the Government of Spain is actively working on the Agenda España Digital, a comprehensive roadmap driving reforms and investments to ensure connectivity for all, promote the digitalization of companies, and foster digital skills across the entire population. The goal is to empower individuals to be active participants in the digital realm rather than passive observers.

Finally, Calviño discussed the Spanish Charter of Digital Rights, developed in collaboration with the European Union and the global community. The charter aims to safeguard fundamental rights in cyberspace, placing citizens and the planet at the core of decision-making processes to foster trust and shape a humanistic approach to digitalization worldwide. Ultimately, the collective objective is to create a better world for present and future generations, transcending the immediate challenges of our time.

Journalist. Head of Innovation
New Business at Broadcaster

Nadia Calviño
First Vice President of Spain and
Minister for Economy and Digitalisation

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Keynote: Spain leading the way to a trustful rights-oriented digital transition

Carme Artigas, Secretary of State for Digitization and Artificial Intelligence of the Government of Spain, began her keynote speech with one important word: Future. The future amidst the uncertainties of a post-pandemic world. Artigas underscored the opportunity presented by technological disruptions to shape a positive future. However, she acknowledged that there are more questions than answers when it comes to the impact of technology on democracies, the influence of metaverse neurotechnologies on human singularity, and the digitalization of the self, among others.

Under the motto 'Velocity - Unleashing tomorrow's technology' inspired by the Mobile World Congress 2023, Artigas called for a moment of slow thinking amidst the fast-paced society driven by algorithms, videos, images and immediate reactions. The Secretary of State for Digitization and Artificial Intelligence highlighted the need to understand the human brain and the broader implications of technology, including ethical concerns related to non-invasive neurotechnologies and digital health treatments.

Artigas recalled the announcement by the Spanish government regarding the launch of Spain Neurotech, the first centre for neurotechnology in Europe and one of the top five in the world. This significant investment of 200 million euros over the next 10 to 15 years also includes the establishment of a national centre for ethical neurotechnology. She underscored the importance of European regulation of Artificial Intelligence, highlighting that, similar to European data privacy laws, it should not only serve as a competitive advantage but also set moral and technological standards on a global scale. Spain is also taking the lead in developing the first Artificial Intelligence sandbox to test future regulations, assuming the responsibility of safeguarding digital rights.

The Secretary of State for Digitalization and Artificial Intelligence echoed the argument of the philosopher Daniel Innerarity, who claims that digitalization should be understood as a political process in itself. Artigas defended the importance of democratic digitalization, which relies on the power of politics and governance to address potential negative trends through regulation. Artigas argued for the need to use technologies such as Artificial Intelligence, neurotechnology, quantum computing, and synthetic biology for the common good, tackling societal challenges like climate change, ageing populations and the necessary protection of civil and democratic values.

In this context, Artigas also expressed the need to ensure not only the preservation of existing rights from the physical world in the digital realm but also the establishment of new rights for new environments. These may include protection against algorithmic discrimination, the right to a second human opinion, safeguarding neuro-technological advancements, protection against undue influence on personal will, and the prevention of manipulation. Artigas believes in the importance of setting limits in this transitional phase between the fading industrial revolution and the emergence of the new digital world, which is yet to be fully defined.

In her view, the fundamental challenges facing humanity that need to be solved once and for all are twofold: ensuring the sustainability of our planet ("There is no Planet B") and grappling with the ethical quandaries arising from future technological advancements, such as privacy and per-sonal data concerns. She further noted that while young individuals may not be actively advocating for their digital rights due to a lack of awareness, it is crucial for older generations to engage in meaningful dialogue with the younger ones, fostering mutual understanding and cooperation. Failure to do so, she cautioned, would impede our ability to rectify the detrimental impact on the future of both the planet and society.

Finally, Artigas pointed out the existential need to create a new social contract that embraces technological disruptions while ensuring safeguards and guarantees. Echoing the words of Catalan scientist Jorge Wagensberg, she emphasised that while finding answers represents evolu-tion, posing new questions is revolution.

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Tier 1: Neurotech: the next frontier

Elsa Punset, content director at the Laboratorio de Aprendizaje Social y Emocional, opened the discussion by providing an insightful overview of neurotechnology and its potential to revolutionise our understanding of the brain, treat brain-related illnesses, and enhance human capabilities. **Punset** also underlined the multidisciplinary nature of neurotechnology, highlighting its connection between technical components and the nervous system. As the moderator of Tier 1, **Punset** summarised the initial insights and outlined the structure of the debate: the first part to define neurotechnology and its main advances now, the second part to explore neurotechnology for healthy human beings, and the final part to address the regulation of neurotech.

Rafael Yuste, neurobiologist and professor of biological sciences at Columbia University and ideologue of the BRAIN Project, defined neurotechnology as the use of devices and methods to record or alter brain activity. He delved into its potential for understanding the human mind and how it works, treating mental illnesses like depression and Alzheimer's disease, and enhancing cognitive abilities. **Yuste** considered the integration of neurotech with Artificial Intelligence and deep neural networks as the most exciting area of neurotechnology, enabling advancements in diagnosis, treatment, and cognitive enhancement. **Yuste** concluded his remarks by addressing ethical considerations and advocating for a balance between innovation and the protection of individual rights in the development and use of neurotech.

Ana Maiques, CEO of Neuroelectrics, began her intervention by highlighting her favourite neurotech application while wearing the device created by her company in Barcelona on her head. She explained that the device is full of electrodes that record brain activity but also have the capability to stimulate the brain. **Maiques** stated that with this device Neuroelectrics aims to treat seizures and epilepsy through non-invasive neuromodulation. She added that the technology could also be applied to treat depression, which constitutes one of the greatest mental health crises nowadays.

Alvaro Pascual-Leone, professor of neurology at Harvard Medical School, acknowledged that brain-related disabilities are the primary challenge facing human society. He emphasised the need for a different approach, shifting from a reactive stance that limits neurologists' impact to an approach that empowers individuals to use technologies to be able to identify the problems that they may have. **Pascual-Leone** advocated for a transition where technology and monitoring are seamlessly integrated into people's lives.

Punset asked the panellists if there is an unrealistic expectation for neurotechnology to heal people. **Yuste** responded by highlighting that humanity and medicine have been relying on the same pharmaceuticals for over a century, despite their inadequate efficacy for the complex organ that is the brain. The neurobiologist stressed the need to explore the brain with the same precision with which it is constructed, and neurotechnology offers the potential to achieve such precision.

Pascual-Leone underscored the importance of personalization and precision in reading brain activity and its correlation with behaviour. He explained that each individual's brain exhibits a unique pattern of spatial and temporal neural activity, allowing for the identification of abnormalities and symptoms.

While controlled experimental settings have shown promising results, transitioning these techniques to a population-level healthcare context presents significant challenges in terms of developing diverse technologies and overcoming scalability limitations.

Yuste agreed with **Pascual-Leone** and underlined the importance of translating research conducted in the laboratory to clinical practice.

According to **José M. Carmena**, Researcher and Professor of Electrical Engineering and Neuroscience at the University of Berkeley, the frontier of technology that holds great promise lies in the field of mental health. While different applications already exist, **Carmena** highlighted the potential of miniaturisation of this technology as a path to address the complex network nature of mental health problems. The miniaturisation of technology allows for precise targeting and modulation of specific nodes within the mental health network, offering a more focused and distinct approach compared to the broader range of interventions provided by pharmacology.

Punset initiated a discussion on the challenges and opportunities associated with invasive and non-invasive neurotechnologies. **Maiques** emphasised the importance of striking a balance between efficiency and ethics in the development and use of these technologies. **Pascual-Leone** responded by addressing the impact of invasive and highly precise interventions, particularly in relation to the dynamic specificity of the brain and the potential for unforeseen consequences.

The moderator asked the panellists about human enhancement and the specific type they would choose for themselves. **Yuste** believes that human enhancement is inherent in everything humans do, from using fire to cell phones. He sees humanity undergoing a profound transformation, evolving into a new species, which he refers to as Renaissance 2.0. **Carmena** differentiated between applications that facilitate interaction with virtual environments and enhancements in daily activities and the real world. **Pascual-Leone** envisioned the acceleration of motor skills acquisition through non-invasive and scalable methods, such as those developed by Neuroelectrics. In response, **Maiques** raised concerns about the consequences and timing of human enhancement.

Punset inquired about what makes the human brain so unique that can never be replaced. **Yuste** responded by emphasising the specificity of the brain's cortex and its neural power, suggesting that humans will not become irrelevant but rather ascend to a position of greater significance and relevance in the face of technological advancements.

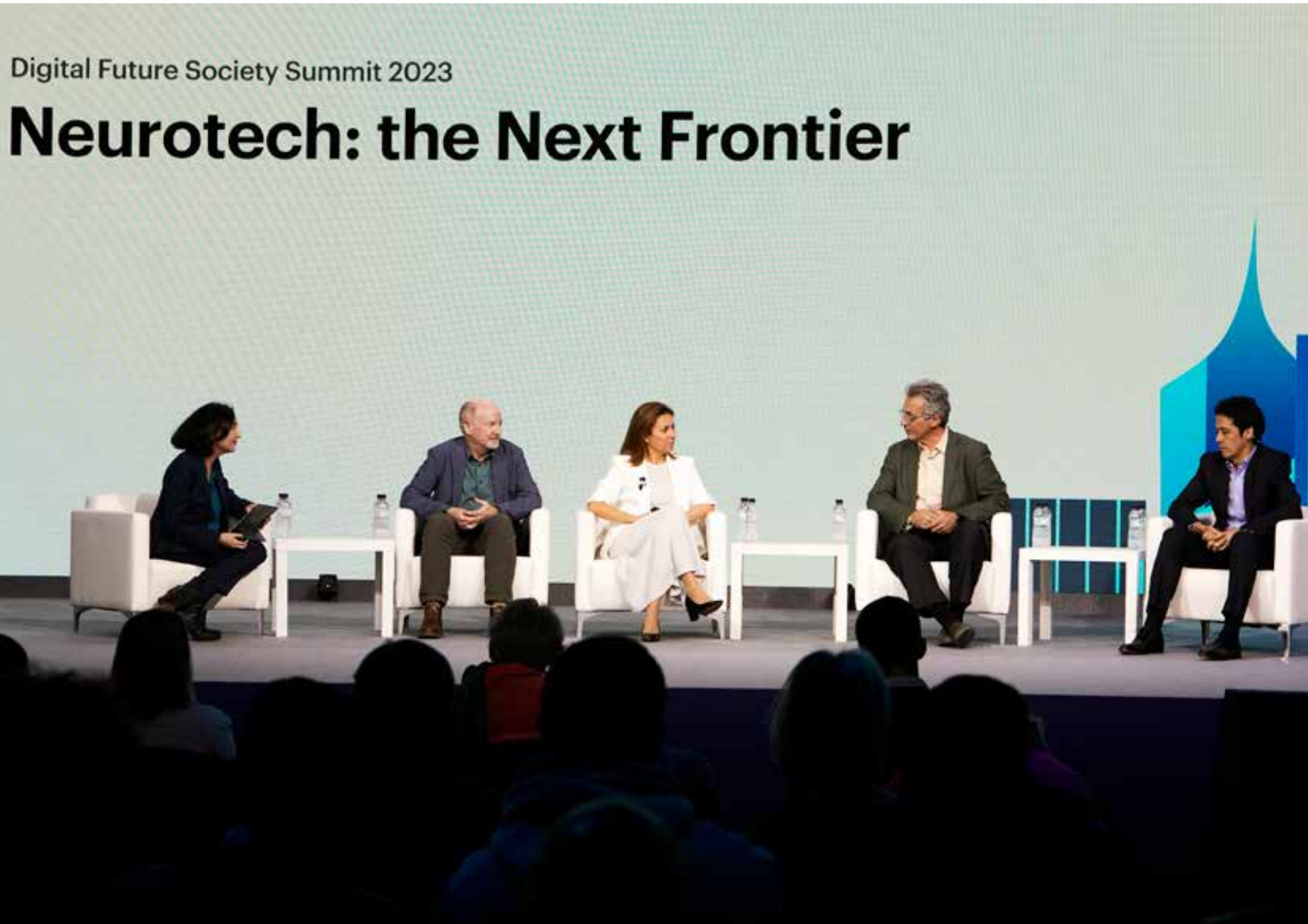
Addressing the moderator's question about recreational uses, **Pascual-Leone** stressed the need to establish appropriate regulations and oversight instead of limiting the access. **Yuste** and **Carmena** further discussed the challenges and opportunities presented by invasive and non-invasive neurotechnologies. Invasive interventions, such as implantable devices, offer greater precision but require rigorous medical regulation. On the other hand, non-invasive wearables provide accessibility and convenience, but their accuracy and effectiveness may have limitations, and they may lack safeguards if treated as consumer electronics.

The discussion explored the concept of human rights in the digital era, with a focus on regulating non-invasive neurotechnology to protect individual privacy and ensure equitable access. The panellists called for a human rights approach to neurotech, advocating for the establishment of basic human rights in this emerging field. **Yuste** argued for the need for a dual approach in regulation, fostering technology development while protecting and determining basic human rights.

He made constant references to the need to include citizens' digital rights in constitutions and highlighted the example of Chile as a country that changed its constitution to protect individuals' digital rights. **Maiques** highlighted her role as the CEO of a company in addressing ethical questions in the field of neurotech, emphasizing that these questions should not only be directed at regulators but also considered by entrepreneurs and society as a whole.

Punset and **Yuste** emphasised the importance of collaboration between scientists, entrepreneurs, clinicians, regulators, philosophers, and social scientists to address the ethical and societal implications of neurotech.

The round table concluded with a discussion on the launching of Spain Neurotech, that has a dedicated centre to develop methods for recording and analysing brain activity. **Pascual-Leone** and **Carmena** expressed particular interest in the initiative's focus on human neuroscience and its potential to translate scientific research into societal benefits. **Maiques** underscored the symbolic importance of the project in Spain and its potential to nurture young scientists and drive advancements in neurotech.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Tier 2: Ethical approaches for immersive realities

Esther Paniagua, Associate Director of Centre for the IE Governance of Change, introduced the panel on ethical approaches for immersive realities. She discussed the concept of the metaverse and how it is currently a buzzword that many people are using incorrectly. **Paniagua** noted that although the metaverse is still in a nascent stage, there are opportunities and risks associated with this emerging technology. She posed questions about how society can ensure that the metaverse delivers on its promises and does not create new problems such as information manipulation, discrimination, harassment, and privacy concerns. **Paniagua** also explored whether the materialisation of the metaverse is even desirable and emphasised the need for responsible governance to address these challenges.

Poonacha Machaiah, CEO of Chopra Foundation, expressed gratitude for the opportunity to participate in the panel discussion. He highlighted the challenges of the loneliness pandemic, citing statistics that 57% of New York's population, 55% of London's population, 80% of children under 18 years old and 40% of those aged over 65 also suffer from loneliness. **Machaiah** suggested that immersive realities in the metaverse could be a solution to this problem.

He furthermore discussed the mental health pandemic and the shortage of therapists available to address it, particularly in emerging markets. He proposed that Artificial Intelligence and immersive realities could be an intervention to address the mental health crisis, especially since an entire generation is growing up in the metaverse. As **Machaiah** explained, 3.6% of the world's population suffers from depression and 3.8% from anxiety, with more than 500 million people having mental health problems.

Machaiah identified three additional areas where immersive realities can provide assistance: promoting healthy ageing, enhancing cognitive behaviour, and improving healthspan in later stages of life. He also introduced the concept of meta-surgical, a method in which medication is administered through the eyes via the metaverse. Furthermore, he proposed that immersive realities have the potential to serve as a catalyst for cultivating a more caring and empathetic society. He insisted that integrating love, kindness, and compassion into the societal operating system could hold significant importance, particularly in light of the current global circumstances.

In response to the moderator's question about implementation strategies, **Machaiah** explained the active involvement of the Chopra Foundation in exploring the use of Artificial Inteligence chatbots to address loneliness during the pandemic, resulting in over 16 million messages exchanged and over 4,600 successful interventions related to suicide prevention. **Machaiah** further discussed the potential of cognitive behaviour therapy and immersive tools like games within the metaverse to tackle anxiety and depression. He also touched upon the possibilities offered by domain-specific Artificial Intelligence in enhancing healthspan and lifespan, mentioning an initiative called Cyber Human that seeks to create digital twins to assist individuals in achieving their full potential. Additionally, **Machaiah** emphasised the role of virtual reality (VR), augmented reality (AR), and extended reality (XR) in fostering compassionate communities where love and action form the foundation and operating system. He underscored the significance of attention, precision, affection, and acceptance in developing avatars with intentions and algorithms that embody love and compassion.

Carissa Véliz, Associate Professor Faculty of Philosophy Institute for Ethics in AI Tutorial Fellow at Hertford College, began by discussing the potential implications of immersive realities, specifically virtual reality, on people's daily lives. Next, she highlighted the importance of gaze-tracking technology in virtual reality and how it can collect personal data that could be misused. **Véliz** emphasised the need to design technology with ethics in mind to ensure autonomy and respect for privacy. She drew parallels with medical ethics and how respect for patient autonomy has evolved over time. The Associate Professor also stressed the importance of not neglecting the physicality of life in favour of digital experiences, and instead cherishing both analog and digital realities.

Véliz also argued that it is crucial for corporations to recognize the value of being ethical and protecting privacy, underlining the consequential impact on the future of democracy. Companies that prioritise privacy and ethics will be better equipped to adapt to future regulations regarding Artificial Intelligence and virtual reality. It is also important to regulate companies in order to address the problem of data collection and ensure collective solutions. However, individuals also have a role to play in choosing privacy whenever possible. Moreover, safeguarding privacy and security aligns with the best interests of the companies themselves, enabling them to mitigate liabilities, cultivate customer trust, and foster a positive work environment. By prioritising privacy and ethics, companies can proactively prevent scandals and foster a sense of pride among their employees.

Mónica Taher, Marketing VP at RocketFuel, focused on the significance of financial inclusion as the most crucial aspect among the discussed emerging technologies, such as Artificial Intelligence, virtual reality, and the metaverse. She drew attention to the fact that globally there are 1.7 billion unbanked individuals, with 980 million of them being women, comprising 56% of the unbanked population. **Taher** recognized cryptocurrencies as a form of currency already in use and believed that the convergence of fiat money and cryptocurrencies is essential for brands and governments to access the $5 trillion metaverse market. She advocated for regulations that simplify and facilitate the utilisation of cryptocurrencies for purchasing services and products, both in the physical world and the metaverse. Finally, **Taher** stressed that achieving financial inclusion, particularly for women in developing countries, will remain elusive unless governments regulate and streamline the use of cryptocurrencies.

While discussing the utilisation of blockchain technology to promote traceability and combat corruption, **Taher** acknowledged that corruption exists globally, from Europe to Latin America and the United States. However, she emphasised the need to harness blockchain's potential to increase transparency and fight corruption. According to **Taher**, governments must collaborate with academia and the public sector to integrate blockchain technology into all government processes. By doing so, she believes that governments can not only successfully tackle corruption but also expand financial inclusion.

Ricardo Baeza-Yates, Advisory Council on AI Member & Director of Research at OptIA, discussed the importance of addressing existing problems before examining the potential issues that may arise from emerging technologies. He emphasised the need to consider the impact on everyone's well-being and questioned whether we are developing technologies for the rich or for the good of all. **Baeza-Yates** used the pandemic as an analogy, illustrating how it exposed the digital divide that existed between people who had access to technology and those who did not.

He identified the challenge of ensuring digital inclusion not only across the entire population but also within a single household to enhance everyone's experience. **Baeza-Yates** also raised concerns about the impact of these technologies on mental health and addiction, emphasising the importance of humans having the right to not live in the digital world. He urged for a consensus among people on what they want from these technologies, rather than just adapting to the wishes of technology creators. Finally, **Baeza-Yates** emphasised the need for ethical principles, as well as for environmental, legal, and risk assessments to regulate these emerging technologies and see whether the benefits outweigh the dangers.

To conclude, moderator **Paniagua** asked the panellists to briefly reflect on the key questions that society needs to address in order to make the metaverse work. **Machaiah** responded by emphasising the importance of trust, stating that building trust needs to be invested in and made the fabric of everything we do. **Véliz** focused on the ethical considerations that need to be made, calling for companies to have an ethicist on the board of advisors and in the team. **Taher** discussed the need for regulation in order to avoid living in the "wild west" of the metaverse, highlighting the need for rules on how we interact. Finally, **Baeza-Yates** made four quick points on the need for transparency, contestability, auditability, and accountability in software systems.

Digital Future Society Summit 2023

Ethical Approaches for Immersive Realities

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Tier 3: Sustainable technology for good

Pipo Serrano, the moderator for the third panel, began by introducing panellists and, in reference to the previous discussion, noted that there is still much reflection needed around the ethics of emerging digital technologies. He stressed the need to adapt to these technologies in a way that creates a safe digital dimension for society. He also highlighted the potential benefits for all of us, particularly in terms of planetary well-being and sustainability. **Serrano** then announced the third panel of DFS Summit 2023, focused on the renaissance of technological humanism, with a particular emphasis on green and ethical approaches. He continued by posing a question to all four panellists about how they understand the relationship between digitalisation and well-being, both personally and on a planetary scale, in the context of the green digital transition.

Lara Urban, PI at Helmholtz Pioneer Campus and Helmholtz AI in Munich, began her intervention by explaining her work on planetary health, which seeks to understand the link between human health and the health of the planet. She highlighted the use of genomic and AI techniques for genetic research, studying how the DNA of organisms and their environment interact and affect each other. **Urban** provided an example of studying the impact of human activities on freshwater systems and the subsequent changes in microbial diversity that can lead to the development of pathogens, antimicrobial resistance, and ultimately affect human health. **Urban** explained that AI is used to analyse large datasets to better understand these complex relationships.

Christopher Fabian, Co-founder and Co-lead at Giga (UNICEF), explained the project Giga, which aims to connect every school in the world to the Internet, in collaboration with UNICEF and ITU. **Fabian** described the challenge of not knowing where all the schools in the world are located and how his team developed software to identify them through satellite imagery. Currently, they have identified 2.1 million schools and are working to understand how connected they are. **Fabian** reminded the audience of the impact of this lack of connectivity, with a clear divide between those who have access to the internet and those who do not. The lack of connectivity leads to bad health outcomes, poverty, lack of dignity, and a bleak future for those who do not have access. **Fabian** suggested solving this human infrastructure problem using data science and technology.

Guillermo Martínez, General Director of Ayúdame3D, talked about how his organisation uses digitalisation to create and distribute free 3D-printed prosthetic arms to amputees around the world. He emphasised the importance of decentralising technology and empowering people in different regions to use it to solve problems. **Martínez** explained how Ayudame3d set up a 3D printer lab in Kenya where local students are creating hands for people in their community. This not only helps those who need it but also creates new job opportunities and entrepreneurs. He highlighted the importance of spreading the social value of new technology to different parts of the world.

Jordi Serrano, expert in Digital and Global Health, founder of Universal Doctor and CEO of UhDa Health, presented his company Universal Doctor and its digital health solutions in the global health space. Universal Doctor has implemented mental health and ageing platforms in over 20 countries with the World Health Organisation (WHO) and many governments. The company also launched a platform called UhDa Health at the beginning of the pandemic to enable physicians and nurses who are not used to doing research to conduct simple studies, using drag-and-drop questionnaires and monitoring, targeting behavioural change.

This democratisation of studies allows for more research to be done, particularly on invisible diseases like long covid. An example of their work is a large study on the psychological effects of long covid, which was launched in February of 2023 in cooperation with Fundación Visible.

Urban shared that her interest in planetary health research stems from having worked in different geographies of the world. She talked about her research in New Zealand where she had to bring AI and genetic research for data analysis to remote islands and mountains in order to study critically endangered species. **Urban** emphasised the importance of not just focusing on centralised and costly equipment, which limits the benefits to only people in big cities. To achieve planetary and global health, she insisted, we need to make sure that we improve the health of everyone on the planet. **Urban** explained how she brought these technologies to the field in New Zealand by automating processes and creating small technologies that could be transported and used in remote areas.

Pipo Serrano asked **Fabian** why he specifically chose schools when focusing on bringing connectivity to people. **Fabian** answered that schools were a good starting point for several reasons. First, everyone has been to school, so it is a simple concept that everyone can relate to. Second, schools are easily identifiable from satellite imagery, as they have distinct features like football pitches and cues of kids arriving in the morning and leaving in the afternoon. Third, schools are the centre of hope and learning and often the centre of a community. Fourth, a school can serve as more than just a place for education. It can be a voting centre, a place for emergencies and care, and a location for after-school activities.

Fabian also explained that connecting schools created positive externalities for the rest of the community. In the last 18 months, they have connected 5,700 schools, which means around 2 million kids, and they plan to connect 30,000 more schools in the next 18 months, which will benefit approximately 10 million kids. **Fabian** explained that they use satellite imagery and track digital fingerprints generated by teachers and students through Android apps to identify the schools. They have worked with organisations such as Unicef, the United Nations, and the European Space Agency and have received support from companies like Ericsson Dell and Elon Musk, as well as the governments of Spain, Catalonia, and Barcelona. They are also setting up a research centre in Barcelona that will open soon.

Following **Fabian**'s explanation of how to use satellite imagery to map schools, **Urban** added that their institute also uses satellite data for various purposes. For example, they use it to estimate the population in certain regions where such information is not readily available. This is important because knowing the number of people in an area is crucial for assessing the environmental risks they face.

Martínez explained his experience volunteering in Kenya, where he brought 3D-printed prosthetic arms and hands to an orphanage to help those in need. They have now provided these devices to people in need across 55 countries, helping 500 people per year and hoping to reach the 83 million who require such help worldwide. He argued that these prosthetics offer people an opportunity to have a better life, particularly in terms of education and work.


Inve igator (HPC)

Martínez shared stories of the impact these prosthetics have had on people's lives, such as allowing them to eat and drink by themselves and freeing up their family members to go to work. The prosthetics are made from PLA plastic, which is a commonly available and recycled plastic that can be used by anyone with a 3D printer, and Ayúdame3D is an ecosystem that encourages people to help others by making and donating prosthetics. The company also recycles prosthetics that have been outgrown by their owners so that they can be used to help others.

Jordi Serrano shared with the audience an explanation of the functionalities and purpose of UhDa Health, a system that allows anyone to create clinical studies using a collection of building blocks, APIs, and templates by other researchers. This platform is a tool for data collection, especially in the area of behavioural change studies where gaps still exist.

Pipo Serrano then took the conversation back to New Zealand by asking **Urban** how she connected artificial intelligence and big data to empower her projects and help the Kakapo species. **Urban** first reminded the audience about the importance of developing technology that can be brought to remote locations to rapidly and efficiently collect data. She continued by explaining that they used new ways to produce genomic data by having tiny nanopores embedded in a membrane, which the DNA of a Kakapo or pathogen could pass through to obtain a signal. They then used AI algorithms to learn which signal fluctuation corresponded to which DNA. In this manner, they studied a fungal infection that killed many Kakapo chicks and brought sequencing into the field to detect and respond to the infection. AI is essential because it helps them mine databases efficiently to compare the data they collect with publicly available data.

The next question was for **Fabian**. The moderator asked about a quote of him, where the Co-founder and Co-lead at Giga stated that innovations to fix the asymmetry of the world normally arise in developing countries. **Fabian** explained that a lot of the problems we face are because of the asymmetry of information, where people who do not have access to information are punished. **Fabian** argued that we can use machine learning (ML) to balance this asymmetry and highlighted the importance of open-source and publicly available data that includes information from different parts of the world. He also gave an example of how drones had been used to reduce technology asymmetry by creating drone corridors in Malawi and other impoverished regions to transport blood samples faster between two locations.

Continuing the conversation, **Pipo Serrano** turned his attention to **Martínez**'s innovative approach of redefining Corporate Social Responsibility (CSR) as Technological Social Responsibility (TSR). **Martínez** elaborated on the challenges they faced in upholding their mission to provide free prosthetic arms and legs to people. They had to improve their business model, ensuring it effectively covered costs and could be sustained in the long term. He shared that TSR aimed to empower companies unfamiliar with CSR initiatives by optimising their technology and resources for greater efficiency. The goal was to inspire companies to leverage their technology knowledge and funds to benefit others and make a positive impact on the world.

Martínez's project involved educating these companies on creating prosthetic arms while emphasising the importance of technology in assisting individuals and preserving the environment. By establishing this innovative business model, they secured funding for the company and promoted the idea of using technology as a tool for societal improvement.

The last question of the panel was targeted to **Jordi Serrano**, and revolved around his vision as a doctor for humans in the technological transition, encompassing both the green and digital aspects. **Serrano** started by acknowledging the healthcare sector's tendency to lag behind in comparison to other fields. He highlighted the fact that while we have apps containing our financial data, we still lack a similarly accessible app for our healthcare information. Although there has been some improvement during the pandemic, there is still work to be done in this area. **Serrano** emphasised the pressing need to integrate healthcare and the Green Revolution to address the challenges posed by climate change. He underscored the importance of enhancing healthcare regulation and empowering individuals to reclaim control over their healthcare data. The ultimate goal is to foster a sustainable future, prevent climate-related casualties such as heat-related deaths, and reduce disparities in access to healthcare and the internet.

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Closing

Francesc Fajula, CEO of Mobile World Capital Barcelona, delivered the closing remarks at the Digital Future Society Summit 2023: Building Trust in the Digital Sphere. He reminded the audience of the significance of velocity, which was the motto in Mobile World Congress 2023. Fajula encouraged everyone to take a moment to think and engage in meaningful discussions about what truly matters. He also expressed gratitude to all the speakers and organisers of the summit.

Fajula revisited the main topics covered in the sessions, including the ethical considerations surrounding immersive realities and digital rights, the importance of sustainable technology for the benefit of society and the planet, and the need to build trust through ethics, regulation, and transparency in the digital sphere. He emphasised the importance of responsible and ethical technology used to enhance the well-being and autonomy of individuals and society as a whole. Fajula acknowledged the ongoing confrontation between the negative effects of technology, such as social division and privacy concerns, and its positive aspects, such as access to information, innovation, and creativity.

The summit host also highlighted the concept of digital humanism, which underscores the necessity for interdisciplinary collaboration and dialogue among technology experts, policymakers, social scientists, and other stakeholders. Mobile World Capital Barcelona embodies this spirit, and Fajula believes that technology will play a main role in creating a more inclusive, sustainable, and prosperous world.

In conclusion, Fajula proudly declared that Barcelona has become a key driving force in the global digital ecosystem, with significant contributions in various areas, including innovation promotion, start-up support, digital skills development, and advancing social impact through technology.

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