DIGITAL 4GOOD

CHALLENGES OF THE DIGITAL REVOLUTION FOR THE SOCIAL SECTOR

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Calouste Gulbenkian Foundation

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DIGITAL4GOOD: FROM SURGICAL INITIATIVES TO A NEW PARTICIPATORY DEMOCRACY

The social sector is benefiting from the push given by the pandemic to the digital transformation process. The pandemic did for the digital transformation, in a short time, what decades of conferences and debates could not: create simple solutions to solve everyday problems. However, this acceleration would not have been possible without the technology having been created upstream for years.

At the Digital4Good Conference, experts presented their perspectives on what has already been done and how much still can be done by the social sector to make the world better, taking advantage of the existing infrastructure. Applications to help combat climate change and food waste, to promote health, and education were just some of the examples presented. But, above all, it is essential to create a collective conscience, a set of values, a new model of digital democracy with skills to distinguish good from evil, to understand what are facts and what is fake.

As Stephen Hawkings said, "AI is likely to be either the best thing or the worst thing that happened to humanity".

António M. Feijó I President of the Calouste Gulbenkian Foundation

The pandemic has accelerated the ongoing digital transformation. But there is still a long way to go, said António Feijó at the opening session of the Digital4Good International Conference - Challenges of the Digital Revolution for the Social Sector. It is necessary to prepare non-governmental organisations and people to deal with changes in this new reality, taking advantage of challenges and opportunities.

The president of the Calouste Gulbenkian Foundation thus opened the conference aimed at civil society organisations, but also open to academy, companies and the general public. During the conference, the digital revolution was approached from a multiplicity of perspectives, including civic participation and human rights; education and social inclusion; environment and climate change, as well as a look at regulation and ethics in the digital world.

A BETTER PREPARED CIVIL SOCIETY WITH THE HELP OF TECHNOLOGY

It is a fact that the digital revolution has contributed to an increase in civic participation, but as much as technologies can be empowering tools, they can also be used to undermine democracy itself. The solution to this paradox involves providing more reliable information and investing in education and digital literacy.

In the past few decades, we have all witnessed how the digital revolution has contributed to an increase in civic participation around the world. The dissemination of information and knowledge through the Internet, advances in communication technologies and the level of networking enabled by social networks "have been decisive to increasing civic awareness and participation in democratic life", said Tove Bruvik Westberg, Ambassador of Norway to Portugal, at the Opening Session of the Digital4Good Conference.

The case of Iran, where social networks served to protest against the morality police, or Volodymyr Zelensky's use of digital tools to show the world what is happening in Ukraine, were recent examples pointed out.

The development of digital technologies has also been fundamental for improving efficiency, transparency, and accountability of governments, administrations, companies and civil society organisations and has permitted reducing the gaps between many corporations and their publics.

It is also a fact that the trend towards digitisation has been accelerated by the COVID-19 pandemic. There was an extraordinary response from governments, technology companies and many other organisations that managed to maintain their activity, but at the same time gaps

"We must realise that, at the end of the day, digital tools are just that: tools

Tove Bruvik Westberg I Ambassador of Norway to Portugal

10:00 – 12:00 PLENARY SESSION

KEYNOTE
Lucy Bernholz I Digital Civil Society Lab at Stanford University

PANEL OF SPECIALISTS
Geoff Mulgan I Faculty of Engineering Sciences, University College London
Alexiei Dingli I Faculty of Information & Communication Technology, University of Malta
Giulia Carosella I IDC – European Digital Transformation Practice Lead
Filipe Santos I Católica Lisbon School of Business and Economics, UCP

MODERATION
Rosália Amorim I Journalist

in terms of the quality of access to technology were also noticed, such as the examples of schools without internet or families without the ability to buy computers or Wi-Fi.

For Tove Bruvik Westberg, we must realise "that, at the end of the day, digital tools are just that: tools".

The trend towards digitisation was also helped by the willingness and ability of all those who embraced technologies during this period to continue with their work, their studies and their social and cultural activities, noted the Norwegian ambassador before concluding her speech.

FOR THE CREATION OF A NEW, MORE PARTICIPATORY MODEL OF DEMOCRACY

" Technology exists, but it is necessary to be prepared for sources of change and uncertainty.

Lucy Bernholz

Unable to travel for health reasons, Lucy Bernholz, from the Digital Civil Society Lab, Stanford University, presented three opportunities that humanity is collectively facing and that are critical, both for the future of digital civil society and for the future of democracy.

Society, as a collective actor, needs to be committed to a new digital public infrastructure. This is related to the investments that need to be made in that infrastructure, which requires not only thinking about technologies and the digital objects themselves, but also the values and the structures that we'll build around those technologies to meet the key-middle word that is "public", when we talk about digital public infrastructure. Lucy Bernholz recalled that the world is changing. The technology exists, but it is necessary to be prepared for change and uncertainty. Climate change – but also war, or the economy – is, for example, generating migratory flows to more temperate or less dangerous regions. These populations that carry with them the need to live in democracy must be welcomed and a digital civil society has everything to do with it.

Furthermore, it is necessary to invest in institutional innovation, a process that is already underway. Lucy Bernholz explained that just as there has been a huge explosion of new technologies, a slower explosion is happening at the organisational level.

New formats of non-profit organisations, new types of associations that allow us to manage and destroy, when necessary, or allocate, when possible, digital resources and data that focus on the true values of civil society and democracy.

She gave practical examples of what is already being done. Concrete initiatives of what the collection of data for altruistic purposes can mean. For example, she presented an application in which people can upload pictures of animals and plants they come across in their daily lives. Through the identification of animals and plants it is possible to follow the subtle changes in the context of climate change. Lucy Bernholz gave multiple examples of applications that, although dispersed and fragmented, reveal a trend: the gradual construction of a system of non-profit entities that take advantage of available data and technology to find innovative solutions to solve age-old problems.

The third opportunity includes all of this in the context of reinvigorating the democracy. A healthy civil society is key to democracy. The civil society is where we have the greatest opportunity to act, to participate and use our imagination to create civil society, organisations, and practices and norms that serve greater good centred on justice. This opportunity involves greater civic participation, with new models of citizens' assemblies, as is already the case in countries that promote participatory budgeting. It is a movement that revitalises society, that creates involvement of populations in decision-making.

In practice, digital civil society transports us from an old system to new models of democracy. Indeed, Lucy Bernholz advocates the creation of a new, more participatory model of democracy that makes the existing model obsolete.

AN OPTIMISTIC VIEW WITH A SLIGHTLY MORE PESSIMISTIC STARTING POINT

We assume that technology has helped democracy and equality, but it's not that linear, began by saying Geoff Mulgan. "We look at countries like the US or like Brazil and we see depolarisation, corrosion of democracy, lies spreading and a series of changes to our lives and power which are deeply problematic and make us wonder what should we have done 20 or 30 years ago to stop this from happening", he said.

According to the professor at University College London, digital for good has four possible dimensions: use, shape, guide and imagine. Each one can be materialised in concrete current examples, as in Ukraine, where not only does President Zelensky use social networks as a means of communication and dissemination of the situation to the world, but also the country's citizens pass on valuable georeferencing information to their army, when they take pictures of Russian troops.

"We have never seen a war with so much citizen collected intelligence mobilised using technology. This is part of a much bigger field called open source intelligence of citizens generated data, rather than state intelligence agencies, and it will be the future", he said.

In terms of guidance, Geoff Mulgan pointed to regulatory initiatives, such as laws relating to Artificial Intelligence technology, considering that in this area it will be equally important to influence public and philanthropic R&D "which continues to come after commercial and military interests", he warned.

The high investment in innovation regarding the commercial and material world compared to the "very little" investment spent imagining a future that rethinks democracy, well-being, health, education, or global governance using digital for the common good was also criticised.

Geoff Mulgan I Faculty of Engineering Sciences, University College London

"All of those visions have to incorporate digital, but they can't only be digital, they also have to be about social imagination, institutional imagination and political imagination. This will be a crucial part of our task for the next few years".

In the beginning, today's digital age "was misunderstood in many ways", said Geoff Mulgan. "We failed to understand how much it empowers both big centralised power and decentralised power". Basically, the rise of platforms was, in the opinion of the university professor, a missed opportunity for civil society.

We will have to be "much smarter now", without repeating the mistakes of the past, as we think about a future that will have even more powerful technologies, such as AI or quantum computing. "That is our collective task as a community".

ARTIFICIAL INTELLIGENCE AT THE SERVICE OF HEALTH AND THE FIGHT AGAINST FOOD WASTE

Alexiei Dingli presented several use cases of applications created in Malta, which take advantage of Artificial Intelligence (AI) for various purposes.

The investigator at the Faculty of Information & Communication Technology, University of Malta, reminded that AI is neither science fiction nor something new. The technology has been there for a long time, although it is now more popular. The professor believes the applications should be as simple as possible and can make a real difference in people's wellbeing.

The speaker presented several solutions. "Save the Food" is a mobile app in which companies can upload information about the extra food they have. Then, non-profit organisations can use that information to collect and distribute food to those who need it. The application contributes to the fight food waste (20 to 30% of food is wasted worldwide every year). This corresponds to 88 million tons of food, equivalent to 143 billion dollars. In Malta, the waste is 22%, which represents 180 kilos per person per year. With this application, those who need it can have at least one quality meal a day, something they wouldn't be able to afford.

Another example given by Alexiei was an automated news aggregator application. The amount of news circulating on the Internet is immense, "we are drowning in information" and it is not always possible to perceive what is true or is fake news. In addition, many people tend to read only the title and at most the first paragraph of the news, which contributes to

"AI is neither science fiction nor something new. Technology has been there for a long time, although it is now more popular.

Alexiei Dingli

misinformation. With this application, a system was created that collects articles from different sources, consolidates them and builds a new article that allows people to create their own opinion, knowing how to distinguish good from bad sources. The professor warns, however, of the risk of a technology like this that, if used for evil, could create hundreds of fake news per minute. "And people are still unprepared for the fake news", he underlined.

Other applications developed by Alexiei's teams, using Virtual Reality, address health issues, to improve the lives of people with autism, with diseases like Schizophrenia, chronic pain, diabetes, cerebral palsy, or bionic hands developed with AI. VR is a powerful technology with enormous potential. For example, as a learning, teaching and training tool. Applications can be used "to help mental health nursing students to increase awareness and foster empathy for this condition". In the future, it may be used in patients and not just in training. Alexiei Dingli's teams are not experts in all these areas, but "we apply AI to all of them".

BETTING ON TECHNOLOGY TO DRIVE ESG PRIORITIES: THE BUSINESS PERSPECTIVE

We live in a time when companies are increasingly aware of the interdependence between environmental, social and economic issues and have therefore been integrating social responsibility initiatives into their strategies. The bet on technology to achieve these goals is a fact.

The growing adoption of the so-called ESG measures - Environmental, Social and Governance - is a reality. This is what a study carried out by IDC at the beginning of the year says, in which more than 70% of European CEOs surveyed say that environmental and social sustainability has become a key priority in their management strategies.

There are several reasons that lead these European companies to invest more in ESG, namely compliance with legislation, the acquisition of counterparties or the observance of corporate performance indicators, said Giulia Carosella. IDC's European Digital Transformation Practice Lead also added the change in expectations from customers, employees and shareholders that companies have to comply with, and in particular the fact that stakeholders are increasingly looking at the impact of the companies' actions on the environment.

Therefore, there is currently talk of a shift from a shareholder economy to a stakeholder economy: business value is no longer just defined only by the value of shares, with CEOs taking into account the opinions of the various stakeholders.

Another aspect highlighted is that, although there is a tendency to always think about issues related to the environment, ESG initiatives increasingly cover other topics such as, for example, diversity, social impact or work practices.

The results of the IDC study also indicate that spending on environmental sustainability in Europe is expected to reach US$100 billion in Europe by 2025 and that 73% of CEOs believe that investments in technology contribute strongly to meet ESG priorities.

More energy efficient data centres or innovative products that contribute to the circular economy or "zero waste" programmes, labour platforms, blockchain for responsible sourcing, ESG software or privacy compliance management technology are some examples where technology can help drive ESG initiatives.

"Technology can indeed play a fundamental role in driving ESG priorities", concluded Giulia Carosella.

Giulia Carosella I IDC – European
Digital Transformation Practice Lead

TECHNOLOGY IN FOUR DIMENSIONS: TRANSPARENCY, MOBILISATION, CONNECTION AND AUTOMATION

"Digital technology is a tool, a very powerful tool, that can be used for the good and for the bad depending on how it is deployed and mobilised.

Filipe Santos

Digital technology is a tool, a very powerful tool, that can be used for good or evil depending on how it is deployed and mobilised, requiring collective intelligence in our society to leverage the good application of technologies, said Filipe Santos, covering the topics presented by previous speakers.

 "I think about technology in four different ways. As a bringer of transparency, as an enabler of mobilisation, as a platform for connection, and as a deployer of automation", he began.

 We live in a world where nothing is hidden. And typically, that's good. "More transparency is better than less transparency", said the professor at the Católica Lisbon School of Business and Economics, UCP. With digital, transparency has become a must as scrutiny is tighter. The information can be found by hackers, activists, journalists, which is a deterrent to reprehensible behaviour. Referring to the immensity of data currently produced, Filipe Santos recalled that "data is not knowledge and knowledge is not understanding", and therefore it is necessary to take all the available data and turn it into something valuable for society to act on. But how? It is necessary to turn to experts who take the data, *analyse* it and process it them based on scientific evidence and without ideology involved. "Transparency must be in the hands of the experts", he said.

In the dimension of mobilisation, technology can be used to mobilises for good, for evil, or simply arise organically. This was the case of the Arab Spring, which emerged organically. It can be used for something innocuous, like getting people together to do a flash dance in the Gulbenkian's gardens, but it can be used for good – like Greta Thunberg's initiative, Fight for Our Planet – or for bad – when a gang leader mobilises elements to attack something or another group. The big question in this matter is the values, for example the values for humanity, the sustainable development goals, which we should think about when invited to mobilises.

 Together, transparency and mobilisation are the paradise for social activists who have the tools to involve society as a whole when alerting to a certain situation, pointed out Filipe Santos.

 As a platform for connection. It is a powerful tool in sharing, commonly used for non-profit purposes, and in transactions, generally used for profit purposes. Filipe Santos used the example of Wikipedia, an open platform for sharing knowledge that replaced traditional encyclopedias and made knowledge a common good available to all. On the other hand, transactional platforms allow us to buy online or be in contact with our doctor. Digital is a tool for prosperity and good, organisations are instruments to provide solutions for society in any model.

 Finally, automation. Today, one can track the performance of social services in a way that was previously impossible. Part of the services can be automated, taking advantage of AI, and when the services of greater added value can be performed by people. This represents cost savings on repetitive tasks, a value that can be reallocated to people performing higher-level tasks.

FOR THE DEVELOPMENT OF COMPETENCES AND REGULATION TOWARDS A NEW DEMOCRACY

During the debate that followed the morning presentations, the issues of artificial intelligence regulation, cybersecurity and the institutions we need to have in two or three decades were at the centre of the discussion. Geoff Mulgan stressed that the regulation must be developed by technicians and experts, with politicians having the role of creating the guidelines.

Alexiei Dingli pointed out that there is a general lack of knowledge about how the Internet or social networks actually work. This implies a more pressing focus on education, from an early age, to higher education "it's necessary to shake up the entire education system" and even in the workplace (upskill and reskill), added Giulia Carosella.

On the new model of democracy pointed out by Lucy, Filipe Santos agreed and added that, if on the one hand, technology already allows new models of participation and activism, on the other hand, old institutions - such as schools - do not change easily. The problem, once again, is not the lack of technology, which is a tool, but the change in mindset. It is also essential to strengthen ties between people, in all dimensions of life: from school to the neighbourhood. The happiest countries are those where there are relationships of trust. It is necessary "not to assume that everyone is an enemy" concludes Filipe Santos.

BREAKOUT THEMATIC SESSIONS

CIVIC PARTICIPATION AND HUMAN RIGHTS: EMPOWER PEOPLE'S VOICES THROUGH DIGITAL LITERACY AND CRITICAL THINKING

Towards a new digital utopia and the affirmation of eDemocracy

Imagine you could use social networks without your data being collected or sold, or using your smartphone without having all your movements tracked and recorded? Technologies like Web3, blockchain or universal basic ownership can help the change. eDemocracy and open source too.

We are leaving an era in which large technology companies had "the world at their feet", influencing governments and banks and obtaining disproportionate profits, with the possibility of entering a digital utopia, in which we are the owners and masters of our data and we can manage our assets, whether physical or digital, through the internet. This is the expectation of Clare E. Vassallo, from the Faculty of Arts, University of Malta, who started the panel «Civic participation and Human Rights: empower people's voices through digital literacy and critical thinking» of the Breakout thematic sessions: Digital social innovation in practice.

Companies like Amazon, Uber or Facebook were created on Web 2, although based on pre-internet business structures, based on profit and little concerned with the common good, to whom customers and consumers handed over their data, so precious for the purposes of marketing and commerce, sacrificing your privacy and often security. However, this is about to change.

Clare E. Vassallo I Faculty of Arts, University of Malta
Paulo Ribeiro I Linkare, Digital on Civic Participation
Maarja Leena Saar I Estonian Cooperation Assembly

MODERATION
Jaime Quesado I Expert in Innovation and Competitiveness

Clare E. Vassallo believes that realities such as Web3, blockchain and universal basic ownership could completely revolutionise the way we live, benefiting the common good and users rather than holders.

"Web3 promises a user owned platform with peer-to-peer contracts protected by blockchain and all sharing profits among the users who hold on to their data", she said. "More power to the people, that's what Web3 will be".

In the future, technology can bring new realities where decentralisation, blockchain, SSI and NFT, Web3, identity sharing, cryptocurrency and universal basic ownership will be keywords.

Based on the convergence of several technologies, but with blockchain as a critical component, the Economy of Things (EoT) will allow the transition to a future "where machines,

@Márcia Lessa

vehicles and robots are independent members of our societies", underlined the Professor of the Faculty of Arts, University of Malta. This with the particularity of blockchain allowing platforms and marketplaces to be created and managed by the people who use them, instead of large companies, she added.

"To me this looks like a revolution, a utopia, a possibility if it is allowed to develop and if enough people know about it and back this shift from Web 2 to a people powered peer-to-peer Web3", says Clare E. Vassallo.

More technology equals more democracy: an inaccurate formula

If we have more technology, do we have more democracy? Not necessarily. Just look at some of the countries considered advanced and we will probably find examples that are not so democratic, although technological development is a reality, recalled Maarja Leena Saar, during her speech.

The representative of the Estonian Cooperation Assembly spoke about the projects she managed in the area of eDemocracy and Open Data, sharing her experience and leaving some reminders. She noted, for example, that there is a lot of tendency for investments to be essentially directed towards

the technology part, ignoring the implementation part, when it is necessary to invest on both sides to make things work.

In an eDemocracy project, it will also be important to analyse the starting point, because it is different if a country already has digital registries, for example, or if is still taking the first steps in dematerialisation.

Maarja Leena Saar also defended that it is necessary to understand that public space also exists in the digital sphere. "I see open data and open technology as a civic space in information society", she underlined. As was said during the morning of the conference, she highlighted the thought that it is necessary to educate politicians so that they realise that we also have a public space of common good in the digital sphere, something that seems to be forgotten and has raised many questions.

Realising the value, political motivation, open data and creating new apps and services are the moments that, in the opinion of Maarja Leena Saar, should be part of the "mind map" of a virtuous cycle of investment in an eDemocracy project. Particularly considering that some of them will need a lot of specialised input "that is not just technical" and that should put people with different expertise – like IT, geography, and natural sciences - to communicate.

When open source is also a form of social innovation

Gone are the days when low cost was the main reason to invest in open source. Today, the choice is made for the possibility of accessing innovation, new technologies and achieving results in a good time to market, said Paulo Ribeiro during his speech on the panel.

The person in charge of Linkare said that the use of open source is growing, citing a study that indicates that around 8% of companies have increased the use of this type of solution over the past year.

Linux on supercomputers or in the public cloud, Apache on web servers, Android on smartphones are examples of how free software leads in innovation and in the market today. "It is everywhere. You can find open-source solutions in corporate IT systems, websites, mobile apps, big data, blockchain, IoT, AI, robotics, education, health, everywhere".

Open source is also a way of thinking and collaborating, underlined Paulo Ribeiro, as well as digital social innovation, as recognised by the United Nations or the European Commission. "The underline principle is that knowledge grows best through sharing and cooperation".

Paulo Ribeiro believes the value of the open source movement was proven with the response to COVID-19, as hundreds of solutions emerged, "some new, others improved based on existing solutions", for sharing information. Also medical equipment based on open hardware, apps for studying from home, chatbots for collecting information emerged in record time and took advantage of the concept of the open source idea, "from software to standards".

During Q&A, Paulo Ribeiro left a note of concern regarding the fact that people currently stick to online platforms in the cloud, based on free software, but based on lock in conditions, which do not allow them to change service provider.

"We have two or three major dominant players in the world market that nowadays use open source but we can't tell in the future", alerts Paulo Ribeiro.

EDUCATION: CHANGING THE WAY WE LEARN

Teachers cannot be replaced, but technology can help

How will we learn in the future? It also means thinking about how we will teach in the future. This was the main idea taken from the panel on education, one of four parallel sessions in the afternoon of the Digital4Good conference. It is not enough to give technology to schools to get better teaching. It is necessary to train teachers so that they can take advantage of technologies to teach better and, in this way, so that students learn better.

   The session moderated by Alexandre Homem Cristo, specialist in Public Education Policies, featured a panel of experts composed of Rui Grilo, from Microsoft, Cláudia Cristóvão, from Axians, and João Correia de Freitas, from the Portuguese Association of Educational Telematics.

   On the theme of the panel, "changing the way we learn", Alexandre Homem Cristo, added that it also means thinking about how we will teach in the future and how to prepare schools for the challenges that children will have to face in this changing and unpredictable world.

   "On the one hand, we have to have more flexible schools, better able to adjust to the needs of each student, better able to work collaboratively and have creative responses to the needs of students that can stimulate them", he summarised.

   Nevertheless, on the other hand, it is also necessary to "give conditions to schools – for training human resources, preparing infrastructure – so that schools are able to respond to this. It is not enough to distribute equipment, it is necessary to frame, train, and provide skills tools for the technology to be useful. In the end, what matters is that either there is learning, or it doesn't work. Moreover, we want solutions that work, concluded Alexandre Homem Cristo.

   More than technology in classrooms, it is

Rui Grilo I Microsoft, Education Sector
Cláudia Cristóvão I Axians, Global Business Development Manager for Education
João Correia de Freitas I Educom, Associação Portuguesa de Telemática Educativa

MODERATION
Alexandre Homem Cristo I Education Policy Expert

necessary to use it and know how to create solutions to improve teaching and learning. Computers locked in a room are useless.

   The effect of the pandemic on the democratisation of technologies that already existed, but that few knew about, must be leveraged by taking advantage of the moment. In just a few months, everyone in schools learned to work with videoconferencing applications and to take advantage of collaboration, something that technology has been trying to integrate into education for a long time.

   Rui Grilo has been responsible for the education sector for Western Europe at Microsoft (12 countries) for five years. During this time, a lot has changed, and the company has gone from a phase in which it was trying to make schools aware of the use of technologies to improve the learning experience. Suddenly, everybody needed the technology and people started asking for the technology. Now, in the aftermath of the pandemic, everyone has become familiar with technologies that already existed before the pandemic, but that few used. It is now important to take advantage of these skills that everyone now has and what we can do with the technology that is now more common.

Referring to examples of the beginning of confinement, in 2020, Rui Grilo pointed out that, in the Netherlands, it took three days to move from classroom lessons to distance learning, because each school already had a domain, and each child had their email and password. In other countries, it was more difficult, but Microsoft managed to create a "red carpet" to automatically create the domain and access for students and teachers in this emergency. Naturally, it was a process that took more than three days.

"The lesson learned is that there are investments that are needed to deal with change and be resilient. The main investment – in addition to a computer for each student – must be the creation of a digital identity managed by the Ministry of Education, schools or universities, in which there is connectivity, governance, security, and data privacy and in which each student and teacher have access to collaborate and use the tools available. It is now possible to re-imagine the school, integrating new technologies, taking advantage of data, improving content, considering the particularities of students (more introverted or with dyslexia problems, just to mention two examples).

Cláudia Cristóvão, Global Business Development Manager for Education, at Axians, recalled the accelerated pace of adoption of new technologies by schools that allowed the continuity of teaching during the pandemic. The expert explains that the solutions and tools made available to teaching are continually being developed and improved. According to Gartner, investment in digitisation of the education sector is increasing at a steady pace and above other sectors.

What is certain is that people are more prepared to use technologies. There are numerous platforms available and young people are experts in their use, hoping that education will follow their needs, but the educational sector is still not at the level of students' expectations, signals Cláudia Cristóvão. The widespread shortage of teachers in Europe and the effects of refugee children from Ukraine needing access to education are other current education challenges.

João Correia de Freitas, from the Associação Portuguesa de Telemática Educativa (Educom), which brings together teachers previously involved in a 1985 project aimed at introducing ICT in schools. The association was created to follow up on the initiative and avoid wasting the information collected. "The pandemic achieved in three days what I had been trying to do for thirty years, which was to convince teachers to use ICT in education", overstated. At March 19, 2020 "we had emergency remote teaching, which is not the same as distance learning, nor

technology-enhanced teaching. We could do a lot more with the knowledge accumulated since the 1980s".

Finding the balance between what you can do with technology and what you can use to improve learning. Rui Grilo says that it is necessary to identify where technology can be of benefit. "Turning a book into a pdf file loaded on a tablet has no pedagogical advantage. You're just reducing the weight you carry and creating the need for battery lifecycle management", said the education sector responsible at Microsoft. However, students can use Minecraft to recreate historical events in a pedagogical context or take advantage of virtual reality in subjects of history or geography to create immersive experiences that can contribute to their engagement. On the other hand, something simpler, like the possibility of working remotely and collaboratively on schoolwork or other projects. Having a chat so that the teacher can pass information to the students are simple tools that can easily contribute to the improvement of teaching, exemplified Rui Grilo.

Technology cannot replace teachers, but it needs to be useful, promoting creativity with the aim of creating better adults, said Cláudia Cristóvão. "The pandemic has shown us that schools and universities are not prepared to teach remotely. We lacked training, infrastructure, and tools" and,

although education is not prepared for a new pandemic, there are lessons learned which would make it more fluid.

If the school is responsible for making new teaching technologies available, teachers are responsible for transmitting knowledge to students and being facilitators, but, nowadays, they do not have sufficient autonomy. It is necessary that higher bodies, such as the Ministry of Education, investigate this, as the teacher's work is limited. João Correia de Freitas explained that 75% of what they teach is pre-programmed, making flexibility difficult. It is necessary to train and prepare teachers for new forms of teaching, including technologies in teacher assessment tests. By trying to be creative, the teacher puts at risk the failure to comply with the programme and the preparation of students for the entrance exams to higher education, concludes João Correia de Freitas.

"The pandemic has shown us that schools and universities are not prepared to teach remotely. We lacked training, infrastructure, and tools

Cláudia Cristóvão

HEALTH AND INCLUSION: NEW WAYS TO PROMOTE WELL-BEING FOR ALL

New ways to promote well-being, but without forgetting the human side

Technology allows the democratisation of health, making it more accessible. At the same time, it is very important for the training and education of health professionals, as well as for communication between patients and doctors. It may help to fill the need for resources in some areas, but it is not expected that it will replace the human component in others.

These were some of the conclusions drawn from the thematic session «Health and inclusion: new ways to promote well-being for all», which included the participation of Shawna Butler, Helena Canhão and Angelo Dalli. What forms does inclusion in health take and what it means, in particular, in the digital context were the questions posed by Catherine Mulligan, ERA Chair – Blockchain, at Instituto Superior Técnico, as a starting point for the debate.

For Shawna Butler, nurse and presenter of the SEE YOU NOW podcast, inclusion is a very broad circle, which includes the people who are being cared for and the people who are providing that health care, but also who prescribes the medicines, who pay for them, among others.

Inclusion also involves accessibility, and here we can talk about access to the devices in question or even the internet, through issues such as cost or robustness. It also involves involving people early on in defining the problem instead of companies coming to us to present ready-made products that can do this.

It is still very important in identifying the problem and the type of solutions to be developed. Above all, when it comes to developing solutions in the field of health, it will be important to "sit at the table" representatives of the various stakeholders, from experts to people who are familiar with the problem and who understand the suffering involved. "There we really get solutions that meet very different

Shawna Butler I Nurse Economist and host, SEE YOU NOW podcast
Helena Canhão I Patient Innovation
Angelo Dalli I UMNAI Malta

MODERATION
Catherine Mulligan I ERA Chair – Blockchain, Instituto Superior Técnico.

needs".

Helena Canhão also highlighted access as one of the key components when talking about inclusion. For the Professor of Medicine at NOVA Medical School and Coordinator of the Comprehensive Health Research Centre (CHRC), digital tools potentially allow reaching more people, but it is necessary to ensure, on the contrary, that the gap does not increase among the most vulnerable, with less literacy and education.

Another important aspect is clinical validation, as it often happens that there are products that work very well from a technology point of view, but have not been tested as a medical device or something that can be used to improve healthcare delivery.

"It is different to have a good technological product and a good clinical product. The two things must be linked". To achieve better results, it's good to get people with different backgrounds to communicate, she said, agreeing with what Shawna Butler had said moments before.

Angelo Dalli, who started developing software at a very early age and is now a specialist in Artificial Intelligence (AI), including managing a company providing AI solutions focused on deep tech, shared his optimistic view that AI can be an element of inclusion, for its egalitarian effect.

He admitted, however, that model validation is an important key issue that needs to be addressed and that one of the problems that

current AI faces is not being able to explain the basis of its decisions. "If a doctor gives us a diagnosis, but we can't explain why, we probably won't trust that doctor. The same goes for AI".

In addition, artificial intelligence technology also does not understand that explaining a diagnosis to a surgeon is different from explaining it to a patient, since we are talking about different levels of knowledge.

The risk of "digital for good" slipping into something less positive

Assuming herself to be a "scepticist" - an allusion to the middle ground between scepticism and optimism -, Shawna Butler defended that digital can become something less good if it accelerates inequality and leaves more people behind, is expensive, unreliable or people don't know how to use the new digital tools. The solution may be to bet on a "digital first" approach, pointed out the nurse.

Nor should we forget about basic things that include, for example, ensuring that doctors are able to interoperate equipment.

Another possibility that digital could be seen as a threat may be related to the issue of confidentiality and the whole ethical part of sharing information, stated Helena Canhão, namely with whom and where people consent to this information being shared.

Specifically with regard to artificial intelligence technology there are also "dark sides". Data can indeed be misused and unethical, agreed Angelo Dalli. "If AI is not aligned correctly, we can have results that are not really what we want".

The expert stressed that there is no easy way out of the problem. It will not be a technological or engineering solution, but rather a combination of legislation, governance and guidelines.

"But there's no guarantee about it and this is something that makes me a little bit worried: that digital for bad is always present on the background of the digital for good", he admitted.

Angelo Dalli shared another less positive point of AI, saying that it is an extremely complex technology that always needs a cause and effect. This makes it very difficult to explain exceptions, namely to make it understand that, at some point, it may reach the limit and need the help of a human.

Despite the cons, the application of AI in healthcare has significant advantages, from the ability to gather representative data to the important decision support capability, helping to set priorities, recalled Shawna Butler.

The ability to read images in large quantities, and to its advantage, is an excellent diagnostic tool, as it identifies patterns quickly, thanks to comparison, for example, added Helena Canhão.

For the Full Professor at NOVA Medical School, it is an important and useful tool, but it will not replace the human component, in her view "impossible to replace", for example, when it is necessary to give bad news about a diagnosis.

Shawna Butler shared the same idea, mentioning that there are already good technological tools, important in certain tasks and that, positively, can contribute to reducing the need for resources in the health area, but that this will free professionals for other functions and facilitate the "most human" parts of the job they have. "I do not at all share this idea that AI is going to replace humans. I think it will help us in our most human tasks", she concluded.

ENVIRONMENT AND CLIMATE CHANGE: MAKE A SUSTAINABLE WORLD

A sustainable economy must be based on data analysis

Energy is crucial for a sustainable economy and must be properly integrated into the price construction equation and the carbon footprint calculation of economic activities. Researchers and academia are prepared and have the technology to collect, analyse and use production chain data that is not always accessible. In addition, the message remains: the circular economy cannot be dissociated from the economy, it is an integral part of the economy, or so it should be.

The Academy and scientists play a key role in finding evidence-based solutions to create technology plans and solutions tailored to real needs, taking into account the environment and climate change. In the panel on the environment and climate change, moderated by Catarina Grilo, from Associação Natureza Portugal in partnership with WWF, scientists and researchers reflected on the impact of digitalisation on the environment. Tiago Domingos, Kristiina Kerge and Michael Parkes shared their experiences and regretted the lack of access to data.

Tiago Domingos divides his time between researching and solving real-life problems. In terms of research, the professor at Instituto Superior Técnico, University of Lisbon, has been trying to understand the impact of human activity and economic growth (an human invention with both positive and negative aspects) on biophysics. The professor explained that energy is crucial for economic growth and that this symbiosis must be considered when thinking about the future.

The scientist pointed out that people are optimistic when they think about the impact of digitalisation on climate change, decarbonisation and energy savings, but warns that the ideal path is not being taken. "Artificial intelligence algorithms are fantastic, but they are actually very dumb, taking a long time to train", explained

Tiago Domingos I Instituto Superior Técnico, Lisbon University
Michael Parkes I BIOS
Kristiina Kerge I Let's Do It Foundation

MODERATION
Catarina Grilo I ANP/WWF – Associação Natureza Portugal, in partnership with WWF

Tiago Domingos, "which requires huge amounts of computing power and energy consumption" which is naturally inefficient. As an entrepreneur, CEO and founder of a spin-off to Técnico, he worked on a large project that applies digitisation in favour of the environment. The system uses remote GPS sensors on the cattle that, through algorithms, optimise herd management, confirming that the cattle are, in net terms, good for the environment. By optimising herd management, it is possible to balance the emission of greenhouse gases.

Kristiina Kerge explained how data, environmental data and design can help citizens understand the impact of their actions on the environment, while providing decision makers with decision-making tools. The representative of Let's Do It Foundation in Estonia explained how the Things Foundation works, which collected data on the location of all waste collection points, containers, recycling bins, reuse centres and repair services. This data combined with clear signage that helps citizens and companies to know what to do with their waste "we give citizens tools to prolong the useful life of products by reusing or repairing them". These tools can also be used by companies or municipalities to improve waste management.

Kristiina Kerge spoke of applications and educational programmes that explain to city executives or workers, entrepreneurs and other stakeholders what it means to reduce our carbon

footprint and how they can teach and implement these theories and principles in all aspects of life. "After all, the circular economy cannot be dissociated from the economy, it is an integral part of the economy, or so we intend", she said.

Michael Parkes, BIOS, is an Australian who moved to Portugal and is developing an indoor vertical farm integrated with functional energy systems. A research project whose intentions end up colliding with the economic side of those involved who are focused from the first moment on knowing what they should produce to sell. The results of the work were recently published. The investigation seeks to answer questions posed by Parkes such as "what are the potential strategies to compensate for energy needs or what is the availability of excess renewable energy in that building to grow the plants inside this indoor vertical farm?" The results point to foods with a lower carbon footprint due to the circular design, if they are produced where they will be consumed, without the need for packaging, transport and possibility of recycling. Which is nothing new however, data was used.

And the prospect of digitisation must be integrated into the calculations. "How are we going to turn them into another carbon equivalent aligned with sustainable development goals?" The study results let us know that we need 17 litre of water to produce one kilo of micro-broccoli for our own consumption. It's quite efficient.

However, when we talk about a kilo of lettuce and tomato and we approach the industry to add value, we need to add productivity - 50 cents per kilo - to have a good salad. Nonetheless, without access to that information, the process slowed down. "We have the tools and technology to help us digitise, but we need access to the data. The big question is, "can we negotiate a contract to access the data?", or, are the companies interested in sharing data on the resources they use, such as water, energy, among others?

During the debate, experts sought to clarify the impact on the environment that the production of meat or processed soy products can have. The complexity of the soy derivatives production process can often be greater than that of meat production for consumption. However, everything always depends on the efficiency of intensive or extensive processes using more or less energy and water. "We can have [cattle raising]

> "**We can have [cattle raising] systems that are positive in terms of carbon, in which the carbon consumed is greater than that produced. But we have to be able to characterise the systems, which implies multiple variables.**
>
> Tiago Domingos

systems that are positive in terms of carbon, in which the carbon consumed is greater than that produced", explained Tiago Domingos. "But we have to be able to characterise the systems, which implies multiple variables". In terms of human behaviour, it is necessary to be able to transform scientific information into accessible and credible information that ends with the false information that states, for example, that "meat is always bad".

Every citizen and organisation has a key role to play in combating climate change. Although "it's easier to believe that someone will discover a machine that will solve all our problems related to CO2 emissions". According to Kristiina Kerge, this is a huge risk, because "decision makers don't feel the urgency to do something right now, to rethink the processes". She adds that "we can't believe we can recycle everything. On the other hand we can build better machines and algorithms to avoid waste. In addition, we can replace the plastic in packaging or single-use products with organic materials that in the end will simply disappear", she concluded.

Tiago Domingos added that, in addition to not being possible to recycle everything, there are cases in which recycling is not the best environmental option at all. Recycling is an energy-intensive process and often the best solution is to build again from new raw materials. Once again, the data can help in this decision making, being necessary to make these calculations. "We really need professionals to analyse things in depth, with a lot of data and calculations, with the involvement of stakeholders" to help with decision making.

In conclusion, quantifying problems is key to finding solutions.

ETHICAL ISSUES, CORPORATE GOVERNANCE AND REGULATORY CHALLENGES IN DIGITAL SOCIAL INNOVATION

PROMOTING A PEOPLE-CENTRIC DIGITAL INNOVATION STRATEGY

We are living in a digital revolution that raises several questions: how can we, as individuals and as a community, increase the benefits while reducing the risks in this process? How can we have an innovation strategy centred on people and at the same time guarantee the economic and social aspects? Under what ethical values or legal framework? In a single question, how can we develop digital for good?

The questions were a kind of challenge from Maria do Céu Patrão Neves to set the tone for the debate in the final plenary session of the Digital4Good Conference «Ethical issues, corporate governance and regulatory challenges in digital social innovation», which moderated and with the participation of Ciro Cattuto, Riitta Vänskä and Stefaan Verhulst.

In a set of introductory notes, Maria do Céu Patrão Neves, from the Faculty of Social and Human Sciences, University of the Azores, which is also a member of the National Ethics Council, highlighted what she considers to be the fundamental aspects to guarantee in order to develop digital for good.

From the outset, she stressed that ethics is not

FINAL PLENARY SESSION

Ciro Cattuto I CRT Foundation and ISI Foundation
Riitta Vänskä I Specialist, Digital Learning and Data Economy
Stefaan Verhulst I GovLab, New York University

MODERATION

Maria do Céu Patrão Neves I Faculty of Social and Human Sciences, University of Azores/Ethics National Council

an obstacle to technical progress, but rather a guide, "a prudent reflection and a wise guide with the aim of identifying and mitigating potential harm and promoting and improving potential benefits". Furthermore, digital governance and regulation must be based on values. "Only in this way can we effectively contribute to the development of a people-centred digital revolution".

Maria do Céu Patrão Neves also defended that there are basic ethical requirements to be addressed, namely ensuring universal access to the "fast, safe, stable" internet and that all people, regardless of age, are empowered with the necessary digital skills, including access to

digital literacy, formal and non-formal. Combating misinformation, not only improving digital literacy and critical thinking, but also strengthening legislation for online platforms and implementing transparency measures, and improving data management, giving people better control over their own data and increasing awareness of better application of existing data protection rules are also aspects that should be considered.

The ultimate goal is to promote a people-centric digital innovation strategy, including, for example, the right to switch off or the requirement for algorithmic transparency when AI is used in the workspace. "Businesses need access to secure data while the digitisation of public services needs to be encouraged", she said.

In her introductory notes Maria do Céu Patrão Neves also included references to the European Union's ongoing legislative strategy in the area of data, with the aim of promoting the internal exchange of data to ensure a free flow of quality data, while promoting a digital society, secure, resilient and reliable.

"The European Data Strategy focuses on putting people first in developing technology and upholding values and rights in the digital world, with the aim of delivering significant benefits to citizens and businesses".

The right data would have helped to anticipate the evolution of the pandemic

Ciro Cattuto began his speech with an invitation to reflect on COVID-19 being the first pandemic of the digital age and, more precisely, on whether we were prepared to deal with it. The representative of the CRT Foundation and the ISI Foundation answered his own question in the negative.

One of the big gaps was data sharing, he pointed out, noting that the right data would, for example, help to better anticipate the evolution of the pandemic.

"We were not prepared to use the right digital tools, in the right hands, at the right speed to respond to the pandemic. We could have done much better than what we did", said Ciro Cattuto.

We also didn't have the right infrastructure in place or the right interfaces and, even now, people are returning to their routines and suddenly it's no longer a priority to ensure such capabilities for the future pandemic, "which will actually happen", he criticised.

The answer will be, according to the official, in how we can create new types of digital products and what role will organisations, such as the Gulbenkian foundation, have in encouraging the creation of these products and in the development of a healthier ecosystem in terms of value we generate and how we share it.

"We were not prepared to use the right digital tools, in the right hands, at the right speed to respond to the pandemic. We could have done much better than what we did

Ciro Cattuto

All schools must start teaching children the importance of privacy

Riitta Vänskä is concerned with citizenship and citizens' reaction to digital transformation. She has 20 years of experience in international digital learning projects and is dedicated to the fair data project and was challenged to answer whether she considers citizens to be active agents of the digital revolution. The specialist in Digital Learning and Data Economy started by saying that only about 10% of citizens have already used their GDPR rights, which she considers insufficient.

   "The digital economy must be fair for everyone, for citizens, for society and for companies. None of these elements can be forgotten when we are developing a fair digital economy", explained the expert. She said that regulation has its role, and it is an important role, but we cannot think that regulation per se can help us to maintain our privacy. After all, each of us has little information about the data companies have about us and what they do with it.

   Riitta Vänskä believes that citizens need to be digitally active, to be empowered and

"The algorithms create profiles and manipulate people to do what they want and it's truly terrifying

Riitta Vänskä

to understand what the data economy is all about. In addition, young people are the most unconcerned about the loss of privacy, unaware that in addition to ads, companies constantly know where they are, with whom, what webpages they visit, who they call. With that information the algorithms create profiles and manipulate people to do what they want each one to do next and it's "truly terrifying". "All schools in all countries should start teaching children why privacy is so important and how it can be protected and what can be done to preserve it", an initiative that has already started in Finland.

   Nevertheless, there's still a long way to go because the teachers themselves don't talk to students about data privacy's economics, "because it's not in the programme".

@Laura Peralta

At the end of the "data divide": we can only do Digital4Good if we have data

Stefaan Verhulst believes that we can only have Digital4Good if we have data. The expert recalls that at first the concept of digitisation focused on disintermediation, decentralisation, creation of new powers, but what we did not anticipate is that digital transformation means the creation of more data, a massive datafication. From a universal point of view, from the moment someone digitise something, it becomes a data organisation with a data trail and the big ethical issue related to the misuse of that data trail.

The head of GovLab, at New York University, pointed out that it is necessary to identify the ethical implications of the potential misuse of data and collect less data. But that must be thought further. "We should start thinking about the ethical implications of the missed use of data. There is a lot of data out there, but it has not yet been possible to apply the data to the public interest objectives that are necessary and important to society".

An asymmetry of data is a fundamental ethical issue. "There is a divide between those who own data and those who need it. And we have not been able to bridge that gap, responsibly, with respect for human rights and, more importantly, creating insights that can contribute to informed decision-making", underlined Stefaan Verhulst.

For example, if a municipality wants to transform its city so that it is aligned with the needs of all genders, it may have difficulty finding the data. Urban mobility assumes that all genders have the same needs, but men and women move in different ways. If it were possible to understand how women move, it would be possible to transform public transport and mobility patterns according to the real needs of the population, he explained.

"We are failing as a society", he said. It is necessary to systematise based on three elements that allow us to deal with the data. It is necessary to specify what is in the data more clearly, for which the 100 questions that can be transformative if we have access to the data was developed. Likewise, it is necessary to create a role in companies called data steward who keep the data in an organisationally responsible manner so that it can benefit society, to whom can be requested the access to data. Stefaan Verhulst defends also more flexibility in informed consent for a purpose, and the creation of a social license to collect and use data in order to solve collective problems. "These elements allow us to revisit data asymmetry to benefit society, especially the social sector. After all, you can only do data4Good if you have data", concluded Stefaan Verhulst.

"Digital transformation means the creation of more data, a massive datafication

Stefan Verhulst

A LOOK AT THE FUTURE OF A MORE DIGITAL SOCIETY

Luís Madureira Pires I Director of Active Citizens Programme, Portugal

Luís Madureira Pires, director of Active Citizens Programme Portugal, closed the Digital4Good international conference, recalling the joint organisation of the initiative by Estonia, Malta, and Portugal, which had the participation of speakers from several countries.

The director of the Portuguese Active Citizens Programme believes "The Conference was very effective in meeting its purpose, to present state of the art and future trends of the digital agenda and its impact on the social sector; and to showcase how Civil Society Organisations have met the new challenges and seized opportunities to generate a transformational move to provide social responses and promote public good and well-being", points out Luís Madureira Pires.

Recalling the interventions and debates during the conference, highlighted seven key takeaways to be noted:

1. The digital revolution has empowered big tech and governments, as well as civil society. As much as digital technologies can empower and strengthen democratic participation, they can also be used to spread misinformation, influence, and control the public space and undermine democracy itself. This landscape provides plenty of new opportunities for non-profits.

2. Besides time and money, CSOs should also provide data, to defend and strengthen social justice and democracy. CSOs must also be more engaged in the design, implementation and control of digital infrastructure and technologies.

3. The digital – and its most updated tools, like open-source – face the challenge of reinforcing the **participation** capability of citizens, and the trust in their political decision-makers.

4. **Education** needs to be more flexible, more diverse, and more collaborative. Technology is an indispensable asset in this transition, but it is essential to make sure we are making evidence-based decisions, to know what works and doesn't work to make students learn better. The education system is slow to engage in digital transformation. Media learning should start in schools as early as possible.

5. Technology creates the possibility of democratising **healthcare**, making it more accessible. Digital tools are very important for the training and education of physicians, but also for communication between all the "players" (patients, physicians, support people). The use of technology, such as Artificial Intelligence, is already very important in the health sector. There are already good digital tools, and health professionals are using them for certain jobs, but those tools will not replace humans.

6. Regarding the **environment**, academic institutions and scientists have a key role in finding evidence-based solutions adapted to real needs. But they need data and human behaviour cannot be overlooked and must be considered to create useful applications for everyone. The challenge is to convince companies to disclose their data about factors such as water consumption, CO2 or land use that should be included in the price. Also, artificial intelligence is using a huge amount of energy whose environmental impact is not being accounted for. Quantifying the problems is key to finding solutions.

7. Advances in digital innovation raise **ethical questions**, which cannot be viewed as obstacles to progress, but rather as a commitment to a human-centred technological revolution. The major problems underlined were related to data, currently the world's most valuable resource (digital algorithms, personal data protection, data sharing and equity in data access). A values-based and risk-based regulation for digital transformation is deemed urgent.

The conference presented the state of the art and future trends of the digital agenda and its impact on the social sector

The director of Active Citizens Programme Portugal ended the day with a special note of appreciation to the keynote speakers, panellists, and moderators for their valuable contribution, remembering that the video of the conference can be seen on the programmeme's website.